



JOINT FLEET MAINTENANCE MANUAL (JFMM)

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VOLUME VI
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LIST OF EFFECTIVE CHAPTERS

Chapter Number	Change in Effect	Chapter Number	Change in Effect
FWD	Change -	22	Change -
1	Change -	23	Change -
2	Change -	24	Change -
3	Change -	25	Change -
4	Change -	26	Change -
5	Change -	27	Change -
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VOLUME VI
FOREWORD
INTRODUCTION

REFERENCES.

- (a) OPNAVINST 3120.32 - Standard Organization and Regulations of the U.S. Navy
- (b) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (c) COMLANTFLTINST 5400.2 - U.S. Atlantic Fleet Regulations
- (d) COMPACFLTINST 5400.3 - U.S. Pacific Fleet Regulations
- (e) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
- (f) SSPINST 4720.1 - Policies and Procedures for Alteration of Strategic Weapon System Equipment

LISTING OF APPENDICES.

A List of Acronyms

1.1 PURPOSE. To provide guidance in the execution and management for maintenance programs applicable to units of the Navy.

- a. The Foreword of this manual contains a master listing of all references used throughout the Joint Fleet Maintenance Manual. These references are arranged in alphanumeric order to facilitate their procurement for use with this manual. References used in specific chapters of this volume are listed at the beginning of each chapter in the order in which they appear in the chapter text.
- b. Acronyms are identified when they are initially used in each chapter of this volume. Appendix A of this chapter contains a master listing of acronyms used throughout all chapters of this volume.
- c. References (a) through (e) **must** be used in conjunction with this manual, however, the requirements of this manual **must not** take precedence over these higher authority directives, or technical directives from applicable Systems Commands (SYSCOM). Where conflicts exist with previously issued Fleet Commander, Commander, Naval Reserve Force (COMNAVRESFOR), Type Commander (TYCOM) letters, transmittals and instructions, other than references (c) and (d), this manual **must** take precedence. Conflicts **must** be reported to the cognizant TYCOM for resolution.

1.2 SCOPE. This volume applies to all ships and shore activities under the cognizance of Commander, Atlantic Fleet (COMLANTFLT), Commander, Pacific Fleet (COMPACFLT) and COMNAVRESFOR. This volume is not intended to be all encompassing, since the guidance for many elements of the maintenance programs and their execution are promulgated by higher **or** technical authority (e.g., Naval Ships' Technical Manuals (NSTM), Office of the Chief of Naval Operations Instruction (OPNAVINST)).

- a. This volume contains general programs applicable to all ships and units under the cognizance of COMLANTFLT or COMPACFLT. In those cases where chapters,

sections or paragraphs of chapters are not applicable to certain Forces, an applicability statement has been used for clarification.

- b. Equipment under the cognizance of Naval Sea Systems Command Nuclear Propulsion Directorate (NAVSEA 08) is maintained **per** NAVSEA 08 directives.
- c. Nuclear-Powered Ballistic Missile Submarine (SSBN) Strategic Weapon System (SWS) and Nuclear-Powered Guided Missile Submarine (SSGN) Attack Weapons Systems (AWS) equipment under the cognizance of Strategic Systems Programs (SSP) is operated, maintained, modified or modernized **per** approved SSP directives **and** instructions.
 - (1) Reference (f) defines policies, controls, processes and procedures for the accomplishment of all SSP Alterations (SPALT) issued by the Director, Strategic Systems Programs for all SSP cognizant equipment on both SSBNs and SSGNs. Reference (f) further defines the methodology and processes to plan, document, coordinate, install, and test SWS, AWS hardware, software and modernization SPALTs.
 - (2) Adherence to reference (f) ensures that all related or affected Equipment, Fleet Documentation, Training, Logistic and Maintenance functions under the cognizance of SSP are fully integrated as part of the SPALT. Only SSP authorized SWS **and** AWS SPALTs are installed on SSBNs and SSGNs.
 - (3) Applicable and required local support services such as Crane, Riggers, Power Isolation, Tag-Out, Hazardous Material, Quality Assurance, Critical Skill requirements, etc., for the conduct of a SPALT **must** be identified within the Director, Strategic Systems Programs SPALT document, related Ordnance Document, or SPALT installation pre-brief. This information **must** be communicated **or** provided to all involved and affected local activities **per** the SPALT process no later than forty-five (45) days prior to the conduct of a SPALT, as outlined and defined within reference (f).
 - (4) **An** SSP Contractor **or** Government Team **must** provide the required operational and engineering support for all SPALT, Maintenance and Repair Activities to SWS **and** AWS equipment under the cognizance of SSP. The respective responsibilities of SSP Contractor, Government Teams, the Fleet Maintenance Activity and other local Commands for the execution of the SSP SPALT program **must** be documented in an overarching Memorandum of Agreement in order to define areas of responsibility for all activities involved in the accomplishment of authorized alterations in a timely, efficient, and coordinated manner.

1.3 CHANGES AND CORRECTIONS. Changes and corrections will be issued as required. Comments and suggestions for improving or changing this volume are invited. Address comments, recommendations, and requested changes to Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity utilizing the change request form located in the front of this manual. If changes are submitted in electronic format, facsimile or E-mail, each change request **must** contain the information required on the change request form.

APPENDIX A**LIST OF ACRONYMS**

2-Kilo	3-M Maintenance Action Form
2M	Miniature/Microminiature
3-M	Maintenance and Material Management
3-MC	Maintenance and Material Management Coordinator
3-MPR	3-M Performance Rate
A&I	Alteration and Improvement
ACAT	Acquisition Category
ACCCIT	Aircraft Carrier Climate Control Investigating Team
ACF	Accomplishment Confidence Factor
ACN	Advance Change Notice
ACO	Administering Contracting Officer
ADP	Automated Data Processing
AEL	Allowance Equipage List
AER	Alteration Equivalent to Repair
AERP	Advanced Equipment Repair Program
AF	Advance Funding
AFOM	Alteration Figure of Merit
AIMD	Aviation Intermediate Maintenance Department
AIS	Automated Information Systems
AIT	Alteration Installation Team
Ao	Operational Availability
AOR	Area of Responsibility
AP	Advance Planning
APL	Allowance Parts List
APPN/PE	Appropriation/Preliminary Engineering
ARRS	Analysis, Records and Reports Section
ASI	Automated Shore Interface
ASTM	American Society for Testing and Materials
ATE	Automated Test Equipment
AWP	Availability Work Package
AWR	Automated Work Request
AWS	Attack Weapons Systems
BAF	Business Adjustment Factor
BART	Beartrap Acoustic Radiated Trials
BAWP	Baseline Availability Work Package
BCA	Business Case Analysis
BCE	Battery Charging Electrician
BCEF	Battery Charging Electrician Forward
BCR	Billet Change Request
BER	Beyond Economical Repair
BRB	Battery Record Book
BSC	Balanced Score Card

C4I	Command, Control, Communications, Computers and Intelligence
C5IMP	C5ISR Modernization Process
C5ISR	Command, Control, Communications, Computer, Combat Systems, Intelligence, Surveillance and Reconnaissance
C5RA	Command, Control, Communications, Computers and Combat Systems Readiness Assessment
CAL STD	Calibration Standard
CAQAP	Contract Administration Quality Assurance Program
CAR	Corrective Action Request
CAS	Contract Administration Services
CASCAN	CASREP Cancellation or Cancellation of Casualty Report
CASCOR	CASREP Correction or Correction of the Casualty in the Casualty Report
CASREP	Casualty Report
CBA	Cost Benefit Analysis
CCA	Commercial Calibration Activity
CCT	Customer Contract Team
CD-ROM	Compact Disk - Read Only Memory
CEIPRP	Continuous Estimating Incremental Planning Review Process
CFOSS	Cargo Fuel Operational Sequencing System
CFT	Cross Functional Team
CHENG	Chief Engineer
CM	Continuous Maintenance
CMAV	Continuous Maintenance Availability
CMF	Confidence Management Factor
CMO	Contract Management Office
CMP	Class Maintenance Plan
CNO	Chief of Naval Operations
CNRMC	Commander, Navy Regional Maintenance Center
COMUSFLTFORCOM	Commander, United States Fleet Forces Command
COMLANTFLT	Commander, Atlantic Fleet
COMLOGWESTPAC	Commander Logistics Western Pacific
COMNAVAIRFOR	Commander Naval Air Forces
COMNAVAIRLANT	Commander Naval Air Force Atlantic
COMNAVAIRPAC	Commander Naval Air Force Pacific
COMNAVAIRSYSCOM	Commander, Naval Air Systems Command
COMNAVRESFOR	Commander Naval Reserve Force
COMNAVSEASYSYSCOM	Commander, Naval Sea Systems Command
COMNAVSURFGRUMIDPAC	Commander Naval Surface Group Middle Pacific
COMNAVSURFGRUPACNORWEST	Commander Naval Surface Group Pacific North West
COMNAVSURFLANT	Commander Naval Surface Force Atlantic
COMNAVSURFOR	Commander Naval Surface Forces

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COMNAVSURFPAC	Commander Naval Surface Force Pacific
COMPACFLT	Commander, Pacific Fleet
COMPATRECONFORLANT	Commander Patrol Reconnaissance Forces Atlantic
COMPATRECONFORPAC	Commander Patrol Reconnaissance Forces Pacific
COMSPAWARSSYSCOM	Commander, Space and Naval Warfare Systems Command
COMSUBGRU	Commander Submarine Group
COMSUBLANT	Commander Submarine Force Atlantic
COMSUBPAC	Commander Submarine Force Pacific
COMSUBRON	Commander Submarine Squadron
COMUSFLTFORCOM	Commander United States Fleet Forces Command
COSAL	Coordinated Shipboard Allowance List
CPARS	Contractors Performance Appraisal Reporting System
CPO	Chief Petty Officer
CPR	Calibration Problem Report
CQA	Contract Quality Assurance
CREI	Cost Reduction and Effectiveness Improvement
CRES	Corrosion Resistant Steel
CRL	Calibration Requirements List
CS	Combat Systems
CS/CCS	Command and Control Systems
CSMP	Current Ship's Maintenance Project
CSP	Commercial Service Provider
CSPE	Combat Systems Project Engineer
CTL	Class Team Leader
CTRA	Consolidated TMDE Readiness Assessment
CVF	CSMP Validity Factor
CVN	Nuclear Powered Aircraft Carrier
CWP	Controlled Work Package
CYBERFOR	Cyber Force
DCMA	Defense Contract Management Agency
Det/DET	Detachment
DFS	Departure From Specification
DIRSSP	Director, Strategic Systems Programs
DLR	Depot Level Repairable
DMP	Depot Modernization Period
DO	Duty Officer
DoD	Department of Defense
DPP	Deployment Preparation Period
DRRS	Defense Readiness Reporting System
DS	Dry Deck Shelter
DSN	Defense Switched Network
DSRA	Dry-Docking Selected Restricted Availability
DSS	Deep Submergence System
EDO	Engineering Duty Officer
EGL	Equipment Guide List

EIC	Equipment Identification Code
EM	Electronic Module
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMO	Electronics Material Officer
EOC	Equipment Operational Capability
EPCP	Electric Plant Control Panel
EPY	Expanded Planning Yard
EQOL	Enhanced Quality Of Life
ERR	Engineering Readiness Review
ESC	Executive Steering Committee
ESD	Electrostatic Discharge
ESL	Equipment Status Log
ETR	Estimated Time to Repair
FC	Field Change
FCA	Field Calibration Activity
FCFBR	Fleet COSAL Feedback Report
FDRMC	Forward Deployed Regional Maintenance Center
FFP	Firm Fixed Price
FLR	Field Level Repairable
FMA	Fleet Maintenance Activity
FMP	Fleet Modernization Program
FMPMIS	Fleet Modernization Program Management Information System
FPY	First Pass Yield
FRTTP	Fleet Response Training Plan
FS&L	Food Service and Laundry
FTA	Fleet Technical Assistance
FY	Fiscal Year
GAPM	Government Availability Planning Manager
GDSC	Global Distance Support Center
GFM	Government Furnished Material
GPETE	General Purpose Electronic Test Equipment
GSI	Government Source Inspection
HIP	Hull Integrity Procedure
HM&E	Hull, Mechanical and Electrical
HMERA	Hull, Mechanical, Electrical Readiness Assessment
HRMC	Hawaii Regional Maintenance Center
HW	Hot Wash
HWAT	Hot Wash Analysis Team
ICAS	Integrated Condition Assessment System
ICCP	Impressed Current Cathodic Protection
ICR	Independent Cost Review
ICV	Individual Cell Voltage
IGE	Independent Government Estimate
ILRRR	Inflatable Life Raft Recertification Record

ILS	Integrated Logistics Support
IMA	Intermediate Maintenance Activity
IMF	Intermediate Maintenance Facility
IMI	Intermodulation Interference
INSURV	Board of Inspection and Survey
IPE	Industrial Plant Equipment
IPTD	Integrated Project Team Development
ISEA	In-Service Engineering Activity
ISIC	Immediate Superior In Command
IT	Information Technology
ITP	Integrated Test Plan
IUID	Item Unique Identification
JCN	Job Control Number
JFMM	Joint Fleet Maintenance Manual
JQR	Job Qualification Requirement
JRMC	Japan Regional Maintenance Center
JSN	Job Sequence Number
LAR	Liaison Action Request
LCAC	Landing Craft Air Cushion
LCM	Life Cycle Manager
LCS	Littoral Combat Ships
LCSRON	Littoral Combat Ships Squadron
LDS	Logistics Data System
LLC	Lessons Learned Conference
LLTM	Long Lead Time Material
LMA	Last Maintenance Action
LMA	Lead Maintenance Activity
LOA	Light Off Assessment
LOD	Letter of Delegation
LOEP	List Of Effective Pages
LSD	Logistics Support Data
LTD	Logistics Technical Data
LWC	Lead Work Center
MACHALT	Machinery Alteration
MARMC	Mid Atlantic Regional Maintenance Center
MAT	Maintenance Assist Team
MCF	MDS Confidence Factor
MCMS	METBENCH Calibration Management System
MCV	Maximum Corrected Voltage
MDCO	Maintenance Document Control Office
MDS	Maintenance Data System
MDT	Mean Down Time
MEASURE	Metrology Automated System for Uniform Recall and Reporting
METCAL	Metrology and Calibration
MFOM	Maintenance Figure of Merit

MFOMa	Average Maintenance Figure of Merit
MFOM _w	Weighted Maintenance Figure of Merit
MILCON	Military Construction
MILSPEC	Military Specification
MIP	Maintenance Index Page
MJC	Master Job Catalog
MMBP	Maintenance and Modernization Business Plan
MMP	Major Maintenance Period
MMPR	Maintenance and Modernization Performance Review
MOA	Memorandum of Agreement
MOGAS	Motor Gasoline
MP	Modernization Plan
MPR	MDS Performance Rate
MR	Maintenance Requirement
MRC	Maintenance Requirement Card
MRI	Machine-Readable Information
MRMS	Maintenance Resource Management System
MSDS	Material Safety Data Sheet
MSF	Magnetic Silencing Facility
MSRA	Module Screening and Repair Activity
MSS	Major Shore Spares
MTBF	Mean Time Between Failures
MTR	Module Test and Repair
MTRF	Module Test and Repair Facility
NACE	National Association of Corrosion Engineers
NAMTS	Navy Afloat Maintenance Training Strategy
NAVAIR	Naval Air Systems Command
NAVICP	Naval Inventory Control Point
NAVSEA	Naval Sea Systems Command
NAVSEA 08	Naval Sea Systems Command Nuclear Propulsion Directorate
NAVSEALOGCEN	Naval Sea Logistics Center
NAVSUP	Naval Supply Systems Command
NC	Critical Noise Deficiency
NCR	No Calibration Required
NDE	Navy Data Environment
NDE-NM	Navy Data Environment-Navy Modernization
NDT	Nondestructive Testing
NEC	Navy Enlisted Classification
NFE	No Fault Evident
NIIN	National Item Identification Number
NMD	Navy Maintenance Database

NPBI	NAVSEA Paint Basic Inspector
NPV	Net Present Value
NRMD	Nuclear Regional Maintenance Department
NRPO	Noise Reduction Petty Officer
NSA	Naval Supervisory Authority
NSN	National Stock Number
NSSC	Naval Submarine Support Center
NSTM	Naval Ship's Technical Manual
NSWC	Naval Surface Warfare Center
NSWCCD	Naval Surface Warfare Center, Carderock Division
NSY	Naval Shipyard
NTIRA	Navy Tool for Interoperability Risk Assessment
NUCALT	Nuclear Alteration
NWRMC	Northwest Regional Maintenance Center
OARS	Open Architecture Retrieval System
OEM	Original Equipment Manufacturer
OJT	On the Job Training
OMMS	Organizational Maintenance Management System
OMMS-NG	Organizational Maintenance Management System – Next Generation
OOC	Out Of Commission
OOD	Officer Of the Deck
OPALT	Operational Alteration
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction
OPTAR	Operating Target
OQE	Objective Quality Evidence
ORATA	Other Restricted Availability/Technical Availability
ORDALT	Ordnance Alteration
PARM	Participating Acquisition Resource Managers
PCD	Production Completion Date
PCMS	Passive Countermeasure System
PCP	Process Control Procedures
PDS	Product Data Sheet
PE	Procedure Evaluation
PEO	Program Executive Officer
PEP	Plant Equipment Project
PFR	Periodic Force Revision
PHD	Port Hueneme Detachment
PHNSY	Pearl Harbor Naval Shipyard
PHNSY-IMF	Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility
PIRA	Pre-Inactivation Restricted Availability
PLAD	Plain Language Address Directory
PM	Program Manager

PMR	Periodic Maintenance Requirement
PMS	Planned Maintenance System
PMSCA	Preventive Maintenance System Coordinating Activity
PMT	Performance Monitoring Team
POC	Point of Contact
POM	Pre-Overseas Movement
P-OMMS	Propulsion - Organizational Maintenance Management System
PPE	Personal Protective Equipment
PPR	PMS Performance Rate
PQS	Personnel Qualification Standard
PR	Procedure Review
PRWL	Planned Refit Work List
PSIA	Private Sector Industrial Activity
PSNS	Puget Sound Naval Shipyard
PSNS-IMF	Puget Sound Naval Shipyard and Intermediate Maintenance Facility
PT	Project Team
PVI	Product Verification Inspection
PY	Planning Yard
QA	Quality Assurance
QAR	Quality Assurance Representative
QBR	Quarterly Battery Report
QC	Quality Control
QOS	Quality of Service
QOL	Quality of Life
RAB	Registrar Accreditation Board
RAF	Reporting and Automated Shore Interface Processing Confidence Factor
RAR	Recorded Accomplishment Rate
RCC	Regional Calibration Center
RCM	Reliability Centered Maintenance
RCP	Recommended Change Package
REC	Re-Entry Control
RFA	Ready For Accomplishment
RFI	Ready For Issue
RH	Relative Humidity
RIP	Readiness Improvement Program
RLP	Regional Loan Pool
RMAIS	Regional Maintenance Automated Information System
RMC	Regional Maintenance Center
ROI	Return On Investment
ROV	Repair Other Vessel
RPCCR	Reactor Plant Configuration Change Report
RPPO	Repair Parts Petty Officer

RPSM	Reactor Plant Ship Modification
RSG	Regional Support Group
SC	Ship Change
SCAT	Sub-Category
SCD	Ship Change Document
SCLISIS	Ship's Configuration and Logistics Support Information System
SCN	Ship Conversion Navy
SCP	System Calibration Procedures
SDI	Ship's Drawing Index
SEF	Ship's Equipment File
SEMAT	Systems and Equipment Material Assessment Team
SEMCIP	Shipboard Electromagnetic Compatibility Improvement Program
SEOC	Submarine Engineered Operating Cycle
SERMC	Southeast Regional Maintenance Center
SF	Ship's Force
SFWL	Ship's Force Work List
SG	Specific Gravity
SGCP	Shipboard Gage Calibration Program
SHIPALT	Ship Alteration
SHIPMAIN	Ship Maintenance
SHW	Super Hot Wash
SISCAL	Shipboard Instrumentation System Calibration
SKED	Scheduling Software
SLICR	Ship's Logistics Indicator Computerized Report
SMART	Submarine Modernization and Alteration Requirements Tool
SME	Subject Matter Expert
SMS	Submarine Maintenance Standard
SNAP	Ship's Non-Tactical Automated Data Processing System
SOC	Scope of Certification
SOS	Source of Support
SOVT	System Operation Verification Testing
SPALT	Strategic Systems Programs Alteration
SPAWAR	Space and Naval Warfare Systems Command
SPETE	Special Purpose Electronic Test Equipment
SPETERL	Ship's Portable Electronic Test Equipment Requirements List
SPM	Ship's Program Manager
SPRUCE	Scheduled Preservation Upkeep Coordinated Effort
SRA	Selected Restricted Availability
SRF	Ship Repair Facility
SRF-JRMC	Ship Repair Facility and Japan Regional Maintenance Center
SSBN	Nuclear-Powered Ballistic Missile Submarine
SSES	Ship Systems Engineering Station
SSGN	Nuclear-Powered Guided Missile Submarine

SSM	Ship Systems Manual
SSP	Strategic Systems Programs
SSPC	Society for Protective Coatings
SSPINST	Strategic Systems Programs Instruction
SSR	Ship's Selected Records
ST1	Surface Team One
STAARS	Submarine Technical Assistance Assessment and Reporting System
STAN	Shipboard Electromagnetic Compatibility Improvement Program Technical Assistance Network
STSC	Submarine Technical Support Center
SUBMEPP	Submarine Maintenance Engineering, Planning and Procurement Activity
SUBSAFE	Submarine Safety
SUPSHIP	Supervisor of Shipbuilding
SUPSHIP NN	Supervisor of Shipbuilding Newport News
SURFMEPP	Surface Maintenance Engineering Planning Program
SURFOR	Surface Force
SWE	Surface Warfare Enterprise
SWLIN	Ship Work List Item Number
SWRMC	Southwest Regional Maintenance Center
SWS	Strategic Weapon System
SYSCOM	Systems Command
TA	Technical Analyst
T/A	Type of Availability
TAAS-INFO	Tech Assist, Assessments and Scheduling Information
TAMS	TYCOM Alteration Management System
TAMS	Test and Monitoring System
TAR	Technical Analysis Report
TAT	Technical Assessment Team
TAVR	Technical Assistance Visit Report
TCV	Total Corrected Voltage
TDC	TYCOM Discretionary Change
TDMIS	Technical Document Management Information System
TEMPALT	Temporary Alteration
TFBR	Technical Feedback Report
TFBR HT	Technical Feedback Report History Tracking
TMA	Top Management Attention
TMDE	Test, Measurement and Diagnostic Equipment
TMDER	Technical Manual Deficiency Evaluation Report
TMI	Top Management Issues
TOMA	Technical Onboard Monitoring Assist
T(pf)	Time (problem free)
TPOC	Technical Point of Contact
TPS	Test Program Set
TRF	TRIDENT Refit Facility

TRID	TRIDENT Alteration
TRIPER	TRIDENT Planned Equipment Replacement
TRIREFFAC	TRIDENT Refit Facility
TRS	Technical Repair Standard
TSRA	Total Ship's Readiness Assessment
TVG	Temperature Voltage Gassing
TWH	Technical Warrant Holder
TYCOM	Type Commander
TYKIT	TYCOM Alteration Kit
TZ	Type Zero
UIC	Unit Identification Code
UPCP	Universal Process Control Procedure
URO	Unrestricted Operation
VIDS/MAF	Visual Information Display/Maintenance Action Form
WC	Work Center
WCS	Work Center Supervisor
WCWL	Work Center Work List
WFD	Work Force Development
WFT	Wet Film Thickness
WP	Work Package
WPER	Work Package Execution Review
WPIC	Work Package Integration Conference
WPS	Work Package Supplement
WSS	Weapons System Support

VOLUME VI**CHAPTER 1****WATERBORNE UNDERWATER HULL CLEANING****REFERENCES.**

- (a) NAVSEA S9086-CQ-STM-010 - NSTM Chapter 081 R4 (Waterborne Underwater Hull Cleaning of Navy Ships)
- (b) NAVSEA 389-0288 - Radiological Controls
- (c) NAVSEA S0600-AA-PRO-010 - Underwater Ship Husbandry Manual

1.1 **PURPOSE.** To implement the program requirements delineated in references (a), (b) and (c), and to provide guidance for waterborne hull cleaning of naval ships. This process applies to all surface force ships, submarines and aircraft carriers.

1.2 **SCOPE.** As stated in reference (a), commercial and Naval experience has demonstrated that appreciable savings in energy are obtainable by maintaining smooth underwater hull and propeller surfaces through periodic waterborne hull cleaning. Additionally, a hull-cleaning program provides a means in which hull damage can be detected in early stages and corrective action can be taken. The hull cleaning and propeller polishing requirements of this instruction apply to all ships. It is intended to conserve fuel, restore effectiveness of sonar systems, and reduce ship self-noise, which increases anti-submarine warfare effectiveness. Reference (a) provides necessary criteria, methodology, and guidelines for waterborne underwater ship inspection and cleaning. Reference (a) provides a rating scale for inspecting and reporting fouling, fouling thresholds to initiate cleaning, approved cleaning equipment for various underwater ship systems (i.e., hull sections, appendages, dome, masker or prairie air), cleaning requirements, safety precautions and procedures for cleaning, guidelines for establishing cleaning intervals and documentation and reporting requirements. To meet the objectives of reference (a), special attention will be given to ensure that appropriate action will be taken to clean ships within 30 days of deployment.

1.3 POLICY.

- a. Scheduling of periodic cleaning will be the responsibility of the Type Commander (TYCOM) and accomplished per reference (a). Full, partial and interim cleaning must be accomplished by diving activities (military and civilian) certified by Naval Sea Systems Command (NAVSEA) code 00C.
- b. Full hull cleaning will only be accomplished by NAVSEA divers contracted for worldwide waterborne underwater hull cleaning services. Interim or partial hull cleaning will be done by a certified navy activity or NAVSEA contracted service.
- c. The execution of waterborne underwater hull cleaning operations must follow best management practices delineated in reference (c) to maximize hull-cleaning effectiveness and to minimize the release of hull cleaning by-products into surrounding waters.

1.4 **RESPONSIBILITIES.** An effective hull-cleaning program that ensures the delivery of reliable, environmentally sound, and quality services to the Fleet requires the well-coordinated effort of several organizations. Together, these groups must manage the planning, execution,

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quality assurance, inspection and condition-reporting functions necessary to ensure the work is performed efficiently and **following** technical specifications. Reference (c), Chapter 28, Appendix A, Section II specifies the responsibilities for each organization (NAVSEA code 00C, Commander United States Fleet Forces Command, TYCOMs, On-Scene Navy Representative, and the Ship's Chief Engineer) involved in the hull cleaning program.

1.5 REPORTS. All waterborne underwater hull cleaning and inspection **must** be documented and submitted to the respective TYCOM and NAVSEA 00C for review. Documentation for cleaning submarines **must** also be transmitted to SUBMEPP Code 1844. Documentation for cleaning and inspection of aircraft carrier hulls **must** also be transmitted to PMS 312C Carrier Planning Activity, Code 22. Inspection results **must** be recorded on the standard Diver Hull Inspection Data form (NAVSEA 4730 available on-line at <http://www.supsalv.org>). The inspection documentation may be mailed or electronically stored and transmitted to the appropriate organizations.

Mailing addresses are:

COMNAVSEASYS COM

Attn: NAVSEA 00C5

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VOLUME VI**CHAPTER 2****FLEET TECHNICAL ASSISTANCE****REFERENCES.**

- (a) COMUSFLTFORCOM/COMPACFLTINST 3501.3 - Fleet Training Continuum
- (b) OPNAVINST 3000.15 - Fleet Response Plan (FRP)

LISTING OF APPENDICES.

- A Area Regional Maintenance Center Fleet Technical Assistance Contact Information
- B Sample Technical Assistance Visit Report (TAVR) Message
- C Sample E-MAIL Technical Assistance Visit Report (E-TAVR)
- D Submarine Fleet Technical Support Providers Roles and Responsibilities.

2.1 **PURPOSE.** This chapter provides policy, procedures and guidance regarding utilization of Fleet Technical Assistance (FTA) program resources in support of all surface ships, aircraft carriers, submarines and craft. Commander, U. S. Fleet Forces Command and Commander, U.S. Pacific Fleet (COMPACFLT) Fleet Maintenance Officers (N43) will ensure that appropriate Fleet resources are available to provide technical assistance to the Naval operating forces under their cognizance.

2.2 **FLEET TECHNICAL ASSISTANCE DEFINITION.** FTA is the help that surface ships, aircraft carriers, submarines and craft request when they are unable to resolve equipment or software deficiencies using their own ships resources or other means available within their Strike Group. Paragraph 2.3 of this chapter lists FTA program exclusion items. Use of Regional Maintenance Center (RMC) or RMC-obtained resources for other purposes, such as non-Ship's Force repairs, assessments, Board of Inspection and Survey inspections, etc., is not considered a FTA but is addressed elsewhere in this manual or other policy guidance. All FTA requests will be responded to by the RMCs as defined in paragraph 2.4.1 of this chapter.

2.3 **FLEET TECHNICAL ASSISTANCE EXCLUSION AREAS.** RMCs are not responsible for technical assistance in the following areas:

- a. Naval Sea Systems Command (NAVSEA) 08 cognizant equipment.
- b. TRIDENT missile weapons systems.
- c. Aircraft.
- d. Catapults and arresting gear - Aircraft Launch and Recovery Equipment.
- e. Ordnance and munitions.
- f. Submarine Safety systems and components.
- g. Nuclear weapons.
- h. Special clearance carry-on equipment.
- i. Undersea and land-based surveillance equipment.
- j. Flight deck certification related systems and equipment.

- k. Diver life support systems.
- l. Non-Program of Record (pre-prototype) programs.
- m. Naval Supply Systems Command (NAVSUP) (e.g., Navy Cash)
- n. Navy Personnel Command (NAVPERS) (e.g., RAPIDS, MIAP, NSIPS)

2.4 FLEET TECHNICAL ASSISTANCE POLICY.

NOTE: WHEN CONTACTING THE NAVY 311 OR AN AREA RMC, UTILIZE SECURE COMMUNICATIONS AS APPROPRIATE TO MAINTAIN SECURITY OF CLASSIFIED EQUIPMENT AND OPERATIONAL PARAMETERS.

2.4.1 Requesting Assistance. It is important that ships develop and exercise self-sufficiency for shipboard system maintenance to the fullest extent possible. If unable to resolve a technical problem internally, or by other means available within their Strike Group, the ship **will** contact the Navy 311, who will route their request to the cognizant Area RMC. In the case where the applicable RMC representatives **or** Other Source of Support SMEs are onboard and available, ships may engage onboard SMEs for immediate support and will follow up with Navy 311 or the Area RMC. If personnel are not onboard, ships will contact Navy 311 or the Area RMC using the following procedures to request FTA:

- a. When a technical assistance requirement is identified, contact Navy 311 as described in paragraph 2.4.1.b of this chapter. Navy 311 will record the FTA request and forward to the appropriate RMC as outlined in paragraph 2.7.2 of this chapter using the contact information in Appendix A. Provide pertinent information listed in paragraph 2.4.2 of this chapter.
- b. Navy 311 can be contacted 24-hours a day via the worldwide web, by E-mail, via Naval message or via toll-free numbers as **indicated here**:
 - (1) SIPR **web** site: <https://www.navy311.navy.smil.mil/navy311/>
 - (2) NIPR **web** site: <http://www.navy311.navy.mil/>
 - (3) SIPR **e-mail**: Navy311@Navy.Smil.Mil
 - (4) NIPR **e-mail**: Navy311@Navy.Mil
 - (5) Message PLAD: NAVY THREE ONE ONE NORFOLK VA
 - (6) Telephone: Comm 1-855-NAVY-311 (1-855-628-9311), DSN 510-NAVY-311 (510-628-9311)

2.4.2 Required Fleet Technical Assistance Request Information. A Casualty Report (CASREP) solely to establish an FTA is not required. When requesting Technical Assistance, the following information is **necessary** to assist in a timely and accurate response, regardless if the RMC representative **or** Other Source of Support SME is onboard for immediate response:

- a. Job Control Number (JCN) (required) and Casualty Report (if applicable) numbers.
- b. Equipment identification: (Noun name, nomenclature, model, MK **or** MOD, etc.).

- c. Equipment failure mode: Detailed description of the nature of failure or casualty, including symptoms and operational condition at time of casualty, current symptoms and indications and any other relevant information available to assist in diagnosing the problem.
- d. Repair actions taken to date: [Include any extra-unit assistance (e.g., Ship Repair Facility, Tender, etc.)].
- e. Parts status: (Indicate spare parts required, estimated delivery date, document numbers, document status, etc., if known).
- f. Technical manual: (NAVSEA, NAVSHIPS, NAVORD Technical manual number or Commercial Off-The-Shelf manufacturer's publication identification, if available).
- g. Dates: (Include earliest through latest possible dates assist is required. Provide alternate dates if possible).
- h. Location: (Country, port, Naval Base, pier, berth, etc.).
- i. Contact information: (Ship **or** staff Point of Contact name(s) and rate **and** rank, DSN, INMARSAT, commercial phone numbers, FAX number, SIPRNET **or** NIPRNET E-mail addresses).
- j. Manufacturer of equipment for which assistance is required (if known).
- k. Equipment Allowance Parts List **or** Record Identification Number.
- l. Commanding Officer assessment as to effect on ship's mission in the event Distance Support is unsuccessful.

2.4.3 Chief of Naval Operations Availability Fleet Technical Assistance Procedures. Fleet units may request technical assistance while in a Chief of Naval Operations scheduled maintenance availability. The request must be submitted to the cognizant Area RMC, which will coordinate with the appropriate Naval Supervising Authority (NSA) (if not the same as the cognizant Area RMC) for technical assistance related to systems **or** equipment that are under the NSA's cognizance or are part of an availability work package. When the cognizant Area RMC is the NSA, the RMC will provide technical support. If not the NSA, the cognizant Area RMC may also do so, as necessary **and** coordinated with the NSA.

2.4.4 Initial Response. The initial response to all FTA requests will be via Distance Support. If the Operational Commander or Type Commander (TYCOM) determines on-site support is necessary, it is incumbent on them to inform the cognizant area RMC that on-site support is required.

2.4.5 On-Site Support. In a port without a RMC or while underway, if Distance Support is determined unsuccessful by the RMC, the Operational Commander or TYCOM will determine whether the cognizant Area RMC will transition to on-site assistance. In a port with a RMC, the RMC may determine transition to on-site support, as prioritized by guidance in paragraph 2.7.4a. of this chapter.

2.5 COMPLETION.

NOTE: THERE WILL BE OCCASIONS WHEN AN UNDERWAY SHIP MAY NOT REQUIRE ALL SYSTEMS TO BE FULLY OPERATIONAL. SUCH

**SYSTEM DEFICIENCIES MAY BE THE SUBJECT OF A CASREP OR
THEY MAY ONLY BE DOCUMENTED IN THE SHIP'S CURRENT SHIP'S
MAINTENANCE PROJECT.**

2.5.1 Fleet Technical Assistance Completion. To complete the FTA the ship must concur that the cognizant RMC **or** Other Source of Support has completed one of the following:

- a. The fault is resolved.
- b. Parts are identified to resolve the fault.
- c. Original fault troubleshooting is complete and the deficiency is identified (i.e., Ship understands what needs to be repaired).

2.5.2 Transition to Repair. A completed FTA may require a subsequent deferral (TA-1, TA-2) for repair activity action or Ship's Force corrective maintenance (TA-4).

2.6 RESPONSIBILITIES.

2.6.1 Ship's Commanding Officer. Ship's Commanding Officer will:

- a. Ensure all FTA requests are accurate, complete and timely.
- b. Ensure all FTA requests reference a JCN and contain a detailed problem description **per** paragraph 2.4.2 of this chapter to enable technical assistance personnel to adequately research the problem and provide timely and accurate technical assistance. Ensure the 2-kilo is up-lined within 24 hours.
- c. For FTA requests associated with systems that are not required to meet current/projected mission tasking, ensure associated CASREP, 2-Kilo, **or both**, address whether or not on-site assistance will be required if Distance Support is unable to resolve the issue.
- d. Ensure that TYCOM, Immediate Superior In Command (ISIC) and Operational Commander are kept informed of technical issues and technical assistance requests **following** existing guidance.
- e. While a ship is underway or in another port without a RMC, ensure Distance Support alternatives are exhausted before on-site technical assistance is requested. This policy is in place to ensure satisfactory crew and technical assistance personnel Distance Support procedure training and proficiency so they are able to efficiently use Distance Support when the ship is deployed.
- f. Ensure Ship's Force technicians who are qualified on the systems **and** equipment in question are available to support technical assistance personnel.
- g. Immediately upon completion of an on-site FTA visit per paragraph 2.5.1 of this chapter, the Fleet unit will release the FTA personnel. When redirection of the same personnel to other problems is desired, the Fleet unit will coordinate with the cognizant Area RMC.
- h. Ships will establish a central, secure E-mail account that will be available to all appropriately cleared technical assistance personnel who visit the ship. The account will be used by visiting technical representatives to communicate with their home

office or detachment for technical support **or** information. The account will be RMCTECHASSIST@Ship.navy.smil.mil where "Ship" is the name of the vessel.

- i. Ship will issue arrival **and** departure message keeping all apprised of technical representative movement.

2.6.2 Regional Maintenance Center Commanders. RMC Commanders will ensure:

- a. Sufficient capability exists to provide timely response to all requests for technical assistance, either with RMC personnel or other sources of support. The RMC is responsible for coordinating the response from other sources of support as detailed in paragraph 2.6.3 of this chapter.
- b. RMC mission funds are used to fund FTA efforts **per** paragraph 2.7.4 of this chapter.
- c. Technical support is provided to Fleet units **per** this directive. In the event there is a work priority conflict, the Area RMC will coordinate resolution with the appropriate TYCOM, Operational Commander or Fleet Maintenance Officer Staff, as necessary.
- d. The initial response to FTA requests is via Distance Support whether in port or at-sea. The use of Distance Support while the ship is in a port with a RMC is encouraged, although not required. It is a tool that can be utilized by the RMC in order to prioritize work assignments and service a wider customer base. On-site support while a ship is in a port with a RMC can allow for quicker identification of the problem and training of Ship's Force technicians. When Distance Support fails to meet the requirements of paragraph 2.5.1 of this chapter, the distance support provider will notify the cognizant Area RMC at the earliest opportunity. The cognizant Area RMC will determine what level of additional support is required and if on-site assistance is appropriate, based on guidance in paragraph 2.7.4.1 of this chapter. If appropriate, the Area RMC will provide on-site FTA from RMC resources or coordinate provision of on-site support from other government **or** contractor organizations as discussed in paragraph 2.6.3 of this chapter.
- e. Personnel responding to a request for technical assistance are thorough in their review of the specific technical problem, including system trouble shooting, fault isolation, root cause analysis, failed parts identification, logistic support and system restoration assistance while imparting the maximum amount of onboard maintenance training to Ship's Force personnel. Troubleshooting **must** be conducted **per** Volume V, Part I, Chapter 2, paragraph 2.4 of this manual.
- f. Acknowledgment and response to all FTA requests within 24 hours, via phone conversation, e-mail or Naval Message.
- g. Personnel providing on-site technical assistance keep the cognizant ship's department head or designated representative informed of the scope of the problem and the recommended corrective action.
- h. A message Technical Assistance Visit Report (TAVR) (Naval), in the format provided in Appendix B, is required at the completion of an on-site FTA anytime one or more of the following criteria are met:
 - (1) Personnel or Equipment safety issue.

- (2) Submarine FTA.
- i. An E-mail TAVR (E-TAVR), in the format provided in Appendix C, is required at the completion of an on-site FTA on Surface Force Ships **and** Carriers anytime one or more of the following criteria are met:
 - (1) C3 **or** C4 CASREP.
 - (2) Repetitive system **or** equipment failure or long-term improvement recommendations.
 - (3) FTA responsibility passed to another RMC or other Source of Support.
 - (4) Loss of mission capabilities (e.g., AAW, MOB, ASW).
 - (5) Significant follow-on repair recommendations.
 - (6) High visibility.
- j. Task other Source of Support provider who responds to an on-site FTA, coordinated by his **or** her RMC, to submit a TAVR as required by paragraph 2.6.3.e of this chapter or task them to provide the technical information necessary for the cognizant RMC to generate a TAVR.
- k. Submission of a message report if an on-site assist visit is terminated. Technicians who are not adequately supported by Ship's Force personnel **must** immediately notify the ISIC **or** TYCOM. If the lack of support by Ship's Force personnel cannot be resolved, then the technicians are authorized to depart the ship and terminate the visit. Termination of the ship visit under these circumstances will be detailed in a follow-up message to the appropriate TYCOM **or** ISIC with information to the appropriate Fleet Commander (N43).
- l. Track all requests for FTA using approved FTA software. Currently, this is the Tech Assist, Assessments and Scheduling Information (TAAS-INFO) for surface ships, and Submarine Technical Assistance Assessment and Reporting System (STAARS) for submarines.
- m. Ensure Submarine Warfare Federated Tactical System **or** Non-Propulsion Electronic System technicians providing FTA to submarines with systems, subsystems **or** equipment postured at the Sensitive Compartmented Information level are eligible for access to Sensitive Compartmented Information based on a current Single Scope Background Investigation.
- n. (Submarines Only) Accomplish assigned Fleet Technical Support as outlined in Appendix D.

2.6.3 Other Source of Support Providers. Examples of other source of support providers include: Naval Warfare Center, Original Equipment Manufacturer, commercial repair firms, Systems Command, non-RMC Naval Shipyard, other Area RMC, Propulsion Plant Engineering Activity, etc. Other source of support providers will:

- a. Acknowledge receipt of FTA assignment to the tasking Area RMC and the requesting unit.

- b. First, use Distance Support to resolve the problem. Provide the tasking Area RMC with timely Distance Support status and results.
- c. Coordinate with the tasking Area RMC and execute an on-site technical assist if Distance Support is unable to resolve the problem. Ensure personnel providing on-site technical assistance are thorough in their review of the specific technical problem, including system trouble shooting, fault isolation, root cause analysis, failed parts identification, logistic support and system restoration assistance, while imparting the maximum amount of onboard maintenance training to Ship's Force personnel.
- d. Ensure that personnel providing on-site technical assistance keep the cognizant ship's department head or designated representative and Area RMC informed of the scope of the problem and the recommended corrective action.
- e. At the completion of on-site technical assistance, comply with administrative requirements addressed in paragraph 2.8 of this chapter within 5 working days of the visit completion.
- f. In the cases where Other Source of Support SMEs are onboard and directly tasked by the ship to perform FTA beyond the original purpose of the on-site support, the responding activity will coordinate with the cognizant Area RMC and provide FTA data upon completion for tracking purposes. If the additional support will cause additional cost, the responding activity will need pre-approval from the cognizant Area RMC. The administrative requirements in paragraph 2.8 of this chapter also apply. Where Other Source of Support SMEs are onboard for FTA and provide non-FTA support, whether solicited or unsolicited, the cognizant Area RMC is not responsible for funding this work outside of FTA.
- g. (Submarines Only) Accomplish assigned Fleet Technical Support as outlined in Appendix D.

2.6.4 Navy 311 Fleet Technical Assistance Request Processing Procedure. Initial FTA requests received by the Navy 311 will be recorded by a Customer Service Representative. The Customer Service Representative must ensure the request is sent to the cognizant Area RMC (if different from the homeport RMC) and notify the cognizant area RMC. This will enable the cognizant Area RMC to commence immediate action on the FTA request.

2.7 REGIONAL MAINTENANCE CENTERS.

2.7.1 Regional Maintenance Centers. RMCs will serve as the primary source of Fleet Technical Assistance. For purposes of this specific FTA policy, use of the term "RMC" includes Regional Support Group New London and TRIDENT Refit Facility Kings Bay since these two activities will be serving as "Area RMCs" in providing FTA as noted in Table 2-1 of this chapter.

2.7.2 Area Regional Maintenance Center Area of Responsibility Assignments. Area RMC Area of Responsibility (AOR) assignments are listed in Table 2-1. Figure 2-1 graphically supplements Table 2-1 in depicting the AOR for each RMC. The AOR in which a ship is operating at the time an FTA request is initiated will dictate which Area RMC is responsible for coordinating or providing that FTA (becomes the "cognizant Area RMC"). If a ship is located in an AOR other than their homeport AOR, and the ship initiates a routine FTA request (one that does not require the cognizant Area RMC to expend travel or overtime funds for on-site support in the event

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Distance Support is unsuccessful), the homeport Area RMC will assume cognizance of that FTA request and accomplish it as a routine priority via Distance Support or, if necessary, via on-site FTA when the ship returns to homeport.

AREA RMC	AREA OF RESPONSIBILITY (AOR)
Southwest Regional Maintenance Center (SWRMC), San Diego, CA	Ships, SSNs*, aircraft carriers and craft in port or operating off the U.S. West Coast from the San Francisco Bay area south to the southern point of South America and selected mine warfare systems worldwide.
Puget Sound Naval Shipyard & Intermediate Maintenance Facility (IMF), Bremerton, WA	Ships, SSNs, aircraft carriers and craft in port or operating in the PACNORWEST area from North of San Francisco, CA, to northern Pacific or Alaska area and all SSBN and SSGN units in PACFLT.
Pearl Harbor Naval Shipyard & IMF, Pearl Harbor, HI	Ships, aircraft carriers, craft and SSN 688 and SSN 774 Class submarines in port or operating in the MIDPAC area and all non-SSBN or SSGN submarines (excluding SSN 21 Class) and submarine tenders operating in the Seventh Fleet AOR (excluding those SSN 688 and SSN 774 Class submarines operating in port or operating out of Diego Garcia, UK).
Ship Repair Facility (SRF) and Japan Regional Maintenance Center (JRMCM), Yokosuka, Japan	Ships, aircraft carriers and craft in port or operating in the Seventh Fleet AOR.
Mid-Atlantic Regional Maintenance Center (MARMC), Norfolk, VA	Ships, aircraft carriers and craft in port or operating in the Atlantic Ocean from Charleston, SC, latitude northward extending to the Azores longitude eastward. Submarines* in port and all SSN 688 and SSN 774 Class submarines operating in the Second, Fourth, Fifth and Sixth Fleet AOR and those submarines operating in port or out of Diego Garcia, UK, excluding those submarines in port or in the Groton and New London, CT regional waters.
Forward Deployed Regional Maintenance Center (FDRMC) Naples, Italy FDRMC Detachment Bahrain FDRMC Detachment Rota, Spain	Ships, aircraft carriers and craft in port or operating from the Azores longitude eastward to include the Fifth Fleet and Sixth Fleet AOR.
Regional Support Group or Submarine Technical Support Center (STSC) Groton, CT	SSN 688 and SSN 774 Class submarines* in port or operating in the Groton-New London, CT regional waters.
TRIDENT Refit Facility, Kings Bay, GA	All Atlantic Fleet SSBN and SSGN units.
Southeast Regional Maintenance Center (SERMC), Mayport, FL	Ships, aircraft carriers and craft in port or operating south of the Charleston, SC latitude in the Atlantic Ocean to the southern tip of South America.

* Puget Sound Naval Shipyard & Intermediate Maintenance Facility has responsibility for all SSN 21 Class submarines regardless of location.

Table 2-1 RMC Area of Responsibility Assignments

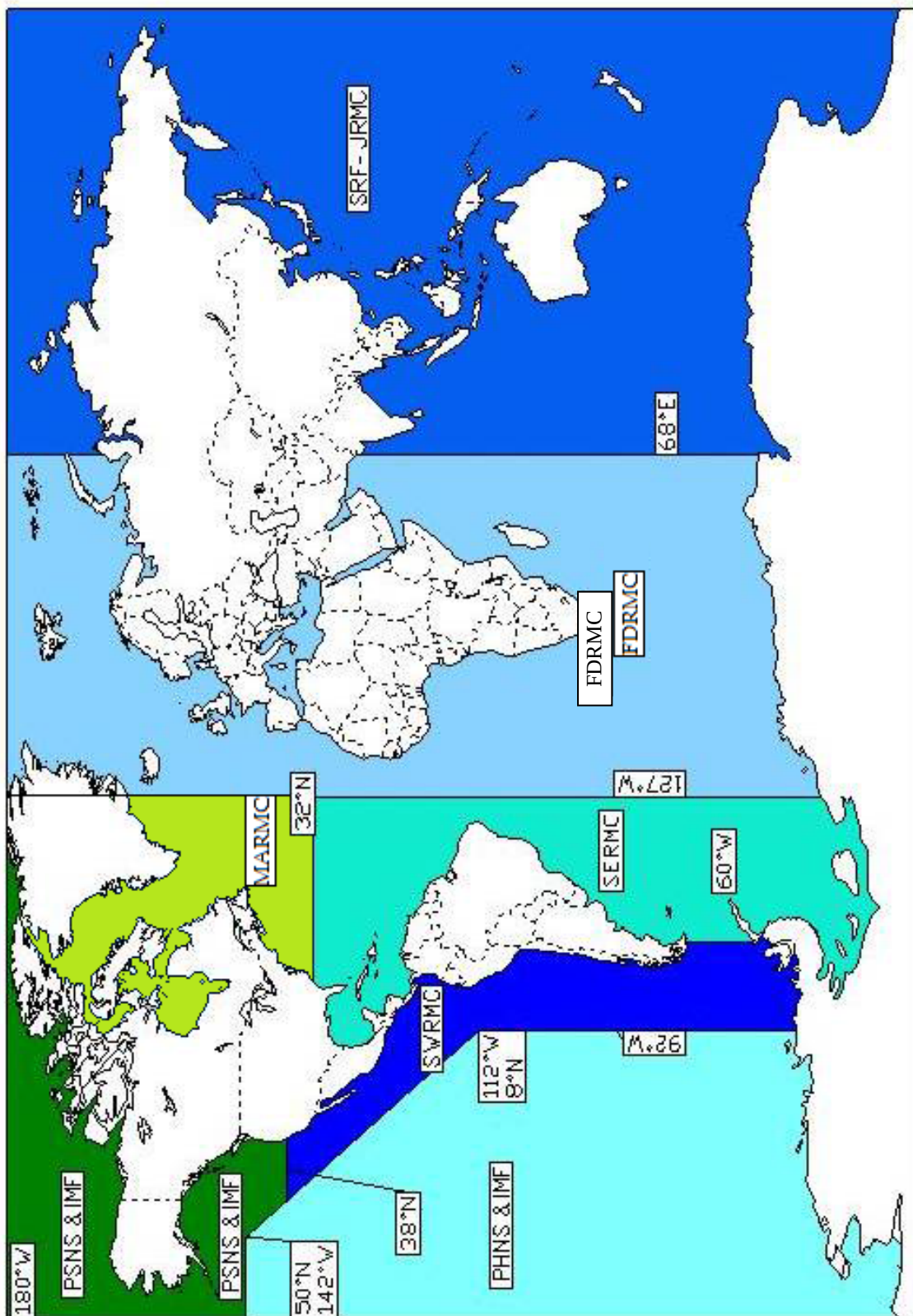


Figure 2-1 RMC Area of Responsibility

2.7.3 Considerations for Providing Assistance.

2.7.3.1 Distance Support. Costs to provide FTA can be dramatically reduced using Distance Support especially when a ship is underway or is not in a port with a RMC. Distance Support may include various forms of two-way communication such as telephone, e-mail, web "chat", streaming video, etc. Additionally, its use has facilitated a more effective use of limited technical resources to service a larger number of customers more efficiently. Normally, the cognizant Area RMC will have a subject matter expert available to respond to FTA requests via Distance Support, but in the event that such an expert is not readily available, the cognizant Area RMC is encouraged to contact another Area RMC to enlist their assistance in providing such Distance Support. In support of the Chief of Naval Operation's guidance to shift away from a risk averse culture in the Navy, not all FTA requests will be responded to with on-site support. However, the Operational Commander or TYCOM may direct immediate on-site support, if warranted.

2.7.3.2 On-Site Support. If the use of on-site support is warranted, the cognizant Area RMC will provide or obtain personnel to affect on-site assistance. When a ship transits from one AOR to another, the cognizant area RMC will validate the need for on-site support before transitioning from Distance Support provided by the homeport. The cognizant Area RMC will take into account the ship's operational schedule, as well as ship, ISIC, Operational Commander and TYCOM requirements, when determining if and at what point to shift from Distance Support to on-site support. Paragraph 2.7.4.1 of this chapter provides additional specific guidance regarding when on-site support will be provided and the prioritization of such responses should there be multiple requirements for the same FTA support personnel.

2.7.3.3 Fleet Technical Assistance Support Transfer and Acceptance. The cognizant Area RMC is responsible for providing or obtaining FTA support and is responsible for its completion. If the cognizant area RMC has neither the capability nor capacity to provide the FTA support required, the cognizant RMC will request FTA support from another source of support.

2.7.3.4 Transferring Regional Maintenance Center. The RMC transferring the FTA will transmit a TAVR via appropriately classified e-mail or Naval message, using the samples provided as Appendix B or C of this chapter, synopsizing actions taken to date on the FTA after reaching agreement with another source of support to accept responsibility for the FTA. The accepting source of support and new Point of Contact information will be identified in the TAVR. For Surface Ships and Carriers, the transferring RMC will document all time and actions taken and will pass the task to the accepting source of support in approved FTA software. For submarines, the ship's homeport will broker the 2-kilo to the accepting source of support.

2.7.3.5 Accepting Source of Support. The accepting source of support for the FTA assumes responsibility to provide the necessary support to resolve the FTA. If the source of support cannot resolve the FTA, they **must** request the cognizant Area RMC obtain the necessary support to resolve the FTA. The accepting source of support will also document all time and actions taken related to the FTA, and inform the cognizant Area RMC on the status of the FTA.

2.7.3.6 Support Coordination. If another source of support is required, close coordination should be maintained between the supporting activity providing such assistance and the cognizant Area RMC to ensure the highest level of responsiveness is being provided. Assistance from another Area RMC does not abrogate the cognizant Area RMC's responsibility to ensure

completion of the FTA request and the cognizant Area RMC retains full responsibilities as outlined in this manual.

2.7.4 Funding.

- a. Expenditure of funds for on-site FTAs has been significantly reduced by increased use of Distance Support. The source selection to provide on-site FTA must consider overall resource availability and total cost to the Government (e.g., labor, travel, per diem, administration, etc.) balanced against criticality of need and required speed of response. Resources to meet on-site FTA needs should be considered in the following priority order:
 - (1) cognizant Area RMC personnel.
 - (2) other Area RMC personnel.
 - (3) other government resources.
 - (4) private sector.
- b. If personnel from another Area RMC are used to support the FTA requirement, the Area RMC providing the personnel will pay all costs for those personnel including base salary, overtime, travel and per diem. For all other sources of support, the cognizant Area RMC will pay all costs for providing the on-site support. Area RMCs will notify the Fleets if their total FTA related expenditures in support of ships home ported in other RMC locations become significant. The Fleets will review these submissions and determine if funds transfer(s) are required to ensure RMC mission completion.

NOTE 1: PER REFERENCE (a), FORWARD DEPLOYED NAVAL FORCES CONTINUOUSLY OPERATE WITHIN THE INTEGRATED OR SUSTAINMENT PHASE UNLESS IN A CNO AVAILABILITY.

NOTE 2: IF U.S. COAST GUARD OR FOREIGN NAVY VESSELS ARE PART OF A CARRIER STRIKE GROUP OR EXPEDITIONARY STRIKE GROUP, EITHER IN WORK-UP PHASE OR DEPLOYMENT, THEY WILL RECEIVE FTA SUPPORT PRIORITIZATION AS THOUGH THEY WERE UNITED STATES NAVY SHIPS (PRIORITIES 1-7 APPLY). REIMBURSEMENT FOR ALL COSTS TO PROVIDE SUCH FTA SERVICES WILL BE FOLLOWING THE MEMORANDUM OF AGREEMENT OR MEMORANDUM OF UNDERSTANDING THAT IS NORMALLY SIGNED BETWEEN THE SERVICES OR GOVERNMENTS WHEN SUCH JOINT OPERATIONAL ARRANGEMENTS EXIST.

2.7.4.1 On-Site Support. If Distance Support is unsuccessful or if the nature of the FTA request warrants immediate transition to on-site support, the cognizant Area RMC will coordinate and provide such on-site support as prioritized:

- Priority 1 - Casualties requiring clear and immediate action to offset personnel safety hazards or catastrophic equipment damage.

- Priority 2 - Services to deployed ships. If resource constrained when there are multiple requirements to provide on-site support to deployed ships, prioritization of response will be:
- (1) SSBN FTAs;
 - (2) FTAs associated with a CASREP as determined by the TYCOM;
 - (3) Other FTA requirements as determined by the Operational Commander and TYCOM.
- Priority 3 - Services to ships that are classified as within the pre-deployment or post-deployment part of the Sustainment Phase of reference (b). If resource constrained when there are multiple requirements to provide on-site support, prioritization of response will be:
- (1) SSBN FTAs;
 - (2) FTAs associated with a CASREP as determined by the TYCOM;
 - (3) Other FTA requirements as determined by the Operational Commander and TYCOM.
- Priority 4 - Services to ships that are classified as within the Integrated phase of reference (b), or ship's that are classified as Independent Unit Ready for Tasking. If resource constrained when there are multiple requirements to provide on-site support, prioritization of response will be:
- (1) SSBN FTAs;
 - (2) FTAs associated with a CASREP as determined by the TYCOM;
 - (3) Other FTA requirements as determined by the Operational Commander and TYCOM.
- Priority 5 - Services to ships that are classified as within the Basic phase of reference (b). If resource constrained when there are multiple requirements to provide on-site support, prioritization of response will be:
- (1) SSBN FTAs;
 - (2) FTAs associated with a CASREP as determined by the TYCOM;
 - (3) Other FTA requirements as determined by the Operational Commander and TYCOM.
- Priority 6 - Other U.S. Navy FTA requests not addressed in one of these priorities (e.g., FTA support during Chief of Naval Operations availabilities addressed in paragraph 2.4.3 of this chapter).
- Priority 7 - Technical assistance requests from non-Navy organizations (e.g., Coast Guard, U.S. Army, U.S. Air Force, Foreign Military Sales, etc.).

2.8. POST-FLEET TECHNICAL ASSISTANCE ADMINISTRATIVE REQUIREMENTS.

- a. At the conclusion of an on-site technical assistance visit, the cognizant Area RMC representative(s) will assist the ship in completing the 2-Kilo and provide a final

debrief to the ship's cognizant Department Head, or his **or** her designated representative, prior to departing the ship. Information collected for the FTA **must** be uploaded to 3M history.

- b. A TAVR is required at the completion of on-site FTA visits as addressed in paragraph 2.6.2.h through 2.6.2.k of this chapter. TAVRs should be submitted within 5 working days after departure from the ship. In cases where urgent information needs to be conveyed, an e-mail will be sent to the ISIC **or** TYCOM while the TAVR is in routing.

APPENDIX A

AREA REGIONAL MAINTENANCE CENTER FLEET TECHNICAL ASSISTANCE CONTACT INFORMATION

AREA RMC	COVERAGE HOURS	PHONE	E-mail/Message PLADs
Mid-Atlantic Regional Maintenance Center (MARMC) Norfolk, VA	24/7/365	Comm: 757-400-0000 Secure: 757-400-3174 CDO: 757-739-5324	NIPRNET: marmc_tsdo@navy.mil SIPRNET: marmc_sipr_tsdo@navy.smil.mil MSG PLAD: MARMC NORFOLK VA
Forward Deployed Regional Maintenance Center Naples, Italy (FDRMC NAPLES)	0600-1800 WEEKDAYS 0800-1200 WEEKENDS & HOLIDAYS	Comm: 011-39-081-568-7857 DSN: 314-626-7857	NIPRNET: FDRMCNAPLESCDO@EU.NAVY.MIL SIPRNET: FDRMCNAPLESCDO@EU.NAVY.SMIL.MIL MSG PLAD: FDRMC NAPLES IT//
FDMRC Detachment Bahrain	Hours: 0730-1600 Sunday-Thursday (TD available after normal hours)	Comm: 011-973-1785-3777 DSN: 318-439-3777	NIPRNET: M-BA-FDRMCBAHASST@ME.NAVY.MIL SIPRNET: M-BA-FDRMCBAHASST@ME.NAVY.SMIL.MIL MSG PLAD: FDRMC DET BAHRAIN//
FDRMC Detachment Rota, Spain	Hours: 0730-1600 Monday-Friday (TD available after normal hours)	Comm: 011-34-956-82-2883 DSN: 314-727-2725	NIPRNET: RMCDETROTA.TECHASSIST@EU.NAVY.MIL SIPRNET: RMCDETROTA.TECHASSIST@EU.NAVY.SMIL.MIL MSG PLAD: FDRMC DET ROTA SP//

AREA RMC	COVERAGE HOURS	PHONE	E-mail and Message PLADs
Regional Support Group Groton/Submarine Technical Support Center (STSC) Groton, CT	0700-1630 WEEKDAYS CDO after hours	Comm: 860-694-7872 Admin: 860-694-4714 DSN: 694-7872/4714 STSC groton CDO after hours: 860-625-3230	MSG PLAD: COMREGSUPPGRU STSC GROTON CT NIPRNET: nwln_stsc_prod@navy.mil
Puget Sound Naval Shipyard & IMF (North West Regional Maintenance Center) PSNS Code 210 Everett, WA (Surface)	0630-1500 WEEKDAYS CDO - 24/7	425-304-5449 DSN: 727-5449 Duty Phone: 360-340-6811 Everett	NIPRNET: techassistnw@navy.mil MSG PLAD: NAVSHIPYD AND IMF PUGET SOUND WA//210/290//
Puget Sound Naval Shipyard & IMF (North West Regional Maintenance Center) PSNS Code 290EE Bremerton, WA (SSNs, SSGNs, SSBNs undergoing overhaul)	0630-1500 WEEKDAYS CDO - 24/7	360-476-5734 DSN: 439-5734 CDO: 360-340-0106 Bremerton, WA	NIPRNET: BREM_PSNSFleetTechAssist@navy.mil SIPRNET: BREM_PSNSFleetTechAssist@navy.smil.mil MSG PLAD: NAVSHIPYD AND IMF PUGET SOUND WA//290//
Naval Intermediate Maintenance Facility, Pacific Northwest (North West Regional Maintenance Center) IMF Code 874 Bangor, WA (SSBNs)	0630-1500 WEEKDAYS CDO - 24/7	360-315-1877 CDO: 360-731-7569 360-315-1297 Bangor, WA	NIPRNET: ssbnpactechassist.fct@navy.mil SIPRNET: ssbnpactechasst.fct@navy.smil.mil MSG PLAD: NAVIMFAC PACNORWEST BANGOR WA//870/874//

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AREA RMC	COVERAGE HOURS	PHONE	E-mail/Message PLADs
South West Regional Maintenance Center (SWRMC) San Diego, CA	24/7/365	DSOC: 619-556-3608 DSN: 526-3608 Secure: 619-556-8710 CDO CELL: 619-381-6632	NIPRNET: swrmctechassist@navy.mil SIPRNET: swrmctechassist.fct@navy.smil.mil MSG PLAD: SOUTHWEST RMC SAN DIEGO CA
Trident Refit Facility (TRF) Kings Bay, GA	24/7/365	CDO: 912-674-3125	NIPRNET: cdo.trfkb@navy.mil MSG PLAD: TRIREFFAC KINGS BAY GA
Pearl Harbor Naval Shipyard and IMF Hawaii Regional Maintenance Center (HRMC) Pearl Harbor, HI	24/7/365	Comm: 808-630-7762 DSN: 315-473-0614 Code 210 DO: 808-630-7762	NIPRNET: hrmc.techassist@navy.mil SIPRNET: hrmc.techassist@navy.smil.mil MSG PLAD: NAVSHIPYD AND IMF PEARL HARBOR HI//101/200/210//
Ship Repair Facility (SRF) and Japan Regional Maintenance Center (JRMCM) Yokosuka, Japan	0730-1630 Mon-Fri CDO after hours	CDO DSN: 011-81-46-816-5488CDO Cell: 011-81-9006-7005	NIPRNET: TECHASSIST_JRMCM@srf.navy.mil SIPRNET: TECHASSIST_JRMCM@fe.navy.smil.mil MSG PLAD: NAVSHIPREPFAC AND JAPAN RMC YOKOSUKA JA
Southeast Regional Maintenance Center (SERMC) Mayport, FL	Call CDO. If no CDO contact, call Quarterdeck.	CDO: 904-591-8008 Quarterdeck: 904-270-5126 DSN: 270-5126	NIPRNET: sermc-cdo.fct@navy.mil MSG PLAD: SOUTHEAST RMC MAYPORT FL

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APPENDIX B**SAMPLE TECHNICAL ASSISTANCE VISIT REPORT (TAVR) MESSAGE**

FROM ON-SITE FTA PERFORMING ACTIVITY// (Could be RMC, NSY, NWC, etc.)
TO: SHIP REQUESTING ASSISTANCE
ADDITIONAL ACTION ADDRESSEES (AS APPROPRIATE, TO INCLUDE ACCEPTING
RMC FOR FTA TRANSFERS)
INFO: COMUSFLTFORCOM NORFOLK VA// (AS APPROPRIATE)
COMPACFLT PEARL HARBOR HI// (AS APPROPRIATE)
NUMBERED FLEET COMMANDER
TYCOM
GROUP
SQUADRON
COMNAVSEASYS COM WASHINGTON DC// (PROGRAM MANAGER)//
ISEA/PROGRAM MANAGER//
COMSPAWARSSYS COM SAN DIEGO CA// (FOR ASSISTS ON C4I)
OTHER REGIONAL MAINTENANCE CENTER (AS APPROPRIATE)
RMC DET (AS APPROPRIATE)
NAVAL SURFACE WARFARE CENTER CORONA CA// (FOR ASSISTS ON C5I AND
HM&E SYSTEMS)
COMNAVSAFECEN NORFOLK VA// (SAFETY RELATED ITEMS ONLY)
NETC PENSACOLA FL// (TRAINING ISSUES ONLY)
SERVSCOLCOM GREAT LAKES IL// (TRAINING ISSUES ONLY)
FLEASWTRACEN SAN DIEGO CA// (ASW TRAINING ISSUES ONLY)
FCTCLANT DAM NECK VA// (FOR ASSISTS ON C4I/COMBAT SYSTEM)
SWRMC// (FOR PACFLT SSN ONLY)
NAVSUBSCOL GROTON CT// (FOR SUBMARINES ONLY)
TRITRAFAC KINGS BAY GA// (FOR SSBN/SSGN SUBMARINES)
NWRMC// (FOR SSBN/SSGN SUBMARINES)
SUBMEPP// (ALL SUBMARINES)
SURFMEPP// (AS APPLICABLE)
CPA// (AS APPLICABLE)
OTHERS (AS APPROPRIATE)
BT
UNCLAS //N0XXXX//
MSGID/GENADMIN/RMC XXXX//
SUBJ/USS XXXX (HULL) EQUIPMENT NAME-NOMENCLATURE TECH ASSIST VISIT
REPORT//
REF/A/CASREP/MSG/TELCON REQUESTING TECH ASSIST//
REF/B/DOC/APPLICABLE TECH MANUAL/(OPTIONAL)//
REF/C/OTHER REFS AS NECESSARY//
NARR/REF A IS SHIP MESSAGE OR TELCON BETWEEN XXXX/X AND XXXX/X.//
POC/NAME/CIV/CODE/-/TEL:DSN XXX-XXXX/TEL:XXX XXX-XXXX//
RMKS/1. BACKGROUND: REF A REPORTED (PROBLEM). AS REQ REF A,
RMCXXXX REP, (NAME) PROVIDED TECH ASSIST (DATE) AT (LOCATION) TO

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ASSIST WITH CORRECTION OF THE PROBLEM. REF B IS THE APPLICABLE TECHNICAL MANUAL.

2. FINDINGS:

- A. BRIEF PROBLEM DESCRIPTION:
- B. SUMMARIZE FINDINGS & CORRECTIVE ACTION ON HARDWARE. (STATE WHY DISTANCE SUPPORT WAS UNABLE TO RESOLVE THIS ISSUE. IF THIS TAVR IS TO DOCUMENT AN FTA TRANSFER, SO STATE AND INCLUDE FTA ACCEPTING RMC COMMAND TITLE AND SPECIFIC POC INFO.).
- C. SUMMARIZE FINDINGS & CORRECTIVE ACTION ON LOGISTICS (IF ANY).

3. CONCLUSION:

- A. STATEMENT ON CAUSE OF PROBLEM (IF NOT OBVIOUS).
- B. SOMETIMES CONVENIENT TO COMBINE WITH FINDINGS.

4. LEVEL OF SHIP'S FORCE SUPPORT:

- A. ABOVE AVERAGE/AVERAGE/BELOW AVERAGE.
- B. NUMBER OF SHIP'S FORCE PERSONNEL TRAINED DURING VISIT.

5. RECOMMENDATIONS:

- A. FOR USS XXXXX:
 - (1) IDENTIFY FOLLOW-ON ACTION.
 - (2) ABOVE DISCUSSED WITH (NAME) PRIOR TO DEPARTING SHIP.
- B. FOR TYCOM/RMC:
 - (1) IDENTIFY FOLLOW-ON ACTION.
 - (2) ABOVE DISCUSSED WITH (NAME) ON (DATE).
- C. FOR NAVSEA/ISEA:
 - (1) IDENTIFY FOLLOW-ON ACTION.
 - (2) ABOVE DISCUSSED WITH (NAME) ON (DATE).

6. INFORMATION FOR BLOCK 35 OF 2-KILO PROVIDED TO SHIP DURING DEBRIEF. JCN _____ APPLIES.

- 7.
 - A. MAN HOURS EXPENDED FOR TECHNICAL ASSISTANCE.
 - B. MAN HOURS EXPENDED FOR TRAINING.
 - C. MATERIAL COSTS.

8. EVALUATION OF NECESSITY FOR TECHNICAL ASSISTANCE:

- A. WAS ADEQUATE TECHNICAL DOCUMENTATION AVAILABLE TO SHIP'S FORCE TO CORRECT PROBLEM?
- B. WERE ADEQUATE TOOLS AVAILABLE TO SHIP'S FORCE TO CORRECT THE PROBLEM?
- C. WERE ADEQUATE MATERIALS/SPARE PARTS AVAILABLE TO SHIP'S FORCE TO CORRECT THE PROBLEM?
- D. WAS SHIP'S FORCE LEVEL OF KNOWLEDGE ADEQUATE TO CORRECT THE PROBLEM?

BT

NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.

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APPENDIX C**SAMPLE E-MAIL TECHNICAL ASSISTANCE VISIT REPORT (E-TAVR)**

E-mail TAVR distribution will include the following:

TO: SHIP REQUESTING ASSISTANCE (C.O., X.O., DEPT HEADS)

ADDITIONAL ACTION ADDRESSEES (AS APPROPRIATE, TO INCLUDE ACCEPTING RMC FOR FTA TRANSFERS)

CC:

U.S. FLEET FORCES COMMAND N43

COMMANDER U.S. PACIFIC FLEET N43

FLEET COMMANDERS: (as appropriate)

TYPE COMMANDERS: (as appropriate)

NAVSEA/SPAWAR PROGRAM MANAGERS: (as appropriate)

NSWC/SSC IN-SERVICE ENGINEERING AGENTS: (as appropriate)

RMCS: (as appropriate)

TRAINING COMMANDS: (TRAINING ISSUES ONLY, as appropriate)

NAVAL SURFACE WARFARE CENTER CORONA (crna_tsp_tavr@navy.mil)

Email TAVR format will be:

SUBJ/USS XXX (HULL) EQUIPMENT NAME TECH ASSIST VISIT REPORT// (Insert brief equipment description; for ex. T 1348 Transmitter)

REF/A/CASREP/DTG//(Reference Designation, change as necessary/Change as necessary/Date Time Group of reference)

REF/B/DOC/2-KILO//

REF/C/TEL/TELCON INFO//

NARR/REF A IS XXXXXXXX. REF B IS XXXXXXXX. REF C IS XXXXXXXX.// (Summary of Tech Assist request. For ex., REF A is CASREP Initial 04003 request for tech assist)

POC/NAME/GRADE-RATE/TEL:DSN /TEL: // (Identify RMC Technician/RMC Technician Grade/Rank. For ex., GS-12 or E7 / RMC Technician DSN/extension/RMC Technician Comm/extension)

1. BACKGROUND: REF A REPORTED (Problem). AS REQUESTED REF A, RMCXXXC REP, (Name) PROVIDED TECH ASSIST (Date) AT (Location) TO ASSIST WITH CORRECTION OF THE PROBLEM. REF B IS THE APPLICABLE TECH MANUAL.

2. FINDINGS/CORRECTIVE ACTION:

A. BRIEF PROBLEM STATEMENT.

B. SUMMARIZE FINDINGS AND CORRECTIVE ACTIONS. (State why distance support was unable to resolve problem. If this TAVR is to document an FTA transfer, so state and include FTA accepting RMC command title and specific POC info.).

3. CONCLUSION:

A. STATEMENT ON CAUSE OF PROBLEM/ROOT CAUSE.

B. SOMETIMES CONVENIENT TO COMBINE WITH FINDINGS.

4. LEVEL OF SF SUPPORT:

A. ABOVE AVERAGE/AVERAGE/BELOW AVERAGE

B. NUMBER OF SHIPS FORCE PERSONNEL TRAINED DURING VISIT

5. RECOMMENDATIONS:

- A. FOR USS XXXX:
 - (1) IDENTIFY FOLLOW-ON ACTION
 - (2) ABOVE DISCUSSED WITH (Name) PRIOR TO DEPARTING SHIP
- B. FOR TYCOM/RMC:
 - (1) IDENTIFY FOLLOW-ON ACTION
 - (2) ABOVE DISCUSSED WITH (Name) ON (Date)
- C. FOR NAVSEA/ISEA:
 - (1) IDENTIFY FOLLOW-ON ACTION
 - (2) ABOVE DISCUSSED WITH (Name) ON (Date)

6. INFORMATION FOR THE 2-KILO PROVIDED TO SHIP DURING DEBRIEF. JCN
_____ APPLIES.

- 7.
 - A. MANHOURS EXPENDED FOR TECH ASSIST.
 - B. MANHOURS EXPENDED FOR TRAINING.
- 8. EVALUATION OF NECESSITY FOR TECHNICAL ASSISTANCE:
 - A. WAS ADEQUATE TECHNICAL DOCUMENTATION AVAILABLE TO SHIP'S FORCE TO CORRECT THE PROBLEM?
 - B. WERE ADEQUATE TOOLS AVAILABLE TO SHIP'S FORCE TO CORRECT THE PROBLEM?
 - C. WERE ADEQUATE MATERIAL/SPARE PARTS AVAILABLE TO SHIP'S FORCE TO CORRECT THE PROBLEM?
 - D. WAS SHIP'S FORCE LEVEL OF KNOWLEDGE ADEQUATE TO CORRECT THE PROBLEM?

NOTE: DEFAULT TO NAVAL MESSAGE TAVR IF NECESSARY EMAIL ADDRESSES ARE NOT KNOWN.

APPENDIX D**SUBMARINE FLEET TECHNICAL SUPPORT PROVIDERS ROLES AND RESPONSIBILITIES**

1. The purpose of this Appendix is to provide standard policy for direction on Fleet Technical Support (FTS) for Submarine Regional Maintenance Centers (RMCs).
2. For the purpose of the FTS policies of this Appendix, use of the term “RMC” includes all Fleet funded activities (i.e., RMC, FMA, NSY, SRF, IMF, RSG, TRF) that execute FTS mission tasks for Submarines.
3. Submarine RMC Commanding Officers are accountable and responsible for accomplishing assigned FTS as outlined **here**:
 - a. Execute FTS mission tasks for Fleet and Type Commander (TYCOM) customers using FTS mission funding.
 - b. Work with the TYCOM and other FTS providers in the execution of assigned FTS tasks.
 - c. Work with the TYCOM to forecast annual FTS workload and identify resources required to accomplish projected workload.
 - d. Manage, track and report actual FTS workload and expenditures to TYCOM and CNRMC.
 - e. Utilize common reporting mechanisms, standard reports, metrics and processes in reporting FTS workload and financial data.
 - f. Provide resources required to manage and accomplish FTS in assigned AOR.
 - g. Categorize FTS mission tasks using the following six functions:
 - (1) Function F1. Fleet Technical Assistance (FTA). FTA is characterized by performing troubleshooting and fault isolation. FTA support consists of waterfront **and** deck-plate engineering, technical, logistics, management **and** coordination assistance and services; technical over-sight and consultation; over-the-shoulder maintenance training; and FTA data collection and reporting.
 - (2) Function F2. System **or** equipment operational and maintenance assessment. System **or** equipment operational and maintenance assessments include scheduled shipboard assessments (i.e., Total Ship Readiness Assessment (TSRA), Combat Systems Assessments (CSA)) and continuous operational and maintenance data assessments (i.e., Top Managements Actions (TMA), Submarine Continuous Operational and Maintenance Assessment). Scheduled shipboard assessments are characterized by teams of Subject Matter Experts (SMEs) led by a Test **or** Assessment Director performing authorized **or** approved test plans **or** procedures to determine material **or** mission readiness; identifying, resolving, and reporting discrepancies; and providing over-the-shoulder maintenance training to ships force. Continuous data assessments are

- characterized by system or equipment analysts and SMEs working together and analyzing fleet maintenance data to identify or address fleet system/equipment problems and trends and provide “Actionable Data” to Fleet, TYCOM and SYSCOM customers in order to make “Data Driven Decisions” to improve mission readiness, system or equipment design, and life-cycle support. Also included in the (F2) Assessment Function is SME waterfront, engineering, technical, and logistics support and feedback to Fleet, TYCOM, SYSCOM, and ISEA customers at Technical Conferences, Lean Events, Working Groups, Integrated Product Teams, etc., for system or equipment maintenance or maintainability and product improvement.
- (3) Function F3 – Modernization or Installation support. Modernization or installation support consists of Alteration Installation Team (AIT) support including dockside, at-sea, pre- and post-modernization or installation testing (PICO and SOVT) and shipboard technical and logistics support during system or equipment modernization installations.
- (4) Function F4. Shipyard, Availability, IMA support. Maintenance support is characterized by SMEs providing technical assistance to shipyard or IMA engineering and ship personnel in troubleshooting and fault isolation; pre-post-availability inspections and grooms; work packages and Task Group Instructions (TGIs) review; provide engineering technical, logistics oversight, guidance, and support to shipyard and IMA personnel during repair, replacement, overhaul, and testing. Maintenance support also includes providing system or equipment operation and maintenance on-the-job training to shipyard and IMA personnel.
- (5) Function F5. Onboard logistics and configuration management support. Onboard logistics and configuration management support is characterized by SMEs and logistics personnel working with Fleet, TYCOM, SYSCOM, ISEA, OEM, NAVSUP WSS, Class CDM, shipyard, IMA, and ships force personnel to identify and resolve logistics and configuration management problems to improve material condition readiness. Onboard logistics and configuration management support includes system or equipment specific logistics and configuration management support for all of the FTS Functions (1-4) such as FTA CASREP material support; assist or support parts identification, requisition, expedition, and delivery; identify or address system, equipment, and material configuration issues; TSRA and CSA logistics or CM audits; assisting ships force in updating supply or COSAL records; installation of ILS products; RMMCO support; and generating 4790CKs.
- (6) Function F6. CHENG or Engineering Technical Authority support. CHENG or Engineering Technical Authority support is characterized by managers, engineers, and SMEs working with and providing engineering and technical support or recommendations to the AOR Chief Engineer (CHENG) to support the resolution of technical authority issues or questions which arise out of FTS and waterfront work executed in their homeport or AOR. Only activities with a warranted CHENG may charge to this functional area.

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REFERENCES.

- (a) NAVSEA SL720-AA-MAN-030 - Navy Modernization Process Management and Operations Manual (NMP MOM)
- (b) NAVSEAINST 9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships
- (c) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
- (d) NAVSEA 0989-LP-037-2000 - Commissioned Submarine General Reactor Plant Overhaul and Repair Specification
- (e) NAVSEA S9213-45-MAN-000 - Navy Nuclear Material Management Manual
- (f) NAVSEAINST 4720.14 - Temporary Alterations to Active Fleet Submarines; Control of
- (g) NAVSEA Technical Specification 9090-310 - Ship Alteration Accomplishment by Installation Teams
- (h) NAVSEA T9044-AD-MAN-010 - Requirements Manual for Submarine Fly-By-Wire Ship Control Systems
- (i) COMUSFLTFORCOMINST/COMPACFLTINST 4720.3 - Commander United States Fleet Forces Command (COMUSFLTFORCOM)/Commander Pacific Fleet (COMPACFLT) C5ISR Modernization Policy
- (j) COMSUBFORINST 4720.15 - Submarine C5ISR Modernization Policy
- (k) NAVSEA Technical Specification 9090-100A - Liaison Action Record
- (l) NAVSEA 0989-LP-058-1000 - Destroyer Tender and Submarine Tender Nuclear Support Facilities Overhaul and Repair Specification

LISTING OF APPENDICES.

- A Major Ship Alteration Types Executive Summary
- B Submarine Alteration Request Format
- C Sample TEMPALT or OPALT Reporting Message
- D TYKIT Requisition Form
- E TYCOM Alteration Management System Interpretation Guide
- F Liaison Action Request (LAR) Form
- G Sample Alteration Feedback Message and Email Format

3.1 **PURPOSE.** To establish procedures, policy and responsibilities for fleet level management and execution of the Navy Modernization Program (NMP) as it pertains to the Submarine Force. Additional information is contained in references (a) and (b).

3.1.1 **Scope.** The scope of this chapter is limited to Ship Alterations (SHIPALT), Naval Sea Systems Command Nuclear Propulsion Directorate (NAVSEA 08) Alterations (NUCALT), Alteration and Improvement (A&I) Items, Type Zero (TZ) Improvements, Engineering Changes,

Field Changes (FC), Ordnance Alterations (ORDALT), Temporary Alterations (TEMPALT), Operational Alterations (OPALT), TRIDENT Command and Control System Modifications, Temporary Engineering Changes and Type Commander (TYCOM) Discretionary Changes (TDC). Appendix A of this chapter provides an executive summary of these major alteration types.

3.1.2 Definition. An alteration is defined as any modification in the hull, machinery, equipment or fittings that involves a change in design, materials, number, location or relationship of an assembly's component parts, whether the change is separate from, incidental to, or in conjunction with repairs. All modifications affecting ship's configuration, both major and minor, are prohibited without the applicable Systems Command technical approval and TYCOM authorization.

3.2 RESPONSIBILITIES.

3.2.1 Immediate Superior In Command (Squadron or Naval Submarine Support Command).

The Immediate Superior In Command (ISIC) will assign an Alteration Coordinator who is responsible for managing the alteration program for each assigned unit:

- a. Informing the Fleet Maintenance Activity (FMA) of upcoming availabilities.
- b. Monitoring FMA long-range modernization and availability planning.
- c. Establishing installation priorities.
- d. Ensuring no action is taken to accomplish alterations which are not authorized for accomplishment. TYCOM concurrence is required for exceptions.
- e. Maintaining a file of active alteration briefs and other related documentation.
- f. Assisting units in the preparation of alteration requests (Appendix B) and reviewing them for technical adequacy, applicability and recommended level of accomplishment. Alteration requests should be limited to alterations affecting safety or providing a substantial maintenance or operational benefit.
- g. Identifying design deficiencies, changes to hull applicability, or non-availability of material or design for alterations.
- h. Ensuring that only TYCOM authorized (including partially completed alterations) appear on the individual ship's Current Ship's Maintenance Project (CSMP). Review the Type Availability Code to ensure alterations have been properly screened for either FMA or Ship's Force accomplishment (Type Availability Two for FMA or Type Availability Four for Ship's Force). Reference (c) provides detailed Maintenance and Material Management (3-M) Program requirements.
- i. Ensuring that the Master Job Catalog (MJC) contains all alterations authorized for accomplishment. The Maintenance Document Control Office (MDCO) or comparable local organization is responsible for the retrieval of authorized alteration information from the MJC and its addition to the Regional Maintenance Automated Information System (RMAIS) or Logistics Data System (LDS) master CSMP or appropriate maintenance database. If an authorized alteration is not contained in the MJC, contact the TYCOM or SUBMEPP or take appropriate steps to locally add it. Reference (c) provides detailed 3-M Program requirements.

- j. Ensuring that all OPNAV 4790/CKs are collected three days prior to the end of the availability. Within two days of receipt, the MDCO (or equivalent maintenance document processing office) will input the original OPNAV 4790/CK into the on-site RMAIS **or** LDS computer or appropriate maintenance database.
- k. Ensuring that a Reactor Plant Configuration Change Report (RPCCR) Completion Report summarizing reactor plant configuration changes accomplished by a shipyard organization, Nuclear Regional Maintenance Department (NRMD) or FMA are forwarded to the ship's Commanding Officer either electronically or by hard copy at the end of each availability. Ensure the ship's engineer acknowledges the report back to the installing activity and that a copy of the RPCCR Completion Report is provided to the ISIC alteration manager and Squadron Engineer so the NUCALTs can be closed out in RMAIS **or** LDS or appropriate maintenance database. Additional details are available in references (d) and (e).
- l. Ensuring situational alterations are accomplished when conditions warrant.
- m. Informing ships of alterations planned during an availability in the pre-arrival message. Include alterations being accomplished by outside activities (industrial activity, vendor, Alteration Installation Team (AIT), etc.).
- n. Verifying reports of alteration completions provided by the industrial activity during Chief of Naval Operations (CNO) Maintenance Availabilities.
- o. Ensuring that alterations authorized for Forces Afloat accomplishment are completed to the maximum extent possible prior to ship entry into a CNO Maintenance Availability.
- p. Ensure a Memorandum of Agreement (MOA) is in place for any alteration, TEMPALT **or** OPALT scheduled for accomplishment before installation begins. Ensure the MOA provides the duration of installation and scheduled removal date for TEMPALTs **or** OPALTs. Reference (f) provides detailed TEMPALT Program requirements.
- q. Ensuring installation of TEMPALTs **or** OPALTs are **per** reference (f) and installation **or** removal is reported in the format provided in Appendix C of this chapter.
- r. Ensuring installation of alterations by the AIT is **per** reference (g).
- s. Ensuring that the FMA requisitions Ready for Issue (RFI) TYCOM Alteration Kits (TYKIT) using a TYKIT Requisition Form provided in Appendix D.
- t. Ensuring that Ready for Accomplishment (RFA) Category A Mandatory Safety A&Is and Mandatory Safety Title D SHIPALTs are completed at the next appropriate availability of sufficient duration. An A&I or SHIPALT is considered RFA if the Integrated Logistics Support is certified and all material is readily available. The appropriate availability duration will be determined based on the alteration's scope and complexity and will be documented by the TYCOM in TYCOM Alteration Management System (TAMS). If an RFA Category A Mandatory Safety A&I or Mandatory Safety Title D SHIPALT must be deferred beyond an appropriate availability, for any reason, concurrence must be granted by the TYCOM, Ship's

Program Manager and NAVSEA 05 Chief Engineer. This concurrence communication may be conducted via electronic mail.

- u. Ensuring that Category “B” A&Is are completed within 24 months of the date of authorization. Category “B” A&Is affect personnel and equipment safety and failure to complete a Category “B” A&I within 24 months could result in personnel injury or equipment damage. Provide a Quarterly Plan of Action and Milestones for the accomplishment of overdue Category “B” A&Is to the TYCOM Modernization Program Manager.
- v. Ensuring all Fly-By-Wire Ship Control System alterations are planned and installed **per** the requirements of reference (h) and Chapter 34 of this volume.

3.2.2 Fleet Maintenance Activity. The FMA will establish and maintain an Alteration Management Group. This group will be responsible for:

- a. Using the priorities set by the TYCOM **or** ISIC, commence alteration planning and material procurement in time to permit on time accomplishment.
- b. Ensuring required ship checks are conducted in a timely manner.
- c. Ensuring no action is taken to accomplish alterations which are not authorized for accomplishment. TYCOM concurrence is required for exceptions.
- d. Notifying the ISIC that an alteration is ready to work when all procedures have been prepared and all material is on hand.
- e. Upon completion of each non-reactor plant alteration, ensure that the OPNAV 4790/CK is completely filled in by the Lead Work Center **per** reference (c) and returned with the signed off Automated Work Request to the Analysis, Records and Reports Section. The OPNAV 4790/CK will be forwarded by the Analysis, Records and Reports Section to MDCO (or equivalent maintenance document processing office) for entry into RMAIS **or** LDS or appropriate maintenance database and then forwarded to the ship for follow-up. Reference (c) provides detailed 3-M Program requirements.
- f. Ensuring that an RPCCR Completion Report summarizing reactor plant configuration changes accomplished by the NRMD or FMA are forwarded to the ship’s Commanding Officer either electronically or by hard copy at the end of each availability. Ensure the ship’s engineer acknowledges the report back to the installing activity and that a copy of the RPCCR Completion Report is provided to the ISIC alteration manager and Squadron Engineer so the NUCALTs can be closed out in RMAIS **or** LDS or appropriate maintenance database. Once the ship’s engineer acknowledges the report, distribute the RPCCR(s) electronically via the Enterprise Business System RPCCR application. Additional details are available in references (d) and (e).
- g. Maintaining a current scheduling and completion status of alterations on assigned units.
- h. Maintaining the status of alteration planning for all alterations authorized for Forces Afloat accomplishment.

- i. Requisitioning RFI TYKITs using Appendix D.
- j. Ensuring material necessary for the installation of alterations is procured in sufficient time to ensure availability during scheduled upkeeps. This includes obtaining all hardware and software required for Ship's Force responsible alterations.
- k. Providing for proper stowage of TYKITs and other alteration material pending installation.
- l. Ensuring all Fly-By-Wire Ship Control System alterations are planned and installed **per** reference (h).
- m. Upon completion of each installation, ensure that red lined drawings (if required) are provided to the ship and planning yard **per** reference (a).
- n. Ensure delivery of all required Integrated Logistics Support (ILS) documentation to the ship **per** reference (a) and the approved ILS Certification Form. Inform ISIC **or** TYCOM if all ILS is not available prior to the start of the installation so a TYCOM Risk Assessment can be conducted.

3.2.3 Ship's Alteration Coordinator. Ships will designate the Ship's Maintenance Manager, the 3-M Coordinator or a designated assistant as the Alteration Coordinator. Responsibilities will include:

- a. Acting as the central point of contact for all matters relating to alterations.
- b. Responding to specific requests for ship checks made by the TYCOM, ISIC or FMA.
- c. Ensuring no alteration is attempted by Ship's Force until the alteration appears in the unit's CSMP as planned for accomplishment by the appropriate work center.
- d. Ensuring that all OPNAV 4790/CK forms provided by the installing activity are expeditiously completed and submitted to MDCO or equivalent maintenance document processing office **per** reference (c) three days prior to end of upkeep.
- e. For reactor plant alterations completed by the Shipyard **or** NRMD, an RPCCR Completion Report will be provided by the shipyard **or** NRMD and within four weeks of receipt, the ship's engineer must acknowledge receipt and return the report to the Naval Supply Systems Command (NAVSUP) Code N87 Waterfront Representative. The shipyard **or** NRMD will be responsible for electronically processing these RPCCRs via the Enterprise Business System RPCCR application.
- f. For reactor plant alterations completed by Ship's Force, RPCCRs will be processed:
 - (1) RPCCRs for Ships with Propulsion - Organizational Maintenance Management System (P-OMMS). Ship's Force updates and reports configuration changes in P-OMMS. The P-OMMS coordinator **must** record all updated configuration information and transmit the e-RPCCR data **per** references (d) and (e). In addition, provide a list of NUCALTs completed by Ship's Force to the ISIC Alteration Manager and Squadron Engineer so they can be closed out in RMAIS **or** LDS or appropriate maintenance database.
 - (2) RPCCRs for Ships without P-OMMS. Paper RPCCRs provided with the alteration **must** be completed by Ship's Force and scanned to a .pdf format and

submitted as uploads via the Naval Reactors Information Portal **per** references (d) and (e). In addition, provide a list of NUCALTs completed by Ship's Force to the ISIC Alteration Manager and Squadron Engineer so they can be closed out in RMAIS **or** LDS or appropriate maintenance database.

- g. Monitoring the accomplishment of alterations during Depot Maintenance Availabilities by both the industrial activity and Ship's Force and reviewing alteration completion reports provided by the industrial activity. Report any discrepancies to the ISIC **or** TYCOM.
- h. Ensuring proper 3-M reporting by monitoring the submission of OPNAV 4790/CK forms regardless of the installing activity or availability. If an OPNAV 4790/CK form has not been submitted for a completed alteration, obtain one. The certification letter of alterations accomplished by a shipyard or AIT will be processed as OPNAV 4790/CKs as required by reference (c).
- i. Ensuring an MOA is in place before installation of an alteration or TEMPALT **or** OPALT by any industrial activity. Ensure the MOA provides the duration of installation and scheduled removal date for TEMPALTs **or** OPALTs.
- j. Ensuring installation of TEMPALTs **or** OPALTs is **per** reference (f) and installation **or** removal is reported in the format provided in Appendix C.
- k. Ensuring TEMPALTs are removed and the ship is returned to its original configuration by the scheduled removal date.
- l. Ensuring all TEMPALTs are removed and the ship is returned to its original configuration prior to a CNO Maintenance Availability.
- m. Ensuring installation of alterations by an AIT is **per** reference (g).
- n. Verifying the accuracy of the TAMS Report, a Non-Nuclear Title "K" SHIPALT Report (available from TYCOM) and a NUCALT Technical Documentation CD report and reporting any discrepancies to the ISIC **or** TYCOM.
- o. Ensuring onboard repair parts are ordered in sufficient time to ensure availability prior to a reactor plant SHIPALT installation.
- p. Ensuring all Fly-By-Wire Ship Control System alterations are planned and installed **per** the requirements of reference (h).
- q. Following installation of an alteration that modifies the structure of the ship, such that access to vital equipment is or may be impacted, the ship **must** evaluate the need to perform Unrestricted Operation (URO)-29. If access to vital equipment could be restricted, the ship **must** perform URO-29 and provide a copy to the installing activity and the ISIC. Partial accomplishment of URO-29 is acceptable if appropriate for the alteration.

3.3 ALTERATION PROGRAMS.

3.3.1 Reactor Plant Ship Alteration Package Program (Nuclear Powered Ships only). A NAVSEA 08 program to package and position reactor plant alteration material at the NAVSUP Weapons System Support (WSS) Mechanicsburg for requisition and installation by Forces

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Afloat. RFI reactor plant alteration packages should be requisitioned via fax to (717) 605-7706 or official correspondence to the address **identified in this paragraph**. All requests must include National Stock Number, alteration number, hull number and name, complete shipping address, point of contact (including phone number), and required delivery date.

Naval Supply Systems Command Weapons System Support (NAVSUP WSS)
Code 009
P.O. Box 2020
Mechanicsburg, PA 17055-1788

3.3.2 Alteration Installation Team Program. A program to support the installation of alterations by an industrial team normally outside of a CNO Maintenance Availability. Specific guidelines governing AITs are contained in reference (g). AIT installations are scheduled and authorized through the Navy Tool for Interoperability Risk Assessment (NTIRA), Submarine Modernization and Alteration Requirements Tool (SMART).

3.3.3 Type Commander Alteration Kit Program. A TYCOM program which packages all hardware and software required to plan, install and report completion of the alteration. No action should be taken by Forces Afloat to obtain material to accomplish an alteration designated as a TYKIT. Accomplishment will be authorized in TAMS when the TYKIT becomes available. In addition, TYKIT inventories are available on the SUBLANT, SUBPAC SIPRNET or NIPRNET Websites. The installing activity should request shipment of RFI TYKITs from the TYCOM using Appendix D.

3.3.4 Alteration & Improvement Item Program. A TYCOM program to **issue** NAVSEA approved changes to the fleet which are different from SHIPALTs in that they do not normally result in significant design changes, have no logistically significant material requirements, no significant ILS Requirements and no significant industrial production work or support requirements. Joint COMSUBLANT **and** COMSUBPAC A&Is are issued by COMSUBLANT.

3.3.4.1 Message Alterations and Improvements. In the event that operational concerns require an immediate configuration change to ships at sea, a Naval Message may be used to direct specific actions with an assigned A&I number.

3.3.4.2 Alteration and Improvement Category Codes.

Category A: Mandatory Safety - Accomplish at the next appropriate availability based on scope and complexity after authorization. Deferral requires TYCOM, Ship's Program Manager and SEA05 approval.

Category B: Safety - Accomplish within two years of authorization.

Category C: Maintenance Improvement - Accomplish within three years of authorization.

Category D: Optional (Habitability).

Category E: Optional (Minor Improvement).

Category F: Situational - Accomplish when the condition outlined in the A&I occurs.

3.3.5 Command, Control, Communications, Computer, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Program (C5IMP). The Submarine Force C5IMP was established to manage configuration baselines, ensure critical C5ISR

interoperability and manage operational risks associated with C5ISR modernization. The C5IMP is scheduled and authorized through the NTIRA-SMART. C5I modernization is normally accomplished during CNO Maintenance Availabilities or by an AIT during pier side availabilities. Additional details are available in references (i) and (j).

3.4 MONITORING OF ALTERATION STATUS.

3.4.1 Type Commander Alteration Management System. An automated system operated by the TYCOMs containing information relating to an alteration's authorization, completion status, scheduling and designated accomplishing activity for all A&I Items, TZ Improvements and SHIPALTs. TAMS is the instrument by which the TYCOM authorizes the accomplishment of TYCOM alterations and maintains completion status. Appendix E provides a TAMS Interpretation Guide.

3.4.2 Navy Data Environment - Navy Modernization. The official automated system supporting the information and decision support requirements of NMP managers Navy wide. Navy Data Environment - Navy Modernization (NDE-NM) contains data related to ships and their availability schedules, alteration applicability, alteration material requirements and procurement status and installation and outfitting costs for non-nuclear alterations. Submarine TYCOM alterations and SSBN and SSGN alterations are not scheduled in NDE-NM at this time.

3.4.3 Navy Tool for Interoperability Risk Assessment, Submarine Modernization and Alteration Requirements Tool. NTIRA-SMART is the authoritative tool for the Submarine Force C5IMP. All C5I modernization planning, scheduling and authorization is conducted utilizing NTIRA-SMART. SMART is available on NIPRNET for SSNs and SSGNs and on SIPRNET for SSBNs. In addition, the TYCOM uses NTIRA-SMART to schedule and authorize all Hull, Mechanical and Electrical non-nuclear alterations being accomplished by AIT.

3.4.4 Nuclear Alteration Technical Documentation Compact Disk. The NUCALT Technical Documentation CD provides information required to accomplish nuclear SHIPALTs and A&I items. It is issued to applicable ships, ISICs and FMAs quarterly. It provides information on all outstanding nuclear alterations applicable to each individual ship.

3.5 LIAISON ACTION REQUEST. A Liaison Action Request (LAR) is to be submitted to the appropriate Planning Yard or Reactor Plant Planning Yard, with copy to the TYCOM Modernization Program Manager, when a technical problem is encountered during the planning for or installation of an alteration. Appendix F provides a generic LAR which contains the minimum information required. Locally modified LARs can be used as long as they provide the minimum information outlined in Appendix F. Reference (k) provides more detail on LARs. Non-technical issues should be addressed to the TYCOM via Alteration Feedback **per** paragraph 3.6 **of this chapter**.

3.6 ALTERATION FEEDBACK. An Alteration Feedback message or e-mail (Appendix G) is to be submitted to the TYCOM Modernization Program Manager when a non-technical or administrative problem is encountered during the planning for or installation of an alteration. Technical issues should be addressed to the appropriate planning yard via LAR **per** paragraph 3.5.

3.7 ALTERATION REQUESTS. Requests for new alterations should be made using the format provided in Appendix B. Alteration requests should be limited to alterations affecting safety or those providing a substantial warfighting or maintenance benefit. Initiator must provide

adequate justification or the alteration request will be returned disapproved. ISIC endorsement of Alteration Requests from the fleet is required.

3.8 TYCOM MODERNIZATION WEBSITES. Both the COMSUBLANT and COMSUBPAC NIPRNET and SIPRNET Websites provide a wealth of modernization information to include periodic TAMS Reports, TYKIT Inventory and Requisition Form, Alteration Document (SHIPALT, A&I, TZ Improvement) Archives and general information.

3.9 PERMANENT MODIFICATIONS TO TENDERS WITH NUCLEAR SUPPORT FACILITIES. Rearrangement or modification to spaces within or adjacent to the Nuclear Support Facility **must** be accomplished **per** reference (1).

APPENDIX A
MAJOR SHIP ALTERATION TYPES EXECUTIVE SUMMARY

TYPE ALTERATION	BRIEF	WHO FUNDS FMP INSTALLATION
Title K SHIPALT	Most complex military characteristic change; requires Industrial Activity (including AIT) expertise.	Program Office
Title K-P SHIPALT	Approved package alteration for AIT or forces afloat accomplishment.	Program Office
Title D SHIPALT	Less complex fleet responsible Alteration Equivalent to a Repair. May require Industrial Activity or FMA expertise. Reactor Plant Title "D" SHIPALTs are situational - to be accomplished only when the situation outlined in the SHIPALT occurs.	Fleet Commander or TYCOM
Title F SHIPALT	Less complex fleet responsible Alteration Equivalent to a Repair. May require FMA or Ship's Force expertise. Only used for Reactor Plant alterations.	Fleet Commander or TYCOM
ORDALT	Modification of ordnance equipment or systems after establishment of the product baseline which involves a change in design, material, quantity, installed location, ILS, or the relationship of the component parts of an assembly within the ship. ORDALTs are normally accomplished by an AIT.	Program Office
MACHALT NOTE: Submarines no longer issue MACHALTs but will retain this definition to support legacy MACHALTs.	Hull, Mechanical and Electrical changes within strict equipment/system boundaries and with limited system ramifications managed by the In-Service Engineering Activity.	Program Office or TYCOM
Engineering Changes, Field Changes (FC)	A mechanical, electronic or electrical change, made to electronic equipment after establishment of the product baseline and delivery to the government, including software changes, which do not impact interfaces to other equipment within the ship, change the footprint, form or fit, change power, weight or air conditioning requirements. Engineering Changes and FCs are normally installed by AIT or Ship's Force.	Program Office
Alteration & Improvement (A&I) Item	Tests, inspections and minor alterations to submarines and submarine tenders; no significant ILS impact.	Fleet Commander or TYCOM
Type Zero (TZ) Improvements	Minor alterations to SSBN and SSGN 726 Class submarines; no significant ILS impact.	Fleet Commander or TYCOM
TYCOM Discretionary Changes (TDC) NOTE: Submarines no longer issue TDCs but will retain this definition to support legacy TDCs.	Minor alteration to SSBN and SSGN 726 Class submarines at the discretion of the TYCOM or ISIC; no significant ILS impact.	Fleet Commander or TYCOM
TRIDENT Command and Control System Modification	Alterations on the TRIDENT Command and Control System.	Program Office

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TYPE ALTERATION	BRIEF	WHO FUNDS FMP INSTALLATION
Temporary Engineering Changes	Emergent temporary modification to the TRIDENT Command and Control System.	Program Office
TEMPALT	Emergent, proof of concept or mission related temporary modification to submarines; installed for short, predetermined time frame not normally to exceed 24 months or 18 months wet duration time with any external structure or any implodable volume features.	Technical Sponsor
OPALT	TEMPALTs with ILS requirements (usually an interim installation pending SHIPALT development).	Technical Sponsor
TRIDENT Alteration (TRID)	Major alteration to SSBN and SSGN 726 Class submarines. Significant ILS impact.	Program Office

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APPENDIX B
SUBMARINE ALTERATION REQUEST FORMAT

4720
Ser
Date

From: Commanding Officer, USS (Ship's Name and Hull No.)
To: Commander, Naval Sea Systems Command
Via: ISIC (as appropriate)
TYCOM (as appropriate)

Subj: USS (Ship's Name and Hull No.) ARN (Hull No.-CY-Ser No.) REQUEST FOR
ALTERATION TO (PROVIDE, REMOVE, REPLACE, RELOCATE,
INSTALL, CORRECT, etc.) IN (Ship Type or Class)

Ref: (a) COMUSFLTFORCOMINST 4790.3; Joint Fleet Maintenance Manual

Encl: (1) (Photographs, sketches, etc. to fully describe the proposed alteration)
(2) Recommended Changes to Technical Documentation

1. Existing Deficiency or Condition. Statement of circumstances which warrant initiation of alteration request.
2. Alteration Request. Per Volume VI, Chapter 3 of reference (a), request that the following alteration be approved for (Ship Type or Class) ships and be authorized for accomplishment on USS (Ship's Name and Hull No.).
 - a. Brief: Description of alteration desired.
 - b. Justification: Statements that the alteration meets one or more of the following criteria:
 - (1) Significant improvement in ship or equipment safety.
 - (2) Significant improvement in equipment or system reliability, reduction in maintenance requirements, or both.
 - (3) Significant benefits to health or safety of personnel.
 - (4) Significant improvement in mission capability.
 - c. Applicable Plans and Publications: List applicable technical manuals, drawings, correspondence, maintenance documentation, etc.
 - d. Priority: Defined by TYCOM instructions.
 - e. Relationship to other issued alterations:
 - f. Manual Changes: Recommended manual changes (attached as enclosure (2)).
 - g. Effect on Habitability.
 - h. Materials.
 - i. Work to be accomplished by:

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**ISIC ENDORSEMENT OF SUBMARINE
ALTERATION REQUEST FORMAT****4720****Ser****Date**

FIRST ENDORSEMENT on Commanding Officer, USS (Ship's Name and Hull No.) ltr 4720
(Ser No. and Date)

From: ISIC (as appropriate)

To: Commander, Naval Sea Systems Command

Via: TYCOM (as appropriate)

Subj: USS (Ship's Name and Hull No.) ARN (Hull No.-CY-Ser #) REQUEST FOR
ALTERATION TO (PROVIDE, REMOVE, REPLACE, RELOCATE, INSTALL,
CORRECT, ETC.) IN (Ship Type **or** Class Ships).

1. Forwarded, concurring with the basic correspondence (with the following comments).
2. The alteration should be applicable to (Type, Class, Hulls).
3. This alteration should be issued as an (A&I, Title D, F, K, P SHIPALT).
4. This alteration should be accomplished by (Forces Afloat **or** industrial activity).

Copy to:

USS (Ship's Name and Hull No.) (requesting ship)

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APPENDIX C**SAMPLE TEMPALT~~OR~~ OPALT REPORTING MESSAGE**

FM (INSTALLING ACTIVITY)//
TO COMNAVSEASYS COM WASHINGTON DC//PMS392 (SSN/SSBN/SSGN)//
TYCOM//N42T// (AS APPROPRIATE)
INFO COMSUBRON (SQUADRON NO.)//
USS (SHIP'S NAME AND HULL NO.)//
BT
UNCLAS //N04720//
MSGID/GENADMIN/(INSTALLING ACTIVITY)//
SUBJ/(SUBS) INSTALLATION/REMOVAL OF TEMPALT (TEMPALT NO.) (ON/FROM)
USS (SHIP'S NAME AND HULL NO.)//
REF/A/LTR/(ORIGINATOR, SERIAL NO.)/(DATE)//
REF/B/LTR/(ORIGINATOR, SERIAL NO.)/(DATE)//
NARR/REF A APPROVED DESIGN OF TEMPALT (TEMPALT NO.). REF B APPROVED
INSTLN OF TEMPALT (TEMPALT NO.)//
POC/(NAME)/(RANK/RATE/TITLE)/(LOCATION)/(DSN/COMM TELEPHONE)//
RMKS/1. TEMPALT (TEMPALT NO. AND NARRATIVE DESCRIPTION), DESIGN
APPROVED BY REF A, INSTALLATION APPROVED BY REF B, WAS
(INSTALLED/REMOVED)(ON/FROM) USS (SHIP'S NAME AND HULL NO.) ON (DATE).
INSTALLATION WAS IAW NAVSEA APPROVED TECHNICAL DATA PACKAGE (TDP).
DEVIATIONS WERE APPROVED BY _____. THIS TEMPALT IS SCHEDULED FOR
REMOVAL ON (DATE)//
RMKS/2. URO-29 WAS OR WAS NOT ACCOMPLISHED//
BT

**NOTE: ENSURE MESSAGES ARE ~~FOLLOWING~~ CURRENT MESSAGE FORMAT
AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS
UTILIZED.**

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APPENDIX D
TYKIT REQUISITION FORM

DATE:

FROM:

TO: TYCOM (as appropriate)

1. REQUEST SHIPMENT OF BELOW LISTED TYKIT(S):

TYKIT#

HULL#

2. COMPLETE SHIPPING ADDRESS:

3. POINT OF CONTACT:

4. TELEPHONE (VOICE or FAX):

5. DATE REQUIRED:

6. SPECIAL INSTRUCTIONS:

APPENDIX E
TYCOM ALTERATION MANAGEMENT SYSTEM
INTERPRETATION GUIDE

ALTID: Alteration Identification Number

Format of ALTID is:

PR Type 00000

Alt Prefix Ship Type Alt Number

The Alt Prefix is SA for SHIPALTs, TY for A&I Items and MA for MACHALT.

Ship Type is a four-character element for the type of ship (SSN, SSBN, SSGN, AS, etc.) and the Alt Number is a five-digit number which begins with a 0 for SHIPALTs and a letter prefix for A&I items.

Ship Type Abbreviation	A&I Prefix	Ship Type
SSN688 or 21 Class	N	Nuclear-Powered Attack Submarine
SSN774 Class	V	Nuclear-Powered Attack Submarine
SSBN or SSGN 726 Class	T	TRIDENT or SSGN Submarines
AS	A or R	Submarine Tender
All Nuclear Ships	Q	Reactor Plant Modifications
Drydocks	D or M	Drydocks
APL Class	L	APL Class

REV: Revision Number

INCR: SHIPALT Increment Number (if applicable).

NI = Not Incremented

TITLE: SHIPALT Title

K = Funded & scheduled by NAVSEA

P = Funded by NAVSEA and scheduled by TYCOM or NAVSEA

F = Funded & scheduled by TYCOM

D = Funded & scheduled by TYCOM

NOUN NAME: Noun Name of Alteration

EIC: Equipment Identification Code (Z0ZZ = Reactor Plant Equipment)

SWAB: Ship Work Authorization Boundary

ICNC: Alteration Cancellation Indicator

0 = Active

1 = Canceled

2 = Superseded

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- 3 = Never Issued
- 4 = Completed
- 5 = Not Used
- 6 = Low Priority, Obsolete, Deferred

08: Nuclear Indicator (* denotes reactor plant alteration)

CAP: Capability Code - Recommended Level of Accomplishment

- S/F = Ship's Force
- FMA = Fleet Maintenance Activity
- SY = Shipyard (Industrial Activity)
- AIT = Alteration Installation Team
- FA = Forces Afloat

CAT: Category Code - (non-reactor plant A&I items only)

- A = Mandatory Safety - Accomplish at the next appropriate availability based on scope and complexity after authorization. Deferral requires TYCOM, Ship's Program Manager and SEA05 approval. Invoke SUBSAFE or Submarine Flight Critical Component Boundary work requirements and document SUBSAFE, REC or Submarine Flight Critical
- B = Safety - Accomplish within two years of authorization.
- C = Maintenance Improvement - Accomplish within three years of authorization.
- D = Optional (Habitability).
- E = Optional (Minor Improvement).
- F = Situational - Accomplish when the condition outlined in the A&I occurs.

ALT NARR: Narrative description of the alteration.

TYST: TYCOM Status

- A = Applicable but not yet authorized. No action should be taken to accomplish this alteration without TYCOM concurrence.
- B = Applicable and Authorized.
- C = Alteration has been fully completed per the alteration document. For non-reactor plant alterations, "C" is assigned only after the completion report has been up-line reported in the 3-M System. For reactor plant alteration, "C" is assigned only after the RPCCR has been distributed per reference (c) and all applicable FCs or RPSMs have been completed.
- D = Deferred. No action should be taken to accomplish without TYCOM concurrence.
- E = Intent of the alteration has been equivalently accomplished via a method other than the alteration document.

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H	=	May or may not have been accomplished during new construction or Post Shakedown Availability via Headquarters or Field Modification Request. A shipcheck is required to determine status.
I	=	Incomplete Reactor Plant Alteration (all applicable FCs or RPSMs have not been completed).
J	=	Title P SHIPALT package scheduled for installation by the FMA.
K	=	Title P SHIPALT package scheduled for installation by an industrial activity during Depot Maintenance Availabilities.
L	=	Title P SHIPALT package scheduled for AIT installation.
N	=	Not Applicable.
P	=	Partially complete.
Q	=	A reactor plant alteration reported complete via paper RPCCR.
T	=	Technically applicable, however, requirement to accomplish has been negated by another alteration.
V	=	Not required within five years of inactivation.
X	=	Cancelled.
Z	=	Interim completion. For non-reactor plant alterations, awaiting feedback from the 3-M system that the completion has been up-line reported. For reactor plant alterations, awaiting RPCCR.

FYPR: Fiscal Year Programmed - Fiscal year in which alteration is to be accomplished
(** denotes situational alteration).

PRRMK: Programming Remarks - Assigned Accomplished Level

AIT	=	Alteration Installation Team
ARP	=	Advance Equipment Repair Program
CMA	=	Continuous Maintenance Availability
CNX	=	Cancelled
CON	=	New Construction
DCA	=	Depot Conversion Availability
DEF	=	Deferred
DMA	=	Docking Maintenance Availability
DMP	=	Depot Modernization Program
DPM	=	Docking Phased Maintenance Availability
DRA	=	Depot Restricted Availability
EOH	=	Engineered Overhaul (Not Refueling)
ERO	=	Engineered Refueling Overhaul
ERP	=	Extended Refit Period
FA	=	Forces Afloat
FMA	=	Fleet Maintenance Activity
IDD	=	Interim Dry-docking
MAC	=	MACHALT
MMP	=	Major Maintenance Period
MTS	=	Moored Training Ship
NKT	=	Nuclear Alteration Kit for Forces Afloat Installation
NSY	=	Nuclear Alteration Kit for Depot Installation

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PIA	=	Pre-Inactivation Selected Availability
PKG	=	Title P Package SHIPALT
PMA	=	Phased Maintenance Availability
POU	=	Post Overhaul Upkeep Period
PSA	=	Post Shakedown Availability
PSC	=	Status Confirmed by Shipcheck
RAV	=	Restricted Availability
ROH	=	Regular Overhaul
SAV	=	Special Availability
SCA	=	Surface Craft Availability
S/F	=	Ship's Force
SIT	=	Submarine Installation Team
SMP	=	Submarine Extended Operating Cycle Modernization Program
SRA	=	Selected Restricted Availability
SY	=	Shipyard
TAT	=	TYKIT for AIT Installation
TAV	=	Technical Availability
TKT	=	TYCOM Alteration Kit
TOA	=	TYCOM Opportunity Availability
TRF	=	Trident Refit Facility
TSY	=	TYKIT for Depot Level Installation
TYC	=	No Installing Activity Assigned
VFS	=	Vendor Field Service
XXX	=	Cancelled

SHPCCK: Shipcheck Indicator

REQD	=	Shipcheck is required
COMP	=	Status has been confirmed by Shipcheck

AUTH/COMP: If alteration is outstanding, this date is the authorization date. If the alteration is complete, this date is the completion date.

DUE DATE: Date the alteration is required to be completed.

LAST

UPDATE: Date the record was the last updated by TYCOM.

REMARKS: Used to record information relating to hull status or situational requirements.

APPENDIX F

LIAISON ACTION REQUEST (LAR) FORM

LIAISON ACTION REQUEST		ACTION NO. _____
		DATE _____
From:		
To:		
Subj:		
Ref:		
ORIGINATOR	APPROVED	CODE
Question or Action Required		Reply is required by _____
COMPLETED BY	DATE	APPROVED BY (BRANCH HEAD)
TELE. NO.	SIGNATURE	
Answer or Action Taken		

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APPENDIX G**SAMPLE ALTERATION FEEDBACK MESSAGE AND EMAIL FORMAT**

FM ORIGINATING ACTIVITY//

TO TYCOM//

INFO ISIC//

BT

UNCLAS//N04720//

MSGID/GENADMIN/(SHIP'S NAME AND HULL NO.)//

SUBJ/ALTERATION FEEDBACK//

REF/A/(ALTERATION NUMBER)//

AMPN/REF A IS (DESCRIPTION OF ALTERATION)//

RMKS/1. DURING (PLANNING/ACCOMPLISHMENT) OF REF A THE FOLLOWING
NON-TECHNICAL PROBLEMS WERE ENCOUNTERED:

A. INSTALLATION DOES NOT ACCOMPLISH THE INTENT OF ALTERATION

B. MATERIAL IS NOT ADEQUATELY IDENTIFIED OR AVAILABLE TO
SUPPORT THE INSTALLATION

C. ALTERATION IS/IS NOT APPLICABLE

D. ALTERATION IS/IS NOT WITHIN FMA OR SHIP'S FORCE CAPABILITY

2. DETAILS OF PROBLEM AREAS NOTED IN PARAGRAPH 1 OR OTHER PROBLEMS
ENCOUNTERED

3. RECOMMEND CORRECTIVE ACTIONS/IMPROVEMENTS/COMMENTS

4. RECOMMEND SCHEDULING/PROGRAMMING CHANGES//

BT

**NOTE: ALTERATION FEEDBACK FORMS MAY BE SUBMITTED VIA EMAIL TO
THE TYCOM MODERNIZATION PROGRAM MANAGER****NOTE: ENSURE MESSAGES ARE **FOLLOWING** CURRENT MESSAGE FORMAT
AND CURRENT PLAD IS UTILIZED.**

VOLUME VI**CHAPTER 4****SHIPBOARD ELECTROMAGNETIC COMPATIBILITY****REFERENCES.**

- (a) OPNAVINST 2400.20() - Electromagnetic Environmental Effects (E3) and Spectrum Supportability Policy and Procedures
- (b) NAVSEAINST 2400.20 - Electromagnetic Environmental Effects (E3) and Spectrum Supportability (SS) Program and Procedures
- (c) NAVSEA STD DWG 407-5291780 - Standard Electromagnetic Interference (EMI) Survey Procedures
- (d) COMNAVSURFPACINST/COMNAVSURFLANTINST 3502.3 – Surface Force Readiness Manual
- (e) NAVSEA S9040-AA-GTP-010 - NAVSEA Technical Publication Shipboard Systems Certification Requirements for Surface Ships
- (f) SUBMEPP Test Procedure 441-5-7001 - SSN 688 Class Submarine, Systems EMI Measurements, Dockside
- (g) Maintenance Plan 4100-02-01 - Command and Control System (CCS) Electromagnetic Interference (EMI) Testing
- (h) NAVSEA STD DWG 407-5287556 - Electronics Material Officer's Guide to Shipboard Electromagnetic Interference Control
- (i) NAVSEA STD DWG 407-5287561 - Industrial Electromagnetic Compatibility (IEMC) Work Process Instructions
- (j) N6-NTSP-S-70-8003() - Navy Training System Plan (NTSP) for Electromagnetic Environmental Effects (E3) and Spectrum Management (SM)
- (k) NWP 1-03.1 - Naval Warfare Publication Operational Report
- (l) NTP- 6() – Naval Telecommunications Procedures, Navy Electromagnetic Spectrum (EMS) Guide
- (m) TACMEMO 3-51.1-15 - Electromagnetic Spectrum Operations Afloat
- (n) NAVEDTRA 43357-4A - Personnel Qualification Standard (PQS) for Electromagnetic Spectrum Operations
- (o) NAVSEA S9407-AA-GYD-010/(S) OP-3840 - Electromagnetic Compatibility Criteria For Navy Systems

4.1 PURPOSE. To provide guidance in the management of shipboard Electromagnetic Compatibility (EMC) through the Shipboard Electromagnetic Compatibility Improvement Program (SEMCIP) for all ships, per reference (a) and procedures outlined in reference (b).

4.2 BACKGROUND. The SEMCIP was established by Naval Sea Systems Command (NAVSEA) under the sponsorship of the Chief of Naval Operations (CNO). The goals of SEMCIP are to rectify mission-degrading Electromagnetic Interference (EMI) problems, support fleet EMC training and maintain shipboard EMC. SEMCIP is divided into five major elements: Up-front Systems Engineering, Fleet Response, EMI Problem Quantification, Spectrum Management, EMC in the ship alteration installation approval process, Engineer EMI Fixes and Fleet EMC Support Tools. One of the Fleet tools is the SEMCIP Technical Assistance Network (STAN), a database containing current and historical information on all known shipboard,

submarine and Strike Force EMI problems. Since some SEMCIP elements are normally associated with the development of new systems, all elements will not be discussed here.

4.3 ELECTROMAGNETIC COMPATIBILITY CERTIFICATIONS AND EMI SURVEYS.

EMC certifications are an important line of defense against shipboard EMI problems and are performed by NAVSEA designated activities for the purpose of testing various shipboard systems for EMI degradation. During an EMC Certification or EMI Survey, EMI problems are investigated and evaluated, applicable EMI fixes are installed and effects of EMI on each system tested is ascertained and recorded in STAN.

4.3.1 Surface Ships and Aircraft Carriers Electromagnetic Compatibility Certifications.

Deploying surface ships and aircraft carriers will receive an EMC Certification from a NAVSEA qualified activity following CNO or extended maintenance availability periods (more than 120 days) or major topside changes prior to deployment. EMC Technicians are billeted onboard CVN, LHA and LHD class ships and at Regional Maintenance Center (RMC) or Fleet Maintenance Activity (FMA). Ships may submit requests for EMI or EMC technical assistance from co-located CVN, LHA, and LHD class ships through their normal chain of command channels. Ships may submit requests for an EMI or EMC technical assistance to the RMC or FMA by submitting an OPNAV 4790/2K. OPNAV 4790/2K should be used to document maintenance actions as part of an Availability Work Package (AWP) for completion during CNO availabilities or prior to and in preparation for EMC Certification. Since there are differences in the systems and processes between platforms, they will be discussed separately.

4.3.1.1 EMC certification consists of four phases: a planning and test plan development phase, an in-port certification testing phase, an underway certification phase, and reporting phase.

4.3.1.2 EMC certifications should not be scheduled coincidental with evolutions that restrict either antenna radiation or personnel movement about the ship.

4.3.1.3 EMC certifications must be performed per the requirements of reference (c), and include, but are not limited to:

- a. Using STAN to verify that all available EMI fixes have been installed, or if not installed, documented in ship's Current Ship's Maintenance Project.
- b. Performing topside visual surveys to ensure the ship conforms to the applicable topside electromagnetic control drawing as specified in STAN for that ship.
- c. Performing High Frequency Intermodulation Interference (IMI) test.
- d. Performing IMI source location when IMI level exceeds the 19th product order.
- e. Performing broadband noise test.
- f. Performing source location when broadband noise is detected.
- g. Performing Time-Domain or Frequency-Domain Reflectometer measurements on all high frequency, very-high frequency and ultra-high frequency transmission lines.
- h. Conducting Voltage Standing-Wave Ratio tests on all high frequency, very-high frequency and ultra-high frequency transmit antennas. Where transmission lines and antennas are coupled and cannot be easily separated, reconnected and weather-proofed, testing of transmission line and antenna combinations may be performed via

Time-Domain Reflectometer or Frequency-Domain Reflectometer, satisfying the testing requirements of this paragraph and paragraph 4.2.1.1.3.g.

- i. Performing insulation resistance tests on high frequency antennas, where required by the Planned Maintenance System (PMS).
- j. Documenting all discrepancies noted on OPNAV 4790/2Ks.
- k. Assisting Ship's Force with hands-on training and technical guidance in correcting discrepancies as appropriate.

4.3.1.4 EMC Certifications. EMC certifications should be scheduled during the O-FRP "Maintenance" phase per reference (d), immediately following the ships Target Configuration Date (TCD) and following periodicity requirements and prerequisites contained in reference (e).

4.3.2 Submarines Electromagnetic Compatibility Certifications.

4.3.2.1 Submarines will receive pre-deployment EMI Surveys from a NAVSEA qualified activity. Ships may submit requests for an EMI or EMC technical assistance to the RMC or FMA by submitting an OPNAV 4790/2K. OPNAV 4790/2K should be used to document maintenance actions as part of an Availability Work Package (AWP) for completion during CNO availabilities or prior to and in preparation for EMC Certification. Since there are differences in the systems and processes between platforms, they will be discussed separately.

4.3.2.2 EMI surveys require up to four working days depending on the ship class being evaluated. EMI surveys can be accomplished concurrently with most submarine work but must not be scheduled coincidental with evolutions that would impede access to the forward sonar and communications system units or cause power-down of systems during the EMI survey without prior notification of the EMC technician conducting the testing. If equipment must be powered down, the EMC technician will determine if further EMI testing can be accomplished. For an accurate assessment of the submarine EMC posture, the ship's forward electronics must be energized as close as possible to the ship's at-sea lineup. The electronics and hydraulics for both multifunction mast antennas must be operational. In addition, crane service is required to lift two antenna shields (approximate weight 130 lbs. each) to cover both partially raised multifunction mast antennas for testing. Major sonar, communications, fire control or navigation system casualties will cause test data to be invalid. EMI surveys must be performed, per references (f) and (g), by qualified NAVSEA or NAVSEA designated activities and include, but not limited to:

- a. Using STAN to verify all available EMI fixes have been installed.
- b. Briefing Ship's Force on the details of the EMI Survey and discussing testing time-lines and potential impacts.
- c. Coordinating antenna shield installation and removal with the ship, RMC or FMA and port services.
- d. Performing a visual survey in the submarine to verify EMI corrective action installations in sonar and communications equipment and to look for potential EMI coupling areas associated with these systems.

- e. Energizing forward electronics following the equipment energized list, provided in reference (f) for SSN Class submarines or reference (g) for TRIDENT Class submarines.
- f. Conducting EMI analysis on sonar and communications equipment.
- g. Installing or repairing any EMI corrective action needed to produce EMI reduction in order to improve the total shipboard EMC of all shipboard electronic equipment and systems. This will include a retest to determine the actual reduction achieved.
- h. Analyzing test data, noting all discrepancies and generating a naval message, prior to departing the ship, documenting the results of the EMI survey.
- i. Providing EMC posture debrief to the designated submarine's officers, chiefs and leading petty officers. The naval message, noting all discrepancies, will be provided to the ship after final report has been reviewed.
- j. Assisting ship with hands-on training and technical guidance in correcting discrepancies as appropriate.
- k. Documenting all discrepancies noted on OPNAV 4790/2Ks.

4.4 FLEET ELECTROMAGNETIC COMPATIBILITY SUPPORT TOOLS. SEMCIP provides Fleet EMC support tools to help eliminate emergent EMI problems between certifications. When a ship encounters an EMI problem beyond the scope of Ship's Force and RMC or FMA capabilities, outside technical assistance can be arranged on short notice. The problem should be reported per guidance in Chapter 5 of this Volume. In addition to the normal message addressees, the message should also be sent to COMNAVSEASYS COM WASHINGTON DC//05H4//, NAVSURFWARCENDIV DAHLGREN VA//B54//, NAVUNSEAWARCENDIV NEWPORT RI//3431// (submarines only), COMSPA WARSYS COM SAN DIEGO CA //051-1C//, INFO COMNAVIFOR SUFFOLK VA, NAVINFOWARDEV CEN NORFOLK VA, NAVMARSPECCEN FT GEORGE G MEADE MD and appropriate regional Navy and Marine Corps Spectrum Office (NMCSO) as outlined in reference (h). The following paragraphs list additional support resources that will improve the warfighting readiness of EM Spectrum Dependent Systems (SDS).

- a. SEMCIP Technical Assistance Network (STAN): The official repository for EMC and EM radiation hazard (RADHAZ) data for systems, ships, submarines and strike groups certifications for all SDS. RADHAZ includes several subsets (e.g., Hazard of Electromagnetic Radiation to Personnel (HERP), Hazard of Electromagnetic Radiation to Fuels (HERF)). Primary products include EMI brief sheets and associated affected ships list, EMI test procedures, tailored ship equipment lists and an Electromagnetic Environmental Effects (E3) document library. Additional products are available in STAN, such as EMI problem listings by selected criteria, EM control drawings and the EMC Certification test plan generator. STAN access and familiarity is highly recommended for all units. Requests for STAN access is obtained via the STAN web site <https://semcip.nswc.navy.mil>.
- b. Air Systems Electromagnetic Interference Corrective Action Program (ASEMICAP): ASEMICAP provides E3 systems engineering support to the Fleet and NAVAIR team to ensure E3 hardness of operational aircraft systems, subsystems and equipment

throughout their life cycles. The primary task is to provide deck plate engineering and technical support to the Fleet in an attempt to rapidly resolve E3 problems while striving to elevate Fleet E3 capabilities through a dedicated process of deck plate support. The emphasis continues to be immediate response to EMI issues through engineering solutions for operational aircraft systems and equipment. The increasing reliance on Unmanned Aerial Systems (UAS) and the resultant demands on the congested EM operational environment (EMOE) forces improved Electromagnetic Spectrum (EMS) awareness and impacts of aviation operations by Sailors and Marines. ASEMICAAP also provides engineering and technical support directly to Fleet units to resolve EMI problems and represents Fleet interest within the acquisition community. ASEMICAAP is located on NIPR at <https://asemicap.navair.navy.mil>.

- c. NAVSEA EMI Capability and Limitations (EMI C&L) Portal: The EMI C&L provides the Fleet a central repository for ship-specific EMI and EMC information. The data is tailored for EMI C&L individual ship and strike forces and provides an overall force-wide EMI and EMC perspective. The C&L portal includes information on shipboard characteristics, coverage plots for selected communications and weapons systems, host nation frequency restrictions (HNR), for all SDS and RADHAZ limitation information. The portal is located on SIPR at http://cnl.phdnswc.navy.smil.mil/emi_cnl/default.htm.

4.5 ENGINEER ELECTROMAGNETIC INTERFERENCE FIXES. SEMCIP EMC engineers identify and characterize new EMI problems and develop and formalize solutions for these problems. When new EMI problems are detected through testing, per references (c), (f) and (g), SEMCIP engineering will develop a fix. SEMCIP engineering also updates standard EMI test procedures for references (c), (f) and (g).

4.6 SHIPBOARD FULL-SCALE ELECTROMAGNETIC COMPATIBILITY EVALUATIONS. Shipboard full-scale EMC evaluations are performed by NAVSEA in the lead ship of a class or in individual ships at the conclusion of any major event (such as conversion, modernization or overhaul) which could affect the EMC status of the ship. SEMCIP engineering teams energize, test and evaluate the capability of electromagnetic emitters and sensors to operate simultaneously on the same ship without interference.

4.7 ELECTROMAGNETIC COMPATIBILITY CERTIFICATION. NAVSEA 05H coordinates EMC Certification in new construction ships, ships undergoing industrial availabilities and ships receiving new systems both in and outside of industrial availabilities. The EMC Certification testing is conducted by NAVSEA or NAVSEA-qualified activities. There are two types of EMC Certification: System and Ship EMC Certification. Each type is addressed **in this section**.

4.7.1 System Electromagnetic Compatibility Certification. System EMC Certification ensures all newly installed electrical and electronic systems are compatible with previously installed systems. System EMC Certification will be accomplished per reference (e) for surface force ships:

- a. For electrical and electronic systems installed by Fleet or Program Alterations following the Navy Modernization Process, Management and Operations Manual (NMP-MOM).

- b. Following the System Operational Verification Test or other operation test for the newly installed system.
- c. By NAVSEA 05H4 test team for the first two ships of a class, flight or baseline.
- d. By Program Acquisition Resource Manager, Ship Program Manager, Naval Supervisory Authority, RMC or FMA or a contractor witnessed by a government activity for the subsequent System EMC Certifications using test procedures provided in references (c) and (f).
- e. System EMC Certification requirements mandate:
 - (1) The system has an approved (Stage 4) Application for Frequency Allocation (JF-12).
 - (2) No mission-degrading EMI has been introduced by installation of the system.
 - (3) EMI fixes have been installed to correct mission-degrading EMI caused by the installation of the system.

4.7.2 Ship Electromagnetic Compatibility Certification. Ship EMC Certification ensures all shipboard systems are compatible with each other and topside EMI mitigation treatments are in place. Ship EMC Certifications will be accomplished per references (e) and (i). Ship EMC Certification requirements mandate:

- a. All “available EMI fixes” that correct mission-degrading EMI problems are installed. Available EMI fixes are fixes that have been developed and listed in the STAN database. An “available EMI fix” is required for certification even if the kit or parts are not in stock. In that case, priority would be given for procurement and installation of the fix required for certification.
- b. All mission-degrading EMI problems that remain uncorrected due to non-availability of EMI fixes, must be identified and reported to the ship’s Commanding Officer (CO).
- c. All discrepancies causing IMI above the 19th order must be corrected. IMI levels are defined in reference (c).

4.8 ELECTROMAGNETIC COMPATIBILITY CERTIFICATION MAINTENANCE. System Commands provide support during ship construction and CNO Maintenance Availabilities at industrial activities to achieve EMC certification. It is the responsibility of the Type Commander, the RMC or FMA and Ship’s Force to maintain EMC at the highest level practical. EMC technical billets (Navy Enlisted Classification (NEC) ET-1419 surface) have been established in reference (j) for RMCs or FMAs, aircraft carriers and selected larger ships to provide technical assistance to Ship’s Force in maintaining EMC. These technicians conduct EMI inspections, install known fixes, test for problems and investigate new problems.

4.9 RESPONSIBILITIES.

- a. Type Commander should:
 - (1) Coordinate with the System Commands in identifying, solving and correcting operational EMI deficiencies.

- (2) Prior to promulgation, review and authorize all documents prepared by technical agencies that contain procedures relative to EMI reduction and the fleet EMC process.
 - (3) Evaluate comments and recommendations regarding EMI reduction and the fleet EMC process. If necessary, **issue** changes to existing policy and procedures.
 - (4) Ensure participation of each aircraft carrier, surface force and submarine EMC technician in at least one EMI survey every 6 months. Qualified EMC technicians must meet this requirement to retain qualification status.
- b. Group, Squadron and Regional Support Group Commanders should:
- (1) Schedule EMC certifications prior to deployment for each unit. For submarines, the EMI Survey should be conducted within two months of deployment during Pre-Overseas Movement 2, take up to four days to perform and can be scheduled concurrently with most shipboard evolutions provided power is not secured to a major system. NAVSEA personnel will be contacted to perform the EMC certification.
 - (2) Review and take the appropriate action to correct EMI discrepancies on EMC reports for subordinate units.
 - (3) Request SEMCIP engineering assistance when determined necessary.
- c. RMCs and FMAs should:
- (1) Maintain qualified EMC personnel (NEC-1419 for Surface Force Ships and Aircraft Carriers) in coordination with NAVSEA 05H4 and ensure that test equipment assets are available to perform EMC assessments and surveys.
 - (2) Assist aircraft carriers, surface force and submarines in conducting EMC-related PMS procedures when requested.
 - (3) Conduct EMC certifications per applicable references (c), (e) through (i) and (k).
 - (4) Install authorized limited corrective actions when required in STAN.
 - (5) Write a naval message, prior to departing the ship, describing the results of the EMC certification using the latest message formats. Message is submitted to the aircraft carrier, surface force or submarine during the EMC certification briefing prior to departing the ship.
 - (6) Maintain an active account on STAN.
 - (7) Maintain an up-to-date file of EMI and EMC information, which includes naval messages generated on tended submarines and original data recorded during the EMI surveys.
- d. Aircraft Carrier, Surface Force and Submarine Commanding Officers should:
- (1) Ensure EMI PMS is conducted. Request RMC or FMA assistance when required.

NOTE: EMC CERTIFICATIONS CONDUCTED WITHIN ONE MONTH PRIOR TO DEPLOYMENT WILL PROVIDE THE MOST CURRENT EMI DATA.

- (2) Request an EMC certification within six months of deployment or when any new indications of EMI in ship's electrical and electronic systems appear.
 - (3) Transmit the EMC naval message promulgating the results of the EMI survey to all cognizant activities.
 - (4) Maintain an up-to-date file of EMI and EMC information that includes EMC naval messages from the last three surveys.
 - (5) Establish an EMS Readiness Improvement Program with following shipboard organization per references (j), (l), (m) and (n).
- e. Electromagnetic Spectrum Operations (EMSO) Officer:
- (1) Assigned CWO-2 or above designated in writing by the Commanding Officer.
 - (2) Qualified 308 Electromagnetic Spectrum Operations (EMSO) Officer.
 - (3) Serve as Principal Advisor to the Commanding Officer on all EMS-related issues and provide the CO with monthly EMS effectiveness summaries to include major EMS degradation, personnel compliance with EMS Certification requirements, and a plan of action and milestones to correct any tactically significant EMI degradations.
 - (4) Prioritize corrective actions for tactically significant EMC deficiencies.
 - (5) Coordinate shipboard EMS indoctrination and training for newly reported personnel.
 - (6) Serve as single point of contact for quality assurance of EMS-related maintenance projects.
 - (7) Review all topside configuration changes (including program alterations, Fleet alterations, field changes, Combat System Smooth Log, etc.).
 - (8) Review and update bills, instructions, and messages (e.g., HERP, RADHAZ, Emissions Control (EMCON), Personal Electronic Device (PED) plans, wireless plans, OPSTAT Unit, Afloat Electromagnetic Spectrum Operations Program (AESOP) reply messages, etc.).
 - (9) Review all EMS incidents (Joint Spectrum Interference Resolution Online (JSIRO), Communications Department (COMSPOTS) and EMI).
 - (10) Ensure EMS-related PMS is included in the command PMS Spot-check Program.
 - (11) Assign a Command Electromagnetic Spectrum Operations (EMSO) Coordinator.
- f. Command EMSO Coordinator:
- (1) Assigned E-7 or above with NEC 2379 Information Technician or NEC 1781 Cryptologic Technician Technical.

- (2) Qualified 304 Electromagnetic Spectrum Operations (EMSO) Coordinator Afloat.
- (3) Designated in writing by the Commanding Officer.
- (4) Perform the duties of the Afloat Spectrum Manager outlined in references (l) and (k).
- (5) Primary assistant to the EMS Officer maintaining the EMS Readiness Program and serve as the EMS subject matter expertise (SME) afloat.
- (6) Perform as EMSO Team Training Lead - developing unit level EMS awareness, effects of all emitters and receivers in the EMOE.
- (7) Establish and maintain accounts for EM SDS databases (Communications Equipment Population Survey (CEPS), JSIRO and STAN).
- (8) Liaison with the Combat Systems Maintenance Manager (CSMM) or equivalent on all EMS issues pertaining to the combat system equipment.
- (9) Ensure the EMS personnel are familiar with EMS tools in paragraph 4.3.

g. EMSO Planners:

- (1) EMSO Radar and Communication Planners should be proficient using AESOP software as mandated by the CNO, reference (o).
- (2) Qualified 301 Radar Planner and 302 Communication Planner.
- (3) Use the AESOP tool to assist in minimizing intra-ship EMI and IMI between radars, communications equipment and all other SDS. Inter-ship EMI mitigation through AESOP planning and best practices for ships in company and future operations.
- (4) Achieve SME level of knowledge of all AESOP reports, reply messages, standing communication plans, radar coverage plots, spectrum occupancy displays and the spectrum monitor functionality.
- (5) Develop and maintain working relationships with Ship's Signal Exploitation Space (SSES) Signal Warfare Officer (SIGWO) for their operations in the EMOE.
- (6) Achieve and maintain a working knowledge of the EMOE and the warfighting impacts of all emitters and receivers in the AESOP EMSO Plan (atmospheric ducting effects on radar probability of detection, counter-detection of high power radars and ducting effects on transmitted energy within littoral operating areas and into host nation restrictions).
- (7) Ensure EMS reporting of JSIRO and COMSPOTS.

h. EMC Maintenance Technicians:

- (1) Assign one E-5 or above from each of the following ratings: Electronic Technician (ET), Cryptologic Technician Technical (CTT), Cryptologic Technician Maintenance (CTM), Information Technician (IT) Fire Controlman Technician (FC), Sonar Technician (ST).

- (2) Qualified 303 EMC Maintenance Technician.
- (3) EMC Maintenance Technicians should be familiar with references (i), (j) and (o); and all EMI and EMC issues for their related equipment (source or victim).
- (4) Serve as the EMI and IMI SME for their equipment and assist with training other personnel on the impacts to the EME and the ship's EMS footprint in the EMOE.

VOLUME VI**CHAPTER 5****DEFICIENCY DOCUMENTATION AND REPORTING****REFERENCES.**

- (a) OPNAVLTR 4700 - Representative Intervals, Durations, Maintenance Cycles, and Repair Mandays for Depot Level Maintenance Availabilities of U.S. Navy Ships
- (b) OPNAVINST 4780.6 - Policy for Administering Service Craft and Boats in the U.S. Navy
- (c) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (d) NAVSEA S0400-AD-URM-010/TUM – Tag-Out Users Manual
- (e) NAVSEAINST 4790.8 - Ship's Maintenance and Material Management (3M) Manual
- (f) NWP 1-03.1 - Naval Warfare Publication Operational Report
- (g) MIL-STD-130N - Identification Marking of U.S. Military Property

LISTING OF APPENDICES.

- A Equipment Operational Capability Range of Values and Definitions.

5.1 **PURPOSE.** The purpose of this chapter is to provide guidance on accurately documenting ship's material condition and on ensuring that this documentation is done in a timely and expeditious fashion. Deficiency documentation is used for determining and reporting a ship's material condition to ensure maximum operational readiness, maintain an adequate quality of life for embarked personnel, maximize safety for all personnel and ensure the ship reaches its designed service life. This documentation will be used for:

- a. Accurate and timely material readiness reporting.
- b. Reporting ship material deficiencies, requests for maintenance assistance or support equipment from off-ship maintenance activities and the documentation of completed maintenance actions.
- c. Maintaining an accurate Current Ship's Maintenance Project (CSMP).
- d. Maintaining an accurate and current ship's configuration database.

5.1.1 Background.

- a. The Navy has identified the need for a more near real time, accurate and comprehensive understanding of an activity's material condition in a more timely fashion to support fleet material readiness reporting. Additionally, this information is used in developing, planning and executing more thorough and comprehensive maintenance availability work packages and to better project future material condition readiness and actionable trends.
- b. Using existing maintenance documentation (Casualty Reports (CASREP), 3M Maintenance Action Forms (2 Kilo), Class Maintenance Plan (CMP), etc.), material readiness is calculated for equipment, systems, activities, ships or ship classes against various tasks, missions and warfare areas. This information is used by Navy leadership to determine an activity's ability to perform a desired mission or task, and

to make recommendations for maintenance actions that can improve the ship's readiness to perform a mission or task. Further, it allows the maintenance community working with constrained budgets, to better prioritize maintenance that can most improve the activity's material readiness for a known mission or task.

- c. Ship operations involve performing various Naval Tasks when, where and how required. While there may be multiple alternate means to accomplish any particular Naval Task to adequately support operations, equipment and systems must function as designed. Constrained resources (time, funds, and manpower) require better synchronization and prioritization of the maintenance effort.
- d. Not all 4790/2Ks impact current material readiness reporting.
 - (1) Condition Based Maintenance (i.e., degraded equipment). Condition Based Maintenance deficiencies drive activity material readiness reporting. The reality of Naval operations is that equipment breaks and system performance is impacted. Condition Based Maintenance is the art of managing material failures. Condition Based Maintenance items run the scope from administrative requirements (placards, stenciling, etc.), run to fail items (e.g., light bulbs, fuses, etc.), gracefully degrading distributed systems (e.g., deck covering, lagging, corrosion, minor leaks, etc.) through catastrophic failures. The Equipment Operational Capability (EOC) Value, Descriptions and Example Table (Appendix A) describes graduations of material condition (fix it after it breaks, fix it before it breaks or fix it because it is about to break).
 - (2) Engineered Maintenance (i.e., CMP or Planned Maintenance System (PMS)). Until they exceed periodicity, engineered maintenance does not impact activity material readiness reporting. Typically, time directed maintenance actions encompass the art of anticipating failure. Engineered maintenance includes both push and pull CMP items, items written to arrange services or order parts to support future PMS and Baseline Automated Work Packages written by life cycle managers as placeholders for historically anticipated depot work.
 - (3) Modernization (i.e., alterations). See Chapter 3 (Submarine Fleet Modernization Program) and Chapter 36 (Surface Force Ship and Aircraft Carrier Modernization Program) of this volume. Planned modernization does not impact activity material readiness reporting. Modernization encompasses replacing obsolete equipment or systems, increasing capacity beyond installed design or adding new capabilities. However, because material deficiencies on replaced or removed equipment or systems are no longer applicable to the activity, material readiness may be positively impacted once modernization is accomplished.
 - (4) Services (i.e., tasks that support maintenance). Services do not impact activity material readiness. Services are overhead items (force protection, berthing ashore, cranes, etc.) in support of maintenance availabilities.

5.1.2 Scope. Except where indicated, this chapter applies to all ships and activities of the Navy (active and reserve). It does not apply to civilian operated ships assigned to the Military Sealift Command. Throughout this chapter, the term “ship” refers to all surface ships, aircraft carriers,

submarines, shore activities and service craft specified in reference (a) and the term “activity” refers to both ship and shore activities. Ship’s Force refers to personnel assigned to any “activity”. Reference (b) provides policy and guidance for maintenance of service craft and boats not addressed in reference (c).

5.1.3 Definitions.

5.1.3.1 Material Readiness. Material Readiness, a term interchangeably used with Material Condition, is a value relative to the observed performance of a single component up to and including a system. The value is obtained through a process of the operator’s observation of the parameters for a component and comparing this measurement to a standard (e.g., design criteria or normal operating parameters). The result of the comparison is the value of Material Readiness or Material Condition. The Fleet Measure of Effectiveness is called the EOC. Found in Appendix A, for the full range of this dimensionless value is the Color Representation when displayed, a specific Definition, a Description and Shipboard Examples.

5.1.3.2 Maintenance Figure of Merit Index Value. The Maintenance Figure of Merit (MFOM) was developed as part of the Defense Readiness Reporting System (DRRS) to provide an objective measure of the true material condition of an activity. The MFOM Index Value is an objectively calculated value where the scale of values and definitions are the same as the EOC as described in Appendix A.

5.1.3.3 Maintenance Worthy. Maintenance Worthy is any object (system, equipment, component, sub component, part, etc.) that is Danger **or** Caution tagged or part of a tag out (i.e., tag hung on it) **per** reference (d), has maintenance preformed on it that is either planned (e.g., PMS, calibration, CMP, etc.) or corrective and has maintenance information (e.g., material history, meter readings, test information) recorded about it. Maintenance Worthy is contextually different from Configuration Worthy. Traditionally, Configuration Worthy was a term used to describe the sparing plan requirements associated with onboard repair parts that enabled ships to be “maintenance self-sufficient” for periods of time away from home port or parent tender. Accordingly, the Consolidated Onboard Shipboard Allowance List provided great merit or support to self-sufficiency. The support of accurate and timely material readiness reporting necessitates the use of a broader term.

5.1.3.4 Current Ship’s Maintenance Project. The CSMP, **per** references (c) and (e), is the primary repository of information concerning the material condition of the activity. The CSMP consists of two files, shipboard (local) file and the master (shore) file.

- a. The Shipboard File **must** be maintained by Ship's Force in a complete and current status at all times. The CSMP **must** be used by the activity to document all completed without prior deferral preventive and corrective maintenance requirements. These deferred items **must** be validated by Ship's Force and entered into the CSMP **per** reference (e) guidelines.
- b. The Master File contains the material deficiencies uploaded from the shipboard (local) file, other work identified by shore-based managers and tasks from CMPs.
- c. Reconciliation of the Shipboard File and Master File is the process of insuring that the two files are essentially the same.

NOTE: THE TERMS “4790/2K”, “2K”, “2 KILO”, “AWR”, “AUTOMATED WORK

REQUEST”, “AUTOMATED WORK NOTIFICATION”, “NOTIFICATIONS”, “AWN” AND “WORK CANDIDATE” ARE USED GENERICALLY THROUGH OUT THIS CHAPTER AND THIS MANUAL TO DESCRIBE ANY SHIP MAINTENANCE ACTION FORM.

5.1.3.5 Ship Maintenance Action Form. The Ship Maintenance Action Form (4790/2K), located at https://navalforms.documentservices.dla.mil/formsDir/OPNAV_4790_2k_IMF_VER_3915.pdf and discussed in chapter 19 of this volume, is the principal means used to document material deficiencies and completed maintenance actions.

- a. A Maintenance Ready 4790/2K contains correct and complete information, and provides an accurate diagnosis of the deficiency affecting the object.
- b. Validated Maintenance Ready 4790/2K properly supports the planning and executing activities ability to understand the maintenance requirement; does not require the expenditure of additional manpower or time to obtain missing required data or information.
- c. Completion 4790/2K contains:
 - (1) A detailed and comprehensive description of the "as found" condition.
 - (2) A synopsis of tasks and actions taken to complete the maintenance requirement.
 - (3) Failure Mode and Root Cause identified.
 - (4) Documentation of labor and material costs.

5.1.3.6 Casualty Report. The CASREP, **per** reference (f), is used to both notify the chain of command and the readiness stakeholders of degradations to operational readiness caused by deficiencies in an activity’s material condition and alert support activities to the nature of outside assistance required for correction. A CASREP is made on a system or equipment which has a maintenance requirement that cannot be corrected within 48 hours and the maintenance requirement reduces the activity’s ability to perform an assigned task or mission (primary or secondary). The CASREP category (C2, C3, and C4) **must** be determined **per** reference (f).

5.1.3.7 Department of Defense Readiness Reporting System. The DRRS was established by the Department of Defense (DoD) Directive 7730.65 (June 2, 2002) establishing the requirement and means to manage and report the readiness of the DoD and its subordinate components to execute the National Military Strategy as assigned by the Secretary of Defense in the Defense Planning Guidance, Contingency Planning Guidance, Theater Security Cooperation Guidance, and the Unified Command Plan. All DoD components will align their readiness reporting processes to DRRS. The DRRS will build upon processes and readiness assessment tools used in the DoD to establish a capabilities-based, adaptive, near real-time readiness reporting system. All DoD Components will use the DRRS to identify critical readiness deficiencies, develop strategies for rectifying these deficiencies and ensure they are addressed in program **or** budget planning and other DoD management systems.

5.1.3.7.1 Joint Mission Essential Tasks. Joint Mission Essential Tasks are developed in support of missions as assigned by the Secretary of Defense. The Joint Mission Essential Tasks will be based on tasks derived from mission analysis using the language of the Universal Joint Task List.

Additionally, the DoD components will develop Mission Essential Tasks or similar indicators for all assigned missions, and use information technology to collect near real-time data on the readiness of military forces and support organizations to perform these missions. The Mission Essential Tasks are based on mission analysis and approved by the commander as absolutely necessary, indispensable or critical to the success of a mission. For a given mission there is generally more than one Mission Essential Task that the object supports.

5.1.3.7.2 Navy Capabilities Readiness Reporting System. Subsequent guidance (NAVADMIN 172345ZAUG05) identified DRRS-N (Navy) as Navy's Capabilities Readiness Reporting System, identified OPNAV N4 as Resource Sponsor and identified United States Fleet Forces Command as executive agent.

5.1.3.8 Item Unique Identification. Item Unique Identification (IUID) is an asset identification system instituted by the United States DoD to uniquely identify a discrete tangible item or asset and distinguish it from other like or unlike tangible items. Reference (g) provides evolving clarification, increased insight and guidance regarding implementation of Machine-Readable Information (MRI) for item identification marking and automatic data capture associated with IUID. The IUID is used by MFOM and the Navy's Configuration Data Base of Record, Ship's Configuration and Logistics Support Information System to uniquely differentiate an object from other objects. IUIDs are either installed by the original manufacture or for legacy items, through the use of the eSOMS software and **per** reference (d).

5.2 RESPONSIBILITIES. Chapter 19 of this volume provides detailed responsibilities with respect to the implementation of policies for the Maintenance and Material Management (3-M) system as set forth in reference (e). The responsibilities delineated **here** represent an overview of those policies.

5.2.1 Ship's Force.

- a. Ship's Force will comply with the guidance provided in reference (c) and Chapter 19 of this volume when submitting a 4790/2K.
- b. Ship's Force will comply with guidance provided in reference (f) and paragraph 5.3.2 of this chapter when submitting a CASREP.

5.2.2 Immediate Superior In Command.

- a. The Immediate Superior In Command is responsible for screening and technically reviewing all submitted 4790/2Ks.
- b. The Immediate Superior In Command is responsible for technically reviewing all submitted CASREPs.

5.2.3 Maintenance Team. The Maintenance Team is responsible for reviewing and validating all submitted 4790/2Ks for content and technical correctness. When directed by the Type Commander (TYCOM), members of the Maintenance Team are responsible for validating, screening and brokering all 4790/2Ks.

5.2.4 Type Commander.

- a. The TYCOM is responsible for validating, screening and brokering all 4790/2Ks.

- b. The TYCOM is responsible for brokering all 4790/2Ks associated with any outstanding C3 **or** C4 CASREP during the next scheduled maintenance availability if it has not previously been corrected as an emergent availability.
- c. The TYCOM is responsible for:
 - (1) Complying with the policy provided in paragraph 5.3.2.3 of this chapter.
 - (2) Enforcing compliance with the policy of paragraph 5.3.2.2 of this chapter.

5.2.5 Fleet Maintenance Activity. The Fleet Maintenance Activity, as described in Volume II, Part I, Chapter 4 of this manual, will comply with paragraph 5.1.3.5.c of this chapter when preparing end of availability completion data associated with each 4790/2K.

5.3 GUIDANCE.

5.3.1 Generation of a Ship Maintenance Action Form OPNAV 4790/2K. The 4790/2K is the principal means used to document material deficiencies and completed maintenance actions. These actions require the highest degree of accuracy and accomplishment in a timely and expeditious fashion. Chapter 19 of this volume provides policy and assigns responsibility applicable to specified 4790/2K data elements critical to obtaining outside support and material readiness reporting.

5.3.1.1 Procedures for Documenting a Maintenance Action. A 4790/2K **must** be filled out **per** Chapter 19 of this volume and the Software Users Guide for the Automated Information System being used. All Unclassified Non-Nuclear Naval Propulsion Information will be handled **per** current regulations and standing guidance from NAVSEA 08. The following policy guidance for data elements is provided:

- a. The 4790/2K associated with a CASREP will remain open, even after the CASREP is cancelled, until repairs have been completed.
- b. Every active CASREP must have at least one active associated 4790/2K. To ensure timely, accurate material readiness reporting when the CASREP is updated, the 4790/2K **must** be updated concurrently. If circumstances dictate, a more appropriate active 4790/2K may be associated with the CASREP and the existing 4790/2K closed **or** canceled.
- c. The associated 4790/2K to the CASREPs **must** have a comparable or equivalent severity coding **per** reference (e). In particular, Ship's Force will ensure that the Equipment Status Code corresponds directly to the equipment configuration (Allowance Parts List (APL) **or** Equipment Identification Code (EIC), Location) that the 4790/2K is written against. Examples where attention to detail is particularly warranted:
 - (1) 4790/2K written against the Main Engine when a thermometer is Out Of Commission (OOC). Equipment Status Code 2 (non-operational) should not be used since it indicates the Main Engine is OOC.
 - (2) 4790/2K written against a Weapons System when construction of storage space was requested. Assigning a Status Code 2 indicates the Weapons System is OOC.

- d. Attention to detail when selecting equipment configuration is critical. To support repair part ordering, some configuration data may be generic (e.g., circuit breaker in the Consolidated Onboard Shipboard Allowance List could have multiple applications). For readiness reporting purposes, it is important to specify which application. Determine if the reported configuration would support an equipment Tag-Out. Configuration elements include:
- (1) APL **or** Allowance Equipage List (AEL). **Must** be written against the sub APL **or** AEL where applicable. Avoid using just any higher level APL **or** AEL for the system or equipment.
 - (2) EIC. **Must** be for the lowest affected assembly, not just any higher level EIC for the system or equipment. The selected level of assembly should be lowest that fully encompasses the material deficiency.
 - (3) Equipment Serial Number: When multiple equipment (fire pumps, main engines, radio transceivers) have the same APL **or** EIC, ensure the serial number designation is appended.
 - (4) Location.
 - (5) Equipment Noun Name. **Must** be the same name that would be used on a Danger **or** Caution Tag **per** reference (d).

5.3.2 Generation of a Casualty Report. The CASREP is used to both notify the chain of command and readiness stakeholders of degradations to operational readiness caused by deficiencies in an activity's material condition and alert outside support activities to the nature of outside assistance required for correction. The CASREP is not a onetime report, but has four distinct types; initial, update, correct or cancel, as specified and described in reference (f). Submitting a CASREP does not relieve the requirement for timely submission of work notifications (OPNAV 4790/2K) or material requisitions.

5.3.2.1 Guidance on Initial Documenting with a Casualty Report. A CASREP **must** be prepared **per** reference (f) and the Software Users Guide for the Automated Information System being used. This section does not apply to Fleet Ballistic Missile systems under the cognizance of Strategic Systems Programs. All Unclassified Non-Nuclear Naval Propulsion Information will be handled **per** current regulations and standing guidance from NAVSEA 08. The following policy guidance is provided:

- a. C3 **or** C4 CASREPs identify severe task or mission degradation that generally requires emergent repairs be effected at the earliest opportunity. C2 CASREPs are less severe and are generally corrected during scheduled maintenance availabilities. C2 CASREPs requiring Fleet Technical Assistance (i.e., Distance Support or onboard Technical Assistance) in determining repairs should result in the technical assistance completed well enough in advance of the scheduled maintenance availability to facilitate repairs during the maintenance availability.
- (1) CASREP category **must** be assigned **per** reference (f). It **must** not be elevated solely to expedite onboard technical assistance, services, parts delivery or repairs.

- (2) Any outstanding C3 **or** C4 CASREP requiring repair assistance should be repaired during the next scheduled maintenance availability if it has not previously been corrected in an emergent availability.
 - (3) If an outstanding C2 CASREP requiring repair assistance is not scheduled for repairs during the next scheduled maintenance availability, it should not be canceled and repairs should be pursued following the normal C2 CASREP procedures.
 - b. Submitting a CASREP during maintenance availabilities is only justified if repairs to the system or equipment resulting in the task or mission degradation will not be corrected during the maintenance availability.
 - c. An activity **must** submit a cancellation CASREP (Casualty Cancellation (CASCAN)) upon the commencement of a maintenance availability for which the effected system or equipment is scheduled for repair.
 - d. Do not CASREP hardware or software that have not completed system operational testing or have not been turned over to the activity for operational use (e.g., System Operation Verification Testing, Acceptance Trials, post availability testing).
 - e. Ship's Force or others may not submit a CASREP for installation of an alteration that will provide for either modernization of existing systems or equipment, or add new capability. CASREPs are used to document material readiness issues with installed systems or equipment. See Volume II, Part I, Chapter 2, Section 2.6 of this manual for questions concerning alterations.
 - f. Any system or equipment casualty that would threaten to cause or cause a discharge of oil or oily waste to sea **must** be reported with a CASREP.
 - g. Any equipment mishap involving damages or losses exceeding \$50,000 **must** be reported with a CASREP. The CASREP alerts the Naval Safety Center an incident has occurred that requires a mishap investigation.
 - h. Estimated Time to Repair (ETR). The ETR must be realistic and an accurate ETR is required for all repairs. Simply extending the ETR by three days (or 30 days for C2) every update period does not support the intent of providing an ETR. If the problem will not be corrected within 24 hours of the ETR, send an update to change the ETR.
 - i. A 4790/2K is required to receive off-ship assistance (technical, repair, parts) or to document Ship's Force work. Every active CASREP **must** be associated with an active JCN – no exceptions.
- (1) CASREPs **must** never be generated with associated 4790/2Ks that have an Equipment Status Code of 1 (operational) or 0 (N/A), or a Priority code of 4 (routine). If the CASREP is required, then the Equipment Status Code and Priority code for the 4790/2K need to be updated.
 - (2) The associated 4790/2K must have the correct configuration data (e.g., APL, EIC) to the lowest assembly and that configuration data must be reported on the CASREP.

- (3) To associate multiple 4790/2Ks with a CASREP, pick a primary 4790/2K to list as JCN and list the remaining 4790/2Ks in the remarks section. If parts are ordered against other APLs than the APL used on the primary associated 4790/2K, those APLs **must** be listed in the amplification line of the parts section.
- j. An assist line is mandatory for an initial CASREP and optional on subsequent updates. In the ASSIST AMPN line, clearly specify type of off-ship assistance and the time frame desired by the activity. Clearly identify Distance Support efforts. The following options are acceptable:
 - (1) Assist, Technical **or** Distance.
 - (2) Assist, Other **or** Distance.
 - (3) Assist **or** none.
- k. CASREP description and remarks should be concise and consistent with the 4790/2K without sacrificing clarity. The system or equipment listed in the casualty line **must** indicate the affected assembly. Wording **must** accurately portray present and potential impacts on the task or mission. The remarks section for an initial CASREP **must** contain the **sub-paragraphs here**. Indicate the classification at the beginning of individual sub-paragraphs to facilitate access to non-classified information.
 - (1) Summary **or** Impact: Brief executive overview of casualty and specific Naval Tactical Task(s) or ROC-POE mission(s).
 - (a) Indicate if this message reflects a downgrade to C2 or upgrade to C3 **or** C4.
 - (b) Identify any loss of operational capabilities such as speed, power output, detection range, self-defense, loss of a sensor, etc.
 - (c) Equipment serial number, location and number of similar equipment (backup or redundancy).
 - (d) Identify which warfare area(s) are impacted, what capabilities **or** functions are degraded and to what degree.
 - (2) Technical Description: Concise synopsis of sufficient granularity to facilitate future Distance support or prepare shore maintenance support services.
 - (a) How and when the casualty was discovered. Provide description of the casualty to include information on operating configuration, symptoms and indications, initial follow-up and troubleshooting.
 - (b) Repair efforts completed to date, or technical assistance received.
 - (c) To facilitate distance support, include any test results from troubleshooting.
 - (3) Pending Actions: Any ongoing or anticipated actions to be taken by Ship's Force or any outside activity.

- (4) Activity Point of Contact: Include name, best time period and the best way to contact the Point of Contact in Zulu time. Typically, phone numbers and E-mail addresses are provided.
- (5) Mishap Report: (If required) Is required to identify whether it has been completed or is still in progress. If in progress, an estimated completion time should be provided.
- (6) Ships Schedule: For the next 30 days at a minimum. Where appropriate, indicate next scheduled maintenance availability.
- (7) Minimize Considered: (When required) Ensure this statement is included inside the remarks section.

1. CASREP transmission, receipt and processing.

- (1) Ship's Force is responsible to verify CASREPs reach the intended recipients. There have been incidents where a CASREP has been released via naval message, but has not reached the intended recipients intact. Attention to detail with respect to Plain Language Addressees (PLAD), a well-trained Radio Central and a controlled chop process are key to success. At a minimum, COMUSFLTFORCOM Norfolk VA (AIG 6842 or 6843) **must** be included on all CASREPs to ensure the CASREP is captured in the shore based CASREP Automated Information System.
- (2) Ship's Force **must** ensure CASREPs are forwarded in a timely manner when requested.

5.3.2.2 Guidance on Updating a Casualty Report. Follow the format guidelines defined in paragraph 5.3.2.1 of this chapter for Initial CASREPs. CASREP update is required for:

- a. Revisions to previously submitted information.
- b. Changes in parts status including receipt of parts.
- c. Requests for additional assistance (an assist line is mandatory).
- d. Substitution of an alternate active 4790/2K in place of a closed or canceled one.
- e. Changes to ship's schedule.
- f. Changes to ETR (CASREP updates are to be made 24 hours prior to the expiration of the ETR).
- g. C4 CASREP, at least every 72 hours.
- h. C3 CASREP at least every 10 days.
- i. C2 CASREP every 30 days.

NOTE: IF A DEFERRED CASREP IS CORRECTED AT ANYTIME DURING THE DEFERRED PERIOD, A CASCOR **MUST BE SUBMITTED.**

5.3.2.3 Guidance on Deferral of a Casualty Report. The TYCOM is required to approve any planned delay of action on a CASREP. In the event that the delay effectively constitutes a CASREP deferral, the activity will forward the deferral recommendation to the TYCOM for

approval. A CASREP Deferral is submitted when it is determined that the CASREP will not be corrected while the activity is in the Sustainment Phase (i.e., deployment or surge). This action places the CASREP in an inactive status which reduces the support and eliminates the activity's requirement for updating the CASREP.

- a. The activity **must** not report a CASREP as deferred until directed by the TYCOM or his designated representative.
- b. The activity **must** submit a CASREP update with the word DEFERD in the estimated time of repair section of a CASREP update. See reference (f) for details.

NOTE: CASREPS WILL NOT REMAIN OPEN FOR RECEIPT OF PARTS IF THE SYSTEM OR EQUIPMENT IS OPERATIONAL. SENDING A CASUALTY CORRECTION (CASCOR) WITH PARTS REQUESTED VIA A WHISKEY NUMBER WILL NOT CANCEL THE PARTS REQUISITION.

5.3.2.4 Guidance on Correction of a Casualty Report.

- a. CASREP Correction is required:
 - (1) After repairs are completed to the affected system or equipment to restore to operational condition. If the system or equipment subsequently fails operational testing, a new CASREP **must** be submitted.

NOTE: MAINTENANCE ASSIST MODULES INSTALLED ASSEMBLIES ARE CONSIDERED TEMPORARY REPAIRS.

- (2) After temporary repairs have been accomplished, and the system or equipment restored to operational status to support the task or mission. Most temporary repairs will require a DFS (see Volume V, Part I, Chapter 8 of this manual) with its associated active 4790/2K until permanent repairs are completed **per** all technical requirements.
- b. Include in the remarks section of the CASCOR:
 - (1) A detailed but concise summary of repairs. If operational testing was not completed, include an estimated date for accomplishment.
 - (2) Ship's Force understanding of what the root cause was for the failure (e.g., normal wear and tear, inadequate design, power transient, etc.). Normally the root cause will mirror the input for block 8 on the 4790/2K.
 - (3) Hours since last failure of the system or equipment prior to the initiation of the CASREP.
 - (4) Adequacy of Ship's Force resources to prevent or correct the CASREP. Details should be provided as to what contributed to the CASREP (e.g., troubleshooting procedures, PMS coverage, parts support, test equipment, conduct of drills, operational policy, technical documentation, training, manning, etc.). Include actions taken to correct lack of resources.

5.3.2.5 Guidance on Cancellation of a Casualty Report.

- a. An activity **must** submit a cancellation CASREP (CASCAN) upon the commencement of a maintenance availability for which the affected system or equipment is scheduled for repair. Ensure the maintenance availability for which repairs are scheduled is recorded in the remarks section of the CASCAN.
- b. If all associated 4790/2Ks are closed or cancelled without repairs being affected, the corresponding CASREP must be cancelled (CASCAN).

APPENDIX A

EQUIPMENT OPERATIONAL CAPABILITY RANGE OF VALUES AND DEFINITIONS

Examples are:

EOC Value - 1.0 (Green) EOC DEFINITION - Fully Operable. EOC Description – Configuration or maintenance worthy object appears to be in very good material condition. It has no evidence of corrosion or noticeable discrepancies. Notification created only for Preventive Maintenance actions or ordering parts. Actions – Document man-hour expenditures.
EOC Value - 0.9 (Green) EOC DEFINITION - Fully Operable with Cosmetic Discrepancies. EOC Description – Maintenance worthy object works with only cosmetic discrepancies. It may have slight corrosion. The documented discrepancy does not affect performance. There are no anticipated problems or a need for troubleshooting. Actions - Equipment requires cleaning or minor maintenance that may be accomplished by Ship's Force. Document man hour expenditures. Shipboard Examples: AIR - Minor leaks (moisture, drips) that do not present a safety hazard. Missing label plates or stenciling. Worn paint or scratches on consoles. Surface Dirty. Minor Surface rust present. C4I, CS - Minor leaks (moisture, drips) that do not present a safety hazard. Missing label plates or stenciling. Worn paint or scratches on consoles. Surface Dirty. Minor Surface rust present. HM&E - Minor leaks (moisture, drips) that do not present a safety hazard. Missing label plates or stenciling. Worn paint or scratches on consoles. Surface Dirty. Minor Surface rust present. Corrosion - Minor Surface rust present. Few corroded topside fasteners. Tank coatings recently inspected. Lifelines have light rust.
EOC Value - 0.8 (Green) EOC DEFINITION – Fully Operable with No Performance Impacting Discrepancies. EOC Description - Maintenance worthy object works with no loss in performance but has minor discrepancies or minimal corrosion. Problems are anticipated or troubleshooting is necessary. Minor redundancy impacted with no effect on performance. Actions – Document man-hour expenditures and 4790/2K deferral for future Ship's Force actions. Shipboard Examples: AIR - Centrifugal pumps cavitate too much. Indicator lights are burnt out. Filters need to be changed. C4I, CS - Centrifugal pumps cavitate too much. A minor number of redundant modules within electronic systems (SLQ-32, SPY-1, etc.) are inoperative. Indicator lights are burnt out. Filters need to be changed.

HM&E - Centrifugal pumps cavitate too much. Indicator lights are burnt out. Filters need to be changed. Corrosion - Some running rust topside. Bilge foundations need preservation. Discolored deck non-skid. Vent plenums have some minor corrosion damage	
EOC Value - 0.7 (Yellow)	EOC DEFINITION - Operable with minor discrepancies that do not impact performance. EOC Description – Maintenance worthy object works with no loss in performance but has significant discrepancies that need to be corrected or monitored. One of many modes may be inoperative. Minor corrosion. Actions – 4790/2k notification needs to be created for discrepancies or requesting outside activity assistance in troubleshooting. Troubleshooting procedures should be initiated. Consult reference (d) for proper usage of Yellow Caution Tags. Shipboard Examples: AIR - Vibration levels for rotating equipment are approaching limits or rising. Object running hotter than normal. Pressure drops more than maximum. Radar fails minimum transmit power specification by a small amount. Significant leakage of fluid(s). Expansion tank levels dropping. Chemistry difficult to maintain. C4I, CS - Vibration levels for rotating equipment are approaching limits or rising. Object running hotter than normal. Pressure Drops more than maximum. Radar fails minimum transmit power specification by a small amount. Significant leakage of fluid(s). Expansion tank levels dropping. Chemistry difficult to maintain. HM&E - Vibration levels for rotating equipment are approaching limits or rising. Object running hotter than normal. Pressure drops more than maximum. Significant leakage of fluid(s). Expansion tank levels dropping. Chemistry difficult to maintain. Corrosion - Running rust in several topside areas. Fasteners in topside boxes need replacement. Tank coating work package close to availability maximum. Watertight Door hinges and latches rusted.
EOC Value - 0.6 (Yellow)	EOC DEFINITION - Operable with discrepancies that could potentially impact performance in the future. No Restrictions. EOC Description – Maintenance worthy object works with no current loss in performance but performance degradation is anticipated. Significant discrepancies need to be corrected or troubleshooting initiated to prevent performance degradation. Corrosion could impact performance if not corrected. Actions – A standing order must be issued to ensure all watch standers are aware of the work around modification to operating instructions and procedures. 4790/2K notification needs to be created for discrepancies. Consult Volume V, Part I, Chapter 8 of this manual for requirements for submitting a DFS. Shipboard Examples: AIR - Leaks that can be controlled (prevented from becoming a safety issue) by wiping up. Temperature that can be controlled by using artificial cooling. Electronic cooling water low flow alarm bypassed because of a faulty flow switch and flow must be monitored by a designated watch stander.

C4I, CS - Leaks that can be controlled (prevented from becoming a safety issue) by wiping up. Temperature that can be controlled by using artificial cooling. Electronic cooling water low flow alarm bypassed because of a faulty flow switch and flow must be monitored by a designated watch stander. HM&E - Leaks that can be controlled (prevented from becoming a safety issue) by wiping up. Temperature that can be controlled by using artificial cooling. Electronic cooling water low flow alarm bypassed because of a faulty flow switch and flow must be monitored by a designated watch stander. Testing salinity manually or sounding tanks manually with alarms disabled. Shifting steering could only be accomplished in after steering with bridge syncro OOC. Corrosion - Incipient damage to structure due to corrosion. Tank work package at limit for next availability. Bilges have loose rust. Fasteners broken due to heavy corrosion. Crew engaged in extensive topside preservation. Some cause code 8 2Ks in CSMP. Vent Plenums significant rusting.	
EOC Value - 0.5 (Yellow) EOC Description – Maintenance worthy object is capable of performing intended functions, but not to all designed performance standards, or not capable of performing required functions in all operating modes. Actions – A standing order must be issued to ensure all watch standers are aware of the work around modification to operating instructions and procedures. 4790/2K notification needs to be created for discrepancies. Based on status of related equipment or systems, consult reference (f) for requirements for submitting a CASREP. Consult reference (d) for proper usage of Red Tags for troubleshooting. Shipboard Examples: C4I, CS - Primary power to weapons system has failed and system is operating on alternate power. HM&E - Ship speed degraded due to hull fouling. Evaporators operating at reduced capacity (less than 50% of optimum capacity). Corrosion - Corrosion induced structural damage. Hull thinning based on UT measurements. Loose topside fixtures due to missing or corroded fasteners. Localized non-skid coating failures.	EOC DEFINITION - Operable with discrepancies that effect performance. No restrictions on operation.
EOC Value - 0.4 (Red) EOC Description – Maintenance worthy object not operating correctly and no means or work-around allow the object to do everything it was designed to perform. Actions – 4790/2K notification needs to be created for discrepancies. Based on status of related equipment or systems, consult reference (f) for requirements for submitting a CASREP. Consult reference (d) for proper usage of Red Tags. Shipboard Examples: AIR - Radar operates but to a reduced range. C4I, CS - Radar operates but to a reduced range. HM&E - Main Engine Lube Oil Pump sequencing not consistent.	EOC DEFINITION - Restricted operation. Significant discrepancies.

Corrosion - Tank contents contaminated due to leakage. Ladder corrosion limits personnel access. Many tanks require immediate preservation. Non-skid Coefficient of Friction failures.	
EOC Value - 0.3 (Red)	EOC DEFINITION - Severely degraded with major operational restrictions.
EOC Description – Maintenance worthy object not operating correctly or performing intended functions. Not a threat to personnel safety but further equipment damage may occur from continued operation.	
Actions – 4790/2K notification needs to be created for discrepancies. Based on status of related equipment or systems, consult reference (f) for requirements for submitting a CASREP. Consult reference (d) for proper usage of Red Tags.	
Shipboard Examples:	
AIR - Can operate a piece of equipment in local manual subject to the watch stander's response time, but not in remote automatic as designed. Remote operators are all inoperative, so space isolation can only be accomplished locally. C4I, CS - Can operate a piece of equipment in local manual subject to the watch stander's response time, but not in remote automatic as designed. Weapons system cannot accept engagement orders from Combat Direction System, but can be operated manually. Remote operators are all inoperative, so space isolation can only be accomplished locally. HM&E - Can operate a piece of equipment in local manual subject to the watch stander's response time, but not in remote automatic as designed. Remote operators are all inoperative, so space isolation can only be accomplished locally. Corrosion- Structural damage to superstructure due to corrosion that restricts access. Corroded and inoperable combat systems equipment. Corrosion to key sensors. Watertight doors inoperable due to corroded hinges.	
EOC Value - 0.2 (Red)	EOC DEFINITION - Repair Before Operation (RBO).
EOC Description – Maintenance worthy object not functioning within designed parameters and may only be operated under emergency conditions.	
Actions - Secure or turn off object. Use object only in an operational emergency. 4790/2K notification needs to be created for discrepancies. Based on status of related equipment or systems, consult reference (f) for requirements for submitting a CASREP. Consult reference (d) for proper usage of Red Tags.	
Shipboard Examples:	
AIR - Certified Inspector identifies a RBO discrepancy. Loss of dry air system (or electronic cooling water) to a Radar. C4I, CS - Certified Inspector identifies a RBO discrepancy. Loss of dry air system (or electronic cooling water) to a Radar. HM&E - Certified Inspector identifies a RBO discrepancy. Boiler inspection device not available. Corrosion - Significant tank leakage due to corroded structure. Evidence of cracking in structural elements. Lifelines corroded through.	

EOC Value - 0.1 (Red)

EOC DEFINITION - Should not be operated-Battle Short.

EOC Description – Maintenance worthy object not functioning. Secure or turn off immediately.

Actions - Secure or turn off immediately. 4790/2K notification needs to be created for discrepancies. Based on status of related equipment **or** systems, consult reference (f) for requirements for submitting a CASREP. Consult reference (d) for proper usage of Red Tags.

Shipboard Examples:

AIR - Steam Receiver alarms are all cut out.

C4I, CS - Safety Cutouts missing on gun mount.

HM&E - Generator vibrates, arcs and sparks. Boiler alarms are all cut out.

Corrosion - Critical tanks corroded so that they cannot be used (Fuel Oil Service, Potable Water, JP-5 or Reserve Feed).

EOC Value - 0.0 (Red)

EOC DEFINITION - Totally Inoperative.

EOC Description – Maintenance worthy object does not work at all.

Actions – 4790/2K notification needs to be created for discrepancies. Based on status of related equipment **or** systems, consult reference (f) for requirements for submitting a CASREP. Consult reference (d) for proper usage of Red Tags.

Shipboard Examples:

AIR - Turn on-off switch on and no response. Pump or equipment removed.

C4I/CS - Turn on-off switch on and no response. Pump or equipment removed.

HM&E - Turn on-off switch on and no response. Pump or equipment removed.

Corrosion - Corrosion in hull such that leakage from sea is occurring.

The EOC range of values and definitions are:

Title	EOC value or range	Description or Definition
Fully Operable	1.0 (Green)	Configuration or maintenance worthy object appears to be in very good material condition. It has no evidence of corrosion or noticeable discrepancies. Notification created only for Preventive Maintenance actions or ordering parts.
Fully Operable with Cosmetic Discrepancies	0.9 (Green)	Maintenance worthy object works with only cosmetic discrepancies. It may have slight corrosion. The documented discrepancy does not affect performance. There are no anticipated problems or a need for troubleshooting.
Fully Operable with no Performance impacting discrepancies	0.8 (Green)	Maintenance worthy object works with no loss in performance but has minor discrepancies or minimal corrosion. Problems are anticipated or troubleshooting is necessary. Minor redundancy impacted with no effect on performance.
Operable with minor discrepancies that do not impact Performance	0.7 (Yellow)	Maintenance worthy object works with no loss in performance but has significant discrepancies that need to be corrected or monitored. One of many modes may be inoperative. Minor corrosion.
Operable with discrepancies that could potentially impact Performance in the future. No Restrictions	0.6 (Yellow)	Maintenance worthy object works with no current loss in performance but performance degradation is anticipated. Significant discrepancies need to be corrected or troubleshooting initiated to prevent performance degradation. Corrosion could impact performance if not corrected.
Operable with discrepancies that effect Performance. No restrictions on operation.	0.5 (Yellow)	Maintenance worthy object is capable of performing intended functions, but not to all designed performance standards, or not capable of performing required functions in all operating modes.
Restricted operation. Significant discrepancies.	0.4 (Red)	Maintenance worthy object not operating correctly and no means or work around allows the object to do everything it was designed to perform.

Severely degraded with major operational restrictions.	0.3 (Red)	Maintenance worthy object not operating correctly or performing intended functions. Not a threat to personnel safety but further equipment damage may occur from continued operation.
Repair Before Operation	0.2 (Red)	Maintenance worthy object not functioning within designed parameters and may only be operated under emergency conditions.
Should not be operated - Battle Short	0.1 (Red)	Maintenance worthy object not functioning. Secure or turn off immediately.
Totally Inoperative	0.0 (Red)	Maintenance worthy object does not work at all.

VOLUME VI
CHAPTER 6
INDUSTRIAL PLANT EQUIPMENT

REFERENCES.

- (a) NAVSO P 1000 - Navy Comptroller Manual
- (b) NAVCOMPTINST 7000.38 - Productivity Enhancing Incentive Fund (PEIF)/The Productivity Enhancement Capital Investment Fast Payback Program
- (c) NAVSUP 5009 (DLAM 4215.1) - Management of Defense-Owned Industrial Plant Equipment
- (d) NAVSO P 3635 - Federal Acquisition Regulation, Section 13, Chapter 312
- (e) SECNAVINST 4855.3 - Product Data Reporting and Evaluation Program (PDREP)

LISTING OF APPENDICES.

A Plant Equipment Project Form

6.1 PURPOSE. To define the responsibilities and procedures for the acquisition and management of Class Three and Class Four Plant Property (inactive equipment) as defined in reference (a).

6.1.1 Scope. This instruction applies to Class Three and Class Four Plant Property as defined in reference (a) with the following exclusions:

- a. Alterations. Develop and submit requests for alterations **per** Volume VI, Chapter 3 of this manual. Requests for additional shipboard equipment that will be permanently installed require an approved alteration.
- b. Productivity enhancement **or** fast paybacks. Develop and submit requirements **per** reference (b). Due to payback documentation requirements the Productivity Enhancement Incentive Fund is most often used in requesting new technology equipment for the establishment of major new capabilities. This fund is also used for the implementation of radical procedural, productivity or efficiency improvements to current maintenance capabilities.
- c. Plant property assigned an active National Stock Number (NSN). Forward requirements by requisition through the supply system to the cognizant Inventory Control Point. Acquisition of new equipment discussed in this chapter pertains only to items that are not assigned an active NSN.
- d. Operating Forces Support Equipment. Submit requirements to the cognizant Area Commander for funding consideration and local procurement by the requesting activity.
- e. Materials Handling Equipment is under the single manager control of the Naval Supply Systems Command (NAVSUP) (see Volume IV, Chapter 13 of this manual). Civil engineering support equipment is under the single manager control of the Naval Facilities Engineering Command. General Purpose Electronic Test Equipment

(GPETE) is under the single manager control of Naval Sea Systems Command (NAVSEA) 04DS (see Volume VI, Chapter 9 of this manual).

6.1.2 Background. The program for acquisition of Class Three and Class Four Plant Property (as defined in section 6.2 of this chapter) is managed and funded by NAVSEA PMS 335. References (a) and (c) provide instructions to facilitate procurement and management of Class Three and Class Four Plant Property within the Department of the Navy.

6.2 DEFINITIONS.

6.2.1 Plant Equipment - Classes Three and Four Plant Property. Navy owned plant property of a capital nature (consisting of equipment, machine tools, test equipment, furniture, vehicles, accessories and auxiliary items, but excluding special tooling and special test equipment) used or capable of use in the manufacture of supplies or in the performance of services or for any administrative or general purpose.

6.2.2 Class Three Plant Property - Other Plant Equipment. That part of plant equipment, with an acquisition cost of \$100,000 or more, used in or in conjunction with the manufacture of components or end items relative to maintenance, supply processing, assembly or research and development operations, but excluding items categorized as Industrial Plant Equipment (IPE).

6.2.3 Class Four Plant Property - Industrial Plant Equipment. That part of plant equipment with an acquisition cost of \$100,000 or more, used for the purpose of cutting, abrading, grinding, shaping, forming, joining, testing, measuring, heating, treating or otherwise altering the physical, electrical or chemical properties of materials, components, or end items entailed in manufacturing, maintenance, supply processing, assembly or research and development operations as identified by noun name in references (a) and (d).

6.3 PROCUREMENT REQUIREMENTS.

6.3.1 Requesting Activities. All requesting activities **must** submit requests for plant property as outlined in paragraphs 6.3.2 through 6.3.4.

6.3.2 New Procurement. Submit all replacement (new equipment) requirements, with an acquisition cost of \$100,000 or more, to the cognizant Type Commander (TYCOM). Use the Plant Equipment Project (PEP) form, Appendix A of this chapter, to submit requirements one calendar year prior to the start of the fiscal year in which equipment is actually required (e.g., 1 October 1995 for Fiscal Year 1997).

- a. Identify each different requirement by individual project format. Instructions for completing the PEP form are included in Appendix A of this chapter.
- b. Provide a priority listing of all projects with each annual submission.
- c. Activities, such as Fleet Maintenance Activities, having an IPE Management System or IPE Maintenance Module Program **must** submit PEPs on computer disk accompanied by a hard copy.
- d. New procurement requirements, with an acquisition cost of less than \$100,000 and Other Plant Equipment **or** IPE Maintenance Requirements (e.g., major repairs or overhaul) **must** be forwarded to the cognizant TYCOM for funding consideration.

6.3.3 **Urgent Replacement.** Submit previously unidentified requirements to the cognizant TYCOM. Use the PEP form of Appendix A of this chapter, or message format if the replacement is associated with correcting a Casualty Report. Assign an integrated priority position for each requirement. If message format is used, justification and all relevant data for equipment acquisition must be provided.

- a. All PEPs **must** be prioritized and evaluated to ensure compatibility with maintenance capability requirements **or** configuration.
- b. PEPs for replacement of currently installed equipment **must** be screened to ensure there is no conflict with other maintenance actions.
- c. Cancel any project which is no longer required. Notify the TYCOM by letter of any canceled requirements.

6.3.4 **Receipt of Plant Property.** Upon receipt of plant property, comply with the procedures described **here**:

- a. Receive the equipment from the staging area.
- b. Notify the procurement activity immediately if deficient conditions are found after receipt. Notifications will be made via a Product Quality Deficiency Report with an information copy to the cognizant TYCOM. Product Quality Deficiency Report preparation and processing instructions are available in reference (e).
 - (1) When timing is critical, such as near the end of the warranty period, or when an urgent need to correct the problem exists, notify the procurement activity by the most expedient method (i.e., telephone or message).
 - (2) Provide the contract number, model and serial number of the plant property, date accepted, date problem developed, nature of the problem and local point of contact (name and telephone numbers).
- c. Notify the TYCOM of actual equipment delivery date.
- d. Notify the TYCOM when installation is satisfactorily completed.
- e. Submit an OPNAV 4790/CK or Allowance Change Request as required to initiate Coordinated Shipboard Allowance List support for new equipment and, if appropriate, to stop Coordinated Shipboard Allowance List support for IPE replaced by new equipment.
- f. Submit requests for excess IPE **or** Other Plant Equipment disposition instructions to the cognizant TYCOM.

6.4 **RESPONSIBILITIES.**

6.4.1 **Fleet Commander.** Fleet Commanders **must**:

- a. Review all PEPs submitted by the TYCOMs.
- b. Prioritize and assign a Project Number to PEPs and forward the approved requests to NAVSEA PMS 335. Return the unapproved requests to the TYCOM.

- c. Upon notification from NAVSEA PMS 335, forward the information regarding disposition (approval **or** disapproval), acquisition status and delivery dates for PEPs to the submitting activities with an information copy to the cognizant TYCOM.

6.4.2 Type Commander. TYCOMs **must**:

- a. Review all PEPs submitted by cognizant afloat and shore activities for technical accuracy and completeness.
- b. Review each PEP that requests replacement of currently installed equipment to ensure there is no conflict with other maintenance actions (e.g., separate repair, rebuild or replacement action).
- c. Prioritize all PEPs and evaluate each project to ensure compatibility with the requesting activity's maintenance capability requirements and site configuration.
- d. Forward the approved requests to the Fleet Commander for consolidation. Return unapproved requests to the submitting activity.
- e. Schedule an annual assessment of assigned activity's IPE and coordinate repairs.

6.5 REPORTS. Information forwarded on forms pertaining to the requirements of PEP, as required in this chapter, are exempt from the report controls required by reference (e).

APPENDIX A
PLANT EQUIPMENT PROJECT FORM

PLANT EQUIPMENT PROJECT						
1. Activity, UIC & Location		2. Activity Priority		3. Type Commander Priority		4. MILCON Proj Number
				5. Project Number	6. Fiscal Year	7. Date
8. Description				9. Plant Equipment Code (12 Digits)		
				10. Number of Equip Items/Systems Requested		
				11. DD Form 1419 (List Req Numbers for each)		
12. ESTIMATED COST - PROJECT				13. JUSTIFICATION CATEGORY (Check Approp. Block)		
(1) Total Cost	(2) Equipment	(3) Transportation	(4) Installation	☐ A. Additional		☐ B. Replacement
C. ☐ Economic D. ☐ Mandatory E. ☐ Safety/OSHA F. ☐ Pollution Abatement						
14. SPECIAL PROGRAM						
A. ☐ FORCES AFLOAT B. ☐ SHIPALT C. ☐ PRODUCTIVITY ENHANCEMENT/FAST PAYBACK						
D. ☐ NUCLEAR SUPPORT E. ☐ COLLATERAL EQUIP.						
15. PROCUREMENT				16. LOCATION OF EQUIPMENT		
☐ A. Procured by NAVSEA ☐ B. Procured Locally by Activity				A. Shop/Code	B. WC	C. Bldg.
17. Purpose, Description and Justification of Project (Identify other special projects here)						
18. Typed Name of Project Preparer		19. Signature of Preparer		20. Date Signed		21. APL No.
						PAGE of

INSTRUCTIONS FOR COMPLETION OF PLANT EQUIPMENT PROJECT FORM

1. (Block 1) Activity, Unit Identification Code (UIC) and Location.
 - a. Activity. The name of the military facility (and hull number if applicable) where the proposed equipment is to be used. (mandatory)
 - b. UIC. (mandatory)
 - c. Location. For shore activities: building number, street, city, state and zip code. (mandatory)
For ships: homeport and building number (if applicable), street, city, state and zip code. (mandatory)
2. (Block 2) Activity Priority. Priority of requested equipment. (Example: 001-94) (mandatory)
3. (Block 3) Type Commander Priority. Priority order for TYCOM. (mandatory)
4. (Block 4) Military Construction (MILCON) Project Number. MILCON Project Number if equipment requested is to be installed as part of a MILCON project.
5. (Block 5) Project Number. Assigned by the cognizant Fleet Commander.
6. (Block 6) Fiscal Year. The fiscal year in which the equipment is requested to be purchased. (mandatory)
7. (Block 7) Date. Record the month, day and year the PEP is developed. (mandatory)
8. (Block 8) Description. Description title of the proposed equipment or system. Include capacity or size. (mandatory)
9. (Block 9) Plant Equipment Code. Use Plant Equipment Code number and include all 12 digits, if possible. Plant Equipment Code numbers are assigned **per** reference (e). For Class Three, use NSN (preferred), or Federal Supply Class.
10. (Block 10) Number of Equipment Items or Systems Requested. The total number of items or systems in Block 8 required by this project. (mandatory)
11. (Block 11) DD Form 1419. Required only for surplus Class Four equipment acquisition.
12. (Block 12) Estimated Costs - Project.
 - (1) The total estimated cost including equipment, transportation and installation. (mandatory)
 - (2) The estimated cost of the equipment includes all desired accessories. (mandatory)
 - (3) The estimated cost of transportation shipping from the supplier to the activity. (mandatory)
 - (4) The estimated installation cost. (mandatory)
13. (Block 13) Justification Category. Check Appropriate Block. (mandatory)
 - A. Indicate if equipment is an additional requirement (additional shipboard requirements to be permanently installed require an approved alteration).

- B. Indicate if equipment is a replacement requirement. For shipboard activities this requires entering the Allowance Parts List (APL) number (if assigned) in Block 21 when replacing existing equipment. A copy of the APL page **must** be attached with the PEP submission.

NOTE: CHECK ONLY ONE OF THE ABOVE TWO CHOICES.

- C. Indicate if equipment is being replaced or added for economic reasons. Economic reasons may include frequent and costly maintenance or an advanced equipment design that makes the installed version obsolete.
- D. Indicate if equipment replacement or addition is mandatory. This block should be checked if new or additional equipment is required to meet significant increases in, or new, tasking.
- E. Indicate if equipment is being replaced or added to meet safety or Occupational Safety and Health Administration requirements. Reasons for checking this block could include replacement of equipment that has become unsafe to operate or is required to meet new safety **or** Occupational Safety and Health Administration regulations.
- F. Indicate if equipment is being replaced or added to meet pollution abatement standards. This block should be checked if the replacement or addition of equipment will facilitate significant reduction in the generation of hazardous waste or is required to satisfy newly levied pollution abatement criteria.

NOTE: MORE THAN ONE BLOCK (C THROUGH F) MAY BE CHECKED.

14. (Block 14) Special Program.

- A. Indicate if equipment is for Forces Afloat Program.
- B. Indicate if equipment is for Ship Alteration Program.
- C. Indicate if equipment is for Productivity Enhancement **or** Fast Payback Program.
- D. Indicate if equipment is for Nuclear Support.
- E. Indicate if equipment is Collateral Equipment for MILCON.

15. (Block 15) Procurement. (mandatory)

- A. Indicate if project is recommended for procurement by NAVSEA.
- B. Indicate if project is recommended for procurement locally by requesting activity.

16. (Block 16) Location of Equipment.

- A. Shop/Code. The shop number, activity code, cost center or organizational segment, as applicable, where the proposed equipment or system is to be used. (mandatory if applicable)
- B. Work Center. Work Centers where the equipment will be assigned. (mandatory if applicable)
- C. Building. The building number where the proposed equipment or system is to be used. (mandatory if applicable)

17. (Block 17) Purpose, Description and Justification of Project.

NOTE: BLOCK 17 MAY BE CONTINUED ON THE BACK OF THE FORM OR ON ADDITIONAL PAGES. IF BLOCK 17 IS CONTINUED ON ADDITIONAL PAGE(S), REPEAT BLOCKS 1 AND 8 ON EACH PAGE. ENSURE ADDITIONAL PAGE(S) ARE ANNOTATED IN THE SPACE PROVIDED BELOW BLOCK 21.

- a. Purpose. Purpose for which the new equipment or system is to be used. In addition, state increased capacities or capabilities (increased power, speeds, feeds, safety, state of the art improvements, pollution abatement features, etc.). An alteration may be required for shipboard applications if other than a "one-for-one" replacement (mandatory).
- b. Description. Include a complete technical description and specifications in sufficient detail to ensure procurement of the exact equipment required (include necessary accessories and attachments). If any of the description is restrictive or proprietary to one manufacturer, underline this portion and give adequate justification for the proprietary requirement. State the manufacturer, model number(s), size, weight, or utility restrictions (mandatory).
- c. Justification. Information and data concerning the following items will constitute the basis of the requirements. Each item should be addressed as fully as possible and in the same sequence in which they are listed **in the following sub-paragraphs:** (A positive or negative statement should be used in lieu of yes or no answers) (mandatory.)
 - (1) Reason for the replacement of the equipment. Identify item being replaced (include manufacturer, model number, serial number, plant account number (where applicable), size and capacity).
 - (2) Is additional space required for the installation? If so, where will the installation be made? Submit sketches, complete with size restrictions, including hatch sizes to be considered if equipment must pass through them.
 - (3) Is military or minor construction required? If MILCON, give the title of the MILCON project and beneficial occupancy date, if available. If MILCON, ensure the project number is in Block 4.
 - (4) Indicate the particular electrical characteristics from which the equipment is to be powered (voltage, frequency, phase, number of wires, and if power source is grounded or ungrounded). Also state whether or not sufficient power is available.
 - (5) Is the need for the requested equipment generated wholly or partially by the assignment of new tasks or by new or tightened specifications for existing task(s)? If so, give details.
 - (6) Will the new equipment produce products of better usable quality (products which will last longer, perform better, ensure ready interchangeability, etc.)? If so, give details.

- (7) What would happen if the present equipment failed? Also, answer the following:
 - (a) What is the remaining life expectancy of present equipment?
 - (b) Is the present equipment worn? To what extent?
 - (c) Is the present equipment unsafe? To what extent?
 - (d) Does the present equipment have an adequate capacity or capability?
 - (8) Is the proposed equipment a mandatory requirement (capability increase)? If so, give reason.
 - (9) Is the proposed equipment recommended for local procurement? Block 15B must be checked. If so, give justification.
 - (10) Does the requested equipment require an hour meter?
 - (11) Will this equipment or system be installed in a secure area thus requiring the prime contractor to provide the installer(s) with current security clearance requirements to enable the timely accomplishment of installation services, training, or warranty repairs?
18. (Block 18) Typed Name of Project Preparer. (mandatory)
19. (Block 19) Signature of Preparer. (mandatory)
20. (Block 20) Date Signed. (mandatory)
21. (Block 21) APL Number.

VOLUME VI**CHAPTER 7****SUBMARINE FORCES AFLOAT PAINTING AND PRESERVATION GUIDELINES
FOR NON-NUCLEAR SPACES AND COMPONENTS****REFERENCES.**

- (a) NAVSEA S9086-VD-STM-010 - NSTM Chapter 631 (Preservation of Ships In-Service - General)
- (b) URO-MRC 003 - Conduct Hull Structural Survey
- (c) SMS 6310-081-015 - Submarine Maintenance Standard - Submarine Preservation General Painting
- (d) COMNAVSUBFORINST 5400.39 - Standard Submarine Organization and Regulations Manual
- (e) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- (f) SSPC Painting Manual - Society for Protective Coating Standards and Specifications
- (g) NAVSEA S6360-AD-HBK-010 - Special Hull Treatment Maintenance and Repair for Submarines
- (h) NAVSEA S6360-AN-MMA-010 - Submarine Mold In-Place Special Hull Treatment and Repair
- (i) NAVSEA S6360-AV-MMA-010 - Submarine Special Hull Treatment; Maintenance and Repair

LISTING OF APPENDICES.

- A Submarine Paint Guide
- B Coating Inspection Report Form
- C Shipboard Power Cleaning Tools

7.1 INTRODUCTION. The objective of this document is to provide Fleet Maintenance Activities (FMA) with the procedures necessary to perform preservation maintenance between major shipyard availabilities. It has consolidated all the necessary knowledge from reference (a) for submarine crews that may be inexperienced in the areas of surface preparation and touch-up painting to maintain protective coating systems. This document is to be used in maintaining and repairing preservation systems on non-nuclear components and spaces of U.S. Navy submarines. Appendix A is a guide to assist with preparing, handling and applying paint to interior submarine surfaces.

7.1.1 Applicability.

- a. This document is not to be used during regular shipyard work, where all prevailing technical requirements of reference (a) applies. This includes preservation of tanks, voids and underwater hull, otherwise referred to as critical coated areas. Critical coated areas are defined as areas that cannot be easily accessed and represerved without drydocking of the ship. Many of these areas are also monitored under the reference (b) inspection program. Ship's Force should not be conducting preservation of these areas unless addressed in this manual. FMAs who are supporting shipyard

availabilities should utilize a trained workforce to accomplish work in critical coated areas or to complete preservation work associated with reference (b). The lead maintenance activity (shipyard, Regional Maintenance Center, Intermediate Maintenance Facility) executing the availability should **publish** to the FMA the qualifications required of personnel who can accomplish preservation in these areas. These qualifications **must** meet the requirements of references (a) through (i) and be acceptable to the lead maintenance activity.

- b. Occasionally tanks are entered for other reasons by the FMA or Ship's Force. National Association of Corrosion Engineers (NACE) Level I and Naval Sea Systems Command (NAVSEA) Paint Basic Inspector (NPBI) training does not instruct on how to inspect an in-service coating system. The Navy is implementing new training and requirements for "coating evaluators". If a tank is entered for any reason, it **must** be inspected. If significant defects or paint failure is found, the Type Commander or shipyard **must** be contacted. A Departure from Specification may need to be submitted to evaluate deferring repair to a future availability. If immediate repairs are needed, NAVSEA will provide the proper guidance.

7.1.2 Technical Point of Contact. Point of Contact for technical questions regarding this chapter is Kevin Klucher, NAVSEA 05U7122, (202) 781-0972. E-mail: kevin.klucher@navy.mil.

7.2 SCOPE. This manual provides information to the FMA with basic step-by-step instructions for:

- a. Inspecting and reporting areas of coating failure.
- b. Providing oversight during the paint process.
- c. Identifying the required surface preparation method.
- d. Preparing the surface for repainting using hand or power tools.
- e. Selecting proper paint(s) for a given application.
- f. Becoming familiar with the Product Data Sheet (PDS) or American Society for Testing and Material (ASTM) F-718 sheet and Material Safety Data Sheet (MSDS) for a given paint.
- g. Mixing and applying the paints.
- h. Using a Wet Film Thickness (WFT) gauge to determine if the proper coating thickness was applied.
- i. Knowing when to apply overcoats in a two (or more) coat system.

7.2.1 Ship's Force Responsibilities. This document assumes that Ship's Force personnel are being assisted by an FMA and:

- a. Will apply all coatings using a brush or roller.
- b. Will not be required to measure environmental conditions such as surface temperature, dew point and Relative Humidity (RH). Personnel should be instructed, during the training program established in Chapter 27, paragraph 27.3.2 of this Volume, that environmental conditions are important when painting and to consult a NACE or NPBI from the FMA if conditions are questionable.

- c. Will not be required to measure surface salt contamination, but should be instructed, as part of the Chapter 27, paragraph 27.3.2 of this Volume, training, that excessive surface salt contamination will shorten the service life of a coating system and to consult a NACE or NPBI paint inspector from the FMA to determine if surface salt concentrations are within the acceptable range for paint application. Also ensures that the surface is washed with clean water.
- d. Will not use spray equipment to apply paint.
- e. Will not use abrasive blast or hydroblasting equipment to prepare the surface.

7.2.2 Fleet Maintenance Activity Responsibilities. This document assumes that the FMA:

- a. Will maintain the tools needed by Ship's Force to accomplish the preservation process and instruct Ship's Force in their proper use.
- b. Will maintain and be familiar with NACE or Society For Protective Coatings surface preparation and cleanliness standards (NACE Level 1 or NPBI inspectors).
- c. Will assist Ship's Force in accomplishing inspections and prioritizing work.
- d. Will maintain copies of reference (f) (VIS-2 Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces) to use when accomplishing inspections.
- e. Will assist in the training of Ship's Force in the preservation process.
- f. Will be onboard when painting operations are underway to monitor that the various steps of the process are being properly accomplished (NACE Level 1 or NPBI inspector).
- g. Will perform spot checks of surface cleanliness, surface profile and WFTs during the coating process (NACE Level 1 or NPBI inspector).
- h. Will monitor environmental conditions, temperature, humidity, dew point, to ensure they are within required limits during the coating process (NACE Level 1 or NPBI inspector).
- i. Will conduct soluble salt testing when needed (NACE Level 1 or NPBI inspector).
- j. Will advise Scheduled Preservation Upkeep Coordinated Effort (SPRUCE) Manager or ship's designated representative if required environmental conditions cannot be met (NACE Level 1 or NPBI inspector).

7.2.3 Quick Reference. A Quick Reference, section 7.10 of this chapter, provides concise steps for surface preparation and coating application in specific areas such as the sail and bilges as well as a "catch all" entitled "Miscellaneous Areas of General Corrosion". This manual is structured so that additional "Quick Reference" entries can be added as needed.

7.2.4 Scheduled Preservation Upkeep Coordinated Effort. The SPRUCE program has been established to ensure that internal and sail preservation is maintained at the highest possible level throughout the life of the ship. SPRUCE barge or FMA personnel are being trained as (NACE or NPBI) coating inspectors. They are a resource to Ship's Force during a SPRUCE availability, providing tools, consumables, services, required support personnel, as well as around the clock

technical guidance and monitoring by a trained coating inspector. Ship's Force should seek guidance from SPRUCE barge or FMA personnel whenever they are uncertain about any phase of the surface preparation or coating application, but particularly in the following instances:

- a. Measurement of environmental conditions (substrate surface temperature, dew point, relative humidity) to determine if painting may be conducted under the current conditions.
- b. Measurement of surface salts. Painting over excess salt contamination is poor painting practice that may result in premature coating failure.
- c. Information concerning specifications or requirements for coating systems.

7.3 GENERAL SAFETY PRECAUTIONS.

7.3.1 Hazards. Every painting assignment exposes maintenance personnel to conditions and situations that represent actual or potential danger to them and to others in the area. The frequent necessity to use toxic and flammable materials, pressurized equipment, ladders, scaffolding and rigging always presents a potential hazard. Hazards may also be inherent in the very nature of the environment or caused through ignorance or carelessness of the operator. It is, therefore, extremely important to be aware of all potential hazards, since continuous and automatic precautionary measures will minimize the problem and improve both efficiency and morale of the painting crew.

NOTE: THE PRECAUTIONS CONTAINED IN THIS MANUAL ARE IN ADDITION TO, AND DO NOT SUPERSEDE, OTHER SAFETY REQUIREMENTS THAT HAVE BEEN ESTABLISHED IN REFERENCE (d), SECTION D AND REFERENCE (e).

7.3.2 Precautions. This document highlights safety precautions for surface preparation and the mixing, handling and application of coatings. The local environmental, safety and health organization has cognizance over the safety precautions to be implemented during all phases of the painting process.

7.4 INSPECTION OF EXISTING PAINT AND BASE METAL.

7.4.1 Required Tools. The purpose of this section is to describe how to report the condition of the coating system in various ship areas. The inspector will need the following tools:

- a. Flashlight.
- b. Inspection mirror (to see hard-to-reach areas, such as behind beams).
- c. Pocket knife.
- e. Rag.
- f. Paint stick **or** non-grease marker.

7.4.2 Failure Locations. Where practical, circle areas of failure with a paint stick **or** non-grease marker. Record location and type of failure on Appendix B. The following failure types should be reported:

7.4.2.1 Percent of General Corrosion. The extent of corrosion in the inspection area will determine how much surface preparation and painting is required. Therefore, the prime objective of the inspection is to accurately report the extent of corrosion. To facilitate accurate evaluation and reporting, reference (f) is available from the FMA and **must** be used. Reference (f), (VIS-2 Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces), is a series of photographs showing various extents of corrosion. To use the reference photos, examine the surfaces in the area being inspected and then select one of the reference photographs that most closely resembles the extent of rust in the area being inspected. Enter the percent on Appendix B in the column labeled, "Percent General Corrosion". If reference (f) is not available, estimate the amount of rust and indicate on the form that the standard was not used in the estimation.

7.4.2.2 Corrosion. After removing the corrosion scale with a scraper, look for structural steel defects such as visible metal loss, pitting or large corroded areas. If any defects are discovered, report findings to cognizant supervisor or hull survey team for further instructions and enter "Y" in column labeled, "Pitting Corrosion". Mark the pits with a paint stick **or** non-grease marker and make a note in the "Notes" column on Appendix B.

7.4.2.3 Percent of Blistering. Enter percentage of the total area showing blistering. Even though the pictorial representations contained in reference (f), (VIS-2 Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces), are intended for evaluating the degree of rusting, they can also be used as a guide in determining the percentage of an area that has blistered paint. Use the "General Rusting" diagrams (not the photographs) and select the diagram that most closely resembles the pattern of blistering in the area being inspected. Enter the percent on Appendix B in the column labeled "Percent Blistering". Work should be prioritized **by**:

- a. Order of importance for type of failure: pitting > corrosion > blistering.
- b. Order of importance for areas: pressure hull > non-pressure hull.

7.4.3 Cosmetic Paint Failure. Cosmetic paint failures may also be observed and should be repaired only after all other types of preservation failures have been repaired. Repeated cosmetic painting can cause excessive film build that will lead to premature paint failure. Stained or discolored paint should first be washed with detergent and lightly hand sanded to attempt to remove stains. If a cosmetic topcoat is applied, it should be applied in as thin a layer as possible to avoid excessive film build over time.

7.4.4 The Difference Between Rust and Rust Staining. It is necessary to know the difference between rust and rust staining. Dirt, residue or rust staining may be mistaken for rust. Stained, intact paint does not require removal and touch-up. Figures 1 and 2 show two photographs taken in the same location. The top photograph shows what may appear to be extensive rust, especially in a poorly lit area. However, the bottom photograph shows that, after rubbing a small circular area with a rag, the discoloration was caused by dirt and residue, not rusted metal.



Figure 1. Stained area before wiping a small area with a rag.



Figure 2. Stained area after wiping a small, circular area with a rag.

7.5 GENERAL SURFACE PREPARATION.

NOTE: POOR SUFACE PREPARATION IS THE CAUSE OF 95% OF COATING FAILURES. PREPARING THE SURFACE PROPERLY MAY WELL PREVENT RE-DOING THE SAME JOB.

7.5.1 Surface Cleaning Methods. The most important factor affecting the service performance of a coating is the degree of care taken in preparing the surface for painting. When scheduling surface preparation work, ensure that sufficient time will be available to paint all surfaces that have been prepared and allow the paint to fully cure before placing the surfaces into service. The goal of surface cleaning is to provide a roughened surface that is free of contamination and gouges or sharp projections. Roughening is necessary to attain the necessary anchor pattern for good paint adhesion. Surface cleaning methods vary with the type of surface preparation needed, location and size of the area being cleaned. These different cleaning methods are described in the following paragraphs. The steps required to prepare a surface for painting are:

- a. Solvent cleaning to remove oil, grease, dirt, chemicals and water-soluble contaminants. If solvents are prohibited, use detergent and fresh water.
- b. Mechanical cleaning (Hand Tool or Power Tool Cleaning) to remove rust and loose paint and to roughen or profile the surface for better coating adhesion.
- c. Feathering edges.
- d. Sweeping or vacuuming loosened material.
- e. Solvent cleaning, if necessary. Check to see if oil was deposited on the surface during power tool cleaning.
- f. Schedule paint application as soon as possible.

7.5.2 Solvent Cleaning. Solvent cleaning prepares surfaces by removing oil, grease, dirt and other foreign matter prior to mechanical cleaning or painting. The simplest procedure is to first remove soil and other dry material with a wire brush. The surface is then scrubbed with rags saturated with solvent. Clean rags are then used to rinse and wipe dry. Solvent cleaning **must** be accomplished only when allowed by local air quality regulations. Recommended solvents: Super high-flash naphtha; Mineral spirits, NSN 010-00-558-7026 (alkyd paints). Surface preparation accomplished by solvent cleaning **must** meet the requirements of reference (f), (SP-1 Solvent Cleaning).

7.5.3 Detergent Cleaning.

- a. If solvent cleaning is prohibited, detergent cleaning may be substituted. A recommended detergent is MIL-D-16791, Type 1, Liquid Detergent. The procedure is:
 - (1) Mix detergent in fresh water according to packaging instructions.
 - (2) Wash substrate surface.
 - (3) Rinse with fresh water.
 - (4) Dry surface with clean dry rags to remove residual water.
- b. Several non-specification cleaners such as Simple Green (produced by Sunshine makers, Inc.) have also been used successfully for smaller areas.

7.5.4 Hand Tool Cleaning.

- a. Hand tools such as scrapers and wire brushes are used on surfaces in confined spaces (corners) that cannot be reached with power tools. Hand tool cleaning will remove only loose or loosely adhering surface contaminants, including rust scale, loose mill scale, loose rust and loosely adhering paint. Hand tool cleaning is not to be considered an appropriate procedure for removing tight mill scale and all traces of rust. It is primarily recommended for spot cleaning in areas where corrosion is not a serious factor. Surface preparation accomplished by hand tool cleaning **must** meet the requirements of reference (f), (SP-2 Hand Tool Cleaning).
- b. Before hand tool cleaning, the surface **must** be free of oil, grease, dirt, chemicals and water-soluble contaminants, all of which may be removed with solvent cleaners and fresh-water rinsing. For small areas, clean dirt, soil, dust or other surface

contaminants by using a detergent wash and freshwater rinse. Wipe the surface with rags or a stiff brush as necessary to remove any residue that does not wash off. Impact tools, such as chipping hammers, chisels or scalers **must** be used to remove rust scale and any heavy buildup of old coatings. Start painting as soon as possible after cleaning.

- c. In those situations where areas are not accessible to power tools, hand tool cleaning methods may have to be used. Since hand tool cleaning will remove only the loosest contamination, careful application of primers is required, preferably by brushing, to thoroughly wet the surface. To achieve satisfactory results, all applied coats **must** be capable of overcoming the interference of contaminants left behind after hand tool cleaning.

7.5.5 Power Tool Cleaning.

7.5.5.1 Safety Warning. Before power tool cleaning, the surface **must** be free of oil, grease, dirt, chemicals and water soluble contaminants, all of which may be removed with solvent cleaners and freshwater rinsing. Never try to remove oil or grease by the use of power tools. This causes the grease to become further imbedded in the metal surface, thus preventing good paint adhesion.

7.5.5.2 Power Tool Cleaning Procedure. The proper procedures for cleaning surfaces prior to the use of power tools are:

- a. For small areas, clean dirt, soil, dust or other surface contaminants by using a detergent wash and freshwater rinse. Wipe the surface with rags or a stiff brush as necessary to remove any residue that does not wash off.
- b. To remove embedded grease, oil or soil from small areas, clean the surface with a clean cloth wetted with solvent. After final application of the solvent, wipe dry with a clean cloth.
- c. Power tool cleaning will prepare surfaces faster and better than hand tool methods. Surface preparation accomplished with power tools **must** conform to the requirements of the Steel Structures Painting Council Surface Preparation Specification No. 11, "Power Tool Cleaning to Bare Metal". Power tool cleaning to bare metal is defined as removal of all rust, loose mill scale and paint to bare metal (except for slight residue in pits if surface is pitted) by chipping, scraping, sanding or wire brushing. Power tools are used for removing small amounts of tightly adhering contaminants that hand tools cannot remove.
- d. If oil residue is detected after power tool cleaning, solvent cleaning should be repeated.
- e. Painting **must** be started and completed as soon as possible after completion of power tool cleaning.

7.5.5.3 Types of Power Tools. Power tools are driven either electronically or pneumatically and the basic units include a variety of attachments. Chipping hammers are used to remove tight corrosion, mill scale and old paint from large metallic and masonry areas. Wire brushes (cup or radial) are used to remove loose mill scale old paint, weld flux, slag and dirt deposits. Grinders and sanders are used to smooth excessively rough surfaces. As with hand tools, care should be exercised with power impact and grinding tools so they do not remove metal or cut too deeply

into the surface, resulting in burrs that are difficult to cover and protect satisfactorily. Care should be taken when using wire brushes and sanders to avoid polishing metal surfaces, which would prevent adequate adhesion of subsequent coatings.

7.5.5.4 Power Tool Allowance. The Master Allowance List, Part II, Group S92-1, contains the base allowances of power preservation tools for all ships. Changes in shipboard allowances may be implemented by direction of the Type Commanders. Common shipboard power tools are shown in Appendix C.

7.5.6 Feathering Edges. After mechanical cleaning (hand, power tool cleaning) is complete, edges of the intact paint surrounding the mechanically prepared area must be “feathered” into the metal. Feathering eliminates the “step” from the intact paint to bare metal. If this “step” is not removed, newly applied paint may crack as it dries leading to premature coating failure. The procedure for feathering an area of exposed metal surrounded by intact paint is:

- a. Lightly abrade the edges of intact paint with a power disk sander or rough sand paper.
- b. Taper the edges to make a gradual transition from intact paint to bare metal so that the underlying coats are exposed at the edges.
- c. Solvent (or detergent) clean.
- d. Apply paint.

7.5.7 Aged Paint. Old paint in good condition is an excellent base for repainting. When a surface is to be repainted and the old paint is not to be removed, the surface must be roughened with abrasive and thoroughly cleaned and dried before new paint is applied. When only localized areas of spots require repainting, it is essential that the removal of the old paint be carried back around the edges of the spot or area until an area of completely intact and adhering paint film with no rust or blisters is attained. Edges of tightly adherent paint remaining around the area to be recoated must be “feathered”. Painting should not be done over loose and cracked paint. When painted surfaces show evidence of corrosion, peeling, blistering, checking, scaling or general disintegration, remove the paint down to the bare surfaces.

7.5.8 Surface Salt Concentration. Coatings will fail prematurely if excess surface salts are not removed prior to coating application. Ship’s Force personnel are not expected to measure surface salt concentration. However, **Ship’s Force** is expected to know where to find qualified help (SPRUCE barge or Quality Assurance personnel (Code 340)) at TRIDENT Refit Facilities.

7.5.9 Equipment Maintenance. To assure the safe and proper operation of surface preparation equipment, the following are provided:

- a. Power Tools.
 - (1) Ensure that no oil or grease is left exposed after completing maintenance work on surface preparation equipment. The slightest amount of oil or grease on the equipment will contaminate the surface and cause poor paint adhesion.
 - (2) Replace the disk on the disk sander when it no longer cuts through the paint film or when dirty. Replace the head of the wire brush unit when the wires are bent, worn, broken or frayed. Clean wires when dirty.

- (3) Replace the head of the needle gun when over one-half of the needles become bent.
- b. Hand Tools.
 - (1) Maintain a sharp and smooth edge on the scraper.
 - (2) Clean wire brush when dirty.
 - (3) Discard wire brush when wires become frayed or broken.
- c. Care and Maintenance of Paint Brushes.
 - (1) Brushes that are to be reused the following day should be marked for white, light colors or dark colors.
 - (2) The weight of the brush should not rest on the bristles.
 - (3) Brushes not to be immediately reused should be cleaned with at least three washings of thinner or solvent, then washed with detergent and water.
 - (4) Brushes should be stored by suspending them from the handle on racks or wrapped in paper and stored flat.
 - (5) Paint rollers should be disposed.

7.6 GENERAL MIXING AND PAINT APPLICATION.

NOTE: PRIOR TO USING ANY PAINT, THE TWO FOLLOWING DOCUMENTS, ISSUED BY THE PAINT MANUFACTURER, SHOULD BE READ AND UNDERSTOOD.

7.6.1 Product Data Sheet or Material Safety Data Sheet. The PDS (or ASTM F-718 sheet) and MSDS provide the information to use the coating properly and safely. To obtain the PDS (or ASTM F-718 sheet) and MSDS, call the coating manufacturer and request them to FAX the PDS (or ASTM F-718 sheet) and MSDS. ASTM F-718s can also be obtained from the National Surface Treatment Center web site, <http://www.nstcenter.com>. Some paint manufacturers may provide an ASTM F-718 sheet instead of a PDS. The use of ASTM F-718 sheets is preferred because they have been approved by NAVSEA. Both documents generally provide similar information.

7.6.1.1 Product Data Sheet. This document provides information about the proper use of the paint including:

- a. Mixing instructions including mix ratio (for a two-part system).
- b. Induction period (if required).
- c. Application methods.
- d. Pot life.
- e. Drying and over coat times.
- f. Wet and Dry Film Thickness (DFT) requirements.

7.6.1.2 Material Safety Data Sheet. This document provides information concerning safe use of the paint including the following sections:

- a. Product identification.
- b. Hazardous ingredients.
- c. Physical data.
- d. Fire and explosion data.
- e. Health hazard data.
- f. Reactivity data.
- g. Spill or leak procedures.
- h. Special protection information including Personal Protective Equipment (PPE).
- i. Special precautions.

7.6.2 Mixing Area.

- a. Shore Facilities.
 - (1) Painters should have detached shops or detached temporary structures where all paint should be mixed, and where paint buckets, brushes and rags can be temporarily stored.
 - (2) Only the quantity of paint needed for one day's work **must** be taken into the mixing area.
- b. Forces Afloat.
 - (1) Paint **must** not be stowed in the mixing area.
 - (2) Mixing of paints and their solvents **must** be confined to the paint mixing room or other designated compartment.
 - (3) Paint **must** not be mixed aboard a submarine.

7.7 SPECIFIC PAINTING REGULATIONS FOR SUBMARINES.

7.7.1 Motor Generator Units. Prior to any interior painting, Positive Pressure Unit must be activated if the Motor Generator is not sealed or is open within five days of paint application. This will prevent solvent from damaging motor generators.

7.7.2 Coating Material.

- a. Mix all paints BEFORE bringing it aboard the submarine. The use of paint pre-packaged in cartridge dispensing systems is encouraged because the paint is mixed in the static mixer as it is dispensed from the cartridge and open containers of paint are eliminated. MIL-DTL-24441 and VACTAN are currently the only paints that are used by Ship's Force available in cartridges.
- b. With the exception of topside boot or other areas that do not vent to the submarine interior, all appreciable painting described in this document **must** be completed at least five days prior to departure for sea. (The date of departure, as it relates to painting, **must** be the date of the first dive after departure for a period of operation. The Commanding Officer of the submarine involved should determine the "date of departure" whenever the question arises.)

- c. Bring onboard only the amount of paint than can be used in the immediate painting operation. The use of paint pre-packaged in cartridge dispensing systems is encouraged because a partially used cartridge can be capped and reused.
- d. Where paint is applied to surfaces that later will be heated (e.g., thermal piping and lagging), the systems **must** be activated (heated) prior to sealing the boat.

7.7.3 Items Not To Be Painted. The following surfaces are not to be painted and, therefore, should be masked off when paint is applied in the vicinity:

- a. Corrosion Resistant Steel (CRES) on decks, CRES galley equipment and CRES bulkheads in wet spaces.
- b. Decorative plastic surfaces such as on bulkheads or table tops.
- c. Dogs or operating gear of watertight doors, hatches, scuttles and similar items.
- d. Hatch and door rubber gaskets.
- e. Labels (e.g., identification plates).
- f. Insulators.
- g. Knife edges of watertight doors and hatches.
- h. Tiled areas.
- i. Threaded parts, such as adjusting threads and take-up threads that, if painted, would not function properly.
- j. Anodic and cathodic protectors (zincs).
- k. Composition metal water ends of pumps.
- l. Condenser heads and outside surfaces of condensers when of composition metal.
- m. Exposed composition metal parts of any machinery.
- n. Glands, stems, yokes, toggle gear and all machined external parts of valves.
- o. Heat exchange surfaces of heating or cooling equipment.
- p. Joint faces of gaskets and packing surfaces.
- q. Lubricating gear, such as oil holes, oil or grease cups, lubricators and surfaces in contact with lubricating oil.
- r. Lubricating oil reservoirs.
- s. Charging water tanks.
- t. De-mineralized water tanks.
- u. Amine storage tanks.
- v. Machined metal surfaces of reciprocating engines or pumps and all "oil wetted" surfaces of internal combustion engines.
- w. Metal lagging.
- x. Rods, gears, universal joints and couplings of valve operating gear.

- y. Expansion joints, pipe hangers, flexible hose connections, items partially fabricated of rubber and rubber resilient elements of isolation mounts.
- z. Springs.
- aa. Strainers.
- ab. Turbine casing joints, nuts and bolts.
- ac. Working surfaces.
- ad. Brass, bronze, gun metal and copper where used in submarine systems.
- ae. Foundation bearing surfaces where alignment or sliding is required.
- af. Electrical outlets, terminals, activating mechanisms of electrical safety devices, control switchboards on machinery elevators and grounding contact surfaces.
- ag. Joints and contact surfaces of explosion-proof enclosures.
- ah. The following interior surfaces (aluminum surfaces may be waxed where desired for appearance).
 - ai. Bins, shelves, dressers, drawers, cabinets, battens and fittings.
 - aj. Interior gratings, hand rails and floor plates.
 - ak. Internal surfaces of ventilation ducts.
 - al. Sight glasses, gauge faces or identification plates or other markings, which, if painted, would be illegible.
 - am. Faces of sonar transducers, hydrophones, no-foul rubber shelling, sonar dome rubber windows, rubber sonar domes and glass reinforced plastic domes.
 - an. Any other components or surfaces where the application of paint would affect the fit, form or function.
 - ao. When in doubt, contact the technical authority for guidance.

7.7.4 Shelf Life of Paints. Shelf life is the period after manufacture when the paint can be used. The date of manufacture is printed on the paint can. Refer to the PDS (or ASTM F-718 sheet) to determine the shelf life of the paint being used. Do not use paint that has passed the shelf life given on the PDS (or ASTM F-718 sheet). Partially used cartridges can be reused if the paint is still within the shelf life.

7.8 MIXING PROCEDURES.

7.8.1 Pre-Packaged Paint. The use of paint prepackaged in cartridge dispensing systems is encouraged because it eliminates mixing of paint. The cartridges may have to be shaken using a mechanical shaker designed for the cartridges. Cartridges are an alternative form of packaging and the dispensing system eliminates mixing. The properties of the paint remain the same with regard to WFT, spread rates, dry times, overcoat times, etc.

7.8.2 Mixing Observations. The following steps should be observed when mixing paint:

- a. Prior to mixing paint, read and understand information in the manufacturer's PDS or ASTM F-718.

- b. Mix all paints BEFORE bringing them aboard the submarine.
- c. Paints should be thoroughly mixed (3 to 5 minutes with a mechanical mixer) and free of lumps, cakes and sediments prior to use. Multiple component paints require thorough mixing of each component before they are combined.
- d. Mixing is best accomplished by the use of mechanical shakers or stirrers. Ground all mixing equipment shakers, stirrers, containers and platforms prior to use.
- e. If a mechanical device is not available, a manual method, such as the boxing method, may be used. The boxing method is a manual paint mixing technique that is used in combination with manual stirring as described [here](#):
 - (1) Pour the top two-thirds of the paint from the original can (#1) into a clean empty can (#2).
 - (2) Stir the pigment and liquid left in can #1 with a paddle until smooth.
 - (3) Gradually pour the paint in can #2 into can #1 while stirring.
 - (4) Pour the paint from can #1 into can #2. Reverse this step and repeat until the paint is uniformly smooth.
 - (5) If any particles do not dissolve after stirring and mixing, strain the paint through a wire screen or two layers of cheesecloth.
- f. The following list of “DO NOTS” should be observed when mixing paints:
 - (1) DO NOT make any assumptions about the correct procedure for mixing paints. Consult the paint manufacturer’s PDS or ASTM F-718 sheet.
 - (2) DO NOT mix more paint than can be used during the pot life time period. Read PDS (or ASTM F-718 sheet) for pot life.
 - (3) DO NOT mix components of different paint formulas.
 - (4) DO NOT use paint with large undissolved particles.
 - (5) DO NOT dilute paints with solvents (thinners).
 - (6) DO NOT keep epoxy paints out in the sun in warm weather, including epoxy paint pre-packaged in cartridges.

7.8.3 Mixing and Application Procedures for the Navy Epoxy Paint System. Navy epoxy Formula 150 is a primer coat that can be applied to bare metal or to sound paint. Topcoats of various colors (Formulas 151-156) are used for specific applications. Formula 151 is the gray color most commonly used. The following procedures should be followed in mixing these paints. Read and understand the manufacturer’s current PDS or ASTM F-718 sheet.

- a. The Navy epoxy paints are supplied in kits containing two components. One container is labeled Component A and the other is labeled Component B. These components are mixed in a 1:1 ratio by volume, i.e., for one gallon of component A add an equal amount of component B. Check the designation on both containers before mixing to ensure that the proper components are being used. The components of the various formula numbers are NOT interchangeable.

- b. Both components in an epoxy paint kit must be stirred separately prior to mixing them together. After combining equal volumes of the two components, the mixture must be thoroughly stirred until well blended, and then allowed to react for the appropriate “induction” stand-in time as stated in the PDS (or ASTM F-718 sheet). Type IV does not require an induction period, but earlier formulations (Types I and III) require induction.
- c. If an induction period is required, the paint should be stirred or agitated for at least 2 minutes every 30 minutes during the induction period. Two minutes of stirring or agitation are required at 4-hour intervals during the application process.
- d. When Navy epoxy paints are used at a work site having temperatures in the range 35° to 50°F, it is essential that the paint components be pre-warmed to 70°F, mixed, and then allowed to stand for 2 hours prior to delivery to the work site. The preferred method of pre-warming is to store unmixed paint at 70°F for 24 hours prior to the job.
- e. After being mixed, epoxy paints must be used within the pot life period, as specified in the PDS (or ASTM F-718 sheet).
- f. During maintenance painting, brush application is recommended for the first coat of paint over mechanically cleaned surfaces such as hand-cleaned bilges. The brushing forces the paint into surface contaminants or displaces them. The MIL-P-24441 paints do not require thinning before application. Apply the topcoat(s) after the first coat has dried.
- g. If more than seven days elapse before over coating, the surface should be cleaned with water and detergent (if required) for grease and oil removal. This should be followed by a fresh water rinse and wiped dry. Then, a tack coat (1 to 2 wet mils) of the last coat applied or Formula 150 is reapplied to the hard epoxy coat and allowed to dry approximately four hours before application of the next full coat of the system.
- h. If more than 30 days elapse before over coating, clean and roughen the aged topcoat before new paint application.

7.8.4 Mixing and Application Procedures for Commercial Epoxy Paint Systems. Read and understand the manufacturer’s current PDS or ASTM F-718 sheet. Specific items that vary depending on the coating manufacturer include:

- a. Mix ratio. Mixing the two components in the proper ratio is absolutely vital.
- b. Induction period. Refer to PDS (or ASTM F-718 sheet) for induction times.
- c. Both components in an epoxy paint kit must be stirred separately prior to mixing them together. In short, there are several qualified commercial epoxy coating systems that are authorized for touch-up painting. They vary depending on the manufacturer. Follow instructions in the PDS or ASTM F-718 sheet for the particular coating being used.

7.9 PAINT APPLICATION.

7.9.1 General Considerations.

- a. Inspect cleaned areas of the ship to determine the suitability of the surfaces for applicable touch-up or repainting operations. Surfaces **must** be free of rust, deteriorated paint, dust, scale, oil, grease, salt deposits or other surface contaminants.
- b. Do not paint over oily, damp or icy surfaces.
- c. Never paint over loose, badly cracked or blistered paint. Old paint in good condition is an excellent base and should be cleaned, roughened and dried before repainting.
- d. Under normal circumstances, the following environmental conditions apply:
 - (1) Surface temperature **must** be at least 5°F higher than the dew point.
 - (2) Paint should not be applied at temperatures of 35°F or lower; check the PDS or ASTM D-718 sheet for the low temperature application limit.
 - (3) Wind velocity should be below 15 miles per hour (exterior work).
 - (4) Relative humidity below 85 percent.
- e. When successive coats of the same paint are used, different colors should be applied to visually facilitate complete coverage.
- f. Apply paint as soon as possible after surface preparation has been completed. Bare metal surfaces will flash rust soon after exposure to the atmosphere.
- g. When painting over a fully cured epoxy paint film, use a “tie coat” to ensure proper adhesion of the overcoat to the existing paint. A tie coat is a thin layer of paint (generally the same type of paint as the preceding coat) that is applied to the surface by brush or roller. The coat should be applied to a DFT of approximately 1 mil (2 mils WFT).
- h. When painting over welds or in hard-to-get-at spaces that could not be cleaned to the proper surface cleanliness, brush on the first coat of paint to obtain the best adhesion. This comment applies to corners behind stiffeners or over weld seams. Hidden areas should be inspected with a pocket mirror to ensure total coverage before applying each succeeding coat and after the final coat.
- i. Do not store paints and solvents inside submarines. Remove paint from the submarine when painting is completed or interrupted.
- j. When replacing anodes, ensure that the area under the anode is adequately painted, but **DO NOT PAINT THE ANODES** themselves.

7.9.2 Brush Application. In larger areas, start work on overhead areas first, and then work downward. Begin painting at a corner or some other logical vertical division. Cover only that area which can be easily reached without moving ladders. Work downward, painting progressive sections to the deck level, then start at the top of the adjacent area and work down again. Paint trim, doors or similar areas after bulkheads and other major surfaces are completed.

- a. Dip the brush into the paint up to ½ the bristle length. Withdraw the brush and tap it against the inside of the bucket to remove excess paint. Hold the brush at a 45o angle to the surface to be painted. Make several light strokes in the area to be painted. This will transfer much of the paint to the surface. Then spread the paint evenly and uniformly. Do not bear down on the brush.

- b. When using paint dispensing cartridges, apply a small amount to an area and spread evenly with a brush. It is better to start with a small amount and apply additional paint, than to dispense a large amount which may have to be spread into areas that were not prepared for painting.
- c. When one section of the surface is painted, adjacent areas should be painted so that the brush strokes are completed by sweeping the brush into the wet edge of the paint previously applied. This helps eliminate lap marks and provides a more even coating.
- d. Finally, cross-brush lightly to smooth the painted surface and to eliminate brush or sag marks. Very fast drying finishes will not permit much brushing and cross-lapping; in such cases, the paint **must** be applied, spread rapidly and then allowed to dry undisturbed. Going back over a fast drying finish will cause piling up of the coating.

7.9.3 Roller Application. To apply paint with a roller, pour the premixed paint into the tray to about ½ tray depth. Immerse the roller and then roll it back and forth along the ramp to coat the roller cover completely. (A specially designed galvanized mesh screen positioned vertically in a 5-gallon bucket may be used instead of a paint tray.) The first load of paint should be worked out on a newspaper to remove trapped air from the roller cover. It is then ready to apply to a surface. Always roll paint onto the surface, working from the dry area into the area just painted. Never roll completely in the same direction. One good technique is to roll the paint onto the surface in a “W” pattern while the roller is very wet. Distribute the paint using horizontal or vertical strokes. Pressure must be applied when rolling or the paint will not adhere and will soon peel off. Do not roll too fast. Avoid spinning the roller at the end of a stroke. Always feather out final strokes to pick up any excess paint on the surface. Feathering is done by rolling out the final stroke with minimal pressure. Paint from cartridge dispensing systems can be poured into trays for roller application.

NOTE: SPRUCE BARGE AND FMA PERSONNEL ARE TRAINED IN THE USE OF WFT GAUGES AND SHOULD BE CONSULTED FOR ASSISTANCE.

7.9.4 Wet Film Thickness Check. The performance of the coating depends on applying the proper thickness. The proper thickness, called DFT, is stated in the PDS or ASTM F-718 sheet. In order to obtain the proper DFT, WFT must be measured and controlled during application. The required WFT for a coating is stated in the PDS or ASTM F-718 sheet. A WFT gauge is used to measure the thickness of a coat of paint that is still wet to the touch. A typical wet film gauge (Figure 3) has several legs, with each of the inner legs (measuring legs) of varying known lengths and somewhat shorter than the two outer legs (support posts). When the gauge edge is pressed into the wet film (Figure 4), the two outer legs penetrate through the wet film to the substrate. Depending on the thickness of the wet film, some of the inner legs will dip into the wet film while others will not touch it. The length of longest inner leg that is wetted by the coating is the WFT (Figure 5). Proper use of the wet film gauge includes the following:

- a. Measure WFT during coating application to determine if sufficient paint has been applied. The PDS or ASTM F-718 sheet will provide the required WFT.
- b. Use the WFT gauge only on a flat surface. Both end legs must be firmly touching the steel surface.
 - (1) On a vertical surface, such as a bulkhead, hold the gauge in a north-south (vertical) position with the longer legs at the top.

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- (2) On a pipe, place the gauge along the length. Both legs must touch the surface.
- c. Lift the gauge from the surface without sliding. Slipping and sliding will give an inaccurate reading because extra paint will be picked up on the legs.
- d. Use only a clean, dry gauge. Clean the gauge after each reading. Dirt or old paint on the bottoms of the legs adds to their length giving lower readings.



Figure 3. Wet Film Thickness Gauge.



Figure 4. WFT Gauge Positioned in Wet Paint Film.

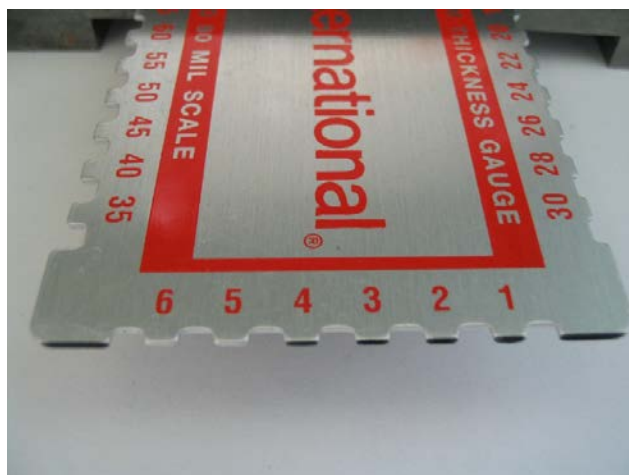


Figure 5. WFT Gauge Showing a Reading of 4-5 Mils.

1. Notice black paint on outer support posts and on measuring legs 1, 2, 3 and 4. No paint on measuring legs 5 and 6.
2. Wet film gauges may be purchased from:
www.elcometer.com (From home page: “Film Thickness Gauge”; then “Wet Film Thickness”.) Elcometer 154 Plastic Wet Film Combs may be an inexpensive option.

Also, vendors from various coating companies often offer wet film gauges.

7.9.5 Overcoating. Most paint systems consist of more than one coat of paint. Proper steps for overcoating include the following:

- a. Consult the PDS or ASTM F-718 sheet to determine the necessary “wait time” before overcoating.
- b. Remember that the time before overcoating is dependent on the temperature. Generally, as the temperature increases, the time before overcoating decreases.
- c. Remember - PDS (or ASTM F-718 sheet) guidance for time before overcoating is only an estimate.
- d. Always check the applied coating before overcoating. If the applied coating is wet, allow more time.
- e. Check the WFT using a WFT gauge (Paragraph 7.9.4 of this chapter).

7.10 QUICK REFERENCE SECTION.

7.10.1 Surface Preparation and Paint Application in Specific Areas. A summary of areas expected to be maintained by Ship’s Force is shown in Table 1. Along with each area is a reference for surface preparation and the required coating system. For each area, a summary procedure is provided.

AREA	SURFACE PREP	COATING
Bilge	Paragraph 7.10.2.1	1 ct - F-150, Type IV (MIL-DTL-24441/29A)

		1 ct - F-151, Type IV (MIL-DTL-24441/30A)
Sail (interior)	Paragraph 7.10.3.1	1 ct - F-150, Type IV (MIL-DTL-24441/29A) 1 ct - F-151, Type IV (MIL-DTL-24441/30A)
Non-skid (not tiled)	Paragraph 7.10.4.1.1	1 ct - primer (proprietary or F-150, Type IV) 1 ct - MIL-PRF-24667B non-skid
Non-skid (tiled)	Paragraph 7.10.4.2.1	2 cts - F-184 (MIL-DTL-24631/1C) 1 ct - F-187 (MIL-DTL-24631/7)
SHT-Topside, sail and rudder	Paragraphs 7.10.4.3.1 7.10.4.3.2	1 ct - F-187 (MIL-DTL-24631/7)
High temperature piping	Paragraph 7.10.5.1	TT-P-28G (Low VOC heat resisting aluminum)
Underway painting	Paragraph 7.10.6.3	VACTAN or UNITED 303 TRIUMPH
Miscellaneous areas of general corrosion (including high solids coatings)	Paragraph 7.10.7.1	1 ct - F-150, Type IV (MIL-DTL-24441/29A) 1 ct - F-151, Type IV (MIL-DTL-24441/30A)
Interior decks/walking surfaces	Section 7.5	1 ct - F-84 (TT-P-645B) 2 cts - MIL-PRF-24635C
Interior bulkheads/overheads	Section 7.5	1 ct - F-84 (TT-P-645B) 2 cts - F-124 (white), F-125 (pastel green), F-126 (bulkhead gray), F-131 (MIL-DTL-24607) <u>OR</u> 2 cts - F-25A (MIL-PRF-24596A)
Painting behind equipment (interior)	Section 7.5	2 cts - F-84 (TT-P-645B)
Exterior of motors, generators and electronic equipment	Section 7.5	1 ct - F-84 (TT-P-645B) 2 cts - F-111 (MIL-DTL-15090D)

Table 1. Summary of Areas for Touch-Up Painting by Ship's Force.

7.10.2 Bilges.7.10.2.1 Surface Preparation.

a. Required Tools:

- (1) Needle gun.
- (2) Inspection mirror (for seeing hard-to-reach areas such as the backsides of beams).
- (3) Brush and dust pan.
- (4) Shop-Vac type vacuum cleaner.

b. Process:

- (1) Read and understand Section 7.3 of this chapter, "General Safety Precautions".
- (2) Read and understand Section 7.5 of this chapter, "General Surface Preparation".

- (3) Solvent clean to remove oil, grease, dirt, chemicals and water-soluble contaminants. If solvents are prohibited, use detergent and fresh water. When implementing these procedures, work sections no larger than 6 feet by 6 feet (36 square feet) should be cleaned at a time. Longitudinal and transverse structural members can be used as boundaries to define the work section. Each section should be fully cleaned and primed before starting work on the next section.
- (4) Use a needle gun to remove loose paint and rust. A needle gun is most effectively used by holding it perpendicular to the surface, making 2-3 passes about 6-8 inches in length over the same path, then moving over and repeating the process until the entire area is completed. The goal is removal of all rust, loose mill scale and paint to bare metal.
- (5) Feather the edges (Paragraph 7.9.3 of this chapter).
- (6) Brush and vacuum loose pieces and dust.
- (7) Check the surface for oil that may have been deposited during surface preparation. If necessary, solvent clean to remove oil. The presence of excess salts on the surface will cause premature coating failure. Therefore, surface conductivity measurements should be made at this point. Contact SPRUCE barge, FMA or other knowledgeable personnel if help is needed. If excessive surface conductivity is measured, wash the area with fresh water and repeat Step (7).
- (8) Apply paint as soon as possible (ideally, the same day) after surface preparation has been completed. Bare metal surfaces will flash rust soon after exposure to the atmosphere. If flash rusting occurs prior to coating application, repeat Steps (3)-(8).

7.10.2.2 Paint Application. Prior to any interior painting, Positive Pressure Unit must be activated. This will prevent solvent from damaging Motor Generators.

a. Required Tools:

- (1) Rollers.
- (2) Brushes.
- (3) Rags.
- (4) Manufacturer's PDS or ASTM F-718 sheet for the following paints:
 - (a) Formula 150, Type IV (MIL-DTL-24441, Formula 150, Type IV, green primer).
 - (b) Formula 151, Type IV (MIL-DTL-24441, Formula 151, Type IV, haze gray).
- (5) Manufacturer's MSDS for the following paints:
 - (a) Formula 150, Type IV, Component A (MIL-DTL-24441, Formula 150, Type IV, green primer, component A).

- (b) Formula 150, Type IV, Component B (MIL-DTL-24441, Formula 150, Type IV, green primer, component B).
- (c) Formula 151, Type IV, Component A (MIL-DTL-24441, Formula 151, Type IV, haze gray, component A).
- (d) Formula 151, Type IV, Component B (MIL-DTL-24441, Formula 151, Type IV, haze gray, component B).

b. Process:

- (1) Read and understand Section 7.6 of this chapter, “General Mixing and Paint application”.
- (2) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the two paint systems to be used.
 - (a) F-150, Type IV, green primer and F-151.
 - (b) Type IV, haze gray top coat.
- (3) Ensure proper ventilation is in place. Maintain ventilation through the curing of the applied coatings.
- (4) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
- (5) Surface temperature **must** be at least 5°F higher than the dew point.
- (6) Paint **must** not be applied at temperatures of 35°F or lower.
- (7) Relative humidity **must** be below 85 percent.
- (8) Mix F-150, Type IV, green primer according to manufacturer’s instructions. Mix ratio is 1:1 by volume. (Paragraph 7.8.3 of this chapter, Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441)).

7.10.2.3 Summary. Table 2 summarizes mixing, application and re-coat parameters.

Paint	Induction Period (hours)	Mix Ratio (volume)	Pot Life (hours)	Time Before Overcoating (hours)	Time to Handle (hours)	Wet Film Thickness (mils)	Dry Film Thickness (mils)
F-150, green primer	N/A	1 : 1	6 @ 70°F	Minimum of 3 @ 40°F 3 @ 70°F @ 50% RH	Minimum of 24 @ 40°F 5 @ 70°F @ 50% RH	6-7	4-5
F-151, gray topcoat	N/A	1 : 1	6 @ 70°F	Minimum of 3 @ 40° F 3 @ 70° F @ 50% RH	Minimum of 24 @ 40°F 5 @ 70°F @ 50% RH	6-7	4-5

Table 2. Mixing, Application and Re-Coat Parameters for Bilges.

- a. Apply by brush. Be certain to force coating into corners, behind beams and areas that are difficult to reach. Pay particular attention to newly installed components such as pipe hangers and clamps. (Paragraph 7.9.2 of this chapter, “Brush Application”)

- b. Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter).
- c. Wait until the first coat is dry, a minimum of 3 hours, before overcoating. If, after 3 hours, coating is not dry, check hourly by pressing thumbnail into surface. Coating is dry when thumbnail does not penetrate.
- d. When first coat is dry, apply a “stripe” coat on welds, corners and edges. The “stripe” coat should be a different color than either the first coat (green) or the topcoat (gray) to facilitate coverage. F-153, Type IV, a black coating, is a good choice. If a different color is not available, use F-151, Type IV, gray as the “stripe” coat.
- e. When the “stripe” coat is adequately dry, mix F-151, Type IV, gray topcoat according to manufacturer’s instructions. Mix ratio is 1:1 by volume. (Paragraph 7.8.3 of this chapter, Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441).)
- f. Apply by brush or roller if a roller can reach all areas that need paint. (Paragraph 7.9.2 of this chapter, “Brush Application”; Paragraph 7.9.3 of this chapter “Roller Application”.) If F-151 was used as the “stripe” coat, pay particular attention to completely cover the “stripe” coat since there is no color difference to provide visual contrast.
- g. Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter).
- h. Freshly painted areas should be roped off to prevent contamination during the curing process. Allow coating to cure per the curing schedule given in the PDS (or ASTM F-718 sheet).
- i. Ventilation should be in place during the curing process as it will facilitate curing and prevent build-up of hazardous vapors.

7.10.3 Sail (Interior).

7.10.3.1 Surface Preparation.

- a. Required Tools:
 - (1) Needle gun.
 - (2) Long-handled paint scraper.
 - (3) Coarse sand paper.
 - (4) Inspection mirror (for seeing hard-to-reach areas such as the backsides of beams).
 - (5) Brush and dust pan.
 - (6) Shop-Vac type vacuum cleaner.
- b. Process:
 - (1) Read and understand Section 7.5 of this chapter, “General Surface Preparation”.
 - (2) Solvent clean to remove oil, grease, dirt, chemicals and water-soluble contaminants. If solvents are prohibited, use detergent and fresh water.

- (3) Use the long-handled scraper to remove any areas of exfoliated metal. Because many areas in the sail are difficult to preserve, advanced corrosion, including exfoliation may occur. In the periscope bay, the bulkhead just forward of the bearing frame is a typical area. Exfoliation is the “delamination” of metal into layers. All exfoliated layers must be removed by scraping them off.
- (4) Starting at the top of a bay and working to the bottom, use a needle gun to remove loose rust and paint. A needle gun is most effectively used by holding it 90° to the surface, making 2-3 passes about 6-8 inches in length over the same path, then moving over and repeating the process until the entire area is completed. The goal is removal of all rust, loose mill scale and paint to bare metal. In areas not accessible by needle gun, use scrapers followed by coarse sand paper. Feather the edges.
- (5) When needle gunning and sanding are complete, brush and vacuum loose pieces and dust from the area. Be sure to get “shelves” and “throughs” and other “collection points”.
- (6) Check the surface for oil that may have been deposited during surface preparation. If necessary, solvent clean to remove oil.
- (7) The presence of excess salts on the surface will cause premature coating failure. Therefore, surface conductivity measurements should be made at this point (Paragraph 7.5.8 of this chapter) if the area is exposed to seawater. Contact SPRUCE barge, FMA or other knowledgeable personnel if help is needed. If excessive surface conductivity is measured, wash the area with fresh water and repeat the step.
- (8) Apply paint as soon as possible (ideally, the same day) after surface preparation has been completed. Bare metal surfaces will flash rust soon after exposure to the atmosphere. If flash rusting occurs prior to coating application, repeat Steps (5)-(8).

7.10.3.2 Paint Application.

a. Required Tools:

- (1) Rollers.
- (2) Brushes.
- (3) Rags.
- (4) WFT gauge.
- (5) Manufacturer’s PDS or ASTM F-718 sheet for the following paints:
 - (a) Formula 150, Type IV (MIL-DTL-24441, Formula 150, Type IV, green primer).
 - (b) Formula 151, Type IV (MIL-DTL-24441, Formula 151, Type IV, haze gray).
- (6) Manufacturer’s MSDS for the following paints:

- (a) Formula 150, Type IV, Component A (MIL-DTL-24441, Formula 150, Type IV, green primer, component A).
- (b) Formula 150, Type IV, Component B (MIL-DTL-24441, Formula 150, Type IV, green primer, component B).
- (c) Formula 151, Type IV, Component A (MIL-DTL-24441, Formula 151, Type IV, haze gray, component A).
- (d) Formula 151, Type IV, Component B (MIL-DTL-24441, Formula 151, Type IV, haze gray, component B).

b. Process:

- (1) Read and understand Section 7.6 of this chapter, “General Mixing and Paint Application”.
- (2) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the two paint systems to be used.
 - (a) F-150, Type IV, green primer.
 - (b) F-151, Type IV, haze gray top coat.
- (3) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
 - (a) Surface temperature **must** be at least 5°F higher than the dew point.
 - (b) Paint **must** not be applied at temperatures of 35°F or lower.
 - (c) Relative humidity **must** be below 85 percent.
- (4) Mix F-150, Type IV, green primer according to manufacturer’s instructions. Mix ratio is 1:1 by volume. (Paragraph 7.8.4 of this chapter, Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441)).

c. Summary.

- (1) Table 3 summarizes mixing, application and overcoat parameters.

Paint	Induction Period (hours)	Mix Ratio (volume)	Pot Life (hours)	Time Before Overcoating (hours)	Time to Handle (hours)	Wet Film Thickness (mils)	Dry Film Thickness (mils)
F-150, green primer	N/A	1 : 1	6 @ 70°F	Minimum of 3 @ 40°F 3 @ 70°F @ 50% RH	Minimum of 24 @ 40°F 5 @ 70°F @ 50% RH	6-7	4-5
F-151, gray topcoat	N/A	1 : 1	6 @ 70°F	Minimum of 3 @ 40°F 3 @ 70°F @ 50% RH	Minimum of 24 @ 40°F 5 @ 70°F @ 50% RH	6-7	4-5

Table 3. Mixing, Application and Overcoat Parameters for Sail (Interior).

- (2) Apply by brush. Be certain to force coating into corners, behind beams and areas that are difficult to reach. (Paragraph 7.9.2 of this chapter, “Brush Application”.)
- (3) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter). Wait until the first coat is dry, a minimum of 3 hours, before overcoating. If, after 3 hours, coating is not dry, check hourly until coating is dry. REMEMBER - PDS (or ASTM F-718 sheet) and Table 3 guidance for overcoating interval is an estimate. You must be able to walk on the first coat without damaging it.
- (4) When first coat is dry, apply a “stripe” coat on welds, corners and edges. The “stripe” coat should be a different color than either the first coat (green) or the topcoat (gray) to facilitate coverage. F-153, Type IV, a black coating, is a good choice. If a different color is not available, use F-151, Type IV, gray as the “stripe” coat.
- (5) When the “stripe” coat is adequately dry, mix F-151, Type IV, gray topcoat according to manufacturer’s instructions. Mix ratio is 1:1 by volume. (Paragraph 7.8.3 of this chapter, Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441)).
- (6) Apply by brush or roller (if a roller can reach all areas that need paint). (Paragraph 7.9.2 of this chapter, “Brush Application”; Section 7.9.3 of this chapter “Roller Application”.) If F-151 was used as the “stripe” coat, pay particular attention to completely cover the “stripe” coat since there is no color difference to provide visual contrast.
- (7) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter). Freshly painted areas should be roped off to prevent contamination during the curing process.
- (8) Allow coating to cure per the curing schedule given in the PDS (or ASTM F-718 sheet). Ventilation should be in place during the curing process as it will facilitate curing and prevent build-up of hazardous vapors.

7.10.4 Non-Skid Areas.

7.10.4.1 Areas That Are Not Tiled With Special Hull Treatment. Non-skid paints are not to be applied to hatch covers, Submarine Rescue Diving Recompression System seating surfaces, safety tracks, life line sockets, deck fittings and gear, faying surfaces of hatches, contact or bearing surfaces, and approximately 1 inch around the periphery of hatches, cleats and access covers.

7.10.4.1.1 Surface Preparation.

a. Required Tools:

- (1) Dull putty knife.
- (2) Needle gun.
- (3) Brush and dust pan.
- (4) Shop-Vac type vacuum cleaner.

b. Process:

- (1) Read and understand Section 7.5 of this chapter, "General Surface Preparation".
- (2) When a coating failure is detected, the area **must** be probed with a dull putty knife or similar instrument, to determine the extent of failure. Once the failure area is identified, the area to be repaired **must** extend slightly (at least 3 inches) outside the perimeter of the failing area to ensure the problem is corrected.
- (3) Clean the surface by removing foreign matter such as oil, grease, dirt and other contaminants. Solvent cleaning is recommended. If solvent cleaning is not permitted, use a commercial cleaner, such as Simple Green or Spray 9. Use only clean, white, lint-free rags and change rags often.
- (4) Use a needle gun to remove all loose paint and rust from the failed area. A needle gun is most effectively used by holding it 90o to the surface, making 2-3 passes about 6-8 inches in length over the same path, then moving over and repeating the process until the entire area is completed. The goal is removal of all rust, loose mill scale and paint to bare metal.
- (5) Feather the edges.
- (6) When needle gunning and sanding are complete, brush and vacuum loose pieces and dust from the area. Again, clean the surface. Solvent cleaning is recommended. If solvent cleaning is not permitted, use a commercial cleaner, such as Simple Green or Spray 9. Use only clean, white, lint-free rags and change rags often.
- (7) The presence of excess salts on the surface can cause premature coating failure. Therefore, surface conductivity measurements should be made at this point. Contact SPRUCE barge or FMA personnel if help is needed.
- (8) Apply paint as soon as possible (ideally, the same day) after surface preparation has been completed.

7.10.4.1.2 Paint Application.

a. Required Tools:

- (1) Rollers.
- (2) Brushes.
- (3) Rags.
- (4) WFT gauge.
- (5) Manufacturer's PDS or ASTM F-718 sheet for the MIL-C-24667 non-skid paint system.
- (6) Manufacturer's MSDS for the MIL-C-24667 non-skid paint system.

b. Process:

NOTE: THE USE OF F-150 (MIL-DTL-24441) PRIMER IS PROHIBITED UNLESS A NON-SKID SYSTEM HAS BEEN QUALIFIED WITH A SPECIFIC MANUFACTURER'S F-150 AS A PRIMER.

- (1) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the non-skid paint systems. Most non-skid systems require a primer system. If a primer is required, check with the manufacturer to determine if MIL-DTL-24441, Formula 150, Type IV, green primer is authorized. The qualified products list of the specification being used **must** be consulted to determine if a particular Formula 150 can be used as a primer. SPRUCE barge or FMA personnel can provide this information.
- (2) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
 - (a) Surface temperature **must** be at least 5°F higher than the dew point.
 - (b) Paint **must** not be applied at temperatures of 50°F or lower.
 - (c) Relative humidity **must** be below 85 percent.
- (3) Mix the primer according to manufacturer's instructions. Be sure to check for an induction period. If an induction period is required, mix for one minute after induction. If F-150 is authorized and is being used as a primer, see Paragraph 7.8.3 of this chapter (Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441)).
- (4) Apply primer by brush or roller. (Paragraphs 7.9.2, "Brush Application" and 7.9.3 "Roller Application" of this chapter.)
- (5) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter).
- (6) Wait until the primer coat is dry before mixing the MIL-C-24667 non-skid coating system. Thoroughly mix the base material of the non-skid using the type of mixer specified in the manufacturer's ASTM F-718 sheets. Make sure that all materials which may have settled during storage (pigments, fillers, aggregate) are lifted from the bottom of the container and are uniformly mixed. Slowly pour the contents of the can of converter (also called hardener, accelerator or curing agent) into the base material. Scrape the bottom of the base material can. Mix converter and base material for 3 to 5 minutes or until uniform color and appearance. Scrape the bottom of the can and mix again for 3 to 5 minutes. If an induction period is required, stir again for one minute after the induction period. Thinning non-skid is strictly prohibited.
- (7) Apply by roller or trowel. If a roller is used, roll across (not along) welds. Cross-rolling **must** extend 3 to 6 inches on each side of the weld. If troweling, consult the manufacturer's PDS (or ASTM F-718 sheet) for recommended trowel size.
- (8) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter).
- (9) Freshly painted areas should be roped off to prevent contamination during the curing process.

- (10) Allow coating to cure per the curing schedule given in the PDS (or ASTM F-718 sheet).
- (11) Ventilation should be in place during the curing process as it will facilitate curing and prevent build-up of hazardous vapors.

7.10.4.2 Special Hull Treatment Tiled Areas (Non-Skid). Non-skid paints are not to be applied to hatch covers, Submarine Rescue Diving Recompression System seating surfaces, safety tracks, life line sockets, deck fittings and gear, faying surfaces of hatches, contact or bearing surfaces and approximately one inch around the periphery of hatches, cleats and access covers.

7.10.4.2.1 Surface Preparation.

- a. Required Tools:
 - (1) 80-100 grit aluminum oxide paper.
 - (2) Shop-Vac type vacuum cleaner.
 - (3) Manufacturer's MSDS for PF-145 HP solvent.
- b. Process:
 - (1) Read and understand Section 7.3 of this chapter, "General Safety Precautions".
 - (2) Read and understand Section 7.5 of this chapter, "General Surface Preparation".
 - (3) Clean the surface of any grease, oil, salt or other residue with a detergent solution and rinse with fresh water.

CAUTION: THE COVERPLY OF THE TILES CONTAINS APPROXIMATELY 10% BY WEIGHT LEAD OXIDE, AN ADDITIVE USED TO CONTROL THE RATE OF WATER ABSORPTION BY THE TILES. WHENEVER SANDING OR GRINDING TILE SURFACES, BE CERTAIN TO WEAR PROPER PPE.

- (4) Hand sand the surface using 80-100 grit aluminum oxide paper to roughen the surface of the tiles for better adhesion. Be sure to remove all old paint in the touch-up area.
- (5) Vacuum up dust.
- (6) Clean surface of remaining dust by wiping with PF-145 HP solvent poured directly onto a clean rag. Do not dip the rag into the solvent. Change rags frequently.
- (7) Apply paint as soon as possible (ideally, the same day) after surface preparation has been completed.

7.10.4.2.2 Paint Application.

- a. Required Tools:
 - (1) Short nap rollers.
 - (2) Brushes.

- (3) Rags.
- (4) Manufacturer's PDS or ASTM F-718 sheet for MIL-A-22262 abrasive grit material.
- (5) Manufacturer's PDS or ASTM F-718 sheet for the following paints:
 - (a) Formula 184 (black flexible epoxy).
 - (b) Formula 187 (black polyurethane camouflage).
- (6) Manufacturer's MSDS for the following paints:
 - (a) Formula 184, Component A (black camouflage epoxy).
 - (b) Formula 184, Component B (black camouflage epoxy).
 - (c) Formula 187, Component A (black polyurethane camouflage).
 - (d) Formula 187, Component B (black polyurethane camouflage).

b. Process:

- (1) Read and understand Section 7.8 of this chapter, "General Mixing and Paint application".
- (2) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the Formula 184 and Formula 187 paint systems.
- (3) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
 - (a) Surface temperature **must** be at least 5°F higher than the dew point.
 - (b) Paint **must** not be applied at temperatures of 50°F or lower.
 - (c) Relative humidity **must** be below 75 percent.

CAUTION: MIXING SHOULD BE PERFORMED AT A TEMPERATURE OF 50° F OR ABOVE.

- (4) Thoroughly mix the A and B components of Formula 184 (black epoxy) in their individual containers by hand stirring. Mix the A and B components together in a 1:1 ratio by volume.

c. Summary.

- (1) Table 4 summarizes mixing, application and overcoat parameters.

Paint	Induction Period (minutes)	Mix Ratio (volume)	Pot Life (hours)	Time Before Overcoating (hours)	Time to Handle (hours)	Wet Film Thickness (mils)	Dry Film Thickness (mils)
F-184, black epoxy camouflage	30 @ 70-90°F 45 @ 55-70°F	1 : 1 (Mix at 50 °F or above)	2 (maximum)	6 hours (minimum) - 6 months	24 (maximum)	8 - 9	4 -5

F-187, black polyurethane camouflage	None	4 : 1 (Mix at 50° or above)	1 (minimum)	18 hours - 7 days	18 (maximum)	4-5	3

Table 4. Mixing, Application and Overcoat Parameters for Non-Skid Areas.

- (2) Apply the F-184 paint in a smooth uniform layer using a paint brush or roller. (Paragraphs 7.9.2, “Brush Application” and 7.9.3 “Roller Application” of this chapter.) Due to difficulty in removing old paint from depressed tile seam areas, “stripe” these areas with a wide brush prior to roller application.
- (3) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter). WFT should be 8-9 mils.
- (4) While the epoxy paint is still wet, sprinkle the abrasive grit material onto the freshly painted film to achieve a uniform roughness over the entire area.
- (5) When the first coat is dry, apply a second coat of Formula 184 black epoxy paint.
- (6) When the second coat of Formula 184 black epoxy is dried, a sealer coat of Formula 187 polyurethane paint must be applied.
- (7) Mix the A and B components of the Formula 187 black polyurethane paint together in a 4:1 ratio by volume. Mix entire gallon of A with entire quart of B. The mixture should be thoroughly blended for two minutes after which it can be used immediately. (There is no induction time for the polyurethane paint.)
- (8) Due to difficulty in removing old paint from depressed tile seam areas, “stripe” these areas with a wide brush prior to roller application.
- (9) Apply the F-187 paint in a smooth uniform layer using a paint brush or roller. (Paragraphs 7.9.2, “Brush Application” and 7.9.3 “Roller Application” of this chapter.)
- (10) Allow 24 hours for paint to cure before permitting foot traffic. Freshly painted areas should be roped off to prevent contamination of the coating.
- (11) Paint should cure for a minimum of 5 days prior to submerging.

7.10.4.3 Special Hull Treatment Tiles - Topside, Sail and Rudder. Due to poor performance of epoxy camouflage paint (Formula 184, old DTRC 2844-1118 formula) when exposed to sunlight, Formula 187, a non-fading polyurethane camouflage paint is used in areas exposed to sunlight, i.e., topside, sail and rudder. This paint is expected to retain its black color for at least two years. It is therefore NOT recommended to recoat the urethane camouflage for at least two years after application. Within the first two years, only cleaning is recommended. References (g), (h) and (i) clearly identify the potential lead hazard associated with Special Hull Treatment (SHT) work and outlines procedures necessary to mitigate this hazard when preparing exterior submarine surfaces for repainting.

7.10.4.3.1 Cleaning of Formula 187 Urethane Camouflage Coating.

- a. Required Tools: “Greenie pads”.

b. Process:

- (1) Apply fresh water from firehose or other source to dirty SHT surfaces.
- (2) Lightly scour the surface with a damp “Greenie Pad” or other similar material to loosen dirt and debris.
- (3) Hose down surface with fresh water to restore original black color.

NOTE: AFTER TWO YEARS OF SERVICE OR SIGNIFICANT MECHANICAL DAMAGE, FORMULA 187 MAY BE TOUCHED UP.

7.10.4.3.2 Surface Preparation.

a. Required Tools:

- (1) 80-100 grit aluminum oxide paper.
- (2) Shop-Vac type vacuum cleaner.
- (3) Manufacturer’s MSDS for PF-145 HP solvent.

b. Process:

- (1) Read and understand Section 7.3 of this chapter, “General Safety Precautions”.
- (2) Read and understand Section 7.5 of this chapter, “General Surface Preparation”.
- (3) Clean the surface of any grease, oil, salt or other residue with a detergent solution and rinse with fresh water.
- (4) **Per** reference (c), Ship’s Force should only remove paint when required to accomplish preservation of corroded surfaces or when bare metal is necessary for an inspection or welding. SHT tiles on 688 Class submarines contain 10 percent lead by weight. The generation of airborne SHT dust may have an adverse effect on worker health and contaminate the surrounding environment. In the case where removal of SHT coverply paint is authorized, special work controls must be followed to ensure appropriate worker protection and prevent environmental contamination.
- (5) Hand sand the surface using 80-100 grit aluminum oxide paper to roughen the surface for adhesion. Polyurethane will not adhere to itself unless the previous coat has been sanded.
- (6) Vacuum up dust.
- (7) Clean surface of remaining dust by wiping with PF-145 HP solvent poured directly onto a clean rag. Do not dip the rag into the solvent. Change rags frequently.
- (8) Apply paint as soon as possible (ideally, the same day) after surface preparation has been completed.

7.10.4.3.3 Paint Application.

a. Required Tools:

- (1) Short nap rollers.
 - (2) Brushes.
 - (3) Rags.
 - (4) Manufacturer's PDS or ASTM F-718 sheet for Formula 187, (black polyurethane camouflage).
 - (5) Manufacturer's MSDS for the following paints:
 - (a) Formula 187, Component A (black polyurethane camouflage).
 - (b) Formula 187, Component B (black polyurethane camouflage).
- b. Process:
- (1) Read and understand Section 7.6 of this chapter, "General Mixing and Paint Application".
 - (2) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the F-187 paint system.
 - (3) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
 - (a) Surface temperature **must** be at least 5°F higher than the dew point.
 - (b) Paint **must** not be applied at temperatures of 50°F or lower.
 - (c) Relative humidity **must** be below 75 percent.
- c. Summary.
- (1) Table 5 summarizes mixing, application and overcoat parameters.

Paint	Induction Period (hours)	Mix Ratio (volume)	Pot Life (hours)	Time Before Overcoating (hours)	Time to Handle (hours)	Wet Film Thickness (mils)	Dry Film Thickness (mils)
F-187, black polyurethane camouflage	None	4 : 1 (Mix at 50°F or above)	At least 1	18 hours - 7 days	At least 2	4-5	3

Table 5. Mixing, Application and Overcoat Parameters for Special Hull Treatment Tiles.

CAUTION: MIXING SHOULD BE PERFORMED AT A TEMPERATURE OF 50°F OR ABOVE.

- (2) Thoroughly mix the A and B components in their individual containers by hand stirring. Mix the A and B components together in a 4:1 ratio by volume. Mix entire gallon of A with entire quart of B. The mixture should be thoroughly blended for two minutes after which it can be used immediately. (There is no induction time for the polyurethane paint.)
- (3) Due to difficulty in removing old paint from depressed tile seam areas, "stripe" these areas with a wide brush prior to roller application.
- (4) Apply the F-187 paint in a smooth uniform layer using a paint brush or roller.

(Paragraphs 7.9.2, “Brush Application” and 7.9.3 “Roller Application” of this chapter.)

- (5) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter). WFT should be 4-5 mils.
- (6) Allow 24 hours for paint to cure before permitting foot traffic. Freshly painted areas should be roped off to prevent contamination of the coating. Paint should cure for a minimum of 5 days prior to submerging.

7.10.5 High Temperature Piping (and Components Near the 12k Evaporator).

- a. To minimize corrosion of carbon steel piping and other components in the vicinity of the 12k evaporator it is important to reduce the accumulation of salt on the surfaces and ensure the heat-resistant paint is applied at the recommended film thickness.
- b. When paint repairs are conducted on high temperature piping or other components in the vicinity of the 12k evaporator, the evaporator **MUST NOT BE OPERATING** (cool).

7.10.5.1 Surface Preparation.

- a. Required Tools:
 - (1) 180 grit sand paper.
 - (2) Shop-Vac type vacuum cleaner.
 - (3) Manufacturer’s MSDS for mineral spirits, TT-T-291.
- b. Process:
 - (1) Read and understand Section 7.5 of this chapter, “General Surface Preparation”.
 - (2) Wash the area to be painted with deionized water. This step removes excess salt.
 - (3) Clean with an approved solvent (mineral spirits, TT-T-291, NSN 8010-00-558-7026) to remove oil and grease.
 - (4) Remove any loosely adherent paint and rust with a wire brush.
 - (5) Lightly abrade with 180-grit sandpaper. Take care to minimize the amount of steel removed. Ensure any residual dust from sanding is removed.
 - (6) Wash the area again with deionized water.
 - (7) Dry the area and check surface for surface salt concentration. SPRUCE personnel are trained in the measurement of surface salt contamination. If required, consult the SPRUCE barge or FMA personnel for help. If the salt concentration limit is exceeded, wash the area again with fresh water. Pay particular attention to crevices, pits and welds. Dry affected area and measure soluble salt level again to verify that salt concentration is below the maximum level. Repeat this step until soluble salt levels are acceptable.

- (8) Apply paint immediately after the surface has been prepared to prevent re-contamination.

7.10.5.2 Paint Application.

NOTE: PRIOR TO ANY INTERIOR PAINTING, POSITIVE PRESSURE UNIT MUST BE ACTIVATED. THIS WILL PREVENT SOLVENT FROM DAMAGING MOTOR GENERATORS.

a. Required Tools:

- (1) Rollers.
- (2) Brushes.
- (3) Rags.
- (4) WFT gauge.
- (5) Manufacturer's PDS or ASTM F-718 sheet for TT-P-28G (Low VOC heat resisting aluminum).
- (6) Manufacturer's MSDS for TT-P-28G (Low VOC heat resisting aluminum).

CAUTION: HEAT RESISTANT PAINT IS EXTREMELY FLAMMABLE AND SHOULD NOT BE APPLIED AT TEMPERATURES ABOVE 85°F.

b. Process:

- (1) Read and understand Section 7.3 of this chapter, "General Safety Precautions".
- (2) Read and understand Section 7.6 of this chapter, "General Mixing and Paint application".
- (3) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the TT-P-28G paint systems.
- (4) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
 - (a) Surface temperature **must** be at least 5°F higher than the dew point.
 - (b) Paint **must** not be applied at temperatures of 50°F or lower.
 - (c) Relative humidity **must** be below 85 percent.

c. Summary.

- (1) Table 6 summarizes mixing, application and overcoat parameters.

Paint	Induction Period (hours)	Mix Ratio (volume)	Pot Life (hours)	Time Before Overcoating (hours)	Time to Handle (hours)	Wet Film Thickness (mils)	Dry Film Thickness (mils)
TT-P-28G	N/A	N/A	N/A	1 @ 400°F	7 minutes @ 400°F	2	0.7-1.0

Table 6. Mixing, Application and Overcoat Parameters for High Temperature Piping.

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- (2) Apply two thin coats of TT-P-28G at a WFT of 2.0 mils per coat. During application (brushing), use a WFT gauge to ensure the film thickness is not exceeded. If the paint is too thick, it will delaminate (pop off) when the system comes up to temperature.
- (3) Freshly painted areas should be roped off to prevent contamination during the curing process. This paint does not fully cure until it is heated. Plan painting when all other work in the area is complete to minimize damage to the coating.

7.10.6 Underway Painting - Rust Converters.

7.10.6.1 Maintenance During Operational Cycle. Preservation maintenance performed during the operational cycle should only be performed to arrest and prevent corrosion problems. The two rust converters listed **here** are approved for use on non-nuclear surfaces with NAVSEA-approved epoxy (MIL-DTL-24441 and MIL-DTL-23236) and enamel (Formula 111) paints.

Rust Converter Paint	Vender
VACTAN	RAYCO Services, Inc. 2512 Broad Bay Road Virginia Beach, VA 23451 (757) 481-0373
UNITED 303 TRIUMPH	United Laboratories 320 37 th Avenue St. Charles, IL 60174 (800) 323-2594

7.10.6.2 Restricted Use. These rust converters are approved under the Submarine Atmosphere Control Program in the LIMITED usage category and may be used with the following restrictions:

- a. Rust converters authorized for use on reactor compartment components which are governed by the Reactor Propulsion Plant Schedules are provided by separate correspondence.
- b. Rust converters are approved for use on all classes of submarines.
- c. Rust converters may be applied to fasteners that are permitted to be painted.
- d. Rust converters are water-based products and should not be used on wetted surfaces or on surfaces of continuous immersion.
- e. Rust converters are used for touch-up not to exceed 10 square feet of surface area per day.
- f. Rust converters are to be applied by brush.
- g. VACTAN should not be applied to surfaces that experience a service temperature greater than 149°F.
- h. TRIUMPH can be used for temperatures up to 200°F.
- i. The minimum temperature during application of TRIUMPH is 38°F; of VACTAN is 50°F.
- j. The maximum quantity to be stored on board while underway is 2 gallons.

7.10.6.3 Surface Preparation.

- a. Required Tools:
 - (1) Needle gun.
 - (2) Inspection mirror (for seeing hard-to-reach areas such as the backsides of beams).
- b. Process:
 - (1) Read and understand Section 7.3 of this chapter, “General Safety Precautions”.
 - (2) Read and understand Section 7.5 of this chapter, “General Surface Preparation”.
 - (3) Remove loose rust, scale and other contaminants using power and hand tool cleaning methods.
 - (4) Detergent wash the area to remove all oil and grease followed by a fresh water wash **and** rinse to remove any residual detergent and soluble salts.
 - (5) Allow surface to dry prior to applying rust converter.

7.10.6.4 Paint Application.

- a. Required Tools:
 - (1) Brushes.
 - (2) Rags.
 - (3) Manufacturer’s PDS or ASTM F-718 sheet for VACTAN or TRIUMPH.
 - (4) Manufacturer’s MSDS for VACTAN or TRIUMPH.
- b. Process:
 - (1) Water-based rust converters must be applied on a dry surface by brush only while underway in a closed ship environment.
 - (2) Two coats of the rust converter should be applied according to manufacturer’s directions.
 - (3) Freshly painted areas should be roped off to prevent contamination during the curing process.

7.10.6.5 Overcoating Upon Return To Port. Upon return to port, intact properly adhering rust converters must be overcoated with two coats of paint (either epoxy (MIL-DTL-24441, Type IV) or enamel (Formula 111), depending on the area. The following procedure **must** be followed:

- a. Read and understand Section 7.5 of this chapter, “General Surface Preparation”.
- b. Use detergents to remove as much oil and grease as possible followed by a fresh water wash **and** rinse to remove any residual detergent and soluble salts.
- c. Allow surface to dry.
- d. Sand surface to be overcoated using 80 grit paper to provide adequate surface profile for paint adhesion.

- e. Wipe surface and vacuum after sanding to remove any loose paint, dirt or dust.
- f. Read and understand Section 7.3 of this chapter, “General Safety Precautions”.
- g. Read and understand Section 7.6 of this chapter, “General Mixing and Paint application”.
- h. Read and understand the PDS (or ASTM F-718 sheet) and MSDS for either epoxy (MIL-DTL-24441, Type IV) or enamel (Formula 111) paint systems.
- i. Apply two coats of paint (either epoxy (MIL-DTL-24441, Type IV) or enamel (Formula 111), depending on the surface being painted. The final coat should be the same color as the surrounding area to maintain color uniformity. The combination of rust converter and specified overcoat paint system is considered permanent.

7.10.7 Touch-Up of Miscellaneous Areas of General Corrosion Including New High Solids Coatings.

7.10.7.1 Surface Preparation.

- a. Required Tools:
 - (1) Needle gun.
 - (2) Inspection mirror (for seeing hard-to-reach areas such as the backsides of beams).
 - (3) Brush and dust pan.
 - (4) Shop-Vac type vacuum cleaner.
- b. Process:
 - (1) Read and understand Section 7.5 of this chapter, “General Surface Preparation”.
 - (2) Solvent clean to remove oil, grease, dirt, chemicals and water-soluble contaminants. If solvents are prohibited, use detergent and fresh water.
 - (3) Use a needle gun to remove loose paint and rust. A needle gun is most effectively used by holding it 90° to the surface, making 2-3 passes about 6-8 inches in length over the same path, then moving over and repeating the process until the entire area is completed. The goal is removal of all rust, loose mill scale and paint to bare metal.
 - (4) Feather the edges.
 - (5) When needle gunning and sanding are complete, brush and vacuum loose pieces and dust.
 - (6) Check the surface for oil that may have been deposited during surface preparation. If necessary, solvent clean to remove oil.
 - (7) The presence of excess salts on the surface will cause premature coating failure. Therefore surface conductivity measurements should be made at this point. Contact SPRUCE barge, FMA or other knowledgeable personnel if help

is needed. If excessive surface conductivity is measured, wash the area with fresh water and repeat Step (7).

- (8) Apply paint as soon as possible (ideally, the same day) after surface preparation has been completed. Bare metal surfaces will flash rust soon after exposure to the atmosphere. If flash rusting occurs prior to coating application, repeat Steps (3)-(8).

7.10.7.2 Paint Application.

a. Required Tools:

- (1) Rollers.
- (2) Brushes.
- (3) Rags.
- (4) Manufacturer's PDS or ASTM F-718 sheet for the following paints:
 - (a) Formula 150, Type IV (MIL-DTL-24441, Formula 150, Type IV, green primer).
 - (b) Formula 151, Type IV (MIL-DTL-24441, Formula 151, Type IV, haze gray).
- (5) Manufacturer's MSDS for the following paints:
 - (a) Formula 150, Type IV, Component A (MIL-DTL-24441, Formula 150, Type IV, green primer, component A).
 - (b) Formula 150, Type IV, Component B (MIL-DTL-24441, Formula 150, Type IV, green primer, component B).
 - (c) Formula 151, Type IV, Component A (MIL-DTL-24441, Formula 151, Type IV, haze gray, component A).
 - (d) Formula 151, Type IV, Component B (MIL-DTL-24441, Formula 151, Type IV, haze gray, component B).

b. Process:

- (1) Read and understand Section 7.6 of this chapter, "General Mixing and Paint Application".
- (2) Read and understand the PDS (or ASTM F-718 sheet) and MSDS for the two paint systems to be used.
 - (a) F-150, Type IV, green primer.
 - (b) F-151, Type IV, haze gray top coat.
- (3) Check environmental conditions. Ask for help from SPRUCE barge or FMA personnel.
 - (a) Surface temperature **must** be at least 5°F higher than the dew point.
 - (b) Paint **must** not be applied at temperatures of 35°F or lower.

- (c) Relative humidity **must** be below 85 percent.
- (4) Mix F-150, Type IV, green primer according to manufacturer's instructions. Mix ratio is 1:1 by volume. (Paragraph 7.8.3 of this chapter, Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441).

c. Summary.

- (1) Table 7 summarizes mixing, application and re-coat parameters.

Paint	Induction Period (hours)	Mix Ratio (volume)	Pot Life (hours)	Time Before Overcoating (hours)	Time to Handle (hours)	Wet Film Thickness (mils)	Dry Film Thickness (mils)
F-150, green primer	N/A	1 : 1	6 @ 70°F	Minimum of 3 @ 40°F 3 @ 70°F @ 50% RH	Minimum of 24 @ 40°F 5 @ 70°F @ 50% RH	6-7	4-5
F-151, gray topcoat	N/A	1 : 1	6 @ 70°F	Minimum of 3 @ 40°F 3 @ 70°F @ 50% RH	Minimum of 24 @ 40°F 5 @ 70°F @ 50% RH	6-7	4-5

Table 7. Mixing, Application and Re-Coat Parameters for Touch-Up of Miscellaneous Areas.

- (2) Apply by brush. Be certain to force coating into corners, behind beams and areas that are difficult to reach. Pay particular attention to newly installed components such as pipe hangers and clamps. (Paragraph 7.9.2 of this chapter, "Brush Application".)
- (3) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter).
- (4) Wait until the first coat is dry, a minimum of 3 hours, before overcoating. If, after 3 hours, coating is not dry, check hourly until coating is dry. REMEMBER - PDS (or ASTM F-718 sheet) and Table 7 guidance for overcoating interval is an estimate. You must be able to walk on the first coat without damaging it.
- (5) When first coat is dry, apply a "stripe" coat on welds, corners and edges. The "stripe" coat should be a different color than either the first coat (green) or the topcoat (gray) to facilitate coverage. F-153, Type IV, a black coating, is a good choice. If a different color is not available, use F-151, Type IV, gray as the "stripe" coat.
- (6) When the "stripe" coat is adequately dry, mix F-151, Type IV, gray topcoat according to manufacturer's instructions. Mix ratio is 1:1 by volume. (Paragraph 7.8.3 of this chapter, Mixing and Application Procedures for the Navy Epoxy Paint System (MIL-DTL-24441).)
- (7) Apply by brush or roller (if a roller can reach all areas that need paint). (Paragraphs 7.9.2, "Brush Application" and 7.9.3 "Roller Application" of this chapter.) If F-151 was used as the "stripe" coat, pay particular attention to

completely cover the “stripe” coat since there is no color difference to provide visual contrast.

- (8) Check WFT to assure proper thickness (Paragraph 7.9.4 of this chapter).
- (9) Freshly painted areas should be roped off to prevent contamination during the curing process.
- (10) Allow coatings to cure per the curing schedule given in the PDS (or ASTM F-718 sheet).
- (11) Ventilation should be in place during the curing process as it will facilitate curing and prevent build-up of hazardous vapors.

APPENDIX A**SUBMARINE PAINT GUIDE****REFERENCES.**

- (a) OPNAVINST 5100.19 - NAVOSH Program Manual for Forces Afloat, Chapter D12, Painting and Preservation
- (b) Naval Ships Technical Manual (NSTM), Chapter 631 - Preservation of Ships in Service - General
- (c) Hazardous Material User's Guide (HMUG), Group 12 - Paint Materials

1. **SCOPE.** This information is intended for use by Ship's Force when preparing, handling and applying paint to interior submarine surfaces. A copy of this guide is available on the Shipboard Environmental Information Clearinghouse (SEIC) web site at: <https://navyseic.dt.navy.mil> under Pollution Prevention for Submarines.

NOTE: BE SURE TO FOLLOW THE GENERAL SAFETY PRECAUTIONS SPECIFIED IN REFERENCE (a) OF THIS APPENDIX AND THE DETAILED PROCEDURES AND PRECAUTIONS SPECIFIED IN REFERENCE (b) OF THIS APPENDIX.

2. SURFACE PREPARATION.

- a. According to the Rohm and Haas Paint Quality Institute (PQI) web site at: www.paintquality.com, inadequate surface preparation is the leading cause of premature exterior paint failures. Paint performance depends on a properly prepared surface, the benefits of which include:
 - (1) Improved adhesion (less blistering, flaking or peeling).
 - (2) Longer service life.
 - (3) Resistance to corrosion.
- b. More information on surface preparation for specific substrates and a list of relevant specifications and standards are available at:
<http://www.industrialpaintquality.com/education/surfaceprep.html>

CAUTION: AVOID MIXING PAINT PRODUCTS IN AN ENCLOSED COMPARTMENT WITHOUT ADEQUATE VENTILATION. PER OPNAVINST 5090.1C PARAGRAPH 22-4.3.2.11E, THE USE OF PAINT THINNER IS PROHIBITED. REFERENCE (c) OF THIS APPENDIX PROVIDES A HAZARDOUS MATERIAL USER'S GUIDE.

3. PAINT MIXING. There are numerous considerations for effective paint mixing:

- a. Always mix paints and their solvents in a designated compartment or mixing room before boarding the submarine.
- b. Prior to mixing paint, read and understand the information in the manufacturer's Product Data Sheet (PDS).
- c. Thoroughly mix each component of multiple component paint before combining.

- d. Mix in Navy epoxy paint components at a 1:1 ratio by volume (MIL-PRF-24441).
- e. Thoroughly mix paints until free of lumps, cakes and sediments.
- f. MIL-DTL-24441, Type IV does not require induction, and may be used immediately.

4. PAINT APPLICATION.

- a. Apply paints under the following environmental conditions:
 - (1) Surface temperature at least 5°F higher than the dew point.
 - (2) Temperature greater than 35°F.
 - (3) Relative humidity below 85%.
- b. Other recommendations for proper paint application include:
 - (1) Apply paint as soon as possible following surface preparation. Two minutes of stirring or agitating is required at 4-hour intervals during the application process.
 - (2) To visually facilitate complete coverage, apply different colors of the same paint when successive coats are used.
 - (3) Use a “tack coat” of Formula 150 when painting over a fully cured epoxy paint film. The coat should be applied to a DFT of 1 mil (2 mils WFT).
 - (4) Paint trim, doors or similar areas after major surfaces (e.g., bulkheads) are completed.
 - (5) If more than seven days elapse before overcoating, the surface should be cleaned, rinsed and wiped dry. This should be followed by either: (1) a tack coat (1 to 2 wet mils) of the last coat applied, or (2) a tack coat of Formula 150 to the hard epoxy coat. Allow to dry approximately four hours before application of the next full coat of the system.
 - (6) If more than 30 days elapse before overcoating, clean and roughen the aged topcoat before new paint application.

5. SAFETY CONCERNS. Painting is an inherently dangerous activity. Remember to always be aware of potential hazards in the area, heed warning signs, and to follow safety guidelines and procedures.

- a. Do not store paints and solvents onboard the submarine.
- b. Activate the positive pressure unit prior to any interior painting.
- c. Terminate all internal painting with oil based paints 5 days prior to sealing the ship. Terminate painting with latex or water based paint 3 days prior to sealing.
- d. Consult the Submarine Material Control List (SMCL) for additional restrictions at: <https://smcl.dt.navy.mil>

6. VOLUME ESTIMATION. Use Table 1 to estimate the volume of paint required to cover a given surface area. For example: 10.0 pints of MIL-PRF-24441 Epoxy topcoat is needed to cover 280 square feet of surface area.

Surface Area in Square Feet	Pints of Paint Required			
	<i>MIL-PRF-24441 Primer</i>	<i>MIL-PRF-24441 Epoxy Topcoat</i>	<i>MIL-PRF-24635 Enamel Topcoat</i>	<i>TPD-24607 Enamel Topcoat</i>
20	0.5	0.7	0.3	0.3
40	1.1	1.4	0.6	0.6
60	1.6	2.1	0.9	0.9
80	2.1	2.9	1.2	1.1
100	2.6	3.6	1.4	1.4
120	3.2	4.3	1.7	1.7
140	3.7	5.0	2.0	2.0
160	4.2	5.7	2.3	2.3
180	4.7	6.4	2.6	2.6
200	5.3	7.1	2.9	2.9
220	5.8	7.9	3.2	3.1
240	6.3	8.6	3.5	3.4
260	6.8	9.3	3.8	3.7
280	7.4	10.0	4.1	4.0
300	7.9	10.7	4.3	4.3
320	8.4	11.4	4.6	4.6
340	8.9	12.1	4.9	4.9
360	9.5	12.9	5.2	5.1
380	10.0	13.6	5.5	5.4
400	10.5	14.3	5.8	5.7
420	11.1	15.0	6.1	6.0
440	11.6	15.7	6.4	6.3
460	12.1	16.4	6.7	6.6
480	12.6	17.1	7.0	6.9
500	13.2	17.9	7.2	7.1

Table 1

7. COMMON PAINTING TERMS.

- a. Pot Life - The length of time that a catalyzed resin system retains a viscosity low enough to be used. Also known as working life or usable life.
- b. Relative Humidity - The amount of water in the air compared with how much the air can hold at the current temperature.
- c. Induction Time - The waiting period required between the time a two-part paint is mixed and the time it can be used. Also known as sweat-in.
- d. Dew Point - The temperature at which moisture will begin to condense out of the air.
- e. Wet Film Thickness (WFT) - Paint thickness of a wet coating (immediately after application). Measured in mils or thousandths of an inch.
- f. Dry Film Thickness (DFT) - Paint thickness of a cured (dried) coating. Measured in mils or thousandths of an inch.

- g. Tack Stage - The point where a slight impression remains when the paint is pressed lightly with a fingertip.
- h. Tack coat - A thin layer of paint applied when painting over fully cured epoxy paint.
- i. Feathering - The process of making a tapered edge between the edges of intact paint and an area that has been mechanically cleaned to allow for proper adhesion of the paint to all surfaces.

APPENDIX B
COATING INSPECTION REPORT FORM

USS _____ DATE _____

Inspection Area Name **or** Number: _____

Inspector: _____

Location *	Percent General Corrosion	Structural Steel Defects (Pitting, Corrosion)? (Yes or No)	Percent Blistering	Notes

* NOTE: Identify frame and location in relation to ship's centerline or general location within the tank or space.

APPENDIX C**SHIPBOARD POWER CLEANING TOOLS**

Vendor	Description	Type Category
Honsa Ergonomic Technologies Inc.	Pneumatic Chipping Hammers: HTC-93-1-H	Chipping Hammer
Tool Crib of the North	DW997K-2: 1/2" Extreme Drill/Driver/Hammerdrill Kit	Drill
Tool Crib of the North	DW4PAK-2K 18V Extreme contractor's Combo Package: 1/2" drill/hammerdrill, 5 3/8" Trim Saw, Recip. Saw, Floodlight, 2 Batteries, charger, & Case	Drill/Recip & Trim Saw
DESCO Manufacturing Co., Inc.	Rt Angle Sander Kit w/Dust Collector Outlet, 7" (151.217)	Grinder
DESCO Manufacturing Co., Inc.	Rt Angle Sander Kit w/Dust Collector Outlet, 4.5" (150.217)	Grinder
DESCO Manufacturing Co., Inc.	Rt Angle Sander Kit w/Dust Collector Outlet, 4" (150.317)	Grinder
DESCO Manufacturing Co., Inc.	VersaTool (170.181)	Grinder/Polisher
DESCO Manufacturing Co., Inc.	Model GD1010 - Navy HEPA Vac System (305.014)	HEPA Vacuum
DESCO Manufacturing Co., Inc.	5" Tile Stripper (180.029)	Long Handle Scaler
McMaster-Carr Supply Company	Screwdriver-Handle Flat-Blade Scraper Offset, 9/16" Blade Width, 8-1/16" Overall Length (3645A4)	Misc. Hand Tool
McMaster-Carr Supply Company	Ceramic-Blade Scraper Plastic Handle, 6-3/4" Overall Length (35685A65)	Misc. Hand Tool
McMaster-Carr Supply Company	3"W X 4-3/4"L Chisel-Edge Bent-Blade Scraper (3668A25)	Misc. Hand Tool
McMaster-Carr Supply Company	Curved Handle Brush W/Stainless Steel Bristles, 4 X 19 Rows (7187T8)	Misc. Hand Tool
McMaster-Carr Supply Company	Stainless Steel Laced Scratch Brush 7 X 4 Rows, 11/16" Trim Length, 8-3/8" Overall Length (7251T97)	Misc. Hand Tool
McMaster-Carr Supply Company	Scaling Hammer 1 lb Head, 12-1/4" Overall Length (5933A11)	Misc. Hand Tool
DESCO Manufacturing Co., Inc.	Needle Scaler System - Model 24 (130.2246)	Needle Scaler (Gun)
Northern Tool & Equipment	1350 PSI Electric Pressure Washer (157421-NET)	Pressure Washer
DESCO Manufacturing Co., Inc.	Mini-Flushplate System (100.216)	Rotary Scaler (2.25" Mini Deck Crawler)
DESCO Manufacturing Co., Inc.	FX-Flushplate System (110.216)	Rotary Scaler (4.25" Mini Deck Crawler)
EDCO Equipment Company, Inc.	EDCO Pro-Scaler, Model PS-GD-2563	Tight-Area Tool
Imperial Tool Company	Straight Geared Die Grinder, .3 HP, 5000 RPM, DOTCO #10S1093A-01	Tight-Area Tool
Imperial Tool Company	90 Degree Die Grinder, .3 HP, 12000 RPM, DOTCO # 10S1200B-36	Tight-Area Tool

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Vendor	Description	Type Category
Imperial Tool Company	Extended Head 90 Degree Die Grinder, .3 HP, 12000 RPM, DOTCO # 10S1290B-36	Tight-Area Tool
D. L. Thurrott Co., Inc.	Bilge Pump, Wilden Pump, Model M1/PT/TF/TF/KT	Tight-Area Tool, Bilge Pump
McMaster-Carr Supply Company	Mini Tank Air-Powered Wet/Dry Vacuum 6 Gallon Tank, 110 Cfm, 116" Water Lift (6433T73)	Wet/Dry Vacuum
Sears Power and Hand Tools	Craftsman 2 Gal 1.5 HP Portable Wet/Dry Vacuum (17711)	Wet/Dry Vacuum

VOLUME VI**CHAPTER 8****MINIATURE/MICROMINIATURE (2M), MODULE TEST AND REPAIR (MTR),
AND FIBER OPTIC TEST AND REPAIR (FOTR) PROGRAMS****REFERENCES.**

- (a) NAVSUP P-485 - Afloat Supply Procedures
- (b) NAVSEAINST 4790.17 - Fleet Test and Repair of Shipboard Electronic Equipment
- (c) NAVSEA SE004-AK-TRS-010/2M Marine Corps TM 5895-45/1B - Standard Maintenance Practices 2M Electronic Assembly Repair
- (d) NAVSEA S9086-PF-STM-010 - Technical Manual Operation, Maintenance, and Repair Chapter 408 Fiber Optic Cable Topology
- (e) MIL-STD-2042 – Fiber Optic Cable Topology Installation Standard Methods for Surface Ships and Submarines
- (f) COMNAVAIRLANTINST 4790.42/COMNAVAIRPACINST 4790.54 - CV/CVN Intermediate Maintenance Activity (IMA) Module Test and Repair Facility (MTRF)
- (g) NAVSEA TE000-AA-MAN-010/2M - Certification Manual for Miniature/Microminiature (2M)/Module Test and Repair (MTR) Program
- (h) NAVPERS 18068 - Manual of Navy Enlisted Manpower and Personnel Classification and Occupational Standards
- (i) MIL-HDBK-263 - Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment
- (j) COMNAVAIRLANTINST 4790.34 - Electrostatic Discharge (ESD) Control Program
- (k) NAVSUP P-484 - Supply Afloat Fleet and Field Packaging Procedures
- (l) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- (m) OPNAVINST 4700.7 - Maintenance Policy for U.S. Navy Ships
- (n) NAVSUP P-488 - COSAL Use and Maintenance Manual
- (o) COMSUBLANTINST 4419.1 - Module Screening and Repair Activity (MSRA) Repairables Management Procedure

LISTING OF APPENDICES.

- A 2M Repair Process
- B Sample MTRF Quarterly Report Message (Naval Air Force Only)

8.1 **PURPOSE.** To issue policy, guidelines and procedures for the management of the Miniature/Microminiature (2M) Electronic Repair Program, Module Test and Repair (MTR) Program and Fiber Optic Test and Repair (FOTR) Program.

8.1.1 **Scope.** This chapter applies to all activities engaged in the repair of electronic equipment, assemblies, subassemblies, and modules. This chapter also applies to all activities engaged in the repair of fiber optic cables and components. This chapter does not apply to electronic equipment under the cognizance of Naval Sea Systems Command Nuclear Propulsion Directorate (NAVSEA 08) or the Strategic Systems Project Office.

8.1.2 Policy. All failed Circuit Card Assemblies (CCA) and Electronic Modules (EM) must be screened for 2M and MTR using Automated Test Equipment (ATE), General Purpose Electronic Test Equipment (GPETE), and test bed installations. CCAs and EMs may be certified Ready For Issue (RFI) per reference (a). All failed fiber optic links are candidates for screening and repair using GPETE and approved repair equipment per reference (b).

8.1.3 Background. The 2M and MTR Programs, established by reference (b), supports the test and repair of electronic equipment at the Fleet level. Reference (c) describes 2M and MTR capabilities including the performance of high quality repairs on CCAs and EMs. The 2M and MTR Work Center (WC) repair capability includes training, tools, techniques, technical documentation and certification. The Fiber Optic Test and Repair Program, established by reference (b), supports the test and repair of fiber optic cabling and components at the Fleet Level. References (d) and (e) describe fiber optic repair capabilities. This fiber optic capability includes training, tools, methods, technical documentation and certification.

8.2 RESPONSIBILITIES.

8.2.1 Fleet Commander. Fleet Commanders must:

- a. Operationally administer the 2M and MTR Programs (e.g. Electronic Repair, Module Test and Repair, Fiber Optic Test and Repair Programs.)
- b. Inspect and certify 2M, MTR, and FOTR facilities and technicians per reference (b) in conjunction with the Command, Control, Communications, Computers and Combat Systems Readiness Assessment (C5RA) or Total Ship's Readiness Assessment (TSRA).
- c. Ensure all 2M, MTR, and FOTR maintenance actions are documented per this manual Volume VI, chapter 19.

8.2.2 Type Commander or Immediate Superior In Command. Type Commanders (TYCOM) or Immediate Superiors in Command must:

- a. Coordinate and manage the 2M, MTR and FOTR programs.
- b. Monitor the effectiveness of the 2M Program and provide recommendations concerning 2M, MTR and FOTR equipment, tools and training.
- c. Execute progressive repair procedures.
- d. Coordinate logistic support, outfitting requirements and deployment priorities for 2M, MTR and FOTR stations and associated test equipment.
- e. Monitor 2M, MTR and FOTR certification status and direct corrective actions as required.
- f. Monitor and enforce the utilization of Module Test and Repair Tracking System (MTRTS) only per MTRTS Business Rules.pdf.

8.2.3 Commanding Officer or Officer In Charge. Commanding Officers or Officers In Charge must:

- a. Establish a 2M and MTR Programs under the cognizance of the Electronics Material Officer (EMO), Combat Systems Maintenance Officer (CSMO) or cognizant

Department Head. For Fleet Maintenance Activities (FMA), utilize the Electronics Repair (or cognizant) Officer as the overall coordinator.

- b. Maintain certified 2M, MTR or FOTR stations and technicians.
- c. Screen and repair all CCAs and EMs using the progressive repair process. Submit CCAs and EMs beyond Ship's Force repair capability to the FMA.
- d. Maintain an active 2M and MTR WC. Ensure MTRTS is used to maintain the ship's 2M and MTR screening efficiency, performance, production and quarterly production or performance reports are submitted.

8.2.4 Miniature/Microminiature Repair Program Coordinator or Module Test and Repair Facility Coordinator. The 2M or MTRF Coordinator (EMO or cognizant repair officer) must:

- a. Coordinate and monitor the effectiveness of the 2M Work Center (WC) and the repair program.
- b. Provide adequate space with environmental controls to support the 2M WC using the guidance of references (c), (f) and (g).
- c. Submit additional or new 2M and test equipment requirements to the TYCOM Representative, providing complete justification (e.g., workload, documented man-hours, or added capabilities with the addition of new equipment).
- d. Ensure adequate numbers of 2M and MTR trained and technically qualified personnel support the WC.
- e. Ensure 2M and MTR personnel and station requirements are met per references (g) and (h).
- f. Ensure 2M and MTR WC personnel are formally trained in the operation and maintenance of all ATE and 2M and MTR equipment.
- g. Maintain an updated library of test routines and test documentation for other installed ATE, per TYCOM outfitting requirements. Develop and submit test routines to Naval Undersea Warfare Center, Fleet Engineering Office for CCAs and EMs.
- h. Ensure all 2M repair actions are documented per this manual Volume VI, chapter 19.
- i. Ensure the Electrostatic Discharge (ESD) procedures of references (i) and (j) are implemented within the 2M and MTR WCs to provide adequate protection for ESD sensitive CCAs and EMs.
- j. Coordinate with supply to ensure all CCAs and EMs meet the packaging requirements of per reference (k).
- k. Ensure all CCAs and EMs certified RFI are processed as discussed in Section 8.4 of this chapter.
- l. Maintain a complete inventory of 2M, MTR and ATE, materials and consumables.
- m. Ensure compliance with all applicable safety procedures per reference (l).
- n. Ensure that the MTR Tracking System is used to record all maintenance actions and produces required production reports.

- o. Ensure the MTRTS Business Rules are used to properly document all screening attempts. Refer to the latest MTR Test Routine ROM for the MTRTS Business Rules.pdf.

8.2.5 Fiber Optic Test and Repair Program Coordinator. The FOTR Coordinator (EMO or cognizant repair officer) must:

- a. Coordinate and monitor the effectiveness of the FOTR Work Center (WC) and the repair program.
- b. Provide adequate space with environmental controls to support the FOTR WC using the guidance of references (d) and (e).
- c. Submit additional or new FOTR equipment requirements to the TYCOM Representative, providing complete justification (e.g., workload, documented man-hours, or added capabilities with addition of new equipment).
- d. Ensure adequate numbers, per FLTMPs requirements of FO trained and technically qualified personnel support the WC.
- e. Ensure FO personnel and station requirements meet the criteria of references (g) and (h).
- f. Ensure all FO repair actions are documented per this manual Volume VI, chapter 19.
- g. Maintain a complete inventory of FO materials and consumables.
- h. Ensure compliance with all applicable safety procedures in accordance with reference (l).
- i. Ensure that the MTR Tracking System is used to record all FO maintenance actions and produces required production reports.

8.2.6 Commander, Navy Regional Maintenance Center. The Commander, Navy Regional Maintenance Center (CNRMC) must maintain qualified 2M, MTR and FOTR Fleet Coordinators at Mid-Atlantic Regional Maintenance Center (MARMC), Southwest Regional Maintenance Center (SWRMC). Fleet Coordinators are responsible for 2M Program Inspections and Certifications in their respective geographical areas (i.e., MARMC is responsible for Atlantic and SWRMC is responsible for Pacific).

8.2.6.1 Regional Maintenance Center. The RMC 2M and MTR Inspection and Certification Branch (MARMC, SERMC, SWRMC, FDRMC Rota, Pearl Harbor, Yokosuka, Sasebo and Everett) shall, per reference (g):

- a. Maintain a certified laboratory for the purposes of recertifying technicians where 2M, MTR and FOTR Inspectors are assigned.
- b. Maintain certified 2M, MTR and FOTR Inspectors.
- c. Inspect and certify all 2M, MTR and FOTR facilities per reference (g) and report inspection results to the commanding officer and TYCOM.
- d. Inspectors shall attend the 2M and MTR Inspector and Instructor training workshop each year. Master 2M and MTR inspectors (Atlantic and Pacific Fleet Coordinators) shall attend all the Inspector and Instructor training

workshops due to their additional responsibilities related to subordinate Inspector site review certifications.

8.2.7 NAVSEA 2M and MTR Program Manager. The NAVSEA 2M and MTR program manager shall assure the 2M and MTR In Service Engineering Certification Agents are civilian government employees to support inherently government functions per references (b) and (m).

8.3 AUTHORIZED MINIATURE/MICROMINIATURE OUTFITTING. Authorized 2M and MTR outfitting is identified in reference (b). Authorized FOTR outfitting is identified in reference (e).

8.4 MINIATURE/MICROMINIATURE PERSONNEL AND STATION REQUIREMENTS. Conduct 2M and MTR technician recertification and issue operator proficiency cards to qualified 2M and MTR technicians. References (g) and (k) provide certification criteria for all 2M and MTR stations and technicians. References (d) and (e) provide certification criteria for all FOTR equipment and technicians.

8.5 PROGRESSIVE REPAIR PROCESS. The progressive repair process is the sequential attempt to test and repair CCAs and EMs. Reference (m) requires repairs at the lowest possible level. Reference (a) describes Repairables Management for Depot Level Repairables (DLR) and Field Level Repairables (FLR). 2M repair technicians will screen and attempt to repair all CCAs and EMs within their training and capability, regardless of cognizance or the Source Maintenance and Recoverability code.

8.5.1 Repair Process. The 2M repair process, illustrated in Appendix A and defined in reference (m).

8.5.2 Ship's Force Process. An activity's repair capability and the type of 2M station may differ depending upon TYCOM outfitting. Such differences include the type of 2M station (miniature/microminiature) and outfitting of test capability. These factors plus 2M technicians' training or certification dictate Ship's Force ability to screen and repair CCAs and EMs. Regardless of these differences, an attempt shall be made to repair all CCAs and EMs prior to their forwarding to the FMA.

- a. The 2M Work Centers must be designated as "CSE3" for surface ships, "CS54" for Aircraft Carriers, and "NE02" for SSBN and SSGN Class submarines. All 2M, MTR and FOTR work will be documented using these WCs. Final action codes will use "7 series" per this manual Volume VI, chapter 19.
- b. Submit Beyond Capability Maintenance to the FMA using an OPNAV 4790/2K or MJC-OXCA-C028. The WC responsible for the system will forward the CCA and EM to the FMA if the CCA and EM repair is beyond the capability of the 2M WC.
- c. Supply Officers have different responsibilities for DLRs or FLRs per references (a) and (n).
 - (1) DLRs. Carcass tracking procedures are delineated in local command instructions and will identify supply or maintenance personnel responsibilities for tracking CCAs and EMs either at the Ship's Force 2M WC or the FMA WC. Supply Officers are authorized to delay stock issue, replenishment and non-RFI turn-in for up to 72 hours pending testing and repair. Aircraft Carrier

WC CS54 MTRF will use the Progressive Repair Program with the MTR Tracking System to support Supply or MTRF interaction.

- (2) FLRs. Disposal of FLRs can be accomplished by either Ship's Force or the FMA.

8.5.3 Fleet Maintenance Activity Process. FMAs have additional 2M repair and ATE capabilities exceeding the Ship's Force level. The FMA will conduct repairs to CCAs/EMs that is beyond the maintenance capability of the submitting activity using the appropriate documentation.

- a. CASREP driven OPNAV 4790/2Ks will be accepted by the FMA on the same day the job is submitted and worked to support a 24-hour turn-around.
- b. Non-CASREP driven OPNAV 4790/2Ks will be screened to support activities and worked to support a 72-hour time limit or deadline date.
- c. If the FMA is unable to repair the CCA and EM, it is condemned according to Repairables Management procedures per the requirements of reference (a).

8.5.4 Certification of Miniature/Microminiature Repaired Assets as Ready for Issue. Reference (a) describes the definition and certification criteria for RFI items. Repaired CCAs and EMs will meet the following basic RFI requirements:

- a. Packaging and preservation.
 - (1) Repaired items from the 2M WC or MTRF will be packaged to meet the minimum standards of reference (a).
 - (2) A repair-unit identification label must be affixed to the body of each repaired unit per reference (a). The label must specify the command or activity performing the repair, the date repaired and the name of the 2M technician.
- b. ESD protection. ESD sensitive CCAs and EMs will be handled, prepared and packaged per references (i) and (o). Ensure all CCAs and EMs are packaged for shipment per reference (k).

8.5.5 Miniature/Microminiature Module Test and Repair Piece Parts. The MTR In-Service Engineering Agent (ISEA) creates, manages and assigns 2M and MTR piece part Allowance Parts Lists (APL) that are custom tailored for each ship class and shore facility having 2M and MTR repair capability. These APLs supplement existing equipment APLs that support the repair of electronics to the component level. It is encouraged that a part needed for 2M repair be ordered against the applicable equipment APL when possible (order a part for 2M repair against a 2M and MTR piece part APL only when the part is not listed on the equipment APL).

- a. 2M and MTR piece part APLs:
 - (1) Contains the piece parts needed to support 2M repairs to all electronics covered by MTR test routines and other electronics commonly repaired in the 2M and MTR WC.
 - (2) Lists the piece parts that are supported with an active National Stock Number (NSN) by the Federal Catalog System and parts such as resistors,

relays, diodes, capacitors, transistors and integrated circuit chips are included. Parts without an NSN that have documented or expected high demand will also be provisioned and included in the APL to obtain an NSN to facilitate repairs.

- (3) The piece parts are supply coded as Storeroom Inventory (SRI) and are maintained by the supply department. Every part consumed during a 2M repair must be reordered on a one-for-one basis as the usage is reported and is eligible for demand-based stocking.
- b. Baseline and Augmented strategies are used to determine range and depth of parts support:
 - (1) Baseline items are coded with an Allowance Note Code (ANC) of one "1" to ensure that 100% of the listed piece parts are stocked onboard regardless of the inventory presently on hand or past usage. These piece parts are identified as maintenance critical items using data obtained from the Maintenance and Material Management (3-M) System and the MTRTS. The use of ANC coding ensures that parts critical to the repair of electronics are always available.
 - (2) Augmented items are included on 2M and MTR piece part APLs to ensure that sufficient piece parts are authorized to support increases in 2M and MTR repairs that are associated with the release of new MTR test routines to the fleet and as determined by feedback from the fleet. These parts include at minimum, all piece parts having an active NSN that appear in the latest MTR Test Routines (DVD AKA "Gold Disk" release and are applicable to a ship class and maintenance capability). The allowancing for these piece parts is computed using applicable Fleet Logistics Support Improvement Program (FLSIP) computations.
 - c. The piece parts that are needed for a 2M and MTR repair, but not listed in a 2M and MTR piece part APL, should be reported by submitting a Fleet Coordinated Shipboard Allowance List Feedback Report per reference (o).

8.5.6 Fiber Optic Repair Piece Parts. Piece parts required for fiber optic repairs have formalized APLs for shipboard approved fiber optic repair consumables. These APLs contain unique high usage piece parts such as connectors, termini, epoxy and polishing papers determined from Fleet-wide demand data and TYCOM recommendations. Parts needed for a FO repair not listed in the APLs should be reported by Fleet Coordinated Shipboard Allowance List Feedback Report in accordance with reference (n).

- a. Intermediate-Level Baseline APL. The Intermediate-Level Baseline APL is supply coded Operating Space Item. FO piece parts listed in this APL are required for Intermediate-Level repair items.
- b. Organizational-Level Baseline APL. The Organizational-Level Baseline APL is supply coded Storeroom Item and contains an Allowance Note Code to ensure that 100% of the listed FO piece parts are stocked on board regardless of stocks presently on hand or past usage.

8.6 CVN MINIATURE/MICROMINIATURE GUIDANCE (NAVAL AIR FORCE ONLY).

- a. The mission of the MTRF WC CS54 must be to enhance the parent Aircraft Carrier and Battle Group units' Combat Systems readiness through onboard I-Level electronics repair of CCAs and EMs.
- b. Aircraft Carrier Combat Systems Material Officers will issue amplifying procedures by message for Battle Group units to request MTRF WC assistance.
- c. Each MTRF must provide Commander, Naval Air Force Atlantic (COMNAVAIRLANT) or Commander, Naval Air Force Pacific (COMNAVAIRPAC) a quarterly summary report of MTRF accomplishments, by message or Naval Telegram, due by the 15th day of the month following the end of each quarter. A sample format is provided in Appendix B of this chapter.

8.7 SUBMARINE MINIATURE/MICROMINIATURE GUIDANCE (SUBMARINE FORCE ONLY).

8.7.1 Module Screening and Repair Activity. The Module Screening and Repair Activity (MSRA) has been developed to support various submarine systems. Parts supported by the MSRA Module Support List are managed per reference (o).

- a. MSRAs are located at the Naval Submarine Support Facility New London, CT and Submarine Base Pearl Harbor, HI.
- b. Maintain ATE and special purpose test equipment in support of functional testing and RFI capability.

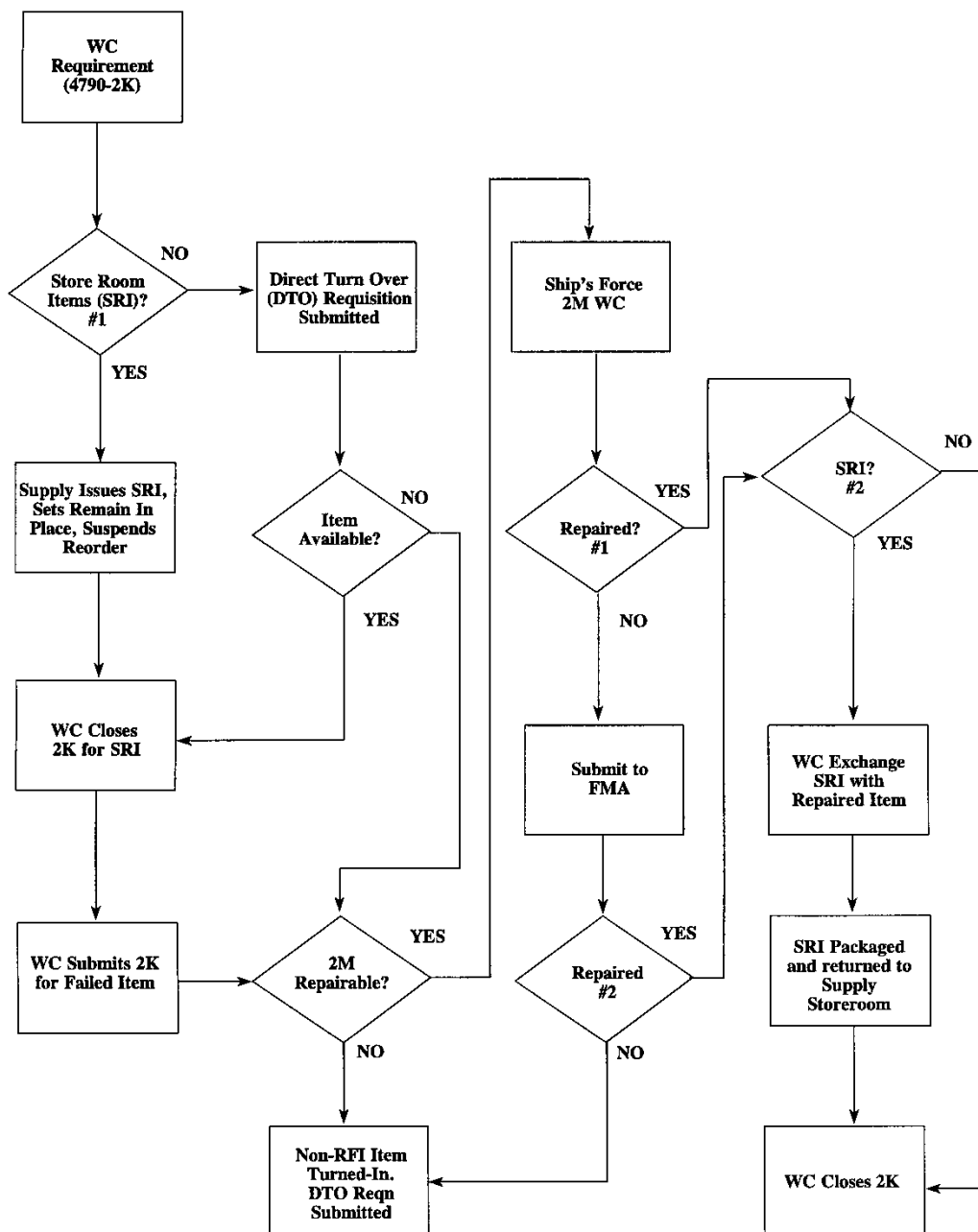
8.7.2 OHIO Class Organizational Repair Capability.

- a. OHIO CLASS SSBNs and SSGNs outfitted with 2M MTR capabilities are to maintain two trained and certified technicians that have completed the AN/USM-674 Operators Training (CIN: A-100-0076) and Miniature Electronic Repair Training (CIN: A-100-0072) for each Blue-Gold crew. Designate one of these technicians from each crew as the 2M MTR Program Coordinator. Responsibilities are cited in paragraph 8.2.4 of this chapter.
- b. Per 2M MTR Certification requirements of reference (g), 2M MTR technicians must complete re-certification requirements every 18 months per reference (g). Site reviews must be conducted every 18 months. Site reviews and personnel re-certifications are conducted by certified 2M MTR Inspectors.
- c. Additional 2M and MTR program management responsibilities are cited in sections 8.2 of this chapter.
- d. Submit Module Test and Repair Tracking System Reports (backup file) to NUWCDET Norfolk after completion of each patrol or crew turnover (2mtrdata@navy.mil).
- e. For submarines that possess the organic electronics repair capability (2M), utilize work center NE02.

8.7.3 Reports. FMAs must utilize the appropriate turn-in repairable tracking system to generate a quarterly Mandatory Turn-in Repairable Summary Package, with option (1) of the MTRF

accomplishments, forwarded to the TYCOM (N42). This summary package is due by the 15th day of the month following the end of each quarter.

APPENDIX A
2M REPAIR PROCESS



APPENDIX B

**SAMPLE 2M AND MTRF QUARTERLY REPORT MESSAGE
(Naval Air Force Only)**

USS (SHIP'S NAME AND HULL NO.)//
TO TYCOM//(COMNAVIAIRLANT OR COMNAVIAIRPAC AS APPROPRIATE)
COMNAVIAIRLANT NORFOLK VA
COMNAVIAIRPAC SAN DIEGO CA
INFO COMUSFLTFORCOM NORFOLK VA
COMPACFLT PEARL HARBOR HI
COMNAVSEASYS COM WASHINGTON DC
PEO CARRIERS WASHINGTON DC
NAVSURFWARCENDIV CRANE IN
NAVUNSEAWARCEN DET FEO NORFOLK VA
BT
UNCLAS
//N04790//
PASS TO OFFICE CODES:
TO COMNAVIAIRFOR SAN DIEGO CA//N41/N43/N435//
COMNAVIAIRLANT NORFOLK VA//N41/N431/N435//
COMNAVIAIRPAC SAN DIEGO CA//N41/N431/N435//
INFO COMUSFLTFORCOM NORFOLK VA//N41/N43//
COMPACFLT PEARL HARBOR HI//N41/N43//
COMNAVSEASYS COM WASHINGTON DC//04//
NAVSURFWARCENDIV CRANE IN//GXST//
NAVUNSEAWARCEN DET FEO NORFOLK VA//2525//
MSGID/GENADMIN/USS (SHIP'S NAME AND HULL NO.)//
SUBJ/(CS54) 2M-MTR-FOTR WORK CENTER PROGRESSIVE REPAIR SUMMARY
REPORT//
REF/A/DOC/CNAL_CNAP/09DEC2013//
AMPN/COMNAVIAIRLANTINST 4790.42A MINIATURE/MICROMINIATURE
ELECTRONICS
REPAIR - MODULE TEST AND REPAIR (2M/MTR) WORK CENTER//
POC//NAME/RANK/DIVO/-/TEL://
RMKS/1. CS54 2M/MTR/FOTR WORKCENTER SUMMARY REPORT: 01MAR19 TO
31MAR19:

	OWN UIC	OTHER UIC	TOTAL
A. REPAIRS SUBMITTED:	(QTY)	(QTY)	(QTY)
B. REPAIRS STARTED:	(QTY)	(QTY)	(QTY)
C. REPAIRS NOT STARTED:	(QTY)	(QTY)	(QTY)
D. REPAIRS IN PROGRESS			
TROUBLESHOOTING:	(QTY)	(QTY)	(QTY)
AWAITING PARTS (AWP):	(QTY)	(QTY)	(QTY)
E. REPAIRS CLOSED/REPAIRED:	(QTY)	(QTY)	(QTY)
F. REPAIRS CLOSED/NOT REPAIRED			

16 Oct 2019

CANCELLED:	(QTY)	(QTY)	(QTY)
REJECTED:	(QTY)	(QTY)	(QTY)
G. CASREPS AVERTED/CORRECTED:	(QTY)	(QTY)	(QTY)
H. TESTED, NO FAULT EVIDENT (NFE):	(QTY)	(QTY)	(QTY)
I. REPAIRS DOCUMENTED IN 3M:	(QTY)	(QTY)	(QTY)
J. TYPE OF 2M REPAIR			
MINIATURE:	(QTY)	(QTY)	(QTY)
MICROMINIATURE:	(QTY)	(QTY)	(QTY)
SURFACE MOUNT TECH (SMT):	(QTY)	(QTY)	(QTY)
K. COST AVOIDANCE SUMMARY:			
TOTAL MODULE COST:	\$(AMOUNT)	\$(AMOUNT)	\$(AMOUNT)
TOTAL PIECE PARTS COST:	\$(AMOUNT)	\$(AMOUNT)	\$(AMOUNT)
TOTAL ESTIMATED SAVINGS:	\$(AMOUNT)	\$(AMOUNT)	\$(AMOUNT)
L. PRIMARY DIAGNOSTIC EQUIPMENT:			
NOMENCLATURE	<u>COMPLETED</u>	<u>CANCELLED</u>	<u>REJECTED</u>
VISUAL INSPECT/NO TMDE RQD	(QTY)	(QTY)	(QTY)
FIBER OPTIC	(QTY)	(QTY)	(QTY)
AN/USM-674PROTRACK	(QTY)	(QTY)	(QTY)
VARIOUS GPETE	(QTY)	(QTY)	(QTY)
MULTIMETER	(QTY)	(QTY)	(QTY)
M. DEPT/DIV SUPPORT:			
N. COMMENTS:			

NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAD UTILIZED.

VOLUME VI**CHAPTER 9****METROLOGY AND CALIBRATION PROGRAM****REFERENCES.**

- (a) OPNAVINST 3960.16 - Navy Test, Measurement and Diagnostic Equipment (TMDE), Automatic Test Systems (ATS), and Metrology and Calibration (METCAL)
- (b) COMNAVAIRFORINST 4790.2 - Naval Aviation Maintenance Program
- (c) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (d) OPNAVINST 4000.57 - Logistic Support of the TRIDENT and POSEIDON Fleet Ballistic Missile (FBM) Systems
- (e) NAVSEAINST 4734.1 - NAVSEA Test, Measurement, and Diagnostic Equipment (TMDE) and Calibration Programs
- (f) NAVSEA ST700-AA-LST-010/NAVAIR 17-35NCA-1 - Navy Calibration Activity (NCA) List
- (g) NAVSEA OD 45845/NAVAIR 17-35MTL-1 - Metrology Requirements List (METRL)
- (h) NAVSEA ST000-AG-IDX-010 - Test, Measurement and Diagnostic Equipment Index (TMDEI) CD-ROM Version
- (i) NAVSEA ST700-AM-GYD-010/METCAL - METCAL Calibration Laboratory Requirements and Certification Guide
- (j) NAVAIR 17-35QAL-15 - Naval Aircraft Carrier and Amphibious Assault Ships Metrology and Calibration (METCAL) Program Manual
- (k) OPNAV 43P6 - MEASURE Users Manual
- (l) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
- (m) NAVSUP Publication 485 - Afloat Supply Procedures
- (n) COMNAVSEASYS COM WASHINGTON DC 03004Z FEB 09 - SISCAL Policy Guidance - Level 2 Calibrations
- (o) NAVSEA S0400-AD-URM-010/TUM - Tag-Out Users Manual
- (p) NAVSEAINST C9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships

9.1 **PURPOSE.** To **issue** policy and assign responsibility for the management of the Navy Test, Measurement and Diagnostic Equipment (TMDE) which includes the associated Metrology and Calibration (METCAL) program, **per** reference (a).

9.1.1 **Scope.** This instruction applies to all Navy commands whose maintenance policy and practices fall under the cognizance of references (b), (c) and (d) and Fleet shore activities such as Fleet Area Control and Surveillance Facilities. Excluded are calibration activities and equipment under the technical cognizance of the Radiation Detection, Indication and Computation program.

9.1.2 **Policy.** The Chief of Naval Operations (CNO), Office of the Chief of Naval Operations (OPNAV) N4, sets policy to ensure all TMDE used for quantitative measurements are maintained and calibrated at the lowest practical level. Specific CNO policy is stated in reference (a).

NOTE: TMDE IS GENERAL PURPOSE ELECTRONIC TEST EQUIPMENT (GPETE), SPECIAL PURPOSE ELECTRONIC TEST EQUIPMENT (SPETE), SUPPORT EQUIPMENT, CALIBRATION STANDARDS AND INSTALLED INSTRUMENTATION THAT SUPPORT HULL, MECHANICAL AND ELECTRICAL (HM&E), WEAPONS SYSTEMS, ETC.

9.2 RESPONSIBILITIES.

9.2.1 Fleet Commanders.

- a. Operationally administer the TMDE and METCAL programs **per** reference (a).
- b. Ensure that TMDE calibration and repair is performed at the lowest level practical using certified laboratories and trained technicians.
- c. Calibrate all TMDE within the capability of the Regional Calibration Centers (RCC), Type Commander (TYCOM) and shipboard calibration activities.
- d. Assign a Fleet Representative to the TAMS Executive Board.
- e. Chair Fleet TMDE - METCAL Working Groups. Commander, Atlantic Fleet chair Test and Monitoring Systems (TAMS) Executive Board Fleet Support Standing Committee.
- f. Establish the Shipboard Instrumentation System Calibration (SISCAL) program **per** reference (e) as required.
- g. Provide funding for calibration and repair of TMDE including calibration standards, except **for**:
 - (1) Naval Air Systems Command (NAVAIR) will fund for fleet aviation TMDE calibration and repair.
 - (2) Strategic Systems Programs (SSP) will fund for TRIDENT TMDE calibration and repair.
- h. Evaluate Regional Maintenance Center (RMC) **and** RCC and coordinate with Naval Sea Systems Command (NAVSEA) for standards to support new capabilities.
- i. Provide funding for audit and certification of Fleet Navy calibration laboratories and Field Calibration Activities (FCA).

9.2.2 Type Commander.

- a. Assign a METCAL Manager to administer TMDE and METCAL program requirements **per** references (a) and (b). Serve as a voting member to the Fleet TMDE - METCAL Working Group.
- b. Review Fleet Forces Allowance Change Requests and forward to the TMDE Allowance Manager. TMDE Allowance Managers are TYCOM for aviation activities, SSP for TRIDENT activities and NAVSEA 04 for all remaining activities.
- c. Redistribute excess TMDE. Aviation activities and TRIDENT activities will follow the guidance of NAVAIR and SSP respectively in redistributing TMDE. The Atlantic and Pacific Fleets will use the Consolidated TMDE Readiness Assessment (CTRA) Program.

- d. Provide properly trained personnel to authorized calibration activities for the repair and calibration of assigned TMDE. Manage assigned calibration standards and calibration laboratories and FCAs **per** reference (a) and the guidance provided by the appropriate Systems Command (SYSCOM). Coordinate with the appropriate SYSCOM during pre-commissioning to verify if Establishment of Field Calibration Activity Request has been submitted and approved **per** reference (a).
- e. Perform Quality Assurance reviews of laboratories and ensure compliance with this instruction and appropriate SYSCOM instructions.
- f. Budget and manage funds to support calibration overflow for calibration support beyond the capability of RMC, RCC, TYCOM and shipboard calibration activities.
- g. Ensure that Regional Loan Pools (RLP) are established in RMC **and** RCC.
- h. Coordinate with NAVSEA 04RM34 for Sub-Category (SCAT) assignments and Ship's Portable Electrical **and** Electronic Test Equipment Requirements List (SPETERL) revisions.
- i. Assist Fleet Commander representatives in managing the Fleet TMDE and METCAL programs.
- j. Assist platforms with their Departure From Specification (DFS) requests and coordinate approval of DFSs that require NAVSEA Technical Warrant Holder (TWH) approvals.

9.2.3 NAVSEA Technical Authority.

- a. The NAVSEA METCAL TWH is the Technical Authority for all equipment **and** systems under the NAVSEA technical cognizance.
- b. Naval Surface Warfare Center (NSWC) Corona Division is the TWH's Engineering Agent (EA) for metrology and calibration. NSWC Corona performs acceptance tests for new equipment for induction into the METCAL program, sets and modifies calibration intervals for non-installed TMDE and publishes metrology-associated documents such as the Naval Calibration Activity List and the Metrology Requirements List (references (f) and (g)) **following** SYSCOM directives. NSWC Corona may be contacted by telephone or message for resolution of urgent technical problems related to calibration standards or Instrument Calibration Procedures.
- c. Naval Surface Warfare Center, Philadelphia Division, (NSWCPD) is the TWH's EA for all shipboard installed instrumentation. NSWCPD determines shipboard instrumentation calibration workload (cal "YES" or "NO") by applying the principles of Reliability-Centered Maintenance, sets and modifies calibration intervals for shipboard instrumentation **and** systems, develops and validates associated calibration procedures and publishes related calibration documentation such as ship-specific Calibration Requirements Lists (CRL), calibration procedures that are **issued** via the Planned Maintenance System (PMS) (Maintenance Requirement Cards (MRC)), and System Calibration Procedures (SCP) **following** NAVSEA directives (see paragraph 9.7 of this chapter). NSWCPD may be contacted by telephone or message for resolution of urgent technical problems related to calibration of shipboard instrumentation, calibration PMS or SCPs.

- d. Naval Air Warfare Center, China Lake is the TWH EA for TMDE, prepares specifications for new TMDE and makes technical recommendations to the TMDE Program Manager on what instruments are listed in the TMDE Index. Seal Beach Detachment may be contacted by telephone or message for resolution of urgent technical problems related to all Navy TMDE.

9.2.4 Immediate Superior In Command.

- a. Monitor calibration readiness status within their respective organizations, especially ships in a pre-deployment status. Forward requests for assistance to the TYCOM METCAL Manager.
- b. Monitor the effectiveness of Shipboard Gage Calibration Program (SGCP) FCAs.
- c. Ensure that ships with FCAs extend their service to other ships in company, as appropriate, to reduce cost and turn-around time of calibration.
- d. Ensure that each ship with an FCA has all the necessary standards, documentation and trained personnel to maintain current certification.
- e. Coordinate resolution of calibration problems found by the TYCOM designated support activity for assigned ships.
- f. (Submarine Force only) Ensure each activity actively supports the TYCOM Calibration Program of Record by maintaining at least 95% accomplishment rate for all TMDE in its inventory. The TYCOM Calibration Program of Record readiness reports will be used to monitor the accomplishment rates.
- g. (Submarine Force only) Support and participate in the TYCOM's CTRA process. Ensure corrective actions resulting from the conduct of a CTRA are completed for activities under the Immediate Superior In Command's (ISIC) cognizance.

9.2.5 Commanding Officers All Forces.

- a. **The Commanding Officer has the overall responsibility for METROLOGY and the Calibration Program under their cognizance and will maintain a high degree of calibration readiness. Calibration Readiness Goal for all forces is 85%.**
- b. Appoint in writing, a calibration coordinator **and** test equipment manager responsible for all matters related to the calibration of ship's TMDE. Separate coordinators may be appointed for electronic and mechanical equipment.

9.2.6 Commanding Officers Naval Air Force. Naval Air Force activities **must** also follow the detailed procedures outlined in reference (j) for TMDE management and for operation of the consolidated FCA.

9.2.7 Regional Maintenance Center Metrology and Calibration Coordinators.

- a. Coordinate and schedule off-ship calibration or repair services for ships within their geographic area of responsibility. Specific lack of capability is the only justification for off-ship calibration.
- b. Maintain close liaison with the RMC **and** RCC shipboard calibration coordinators, ISIC **and** TYCOM to prevent or resolve calibration scheduling and readiness problems.

- c. Review ship's calibration work requests to ensure that TMDE within the calibration capability of the ship's FCA are not sent to a higher-level calibration laboratory.
- d. Contact all deploying ships that have not delivered a pre-deployment calibration work package at least 45 days before deployment to determine ship's requirements.
- e. Notify TYCOM METCAL Managers, as applicable, of all changes in RMC or RCC calibration capability.
- f. Assist RMC or RCC calibration laboratories in obtaining calibration or repair services for laboratory standards.
- g. Identify TMDE calibration requirements beyond the technical capability of the RMC or RCC. Coordinate with TYCOM METCAL Managers for scheduling of TMDE overflowed to an approved calibration laboratory.

9.2.8 Regional Maintenance Center and Regional Calibration Center.

- a. Calibrate and repair TMDE including calibration standards assigned by the RMC METCAL Coordinators. Document all calibration actions using the METBENCH Calibration Management System (MCMS), Metrology Automated System for Uniform Recall and Reporting (MEASURE) or the TYCOM directed data collection method.
- b. Ensure that electronic TMDE submitted by the Fleet is standard test equipment listed in reference (h). Contact the submitting activity and the TYCOM METCAL Manager when non-standard TMDE is submitted for calibration. Non-standard TMDE will not be calibrated or repaired unless approved by the TYCOM.
- c. Ensure all laboratory standards are properly calibrated at the lowest appropriate level. Notify the TYCOM METCAL Manager of any lost or reduced laboratory capability.
- d. Ensure all TMDE repaired by the RMC or RCC are completely recalibrated before being returned to service. Calibration of a repaired instrument will serve as Quality Assurance of an accomplished repair.
- e. Prepare and submit Calibration Problem Reports to NSWC Corona for assistance or guidance concerning calibration problems encountered during operation of the calibration laboratory.
- f. Refer to Section 9.5 of this chapter for replacing malfunctioning calibration standards certified by a repair facility to be Beyond Economical Repair (BER), (i.e., having a repair cost in excess of 50% of the replacement cost).

9.3 CALIBRATION MANAGEMENT.

9.3.1 Shipboard Gage Calibration Program Field Calibration Activity. The SGCP provides onboard calibration capability for TMDE in the measurement areas of high and low temperature, pressure, vacuum, and torque (selected ship classes only).

- a. Maintain SGCP certification per the requirements of reference (i).
- b. Ship's Force is responsible for the calibration of all instrumentation within their SGCP FCA capability. Certified FCA technicians are the only authorized personnel to accomplish calibration using SGCP calibration standards (not applicable to CVN,

- LHA or LHD). SGCP calibration standards allowance quantities are listed in the SPETERL per reference (i).
- c. Use the TYCOMs' approved formal recall system (e.g. MCMS, MEASURE, SKED) for scheduling, planning, monitoring and reporting the ship's calibration status. The SGCP Calibration Coordinator or SGCP technicians are responsible for adding the calibration data into the TYCOM directed recall program. Submarine activities using the PMS program of record (SKED) to schedule, track, document and report accomplishment of "O" level calibrations will employ the PMS rules for establishing the accomplishment periodicity. Ideally, the accomplishment of the test instrument's calibration will be performed on the day initially scheduled in SKED. This date should match the due date located on the test instrument's calibration sticker. The test instrument will not be considered out of calibration until it exceeds PMS periodicity.
 - d. Ensure all calibration is conducted at the lowest level of calibration feasible. Accomplishment of calibrations beyond SF capabilities should be coordinated with the TYCOM, Regional Calibration Facility and/or RMC Calibration Coordinator.
 - e. All components being calibrated using a SGCP calibration standard (i.e. PPC, 3604, 3605, etc.) must have a NAVY METCAL calibration sticker affixed. SGCP technicians are responsible for placing the appropriate METCAL label on the installed instruments.
 - f. The SGCP Calibration Coordinator is responsible for ensuring that the CRL data is aligned with ship's configuration and ensuring that instrumentation identified in the TYCOM calibration recall inventory matches CRL data: system, nomenclature, periodicity, etc. The CRL should be validated annually. Recommended changes (e.g. adds, deletes etc.) must be forwarded to the EA via MCMS, TMDER or a PMS TFBR to correct the hull specific CRL
 - g. Ensure the CRL is used as a technical authority guidance to determine calibration requirements for all installed instruments. The calibration requirement determines whether an installed instrument is either critical or non-critical. Critical instruments are defined as instrumentation that monitors a parameter which is required to be within a specified operating range, or limits, to minimize hazards to human safety or failure of a mission essential equipment or system. These instruments are calibrated at a specific frequency (e.g., 12, 18, 24 or 36 months etc.). All other instruments are classified as non-critical, No Calibration Required (NCR).
 - h. Non-critical instrumentation will have an NCR METCAL label attached. When a NCR instrument's reliability is suspect, it will be sight compared with a critical instrument or a SGCP standard. When a NCR instrument is repaired or replaced, it will be installed and sight compared with a critical instrument or SGCP standard. If a primary instrument is out of commission, a NCR instrument which is secondary to the primary instrument out of commission may be calibrated to facilitate the validation of system parameters when approval by higher authority has been granted to deviate from the original test procedure.

- i. Individual measurement chain components that are designated as NCR in the CRL such as remote temperature detectors, thermocouples, magnetic pickups, etc., do not require comparison prior to being installed in a system.
- j. System calibrations (e.g. a transducer and associated panel meter) in the same measurement chain being calibrated simultaneously) accomplished by ship's force will utilize a "Special Calibration" (black lettering, yellow background) label annotated to reflect system calibration and the components tested. The Special Calibration sticker is to be located on the "readout component". When the "readout component" is a flat panel display, PLC interface display, laptop or similar display method, apply the label to the instrument vice the "readout component". In cases where a component such as a transducer provides input to an alarm or shutdown function but no indication or parameter measurement (i.e., air compressor high pressure shutdown); apply the calibration sticker to the transducer. This requirement is not applicable to Level 2 system calibrations performed by SISCAL teams. SICAL teams use "System Calibrated" labels (black lettering, orange background) to indicate that the measurement chain (e.g. sensor, signal conditioner and display) is within the applicable tolerance on all parameters and there are no qualifying conditions for use.
- k. Maintain liaison with the RMC METCAL Coordinator to ensure TMDE scheduled for off-ship calibration is delivered and returned according to the agreed upon schedule.
- l. Use the RLP for maintenance requirements while the ship's test equipment is being calibrated or as indicated in the SPETERL (borrow from Regional Loan Pool).
- m. Ensure all TMDE has a current calibration sticker, reference (i).
- n. Maintain TMDE allowances in the SPETERL. Advise the TYCOM METCAL Manager and contact the CTRA center to fill deficiencies prior to submitting requisitions for replacement test equipment through the supply system. o. Use only standard test equipment listed in reference (h). Inform the TYCOM METCAL Manager of system maintenance requirements that are not supported by standard test equipment. SPETE that is approved per reference (e) is authorized for designated systems only. SPETE will not be used as general-purpose test equipment.
- p. Ensure TMDE is submitted for calibration prior to the calibration due date, with all accessories, power cords and technical manuals required to complete calibration.
- q. Submit pre-deployment calibration requirements to the RMC METCAL Coordinator at least 60 days prior to deployment. Conduct an inventory of all SPETE to confirm material condition and calibration due dates.
- r. (Submarine Forces Only) Interval changes affecting test instruments that are calibrated at the Organizational Level (Ship's Force/Calibration Activity 1) must be implemented upon notification from higher authority. Notification includes but is not limited to Technical Feedback Responses (TFBR), PMS Force Revisions, etc. Documenting the interval change includes updating the TYCOM directed recall program, if not accomplished automatically, as well as re-stickering the instruments affected with the new calibration due date. Ship's Force is not authorized to re-sticker test instruments calibrated at the Intermediate or Depot level (Calibration Activity 3).

9.3.2 Calibration Accounting. TMDE calibration actions are recorded in the TYCOM directed Calibration Recall Program. Surface force ships use one of the three different programs: MEASURE (LHA and LHD), MCMS, or the TYCOM Calibration Recall Program (TCR).

- a. Measure implementation and operation guidance, reference (k).
- b. MCMS supports surface force ships and provides shipboard personnel with the capability to update inventory files using LAN access. MCMS also provides the capability to generate reports and upload data to the master server through distance support. Readiness information and inventory status is readily available to Ship's Force and TYCOM METCAL Managers.
- c. TCR program (Excel file) is used on those ships that do not yet have MCMS installed. The file provides inventory information to track calibration status.

9.3.3 Shipboard Calibration Recall Inventories for MEASURE, TCR, and MCMS.

- a. MEASURE and TCR.
 - (1) "S" inventory: All installed instrumentation identified in the CRL and mechanical TMDE that is not SCAT coded (i.e., torque wrenches, micrometers, etc.).
 - (2) "E" inventory: All portable test equipment including electronic and mechanical SCAT coded test equipment that appears in the SPETERL.
- b. MCMS.
 - (1) "S" inventory: All installed instrumentation identified as CAL=Y in the CRL. (All installed instruments i.e., both Cal = Y or N are in the "CRL" tab.)
 - (2) "E" inventory: All portable test equipment including electronic and mechanical SCAT coded test equipment that appears in the SPETERL
 - (3) "P" inventory: All mechanical TMDE that is not SCAT coded (i.e., torque wrenches, micrometers, etc.).

9.4 REGIONAL LOAN POOLS. RLPs are established at the RMC or RCC to alleviate shipboard maintenance support shortfalls caused by a lack of shipboard GPETE due to calibration or repair requirements.

- a. RLPs include a wide variety of calibrated, Ready For Issue items stocked in sufficient quantity to ensure continuous availability.
- b. GPETE from the RLPs may be checked out for a specific purpose (i.e., repair of the AN/SPS-73 Radar, PMS of the AN/WSC-3, etc.) or to satisfy a temporary requirement for special purpose items not normally included in the ship's allowance. Pool items are intended as short-term substitutes for unavailable shipboard items. Pool items may be checked out for ten working days; however, the RMC METCAL Coordinator may authorize an extension of the ten-day limit on a case basis.
- c. All GPETE returned to the RLP must be inspected by representatives of the lending RMC or RCC and the borrowing command. The original inventory receipt is checked to see if the GPETE has been damaged or is missing accessories provided at the time of the loan. GPETE lost, damaged beyond repair or destroyed must be surveyed by

the borrowing command using procedures established in reference (m). A copy of the completed survey report **must** be forwarded to the appropriate TYCOM METCAL Manager.

9.5 REPLACEMENT OF GENERAL PURPOSE ELECTRONIC TEST EQUIPMENT OR CALIBRATION STANDARDS.

9.5.1 Depot Level Repairables. GPETE **or** Calibration Standards (CAL STD) (7Z Cog), certified by a RMC **or** RCC or a higher-level activity as BER will be turned into the Naval Supply System. (Note: NAVAIR CAL STDs will not fall under these instructions.) For BER NAVAIR CALSTDs, RMC **or** RCC and Customer activities are required to contact TYCOM METCAL manager.

- a. The RMC **or** RCC certifying the GPETE **or** CAL STD as BER may turn the defective unit in to the Navy Supply System for the customer activity, provided the customer has given the RMC **or** RCC a requisition number under which a replacement will be ordered. If the RMC **or** RCC turns the defective GPETE **or** CAL STD in to the Naval Supply System, all turn-in data must be given to the customer to assist in any future carcass tracking follow-up investigations by the Naval Supply System.
- b. The customer activity may accept return of the defective GPETE **or** CAL STD from the RMC **or** RCC and initiate turn-in and replacement procedures through the normal Navy Supply System process.
- c. Depot Level Repairable GPETE **or** CAL STD will not be processed for survey by a RMC **or** RCC.

9.5.2 Navy Stock Funded. GPETE (1H or 9N Cog), certified by an RMC **or** RCC or a higher-level authority as BER will be processed for survey.

- a. The RMC **or** RCC certifying the GPETE **or** CAL STD that is BER must notify the customer of a requirement to survey the defective GPETE **or** CAL STD. The customer is responsible for initiating a survey action and requisitioning a replacement item through normal Operating Target funded supply channels.
- b. The RMC **or** RCC certifying the GPETE **or** CAL STD as BER may retain the carcass for cannibalization of repair parts provided the customer has acknowledged that the survey process has been initiated and has provided a copy of the survey document to the RMC **or** RCC.

9.6 TEST MEASUREMENT DIAGNOSTIC EQUIPMENT MANAGEMENT.

9.6.1 Ship's Portable Electronic Test Equipment Requirements List. The SPETERL is the allowance document for all GPETE, SPETE and FCA calibration standards. Test equipment and FCA calibration standards allowance requirements (quantity and type) are computed on an individual ship's entire configuration of installed electrical and electronic equipment, with due consideration for function, quantity, usage and location of prime equipment. The Allowance Change Request form, NAVSUP 1220-2, is used to request an increase or decrease in the SPETERL allowance.

9.6.2 Test Measurement Diagnostic Equipment Index. Reference (h) is the primary source for determining test equipment uses and requirements. Consult reference (h) to determine the

preferred model of test equipment needed to fill a specific deficiency. Test equipment deficiencies fall into two categories, initial outfitting and replacement.

9.6.3 Sub-Category Code. Defines a family of test and measurements parameters. Test equipment within the SCAT code is prioritized **per** reference (m), with the lowest priority number assigned to the TMDE currently being procured to fill outstanding deficiencies. SCAT codes are the basis for identifying TMDE on MRCs.

9.6.4 Ship's Configuration and Logistics Support Information System Index. The primary test equipment inventory document for ships. The Ship's Configuration and Logistics Support Information System (SCLSIS) Index must be kept current by the submission of completed OPNAV 4790/CK forms.

9.6.5 Consolidated Test, Measurement and Diagnostic Equipment Readiness Assessment.

9.6.5.1 Consolidated Test, Measurement and Diagnostic Equipment Readiness Assessment Program. The CTRA Program is a joint fleet program that improves fleet and shore command non-Aviation TMDE readiness. The CTRA Program also includes the receipt, staging and redistribution of Fleet excess electronic test equipment, mechanical test equipment and calibration standards used to replace equipment that is missing or BER.

9.6.5.2 Type Commander Metrology and Calibration Program Managers. TYCOM METCAL Program Managers are responsible for the following:

- a. Scheduling a CTRA during ship Fleet Readiness Training Plan or Integrated Logistics Overhaul and every 18 to 24 months for shore commands.
- b. Budget for the CTRA program as necessary.
- c. Develop and **issue** CTRA schedule as required.
- d. Maintain excess test equipment and calibration standards at CTRA staging area for redistribution to fleet activities.

9.6.5.2.1 Consolidated Test, Measurement and Diagnostic Equipment Readiness Assessment Review Process.

- a. Brief ship's department heads, division officers and technicians.
- b. Conduct training for TMDE management and the calibration recall software.
- c. Review SPETERL and electronic (E) TMDE inventory with the ship's Combat Systems Test Equipment manager. Review will include: Configuration verification of prime systems and Fleet Supplemental Test Equipment Requirements, verification of shipboard TMDE inventory and revisions to the TYCOM approved calibration recall system inventory, prime system and test equipment updates to Navy configuration database (if during Integrated Logistics Overhaul availability), identification of SPETERL allowance changes based on actual configuration, listing of inoperable items and coordination of repair of items that fill deficiencies, removal of excess equipment from the ship and filling of deficient equipment from CTRA staging assets. Deficient initial outfitting items will be coordinated through NAVSEA.
- d. Review Mechanical "S" inventory with the SGCP Coordinator using the CRL to determine calibration requirements (TCR and MEASURE ships only). Mechanical

test equipment will be listed on this mechanical inventory. Use the CRL to validate the recall inventory (TCR and MEASURE ships only).

- e. (Submarine Force only) Prior to the completion of a CTRA, coordinate the delivery of identified excess test equipment to the designated CTRA facility.
- f. Provide the results of the assessment to the ship.

9.6.5.2.2 Consolidated TMDE Readiness Assessment Test, Measurement and Diagnostic Equipment Redistribution. The CTRA Center manages the redistribution of Fleet TMDE to fill allowance deficiencies or replace equipment that is missing or BER. Excess TMDE and decommissioned ships' assets are received and made available for redistribution to FLEET activities. Fleet activities are required to forward all excess TMDE to the CTRA Center and to utilize the CTRA Center for the initial requests to fill replacement or deficient SCAT coded TMDE.

9.6.5.2.3 Completion and Corrective Action Reporting (Submarines only). Executive Director, Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity issue a CTRA Completion Report, via the parent ISIC with TYCOM on copy, outlining corrective actions to be taken by the assessed command as a result of the CTRA. The assessed command will issue a corrective action letter within 90 days of receipt of the CTRA Completion Report, via the parent ISIC with TYCOM on copy, to Executive Director, SUBMEPP Activity.

9.7 SHIPBOARD INSTRUMENTATION AND SYSTEM CALIBRATION. The SISCAL Program, which includes SGCP, is responsible for the calibration and maintenance support for installed instrumentation and machinery control system calibration requirements per reference (e). Installed instrumentation calibration support parameters are documented in the ship specific CRL:

- a. Calibration Activity. Defines responsibility for calibration of shipboard installed instrumentation for the following three calibration activities.
 - (1) Calibration Activity 1 (Level 1). Shipboard FCA is responsible for calibrating stand-alone instrumentation (i.e., gages, thermometers and switches). Instruments are typically calibrated onboard (in place **or** onsite) by the certified SGCP technicians using PMS MIP 9802 calibration procedures per the hull specific CRL. On submarines, shipboard FCA also perform transducer calibrations (system calibration) using H coded calibration cards in the PMS deck.
 - (2) Calibration Activity 2 (Level 2). (Applicable to Surface Force ships, aircraft carriers and Landing Craft Air Cushion (LCAC)) SISCAL teams perform calibration support for machinery control system components (i.e., pressure transducers, temperature transducers, signal conditioners, display devices, meters, etc.). Except during yard **or** industrial periods when testing is mandated, these components are not calibrated as individual items. Instead, the entire measurement chain is calibrated as a single entity using Navy approved calibration standards and SCPs. Only SISCAL teams are authorized to use SCPs. Level 2 calibrations are performed onboard (in place **or** onsite) by SISCAL teams certified by the SISCAL EA, SSES 953. These teams are:

- (a) Surface Ships and aircraft carriers - NSWCPD, NAVSHIPYD and IMF Pearl Harbor and NAVSHIPREPFAC Japan. These teams will be augmented by RMC I-Level Production.
 - (b) Landing Craft Air Cushion (LCAC) - certified SISCAL teams at Assault Craft Units.
- (3) Calibration Activity 3 (Level 3). RCC calibrates those instruments which require the use of unique calibration standards or facilities.
- b. SISCAL Team Scheduling. (Not applicable to Sub platforms) SISCAL scheduling begins approximately six months before expiration date and is coordinated between the Port Engineer, CVN Maintenance Manager **or** SHIPSUP and the SISCAL scheduler. The SISCAL team workload is the Calibration Activity 2 instruments listed in the ship's CRL and is accomplished only by the NAVSEA authorized calibration agents listed in **sub-paragraph a**. SISCAL visits are scheduled for both triennial SISCALs and subsequent return visits (call-back). If a ship is in an industrial environment, then reference (n) applies until SISCAL effort can commence within the six months postindustrial availability period.
- c. SISCAL Dashboard. A bi-weekly document issued by the SISCAL EA via e-mail to all SISCAL stakeholders provides the following:
 - (1) Triennial SISCAL visit scheduled on or before the calibration due date.
 - (2) SISCAL Report. A SISCAL report is provided to the ship after the triennial SISCAL visit. The report identifies the results of the calibration effort and includes a listing of all instruments that were not calibrated during the visit. Instruments that were not calibrated are listed under the following categories:
 - (a) Rejected (broken or out of tolerance).
 - (b) Previously rejected (PRE_REJ), left over from last SISCAL.
 - (c) Not Installed (NI), instrument missing.
 - (d) Not Done Due to Ship Operations (NDSO).
 - (e) Not Done at Ship's Request (NDSR).
 - (f) Not Done Due to Shipyard (NDSY).
 - (g) Could Not Be Isolated (CNI).
 - (h) Equipment Out Of Commission (OOC).
 - (i) Not On Site Capable (NOSC), No Procedure (NOPRO) or No Calibration Standard (NS). NSWCPD will coordinate with NAVSEA Program Offices to resolve.
 - (3) Call-back SISCAL visit. Listed as either a SISCAL call-back or SISCAL II. SISCAL II is used when more than 100 instruments require calibration. Visit is requested by ship, SHIPSUP or Port Engineer **or** CVN Maintenance Manager via OPNAV 4790/2K or AWR. Call-back requests citing multiple instruments are preferred to maximize SISCAL manpower availability and

minimize cost. Non-specific requests (e.g., calibrate various instruments) should be avoided since the task breadth (quantity of instruments) and scope (type of instruments) cannot be readily determined. The 2K also identifies the deferred maintenance for the instrumentation in the Current Ships Maintenance Project (CSMP).

- d. Departure From Specification (DFS). DFS messages are requests for temporary departures and are submitted **per** Volume V, Part I, Chapter 8 of this manual.
- (1) A DFS for deferring SISCAL could be submitted for the following reasons:
- (a) Extending the periodicity of the ship's SISCAL requirement. TYCOM approves DFS up to six months. DFS in excess of six months requires NAVSEA 04RM concurrence.
 - (b) Extending the periodicity for individual Level 2 and 3 instruments with expired calibration due dates or replaced while away from homeport **or** calibration facility.
 - (c) Level 2 instruments that were not calibrated during SISCAL due to lack of a calibration procedure or calibration standard.
 - (d) Other shipboard SISCAL DFS requests will be evaluated on a case-by-case basis.
- (2) DFS requests will not be approved for the following:
- (a) Instrumentation within the calibration capability of the SGCP FCA.
 - (b) Instrumentation not calibrated during a SISCAL visit due to an out of commission or rejected status.
- e. Shipboard Level 1 calibration workload beyond shipboard FCA capability or capacity must be submitted to their respective TYCOM or RMC calibration coordinator for scheduling and accomplishment. When contracted out to a Commercial Calibration Activity (CCA) or Commercial Service Provider (CSP) or an Original Equipment Manufacturer (OEM), the CCA, CSP **or** OEM calibrating such instruments must meet the NAVSEA METCAL TWH guidance for certification, accreditation, traceability and Test Accuracy Ratio, Test Uncertainty Ratio **or** Probability of False Accept. Commercial activities must provide the results of all calibrations performed by them and must use periodicities listed in the CRL for installed instruments. Commercial activities must also provide calibration event data to Ship's Force and TYCOM in a Microsoft Excel format for easy entry into the TYCOM Calibration Recall Program. Entries in the calibration events file **must** not be abbreviated. For existing, permanently installed instruments, the calibration events file data set **must** include the nomenclature, CRL reference number, condition received (i.e., In Tolerance (IT) or Out of Tolerance (OOT)), date calibrated, date due, procedure used, calibration standard used, servicing lab code and service label applied (i.e., calibrated, special calibration, rejected, etc., **per** reference (i)).

9.7.1 Calibration Requirements List. The CRL is the technical authority document for installed calibration requirements and includes data pertinent to each instrument (e.g., nomenclature, system, periodicity, calibration activity, etc.).

- a. The CRL is the specific primary technical authority guidance for shipboard installed instrumentation. CRLs are uploaded and maintained in the MCMS. For those ships that do not have MCMS, a CD-ROM will be distributed.
- b. CRL Validation. Ship's Force, TYCOM, or both, validate the CRL to identify any gaps or required modifications for their platform's unique configuration. Submit TMDERs for CVNs, Technical Feedback Reports for submarines and MCMS feedback for surface ships for conflicts in nomenclature, function, range, location or calibration requirement. SISCAL teams are responsible for validating Level 2 instruments on surface ships and LCACs, LHA, LHDs and CVNs.
 - (1) (Surface and CVNs) An editable TMDER (NAVSEA form 4106/1) can be downloaded from Navy Forms Online web site at <https://navalforms.documentservices.dla.mil/web/public/forms> and submitted hardcopy or completed online from the Navy 311 web site at <http://www.public.navy.mil/spawar/navy311/Pages/Links.html#EquipmentTechnical> under the Equipment/Maintenance section.
 - (2) (Submarine) TFBs are submitted via normal PMS process outline in Chapter 19 section 19.2.4.3.
- c. For Calibration Recall and Inventory Systems other than MCMS, Ship's Force should match CRL data to the METCAL Automated Information System or Calibration Recall and Inventory System inventory and submit changes to the MEASURE Operational Control Center if the CRL and METCAL Automated Information System do not have matching data elements. Refer to the CRL CD-ROM Users Guide.
- d. The CRL is the technical authority document for all shipboard instrumentation calibration requirements. To preclude continuous and duplicative review of TMDERs, inspecting activities are to coordinate directly with NAVSEA METCAL TWH, regarding any instrument believed to be critical but indicates No Calibration Required in the CRL. **Ship's Force must not calibrate these instruments unless specifically approved by NAVSEA METCAL TWH.**
- e. Broken or inoperative Level 2 installed instruments identified as CAL=Y in the CRL that are replaced during deployment must be calibrated prior to use. Broken or inoperative Level 2 instruments replaced during deployment must be calibrated as stand-alone instruments if they cannot be system calibrated prior to use. If unable to calibrate due to lack of Calibration Standard, qualified personnel or calibration procedure, submit a DFS per paragraph 9.7d. of this chapter and use an "Out-of-Cal" label per reference (o). Extreme care should be exercised when using "Out-of-Cal" instruments.

9.7.2 Calibration Interval. Since calibration intervals are identified in different technical documents, use the following order of precedence for determining and assigning the proper calibration interval:

- a. Reactor Plant Manual.
- b. PMS documentation.
- c. CRL.
- d. Reference (g) of this chapter. Unless superseded by PMS, the generic calibration intervals for all other instruments found in Section 2 of reference (g) will be used.
- e. System or equipment technical manuals.

9.7.2.1 Switch Settings. Switch settings **must** be **following** the applicable values listed in the CRL-MCMS for surface ships, Air Capable Ships and PMS system MRCs for submarines. If there is “To Be Determined” or no value listed, consult the applicable equipment technical manual and submit TMDER, Technical Feedback Report or MCMS feedback to get the documentation updated. Provide CRL Reference Number, setting used and the reference document used to derive the setting.

9.7.3 Markings for Test, Measurement and Diagnostic Equipment.

- a. Installed Instrumentation. All instrumentation will have easily read serial numbers and be clearly labeled with current calibration labels per NAVAIR 17-35-TR8 except the Level 1 instruments that are calibrated by CCAs, CSPs or OEMs meeting the requirements of 9.7e. of this chapter will be affixed with their own labels showing their unique identifiers instead of the Navy METCAL labels. If the instrument does not have a serial number inscribed by the manufacturer, Ship’s Force must inscribe a ship-generated serial number in a clearly visible location. Attached tags are acceptable for instruments without space for inscribing a serial number. Serial number should include Hull Number plus CRL reference number (i.e., DDG5100025).
- b. Serial Numbers for TMDE other than Installed Instrumentation. All TMDE will have easily read serial numbers and be clearly labeled with current calibration labels per NAVAIR 17-35-TR8 except TMDE that is calibrated by CCAs, CSPs or OEMs meeting the requirements of 9.7e. of this chapter will be affixed with their own labels showing their unique identifiers instead of the Navy METCAL labels. If the TMDE item does not have a serial number inscribed by the manufacturer, Ship’s Force must inscribe a ship-generated serial number in a clearly visible location. Attached tags are acceptable for TMDE without space for inscribing a serial number. Serial number should include Hull Number, plus Work Center, plus four-digit sequential number starting with 0001 (i.e., DDG51OE010001). The new serial number should be annotated in the TYCOM Calibration Program, either by the SGCP FCA for mechanical instrumentation or the Test Equipment Petty Officer for electronic test equipment.
- c. The “Out-of-Cal” label listed in reference (o) is not a METCAL label but rather an operational label used to make watch standers aware of abnormalities that require additional attention. Please refer to reference (o) for proper use of the label. Extreme care should be exercised when using “Out-of-Cal” instruments.

9.7.4 SISCAL System Level Calibration Guidance for Ship Conversion Navy Platforms and Platforms in CNO or other Maintenance Availabilities.

- a. The purpose of this section is to address the calibration of shipboard installed instrumentation requiring system calibration (Level 2) for new construction ships, ships in availability **or** overhaul and ships in their Fleet Response Training Plan (FRTTP). This section does not apply to systems **or** instruments that are calibrated using the reactor plant manual guidance.
- b. For Ship Conversion Navy (SCN) platforms, the CRL is **issued** within 90 days of delivery and a baseline SISCAL team visit should occur as soon as practicable but must be completed within six months of Post Shake-Down Availability or availability completion. Prior to system **or** equipment acceptance testing and turnover to the Navy, the SCN program managers **must** ensure that all installed instrumentation requiring Level 2 calibration has been verified **or** tested by the shipyard **or** repair activity to ensure that they meet manufacturer's performance specification.
- c. For COMNAVSURFOR and COMNAVAIRFOR FRTTP platforms, no changes have been made to the current Level 2 calibration requirements for ships in their FRTTP cycle. Ships **must** submit a work request via 2-kilo or AWR as needed to maintain current periodicity requirements.
- d. Any work package authorizing modernization (i.e., accomplishment of a Ship Change Document outside of a scheduled availability), **must** include a requirement for calibration of Level 1 components as stand-alone individual items before turnover to the Navy and is the responsibility of the sponsor of the specific modernization item. These components **must** have valid calibration labels per NAVAIR 17-35-TR8 or calibration labels from CCA, CSP **or** OEM that meet NAVSEA METCAL TWH requirements. In addition, work packages that modify or install either complete or partial "measurement **or** signal chains" consisting of individual components (e.g., sensors, signal conditioners, displays) **must** also include a requirement for a Level 2 (system-level) calibration by a NSWCPD certified SISCAL team after completion of system acceptance testing by the Navy. All installed instrumentation requiring Level 2 calibration should be verified **or** tested by the shipyard **or** repair activity to ensure that they meet manufacturer's performance specification. The Level 2 calibration must be completed at the end of the maintenance availability. Should this requirement not be identified in existing planned and budgeted modernization efforts, it should be handled individually with sponsor. Work packages which only replace individual measurement chain components that are designated as NCR in the CRL such as Remote Temperature Detectors, thermocouples, magnetic pickups, etc., would not require Level 2 system calibration.
- e. To mitigate warranty and contractual issues on ships in industrial availabilities (i.e., maintenance availabilities or SCN overhauls), the NAVSEA Metrology and Calibration TWH has authorized a six month temporary DFS for system calibration of systems designated as Level 2 per the ship's CRL. To facilitate equipment testing and acceptance by the Navy during the industrial period, the following actions should be taken:
 - (1) Systems requiring system level calibration which are not affected by the availability or overhaul **must** be calibrated prior to start of the availability **or**

- overhaul to ensure that such systems are not in overdue status upon completion of the yard period.
- (2) Systems or equipment that are added or modified with either complete or partial “measurement **or** signal chains” consisting of individual components (e.g., sensors, signal conditioners, displays) **must** include a requirement for the components to be verified **or** tested by shipyard **or** repair activity to ensure that they meet manufacturer’s performance specification before system **or** equipment acceptance testing and turnover to the Navy. Note that while the TWH has authorized a DFS for system level calibration during the industrial period, the DFS must be approved by the TYCOM **per** Volume V, Part I, Chapter 8 of this manual.
 - (3) Validity of all calibration labels **must** be verified during start-up maintenance.
 - (4) The Level 2 system calibrations must be scheduled and completed at the end of the maintenance availability.
- f. It should be recognized that individually calibrated components, which are part of a measurement chain requiring system calibration, may not adequately represent the measurement accuracy normally provided by the system calibration process. Therefore, care should be exercised when using systems under temporary departure from system level calibration requirements.
- g. Inspection teams, assessment organizations and training groups **must** not require ships coming out of an availability, overhaul or new construction to have Level 2 calibrations completed prior to the ship’s first post maintenance period SISCAL visit unless the 6-month period has passed.

9.8 LHA AND LHD CLASS SHIP METROLOGY AND CALIBRATION PROGRAM.

9.8.1 Purpose. To establish the consolidated METCAL program for LHA and LHD class ships. This guidance implements policy and responsibility for the management of TMDE onboard these ship classes. The CNO METCAL policy is **published** in reference (a).

9.8.2 Background. LHA and LHD class ships have formerly operated three distinct calibration programs: AIMD FCA for aviation Support Equipment; Combat Systems Electronic FCA supporting GPETE and SPETE for the ship’s non-aviation electronic **or** electrical and weapons systems; and the Engineering SGCP for installed instrumentation associated with HM&E systems. This guidance establishes and describes a consolidation of the three programs into a single program for shipboard calibration support. For the purpose of this section, TMDE are considered to be all shipboard GPETE, SPETE, Support Equipment, calibration standards and the installed instrumentation that support HM&E systems.

9.8.3 Discussion. The forces afloat METCAL program for LHA and LHD class ships is intended to improve force readiness and self-sustainability through the consolidation of the three existing, separate calibration programs laboratories into a single management entity under the management of the AIMD Officer. This guidance preserves the positive aspects of all previous calibration programs and results in a more efficient use of personnel, a conservation of physical space and a reduction of expenditures for calibration standards.

9.8.4 Scope. This guidance is directive in nature and may be cited as authority for actions as the need dictates. Reference (j) is a parallel effort onboard aircraft carriers, and may be used as an authoritative reference for overlapping procedures and responsibilities. Reference (k) provides MEASURE documentation procedures. Reference (g) remains the authoritative reference document for all general procedural issues relating to calibration. Reference (b) addresses CNO concepts, policies, organizations, maintenance support procedures and organizational **or** intermediate maintenance. In the event the contents of this guidance or reference (j) conflict with any directive issued by higher authority, the latter **must** prevail.

9.8.5 Applicability. This guidance is applicable for all calibration performed by LHA and LHD class Ship's Force personnel, with the exception of technical matters pertaining to Radiation Detection, Indication and Computation equipment, which are the responsibility of Commander, Naval Sea Systems Deputy for Logistics (SEA 04). Nothing in this directive detracts from these responsibilities.

9.8.6 Action.

- a. Commanding Officers **must** have the overall responsibility for maintaining a high degree of calibration readiness for all TMDE.
- b. AIMD Officers **must**:
 - (1) Be the shipboard METCAL program manager.
 - (2) Be the consolidated FCA manager.
 - (3) Provide calibration, per the intervals and procedures of reference (g), except as noted in paragraph 9.7 of this chapter, where the CRL takes precedence for SISCAL instrumentation calibration intervals and procedures. Provide repair services for all qualifying shipboard TMDE per reference (j).
 - (4) Maintain custody of, and be accountable for, all shipboard standards for calibration of TMDE.
 - (5) Use MEASURE to plan, schedule, monitor and document the calibration of all TMDE per reference (k).
 - (6) Staff the shipboard FCA with qualified calibration technicians and provide training to maintain their proficiency.
 - (7) Ensure all approved calibration standards are available to support the authorized workload.
 - (8) Ensure all documentation required to support calibration is current and available to personnel operating the FCA.
 - (9) Produce appropriate documentation or document the repair requirement and record repair accomplishment into MEASURE and the aviation Maintenance and Material Management system.
 - (10) Calibrate all TMDE within the capability of the onboard FCA. Calibration standards have first priority for calibration, with all other priorities based on mission requirements determined in coordination with affected department heads.

- (11) Schedule required calibration and repair requirements beyond the capability of the shipboard FCA to another calibration laboratory. Calibration of NAVAIR Standards and Support Equipment beyond the capability of the FCA **must** be authorized and scheduled **per** reference (b).
- (12) Coordinate the calibration of TMDE that is beyond FCA capability with external resources based on accessibility and cost effectiveness. Five general categories of external resources are available to the FCA. The resources, in order of precedence to be used, are:
 - (a) Ashore AIMDs and RCCs.
 - (b) System Command sponsored Navy Calibration Laboratories.
 - (c) Navy depot level activities.
 - (d) Other Department of Defense calibration laboratories approved for use by TYCOM.
 - (e) Navy Certified commercial calibration laboratories.
- (13) Coordinate all TMDE repairs with outside resources. The precedence (based on cost effectiveness) for selecting the outside resource for repairs is:
 - (a) AIMD and RCC.
 - (b) COMNAVAIRSYSCOM Depot Level Rework Program for Support Equipment and Items (Individual Material Readiness List).
 - (c) Naval shipyards and ship repair facilities.
 - (d) Designated Overhaul Points listed in the Master Repairable Item List.
 - (e) Naval Systems Command field activities.
 - (f) Navy Certified commercial repair facilities.

NOTE: REPAIR OF NAVAIR STANDARDS AND SUPPORT EQUIPMENT BEYOND THE CAPABILITY OF THE FCA **MUST BE AUTHORIZED AND SCHEDULED **PER** REFERENCE (b).**

- (14) Submit only operational TMDE for off-ship calibration. All functions and ranges to be calibrated must be operating and usable unless special calibration is requested. Verify all necessary accessories, power cords, and technical manuals, as required to complete the calibration, are included with the instruments at the time of calibration.
- (15) Request TYCOM authorization (COMNAVAIRFORCE) for repair of NAVAIR assigned calibration standards per the NAVAIR METCAL Scheduling Letter, NAVAIR Ltr 13640 Ser 3.9.2/series. Contact information for COMNAVAIRFORCE:

Phone - Commercial (757) 445-4434, DSN 565-4434

Fax - Commercial (757) 444-1690, DSN 564-1690

Message - COMNAVAIRFORCE SAN DIEGO CA//N421Q/N421QC//

- (16) Coordinate with Commander, Regional Support Center METCAL manager for SISCAL scheduling. AIMD is authorized to calibrate all instrumentation within the capability of the FCA except instruments requiring SCPs per the CRL. SCPs will be performed by SISCAL teams. Ensure SISCAL instrumentation is calibrated at the periodicity with the procedure listed in the CRL.
 - (17) Ensure the FCA provides support under the Strike Force Intermediate Maintenance Activity concept.
- c. Engineer Officers **must**:
- (1) Report all TMDE which require calibration to the AIMD Officer for inclusion in the ship's calibration recall schedule upon request.
 - (2) Deliver portable TMDE for calibration to the FCA per the AIMD managed calibration recall schedule.
 - (3) Coordinate in-place calibration requirements for non-portable TMDE with the AIMD Officer.
 - (4) Ensure only operational TMDE are submitted for calibration. All functions and ranges to be calibrated must be operating and usable unless special calibration is requested. Verify all necessary accessories, power cords, and technical manuals, as required to complete the calibration, are included with the instruments at the time of submission.
 - (5) Notify the AIMD Officer and, when applicable, the Combat Systems Officer, of any TMDE inventory changes, TMDE configuration changes, CRL changes that may affect the calibration recall schedule or require additional calibration procedures or standards.
 - (6) Maintain the allowance quantities of authorized TMDE.
 - (7) Report the inventory and configuration of all TMDE supporting HM&E systems and combat support systems using the SCLSIS.
 - (8) Maintain a ship specific CRL or Critical Instruments List for ship HM&E systems and combat support systems.
 - (9) Submit all TMDE repair requirements to the AIMD Officer. A formal repair request, such as a Visual Information Display System/Maintenance Action Form (VIDS/MAF) or an OPNAV 4790/2K, is not required for repair by the shipboard FCA. MEASURE METER cards will be provided by the ship's calibration laboratory.
- d. Air Officers **must**:
- (1) Report all TMDE eligible for calibration to the AIMD Officer for inclusion in the ship's calibration recall schedule.
 - (2) Deliver portable TMDE for calibration to the FCA per the AIMD managed calibration recall schedule.

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- (3) Ensure only operational TMDE are submitted for calibration. All functions and ranges to be calibrated must be operating and usable unless special calibration is requested. Verify all necessary accessories, power cords, and technical manuals, as required to complete the calibration, are included with the instruments at the time of submission.
 - (4) Coordinate in-place calibration requirements for non-portable TMDE with the AIMD Officer.
 - (5) Notify the AIMD Officer and, when applicable, the Combat Systems Officer, of any TMDE inventory changes, TMDE configuration changes that may affect the calibration recall schedule, in-place calibration requirements or require additional calibration procedures or calibration standards.
 - (6) Maintain the allowance quantities of authorized TMDE.
 - (7) Submit all TMDE repair requirements to the AIMD Officer. A formal repair request, such as a VIDS/MAF or an OPNAV 4790/2K, is not required for repair by the shipboard FCA. MEASURE meter cards will be provided by the ship's calibration laboratory.
- e. Combat Systems Officers **must**:
- (1) Report all portable and installed GPETE or SPETE eligible for calibration to the AIMD Officer for inclusion in the ship's calibration recall schedule.
 - (2) Deliver portable TMDE for calibration to the FCA per the AIMD managed calibration recall schedule.
 - (3) Ensure only operational TMDE are submitted for calibration. All functions and ranges to be calibrated must be operating and usable unless special calibration is requested. Verify all necessary accessories, power cords, and technical manuals, as required to complete the calibration, are included with the instruments at the time of submission.
 - (4) Notify the AIMD Officer of any TMDE inventory changes, TMDE configuration changes that may affect the calibration recall schedule or require for additional calibration procedures or calibration standards.
 - (5) Maintain GPETE **and** SPETE inventories in quantities allowed in the SPETERL. Include funding procurement of TMDE when assets are not available through CTRA programs.
 - (6) Report the inventory and configuration of all TMDE supporting combat systems using SCLSIS.
 - (7) Submit all TMDE repair requirements to the AIMD Officer. A formal repair request, such as VIDS/MAF or an OPNAV 4790/2K, is not required for repair by the shipboard FCA.

9.9 NUCLEAR PROPULSION CALIBRATION REQUIREMENTS. Nuclear propulsion plant gages, meters, thermometers and other instruments in those reactor plant systems specified by reference (p) must be calibrated **following** the requirements of the applicable Reactor Plant

Manual. Other nuclear-powered ship's system calibration must be performed per the requirements of reference (a).

VOLUME VI
CHAPTER 10
MOTOR GASOLINE HANDLING AND STORAGE

REFERENCES.

- (a) NAVSEA S9086-SP-STM-010 - NSTM Chapter 542 (Gasoline and JP-5 Fuel Systems)
- (b) COMNAVAIRLANT/COMNAVAIRPACINST 3400.4 - Air Department Standard Operating Procedures
- (c) NAVSEA S9086-WK-STM-010-NSTM - Chapter 670 (Stowage, Handling and Disposal of Hazardous General Use Consumables)
- (d) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- (e) LPD 17 MOGAS System Technical Manual
- (f) CNSFINST 4020.1 - Motor Gasoline (MOGAS) Certification Program for L-Class Ships

10.1 PURPOSE. To provide guidance and safety requirements for the storage, handling and loading of Motor Gasoline (MOGAS) aboard ship. In view of the special hazards involved in the handling of MOGAS, Commanding Officers must ensure strict compliance with all MOGAS handling safety instructions, Cargo Fuel Operational Sequencing System (CFOSS) (as applicable), references (a) through (f) and this chapter. The Commanding Officer's approval **must** be obtained prior to any MOGAS operation. The Aviation Fuels Officer, or other officer as may be directed by the Commanding Officer, **must** be directly responsible for the planning of all MOGAS operations (i.e., loading, off-loading or transfer of gasoline, etc.), and the operation of the MOGAS system, including the training of all MOGAS operation and handling personnel. Any deviation from the safety precautions and procedures of reference (a) or this chapter **must** have the approval of the appropriate Type Commander. Additionally, the Commanding Officer may specify any additional safety precautions to be taken as the situation dictates.

10.2 CHARACTERISTICS.

- a. Gasoline is a highly volatile liquid that gives off vapors under all environmental conditions. This vapor, when combined with air in the proper proportion (approximately 1.4 to 7.6 percent by volume), forms an explosive mixture that can be set off by any ignition source such as a slight spark or flame. If liquid gasoline is present, the violent explosion will be followed by fire.
- b. Air, at ordinary atmospheric temperature, can absorb as much as 28 percent gasoline vapor. Gasoline vapors are three to five times heavier than air, and when released, will tend to sink to the lowest level of a compartment. Liquid gasoline will expand 0.7 percent for each ten-degree increase in temperature.

10.3 PERSONNEL HAZARDS. Gasoline and gasoline vapors are extremely toxic; breathing air that is rich in gasoline vapor can and has caused unconsciousness and in some cases death. Gasoline vapors, even in concentrations of less than 1.0 percent, may cause nausea and

headaches if inhaled for any length of time. Strong concentrations of gasoline vapors produce an excited state leading to unconsciousness. Gasoline saturated clothing will cause irritation and severe burns to the skin and will ignite if exposed to a source of ignition. Gasoline splashed in the eyes can cause blindness. Severe physical and mental complications may result from inhalation or body absorption. Ship's personnel **must** be instructed in the characteristics of MOGAS and the necessary precautions to prevent personnel injury by exposure to MOGAS or its vapor.

10.4 STORAGE AND HANDLING.

10.4.1 Tank Conditions. Ships with installed MOGAS tanks **or** systems will maintain them in one of the following conditions at all times.

- a. Tank is empty and gas free certified.
- b. Tank is filled with water (Cofferdam may or may not be inert).
- c. Tank is filled with gasoline and water (Cofferdam must be inert).
- d. Gasoline has been pumped off and the tank is full of water with trace amounts of gasoline. The Cofferdam will remain inert until the tank has been flushed three times per the CFOSS and has been turned over to an industrial activity or contractor. In no case will the tank be emptied until the industrial activity or contractor is ready to gas free the tank.

10.4.2 Loading and Off-loading.

- a. Before transferring MOGAS, the planning phase must include:
 - (1) Time the operation will start and its expected duration.
 - (2) CFOSS training of all involved personnel for their respective watch stations. All involved personnel must be Personnel Qualification Standard qualified for their assigned operating stations. A CFOSS talk-through and walk-through must be completed prior to commencing any MOGAS evolution.
 - (3) Stationing of special firefighting personnel and their equipment, as required by the CFOSS, plus any additional requirements mandated by the Commanding Officer.
 - (4) Control of the smoking lamp.
 - (5) Setting of material condition "YOKE".
 - (6) Use of non-ferrous (spark-proof) tools.
- b. Loading and off-loading of MOGAS to or from the installed ship's system **must** be conducted pier-side. Since the MOGAS tanks overflow directly overboard, any single tank **must** normally never be filled above 80 percent capacity. Operational necessity, as dictated by the appropriate Type Commander, may require the tank to be filled to 95 percent. During this time, additional precautions must be taken:
 - (1) MOGAS pumping **must** be reduced to the minimum rate.
 - (2) Posting of additional overboard discharge watches.

- (3) Loading only that amount of gasoline that has been calculated to fill the tank to 95 percent.
- c. Most MOGAS inventory requirements are controlled by the Fleet Marine Force. They will make necessary arrangements for the delivery or pickup of the MOGAS. The ship will be responsible for requesting, by message, an on-load **or** off-load date and time, and an alternate date and time, for the evolution to commence. This message information will be provided to the local Naval Base Commander and Base Fire Marshal.
- d. The Base Fire Marshal **must** ensure that all firefighting equipment is in position, rigged and properly manned. Additionally, the Base Fire Marshal **must** ensure that all MOGAS connections are tight, and that no leaks are apparent when the pumps are started.
- e. Constant communication **must** be maintained between all operating stations throughout the evolution.
- f. The Ship's Fire Marshal will ensure that firefighting equipment is rigged and manned **per** the CFOSS and ship's regulations.
- g. Sample MOGAS per the requirements identified in paragraph 10.4.3.b.

10.4.3 Identification and Sampling Requirements.

- a. Only unleaded gasoline is used aboard naval ships with installed gasoline tanks. MOGAS color can range from light red to a straw color.
- b. MOGAS samples **must** be taken for laboratory analysis during on-load evolutions at the following times; (1) just prior to starting the evolution, (2) at approximately the midpoint, and (3) just prior to completion. During off-load, laboratory samples need only be taken just prior to commencing the off-load evolution. Gasoline samples must be clearly marked and handled with extreme care.

10.4.4 Safe Handling of Motor Gasoline.

- a. Maintain all portable and installed firefighting equipment and alarm systems in proper operational condition.
- b. Maintain all grounding cables in proper operational condition.
- c. Conduct frequent inspections to ensure system integrity and tightness.
- d. Hold frequent firefighting drills, with particular emphasis on the MOGAS system and storage tanks.
- e. Immediately clean up any spilled or leaked gasoline and dispose of any rags or other cleanup material **per** ship's instructions.
- f. Gasoline **must** not to be used for cleaning purposes under any circumstances.
- g. When the MOGAS system is in use, maintain a security watch **per** the requirements of the CFOSS. When the system is secured, the aviation fuels watch **must** inspect the MOGAS system to ensure that there are no leaks, and that the inert readings and pressures are satisfactory.

10.4.5 Containerized Motor Gasoline. Gasoline in drums, bladders or cans **must** be located on the weather deck only, and stored so that the containers can be readily jettisoned as described in reference (a).

10.4.6 LPD 17 Class MOGAS System.

10.4.6.1 Storage and Handling. The LPD 17 Class MOGAS System has the capability of storing MOGAS containers up to 1500 gallons (combination of 18 and 6-gallon bladders, 55-gallon drums and 5 gallon cans), in the MOGAS Service and Bladder Storeroom (Compartment Number 4-145-4-G) and three 500-gallon bladders (bulk fuel) on a jettison rack, for a total of 3000 gallons. The passageway (Compartment Number 4-143-2-L) adjacent to the MOGAS Ready Service and Bladder Storeroom was modified to support MOGAS transfer from 55-gallon drums to portable containers, or between containers.

10.4.6.2 Firefighting and Safety Requirements. The LPD 17 Class ships are designed to store MOGAS fuel containers inside the MOGAS Ready Service and Bladder Storeroom. The MOGAS storeroom and transfer room firefighting and safety systems have been installed, satisfactorily tested and validated to satisfy all required NAVSEA Safety and Firefighting requirements, to include:

- a. Eductor Sweep hose for dedicated drainage.
- b. Standard Navy Gasoline Spill Clean-up Kit.
- c. AFFF Fire Protection System.
- d. HFP System.
- e. Smoke and Heat Detection System.
- f. Explosion proof electrical equipment (storeroom only).
- g. Any electrical equipment (including switches and power outlets) in the transfer room that were not explosion proof or intrinsically safe were relocated to be at least 48 inches above the deck.
- h. Dedicated Ventilation System.
- i. Vapor Detection System.

10.5 MOTOR GASOLINE ASSESSMENT PROGRAM.

- a. The MOGAS Assessment Program has been established to assist Ship's Force personnel in the operation and maintenance of the installed MOGAS systems. This program requires an assessment to be conducted on each MOGAS equipped ship annually, prior to on-load or off-load of MOGAS evolutions, and prior to an industrial or fleet maintenance availability.
- b. The MOGAS Assessment Program **must** be conducted by the ISIC, and will consist of the following elements:
 - (1) Conducting required assessments, and providing assessment reports to the appropriate Type Commander and Fleet Commander.
 - (2) Taking corrective action on minor discrepancies and providing guidance for repairs of major discrepancies.

- (3) Providing On the Job Training for operators and maintenance personnel, as requested.
- (4) Reviewing and validating the Coordinated Shipboard Allowance List, CFOSS, Planned Maintenance System, Personnel Qualification Standard and the associated technical manuals.
- (5) Providing assistance during MOGAS on-load or off-load evolutions, as requested.
- (6) Performing assist visits when requested by the ship.

- c. LPD 17 Class MOGAS Assessment and Certification should be conducted per reference (f).

VOLUME VI**CHAPTER 11****MAINTENANCE, REPAIR AND OVERHAUL OF
SERVICE CRAFT, LANDING CRAFT AND SMALL BOATS****REFERENCES.**

- (a) OPNAVINST 4780.6 - Policy for Administering Service Craft and Boats in the U.S. Navy
- (b) OPNAVNOTE 4780 - Service Craft and Boats Accounting Report (SABAR)
- (c) NAVSEA S9086-TX-STM-010 - NSTM Chapter 583 (Boats and Small Craft)
- (d) NWP 1-03.1 - Naval Warfare Publications Operational Report
- (e) NAVSEA S9086-HB-STM-010 - NSTM Chapter 233 (Diesel Engines)

11.1 **PURPOSE.** To provide guidance and assign responsibilities for the maintenance and repair of service craft, landing craft and small boats.

- a. Personnel assigned to individual ships, service craft or responsible shore based activities **must** perform all landing craft, service craft and boat maintenance within their capabilities.
- b. Landing craft, small boats and service craft **must** be maintained with the same care that naval ships receive. This is particularly true for boats which also serve as ready lifeboats.
- c. (Submarine Force only) If there is no Unit Identification Code (UIC) assigned to the craft, the parent command's UIC and a unique Work Center will be used for Current Ship's Maintenance Project control and any related OPNAV 4790/2K (see Chapter 19, Appendix E of this volume).

11.2 **MATERIAL READINESS.**

- a. Regular periodic inspections of landing craft, small boats and service craft **must** be conducted by the command to which the craft is assigned (referred to hereafter as the "parent command"). Use Fleet Maintenance Activity (FMA) facilities to conduct the required periodic inspections, whenever possible. The results of these inspections will determine the need for repairing a craft or boat. Submit overhaul and major maintenance items (i.e., engine overhauls and hull repairs beyond the ability of the parent command) to the appropriate Type Commander (TYCOM), no later than 15 January for the current and following two years. The requests for maintenance must cite the boat or craft hull number and the fiscal year quarter in which the overhaul or major maintenance availability is desired. Any significant changes to previously submitted maintenance requests must be discussed in detail (i.e., material condition of the craft affected by the change, operational commitments requiring changes, etc.).
- b. To conserve repair funds and assets, and to maintain craft and boats in a satisfactory state of material readiness, Commanding Officers of ships and shore activities **must** set up a training program for all personnel connected with the operation and maintenance of craft and boats. Pride of ownership should be instilled in boat crews and assigned

unit personnel. Use available personnel and funds to the fullest extent possible before requesting help from the FMA to perform routine or emergent repairs.

- c. Active service craft are inspected by the Service Craft Material Inspection Board, per reference (a), to support industrial availability planning. Deficiencies identified by the Service Craft Material Inspection Board must be entered in the Current Ship's Maintenance Project prior to the Work Definition Conference. Service craft parent commands **must** ensure reference (b) accurately reflects the current status of requested availabilities.
- d. TYCOMs will aid parent commands with landing craft, small boat and service craft industrial availabilities by:
 - (1) Scheduling availabilities.
 - (2) Establishing overhaul cycles including, budgeting, scheduling, and funding per the requirements of reference (b).

11.3 MAINTENANCE OF LANDING CRAFT AND SMALL BOATS ASSIGNED TO AFLOAT UNITS.

- a. Commanding Officers are urged to take full advantage of the FMA facilities for Ship's Force upkeep and repair of their landing craft and boats. A limited quantity of hand and power tools and air compressors are available at the FMA for Ship's Force use. Ships may borrow these tools by sending a properly prepared work request (OPNAV 4790/2K) directly to the FMA, Regional Support Group (RSG) **or** Regional Maintenance Center (RMC). Depending on the workload, assist teams from the FMA, RSG **or** RMC may be available to assist with the inspection of boats and craft. COMNAVSURFLANT and COMNAVSURFPAC ships and units **must** obtain tools from the FMA per the requirements of Chapter 30 of this volume.
- b. Ship personnel desiring to make use of FMA, RSG **or** RMC facilities should send a work request (OPNAV 4790/2K) to the FMA, RSG **or** RMC requesting crane services to handle the craft or boat and stowage space for accomplishing the work. Limited repair material not normally available onboard ship, may be obtained from the FMA, RSG **or** RMC by including required items in the work request.
- c. If long usage or extensive damage to any boat or landing craft is such that repairs by Ship's Force cannot keep a boat or craft in a proper state of readiness, a work request (OPNAV 4790/2K) must be submitted to the FMA, RSG **or** RMC via the TYCOM or Immediate Superior In Command (if assigned). The work request must show the following additional information in Section IV of the OPNAV 4790/2K:
 - (1) Boat or landing craft registry number.
 - (2) Complete description of the work requested.
- d. The FMA, RSG **or** RMC will accept such requests, provided that:
 - (1) The ship is not scheduled for a routine Chief of Naval Operations (CNO) Maintenance Availability in the immediate future.

- (2) The repairs are beyond the capacity or capability of Ship's Force to accomplish.
- (3) Enough time in advance of the ship's next scheduled operation is allowed for the FMA to perform the repairs and return the boat or landing craft to the ship before departure.
- e. When a boat or landing craft is badly damaged, a statement of the circumstances surrounding the damage must be submitted with the request for repairs.
- f. Before delivery of a boat or landing craft to the FMA for repairs, Ship's Force must accomplish the following:
 - (1) Remove all items of outfitting and all portable parts invoiced with the hull, including compass, tools, batteries, and portable lights.
 - (2) Drain and clean the bilges of dirt, diesel fuel, and oil. When it is not possible to deliver the boat or landing craft in this condition, the repair activity will be notified in advance so that arrangements can be made for gas free inspections.
- g. Reference (c) provides details for transfer, receipt, disposal and survey of boats and landing craft. Replacement boats or landing craft are normally available from Naval Sea Systems Command (NAVSEA), via the TYCOM, upon receipt of a valid Boat Inspection Report per reference (c).
- h. If the FMA cannot accomplish the requested boat or landing craft repairs, the Commanding Officer of the FMA will advise the ship to request an availability from the TYCOM.

11.4 LANDING CRAFT AND SMALL BOAT REPAIRS DURING CHIEF OF NAVAL OPERATIONS MAINTENANCE AVAILABILITY.

- a. Hull repairs affecting strength and watertight integrity beyond the capability of Ship's Force are considered urgent items. Ship's Force **must** ensure that the required repairs are included in the work package for screening at the Work Definition Conference.
- b. Boats and landing craft which do not require work by an industrial activity should normally accompany the ship during the availability. Stowage areas can usually be made available at the industrial facility for accomplishment of Ship's Force work. Commanding Officers should not overlook the facilities available at FMAs for accomplishment of this work while the ship is undergoing a CNO Maintenance Availability.
- c. Tests of landing craft and boat lifting gear **must** be accomplished during the ship's CNO Maintenance Availability **per** reference (c) and Volume IV, Chapter 13 of this manual.

11.5 MAINTENANCE OF SERVICE CRAFT, LANDING CRAFT AND SMALL BOATS ASSIGNED TO SHORE ACTIVITIES, GROUP AND SQUADRON COMMANDERS.

11.5.1 Unit Level Maintenance.

- a. Maintenance and repair of craft and boats within the capability of the parent command should be budgeted, scheduled, and accomplished to maintain a high state of material

readiness. Commands and activities **must** appoint a Maintenance Officer as a sole point of contact for all matters relating to boat and craft maintenance. The Maintenance Officer **must** be capable of making maintenance decisions based on engineering and operational parameters and should actively participate in the planning and execution of all maintenance actions affecting the parent command.

- b. Annual budget proposals submitted by the parent commands to their TYCOM **must** address anticipated funding requirements to maintain the material condition of all assigned boats and craft, the accomplishment of approved modifications and modernization work (within the parent command's capability), and must discuss in detail how these funds will be applied to specific craft or boats.
- c. Request for changes to boat or craft inventories, resulting from mission requirement changes, must be assessed in terms of maintenance capabilities and budget constraints. Approval of such changes may require the TYCOM to adjust the unit's Operating Target allocation for maintenance. The impact on maintenance support for changes in inventory must be assessed for each unit by the TYCOM before instituting changes.

11.5.2 Fleet Maintenance Activity Level **or** Contractor Assist Maintenance.

- a. Repairs to craft and boats which are beyond the capabilities of the parent command, **must** be documented on work requests (OPNAV 4790/2K) and submitted to the cognizant FMA, RSG **or** RMC for accomplishment. Repair funds for craft and boats are budgeted for FMA activities, on a quarterly basis, by the TYCOM. Individual craft and boat work packages will be screened by the TYCOM to ensure accomplishment within allocated funding.
- b. Work requests which are screened as beyond the capability of the FMA will be submitted to the TYCOM for screening to an industrial activity. Industrial repairs are normally programmed for accomplishment during scheduled craft or boat overhauls or other availabilities, unless the repairs are of an emergent nature and have been documented with a Casualty Report **per** reference (d). FMAs, RSGs **or** RMCs will accept emergent work requests, to clear Casualty Reports, on a case basis with TYCOM approval.
- c. Shore based commands which have craft or boat repairs being accomplished by industrial activities retain the responsibility for these repairs. The parent command is responsible for maintaining liaison with the industrial activity and keeping the TYCOM informed, via the RSG, RMC **or** Immediate Superior In Command, of problems or potential problems.

11.5.3 Overhaul of Service, Landing Craft and Small Boats.

- a. A four to five-year overhaul cycle has been established by the CNO for self-propelled service craft, high value boats and landing craft (e.g., SLWTs, service craft and LCUs). For other craft and boats, the necessity for overhaul is determined by usage and material condition and will generally be conducted every four to five years or as required by reference (a).
- b. Service, landing craft and boats undergo CNO Maintenance Availabilities to accomplish major maintenance and modernization items which, in the judgment of the

TYCOM, are beyond the unit or FMA capability. All high value boats, landing craft and service craft receive complete and thorough availabilities within the available funding. The primary goal is to accomplish all outstanding repairs and major maintenance items to ensure reliable operations during the craft's projected operational cycle.

- c. There are basically two distinct types of availabilities applicable to boats and service or landing craft:
 - (1) Supervisor of Shipbuilding administered industrial availabilities using a work package consisting of OPNAV 4790/2Ks.
 - (2) CNO Maintenance Availabilities administered through the Naval Supply Center (contracting agency) by the FMA, RSG or RMC for smaller craft or boats with less extensive maintenance and repair packages.
- d. After the Work Definition Conference, and before the contracting authority (Supervisor of Shipbuilding or Naval Supply Center) issues the Invitation for Bids to potential bidders, the TYCOM and parent command will review the copies of the bid specifications for accuracy and completeness. The parent command must complete the review quickly and report any discrepancies to the TYCOM. The TYCOM will resolve any discrepancies in the bid specifications with the contracting authority before the Invitation for Bids is released.
- e. Post-repair trials for craft and boats are conducted, as applicable, per Volume II, Part I, Chapter 3 of this manual.

11.6 RESPONSIBILITIES. For both types of industrial availabilities identified in paragraph 11.4.3.c of this chapter, the following responsibilities are assigned:

11.6.1 Type Commander.

- a. Coordinate all aspects of the advance planning.
- b. Authorize all new industrial work items.
- c. Authorize all growth in an existing industrial work item.
- d. Provide funding to accomplish all authorized work.
- e. Monitor and approve all changes in established milestones (internal milestones, used by the industrial activity to monitor schedule progress, are not subject to TYCOM approval).
- f. Direct appropriate action when the quality or completeness of the industrial activity work is in question.

11.6.2 Immediate Superior In Command. (if not assigned, these functions will revert to the TYCOM)

- a. Review overhaul progress reports.
- b. Review Ship's Force and FMA concurrent work.
- c. Ensure pertinent directives are followed concerning the safety of personnel and equipment.

- d. Attend sea trial and overhaul completion review conferences.
- e. Assist in all aspects of the planning and monitoring of industrial availabilities.

11.6.3 Commanding Officers of Parent Commands.

- a. Coordinate all planning aspects of craft or boat overhauls with the TYCOM and Immediate Superior In Command (where assigned).
- b. Prepare and submit overhaul progress reports **per** Volume II, Part I, Chapter 3 of this manual.
- c. Ensure enough trained personnel are assigned to on-site monitoring of craft or boats while in an industrial availability.
- d. Fulfill all responsibilities for safety of craft and personnel.

11.7 REPAIR AND OVERHAUL OF SMALL BOAT ENGINES.

- a. Boat and craft custodians **must** repair and maintain engines on a continuing basis, using their Operating Target. Replacement parts **must** be obtained through the Navy Stock system, when available, to prevent the potential for using erroneous parts and to simplify stocking of parts.
- b. Craft and boat engine overhaul intervals are determined by engine operating hours as specified in reference (e) or, for engines over 400 Brake Horsepower, by trend analysis.
- c. Boat Alterations are issued for the replacement of engines no longer supported by the supply system. Direct questions concerning the status of obsolete engines to NAVSEA (PMS 325) or the TYCOM.
- d. All spare boat engines, or engines being turned in for replacement, must be preserved **per** reference (e) and stored in an enclosed protective compartment.

11.8 BOAT ALTERATIONS.

- a. Submit Boat Alteration requests to NAVSEA, (PMS 325) via the chain of command.
- b. The accomplishment and funding of approved Boat Alteration **must** be managed by the TYCOM.

11.9 OPERATION OF SMALL BOAT ENGINES. The operation and maintenance of all diesel engines on boats and craft **must** be **per** reference (e).

VOLUME VI
CHAPTER 12
DEGAUSSING

REFERENCES.

- (a) OPNAVINST S8950.2 - **Electromagnetic and Acoustic Signature Control for Mine Warfare**
- (b) NAVSEA S9086-QN-STM-010 - NSTM Chapter 475 (Magnetic Silencing)
- (c) NAVSEA S9475-AC-PRO-010 - Degaussing Forms, Records and Reporting Procedures
- (d) NAVSEA S5475-AL-PRO-010 - Principles and Procedures for Magnetic Treatment of Ships
- (e) SSPINST 8950.2 - Procedure for Fleet Ballistic Missile (FBM)/Strategic Weapons System (SWS) Components During Flash-Deperm Treatment of an SSBN

12.1 PURPOSE. To provide magnetic silencing and deperming requirements, and the check ranging and reporting procedures defined by reference (a). Reference (b) provides the basic principles and background of degaussing.

12.2 DEGAUSSING DEFINITIONS.

12.2.1 Check Ranging. The action of a ship making reciprocal range runs over an instrumented array at a Magnetic Silencing Facility (MSF), for purposes of measuring the ship's degaussed magnetic signature. Check ranging is the principle method **to determine** the effectiveness and reliability of degaussing systems. A satisfactory check range is two range runs on reciprocal headings within a six-week period which are determined to **satisfy the requirements of reference (a) while ship's degaussing equipment (if installed) is operating properly and all required on-board information has been provided.** Underwater Electromagnetic Measurement Systems for check ranging are available at the following locations:

San Diego, CA	Norfolk, VA
Pearl Harbor, HI	Mayport, FL
Yokosuka, Japan	New London, CT
Kings Bay, GA	Souda Bay, Greece

12.2.2 Degaussing Folder. The Degaussing Folder (NAVSEA 8950/1) is an official ship log which contains **all information needed by degaussing authorities. It contains instructions for operation of the degaussing system, degaussing charts, values for current and turn settings, installation forms, compass compensation forms and a log section which documents all pertinent details of magnetic treatment and of actions taken related to the ship's degaussing system.** The degaussing folder is issued to a ship by the MSF that renders the initial magnetic treatment and system calibration. Reference (c) provides the detailed requirements for maintaining the degaussing folder.

12.2.3 Degaussing System. A shipboard system which reduces the residual permanent and induced magnetic signature of the ship, and is the ship's primary passive mine countermeasure

system. Different combinations of degaussing coils, types of controls and power supplies comprise a degaussing system.

12.2.4 Degaussing System Calibration. The process whereby the ship's magnetic signature is measured, analyzed and ship-specific signature compensating coil settings are developed and provided to the ship.

12.2.5 Deperming. Deperming is typically performed as part of the ship's degaussing system calibration, as specified in reference (a). It is the magnetic treatment of a ship's hull to minimize permanent magnetism and is also performed to place the ship's permanent magnetization into a standard condition such that it is approximately the same as the other ships in the class. The deperming needs of operational ships are established by check ranging.

12.2.6 Magnetic Compass Compensation. Magnetic field from a ship's degaussing system can interfere with a ship's magnetic compass heading and make the system useless for navigation. Per reference (b), a compensating coil is set up around the magnetic compass to neutralize the effect of degaussing coil field in the vicinity of the compass. Magnetic compasses that use fluxgate technology have a degaussing compensation system that does not rely on compensation coils.

12.3 SURFACE SHIPS AND SUBMARINES WITH DEGAUSSING SYSTEMS.

- a. Reference (a) mandates check ranging for **all surface ships and submarines with degaussing systems**. To meet minimum requirements, a satisfactory check range is required every six or twelve months depending on the type of system installed. Normally, ships are automatically ranged by degaussing facilities (listed in paragraph 12.2.1 of this Chapter) as they transit channels between the hours of 0800-1600 weekdays only. If ranging is required outside of typical hours or on weekends, arrangements must be made with the MSF. In addition to periodicity requirements, check ranging must be performed:
 - (1) After new construction.
 - (2) Before and after a major dry-docking availability.
 - (3) After a major shock to the hull from a nearby explosion.
 - (4) After grounding or collision.
 - (5) As feasible, before entering mined waters.
 - (6) Before issuing a Casualty Corrected of any Casualty Report degaussing equipment.
 - (7) At every opportunity, when entering or leaving a **U.S. Navy** port with ranging facilities (**ranging at a non-USN range facility is not permitted without prior CNO approval**). **Declining use of range facilities is not an option**.
 - (8) After a major alteration to the hull and superstructure.
- b. Ships forward deployed to areas without ranging facilities are exempted from check range requirements by reference (a).
- c. **When** a ship which receives notification from an MSF of unsatisfactory magnetic condition and the reason for unsatisfactory signature is a degaussing equipment

failure, the ship is required by reference (a) to report via Casualty Report as directed by Chapter 5 of this volume.

- d. A ship's degaussing system must be de-energized (or secured) prior to system calibration, unless degaussing coil settings approved by NAVSEA have been provided. Alternatively, if it is not feasible to secure the system, the degaussing coil power supply outputs must be set to zero Amperes. The degaussing system may temporarily be energized for testing, maintenance and other related work.
- e. Calibrated degaussing systems will be operated at all times while underway.

12.3.1 Check Ranging.

- a. Before check ranging, contact the range facility by voice radio. Range crossings will be considered invalid unless the range is clear of other traffic (including tugboats) before and during the crossing.
- b. Ranging facility requires the following information:
 - (1) Coil Settings. Once the ship is on course, and before the ship crosses the range, inform the facility of actual ammeter currents and polarities. Ensure the meter readings are correct for both zone and polarity. Actual coil currents in effect during the crossing MUST be recorded and reported to the MSF for satisfactory check ranging.
 - (2) Ships with Advanced Degaussing systems. Due to the large number of coil currents required to be reported, ships with these systems must make arrangements with the MSF to deliver this information by facsimile or other electronic methods after the crossing occurs. Current values must be recorded while ship is crossing the range on a steady heading.
 - (3) Ship's Draft. Forward and aft drafts. Provide actual keel drafts, vice navigational drafts.
 - (4) Ship's heading. Provide the range with the actual ship's heading. Once the course is established, maintain a steady course and constant speed between 8 to 10 knots, or as the range operator directs.

12.3.2 Responsibilities.

12.3.2.1 Type Commander or Immediate Superior In Command.

- a. Monitor the degaussing readiness of assigned ships.
- b. Ensure that ships "check range" as required by paragraph 12.3 of this chapter.
- c. Issue waivers to check ranging and deperming requirements if necessary. The Technical Warrant Holder (NAVSEA 05P1) may be contacted if advice on impact to ship susceptibility is needed.

12.3.2.2 Ship Commanding Officer.

- a. Ensure ship's magnetic signature is minimized by periodic check ranging.
- b. Maintain ship's degaussing system.

- c. Ships unable to check range or unable to establish communications with the MSF **must** make comments as appropriate in the remarks section of the daily Operational Reports.
- d. Ships with installed systems may not decline check ranging.
- e. Submit a minor Departure From Specification per Volume V, Part I, Chapter 8 of this manual if range checking requirements of paragraph 12.3 of this chapter are not met.

12.4 SUBMARINES WITHOUT INSTALLED DEGAUSSING SYSTEMS. The submarine force **must** maintain all units in the best degaussed condition within expected areas of operation. Expected areas of operation include zones .22, .33, .44, and .55 as shown in reference (d). Operations in zone .55 will necessitate additional treatment, since presently used flashing procedures are designed to provide protection only in zones .22, .33, and .44. Normally, **submarines** are automatically ranged by degaussing facilities as they transit channels between the hours of 0800-1600 weekdays only. **If ranging is required outside of typical hours or on weekends, arrangements must be made with the MSF.** Reference (a) mandates check ranging for **all submarines**. To meet minimum requirements, a satisfactory check range is required **at least once yearly**. **In addition to periodicity requirements, check ranging of submarines must be performed:**

- a. Before and after Post Shakedown Availability (following new construction).
- b. After a CNO Maintenance Availability.
- c. After a major shock to the hull from a nearby explosion.
- d. After grounding or collision.
- e. **At every opportunity, when entering or leaving a U.S. Navy port with ranging facilities (ranging at a non-USN range facility is not permitted without prior CNO approval). Declining use of range facilities is not permitted.**

NOTE: THE PRECEDING REQUIREMENTS ARE THE MINIMUM RANGING REQUIREMENTS. RANGING SHOULD BE PERFORMED AT EVERY OPPORTUNITY TO ENSURE EARLY IDENTIFICATION AND CORRECTION OF MAGNETIC SILENCING DEFICIENCIES.

12.4.1 Check Ranging.

- a. Before check ranging, contact the range facility by voice radio. Range crossings will be considered invalid unless the range is clear of other traffic (including tugboats) before and during crossing.
- b. Ranging facilities require the following information:
 - (1) Submarine's Draft. Forward and aft drafts. Provide actual keel drafts, vice navigational drafts.
 - (2) Submarine's heading. Provide the range with the actual submarine's heading. Once the course is established, maintain a steady course and constant safe speed between 8 to 10 knots, or as the range operator directs.

12.4.2 Responsibilities.

12.4.2.1 Type Commander or Immediate Superior In Command.

- a. Ensure that **submarines** check range as required by paragraph 12.4 of this chapter.
- b. Issue waivers to check ranging and deperming requirements if necessary. The Technical Warrant Holder (NAVSEA 05P1) may be contacted if advice on impact to ship susceptibility is needed.
- c. Schedule ships with unsatisfactory magnetic signatures for flash deperming at the earliest opportunity.

12.4.2.2 Ship Commanding Officer.

- a. Ensure ship's magnetic signature is minimized by periodic check ranging.
- b. Inform the ISIC upon receipt of an unsatisfactory ranging. **Submarines may not decline check ranging.**
- c. Maintain the ship's Degaussing Folder.
- d. Undergo flash deperming as directed by the ISIC or TYCOM.
- e. Before flash deperming prepare ship's equipment and off-load **or** protect material **per** references (b) and (e). Additional guidance can be obtained from the MSF.
- f. Submit a minor Departure From Specification per Volume V, Part I, Chapter 8 of this manual if range checking requirements of paragraph 12.4 of this chapter are not met.

12.5 SURFACE SHIPS WITHOUT DEGAUSSING SYSTEMS

Surface ships not equipped with a degaussing system (except LCS 2 class) are not required to check range **per** reference (a).

VOLUME VI
CHAPTER 13
SURFACE SHIP CORROSION CONTROL

REFERENCES.

- (a) NAVSEA S9086-DA-STM-010 - NSTM 100, Hull Structures
- (b) NAVSEA S9086-VD-STM-010 - NSTM Chapter 631 (Preservation of Ships In-Service - General)
- (c) NAVSEA Technical Publication T-9630-AB-MMD-010/ALL USN HULLS - Corrosion Control Assessment and Maintenance Manual (CCAMM) for the Corrosion Control Information Management System (CCIMS)
- (d) COMNAVSURFOR Instruction 3120.1 - Zone Inspections
- (e) COMNAVAIRFORINST 4790.1 - Commander Naval Air Forces Surface Maintenance and Material Management (3-M) System Manual

LISTING OF APPENDICES.

A Preservation Departures from Specifications Process Decision Tree

13.1 PURPOSE. To provide basic guidelines necessary to maintain an effective Corrosion Prevention and Control Program. Guidance for inspection, prevention and repair of corrosion on ships is contained in references (a), (b) and (c), which supersedes all previous class specific Corrosion Control Manuals distributed by Naval Sea Systems Command. In addition, this chapter requires the use of the Corrosion Control Information Management System (CCIMS) database as the repository for all inspection and maintenance data. The maintenance of coating integrity to prevent structural degradation is necessary to ensure the safe and proper operation of the ship. Maintenance of areas with severe corrosion require enhanced and targeted surveillance due to the highly corrosive conditions that can lead to higher risk of accelerated structural degradation. Reference (a) provides structural system survey and inspections criteria for surface ships and aircraft carriers. Reference (c) provides specific requirements for inspecting tanks and voids and provides condition based maintenance guidance for availability planning.

13.2 BACKGROUND. Protective coatings are the most widely used method of corrosion control and have specific applications. Therefore, the physical location and operating environment **must** be taken into consideration when choosing a coating system. Through the application of improved corrosion prevention and control techniques, procedures, and materials, longer lasting and more effective results can be obtained with a reduction in man-hours spent on preservation. The Department of Defense “Annual Cost of Corrosion for Navy Ships” study identified corrosion control **and** preservation as a high cost driver for ship life cycle maintenance. In order to reduce this life cycle maintenance cost, an accurate database of coating conditions is required to facilitate timely and appropriate maintenance decisions. The failure to identify, track, and repair a preservation system deficiency can result in coating failure and can result in damage to the structure, substantially increase repair costs and adversely impact both the seaworthiness and combat worthiness of the hull. The CCIMS database was developed to document coating conditions to assist in maintenance planning. The CCIMS database is located

at <https://ccims.dc3n.navy.mil> and can be accessed to record the results of tank, void and general structural inspections, coating systems installed, and all repairs conducted.

13.3 POLICY.

- a. All Level 1 and 2 corrosion control structural system surveys and inspections **must** be accomplished **per** reference (a).
 - (1) Level I Structural System Surveys are defined as scheduled inspections per the Class Maintenance Plan specific to each ship class and are focused on ship structure and foundations.
 - (2) Condition-directed Level 2 structural inspections **must** be conducted if warranted by deficiencies identified by a Level 1 survey. The Level 2 inspection **must** include, but is not limited to, thickness gauging measurements and Non-Destructive Testing as applicable to the structural condition to allow for adequate assessment.
- b. The CCIMS database **must** be used for documenting coating system inspections, maintenance and repairs.
- c. All inspectors and surveyors **must** be qualified **per** reference (c) requirements.
- d. Whenever a tank or void is opened for manned entry, an inspection **must** be performed. The inspection **must** be performed **per** reference (c). All inspection results will be entered into the CCIMS database.
- e. For surface force ships and aircraft carriers, the CCIMS database will be used for ship maintenance availability planning.

NOTE: ANY OUT-OF-SPECIFICATION CONDITION FOUND IS TO BE MITIGATED **PER APPENDIX A OF THIS CHAPTER AND **PER** VOLUME V, PART I, CHAPTER 8 OF THIS MANUAL.**

13.4 RESPONSIBILITIES.

13.4.1 Type Commanders.

- a. Port Engineers and Maintenance Program Managers (MPM) schedule and screen corrosion control work items to the appropriate repair activities during industrial availabilities and upkeeps with sufficient length to accommodate the work.
- b. Port Engineers and MPMs screen tank, void and general structural inspection Automated Work Requests (AWR) in Availability Work Packages to the repair activities capable of performing the inspections including in-house Type Commander resources as applicable.
- c. When tasked by Port Engineers and MPMs, inspectors and surveyors assigned by Fleet Maintenance Activity, Regional Maintenance Center (RMC) **or** Type Commander will perform inspections using references (a) and (c). Inspector **or** surveyor will ensure all inspection data is entered into CCIMS database within three working days upon completion of inspection.
- d. (Aircraft Carriers only) Provide to Ship's Force:

- (1) Self-help information on corrosion control information.
- (2) Technical assistance on setting up and updating a ship's Corrosion Prevention and Control Program.
- (3) Coordinate or provide training **per** reference (c) for inspection personnel assigned by the Repair Officer (Ship's Corrosion Control Officer for Aircraft Carriers).

13.4.2 Fleet Maintenance Activity **or** Regional Maintenance Center.

- a. Maintain facilities and sufficient qualified personnel to apply protective coatings.
- b. Conduct Technical Assist Visits upon request from a ship during a fleet maintenance availability, or at other times as the workload permits, to include:
 - (1) Identification of shipboard topside corrosion problem areas.
 - (2) Recommendations for methods and means of corrosion problem correction.
 - (3) Informing Ship's Force of local industrial assets, including local Fleet Maintenance Activity, RMC, other industrial facilities (i.e., industrial activities) or Commercial Industrial Services assets.
 - (4) Self-help information for Ship's Force.
 - (5) Technical assistance on setting up and updating a ship's Corrosion Prevention and Control Program.
- c. Perform tank, void and general structural inspections as tasked by the Port Engineers and MPMs. Inspections on surface ships and aircraft carriers will use references (a) and (c). Inspector **or** surveyor will ensure all inspection data is entered into the CCIMS database within three working days upon completion of inspection.

13.4.3 Surface Force Ships and Aircraft Carriers.

- a. Set up an ongoing corrosion prevention and control program, including all topside structure, equipment, machinery, fixtures, combat and weapons systems, and components.
 - (1) For Commander, Naval Surface Force, use reference (d) as guidance.
 - (2) For Commander, Naval Air Force, use reference (e) Chapter 8 as guidance.
 - (3) Additional guidance can be found in references (a), (b), Maintenance Index Page (MIP) 1500, MIP 6300 and MIP 6641.
- b. Take planned or corrective action on all potential discrepancies, and enter all significant discrepancies into the Current Ship's Maintenance Project.
- c. Ensure scheduled AWRs requesting tank, void and general structural inspections are conducted by RMC or Type Commander assigned inspectors and surveyors as required by work center Planned Maintenance System. Ensure the AWR includes requirements for cleaning and gas free services as required.
- d. (Aircraft Carriers only) Aircraft carrier Type Commanders (TYCOM) **must** employ Level 1 Surveyors (Coatings Inspectors) certified **per** the requirements of reference

- (c). These Certified TYCOM Level 1 Surveyors **must** train and assist Ship's Force with performance of Level 1 Surveys and documentation of survey findings in support of the availability planning process **per** reference (c). These certified TYCOM Level 1 Surveyors will also provide additional Shipboard Corrosion Assessment and Reporting (SCAR) training to designated Ship's Force personnel who can assist other Ship's Force personnel in areas of surface preparation, coating selection and application and Quality Control process for the preservation of spaces and equipment. The overall collection, input and management of the CCIMS database by certified Level 1 Surveyors at the TYCOM is required throughout the 32-month availability cycle to fully support Maintenance Program Managers in the life cycle management of shipboard preservation.
- e. (Aircraft Carriers only) The Repair Officer is designated as the Ship's Corrosion Control Officer and is responsible to ensure divisions outlined in reference (e) (or series) Chapter 8 have sufficient numbers of Ship's Force personnel certified as Level 1 Surveyors **per** reference (c) to conduct Level 1 Structural and Coating Condition Surveys. All inspection results will be entered into the CCIMS database. Departures From Specifications (DFS) **must** be submitted **per** this manual and as defined in reference (c). The Repair Office will accomplish a joint inspection with the Supervisor and the Commanding Officer's designated representative (i.e., either a qualified Ship's Force Level 1 Surveyor or TYCOM Level 1 Surveyor) upon completion, inspection and acceptance, by the contractor, of work within each compartment.
- f. (Aircraft Carriers only) For any tanks or voids which are not normally filled with seawater or not designed to be exposed to seawater, Ship's Force will ensure the following:
- (1) Only fresh water may be used in any tanks or voids which are not normally exposed to seawater (e.g., water transferred to peak tanks or dry voids for use in controlling list or ballasting the ship must be fresh water).
 - (2) Report to the TYCOM those tanks or voids in which fresh water is being used for controlling list or ballasting the ship.

APPENDIX A**PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE**

NOTE: THIS DECISION TREE DOES NOT CHANGE ANY TECHNICAL REQUIREMENTS. THE LEVEL OF AUTHORITY REQUIRED INDICATES AT WHAT LEVEL AN OUT-OF-SPECIFICATION CONDITION CAN BE APPROVED WHEN PROPERLY DOCUMENTED AND WITH AN ACKNOWLEDGED INCREASE IN THE RISK OF PREMATURE FAILURE. THIS DOES NOT MEAN THAT THE OUT-OF-SPECIFICATION CONDITION WILL NECESSARILY BE ACCEPTED. THE DECISION TO ACCEPT OR REJECT WORK WILL BE MADE BASED ON THE APPLICABLE REQUIREMENTS AND OTHER CONSIDERATIONS.

General Usage of the Table

- A. This decision tree does not change any technical requirements. The "Level of Authority Required" indicates at what level an out-of-specification condition can be approved. Mitigation guidance on out-of-specification requirements does not imply that a particular out-of-specification condition will be accepted. The decision to accept or reject an out-of-specification requirement will be made at the level indicated in the table.
- B. Minor out-of-specification conditions as described in the columns for "Mitigation Only" and "Local Chief Engineer (CHENG)" in this table represent a low risk of premature coating failure as long as required mitigation actions are taken and the out-of-specification condition is limited with respect to the area being worked. More significant out-of-specification conditions require a formal Waiver **or** Deviation (Departure from Specification (DFS)) for adjudication of the condition.
- C. With the exception of submarines, the "Mitigation Only" category must be adjudicated by the local Technical Authority (shipyard or Regional Maintenance Center engineering code) at the first occurrence of an out-of-specification condition during a particular work item after which the government Quality Assurance (QA) activity **or** representative can apply the same mitigation guidance for the specified requirement (for submarines, see **paragraph K**). Re-occurrences of a previously mitigated condition require documentation at each occurrence (see **paragraph J**).
- D. All DFSs (minor or major, temporary or permanent) must be adjudicated **per** Naval Sea Systems Command (NAVSEA) 5400.95 Enclosure 2.
- E. Unless otherwise specified, this table applies only to critical-coated areas.
- F. This table does not apply to NAVSEA 08 cognizant spaces as described in NAVSEA Instruction C9210.4, which specifically includes potable water tanks and reserve feed tanks.
- G. When using this decision tree for submarine preservation, the local technical authority is required to evaluate the nonconformance **per** the appropriate Unrestricted Operation/Maintenance Requirement Card requirements.
- H. Repeated waiving of the same out-of-specification requirements **must** be cause for the applicator, with the assistance of the local Technical Authority (shipyard or Regional Maintenance Center engineering code), to determine and eliminate the root cause of the noncompliance. If it is determined that the applicator cannot meet the stated requirements, notify NAVSEA accordingly.
- I. The local Technical Authority **must** decide when multiple out-of-specification conditions or repeated (same) out-of-specification conditions on the same work item warrant a minor or major DFS. In particular, if multiple out-of-specification "Mitigation Only" or "Local CHENG" conditions exist or affect an area in excess of 0.3% of the total surface area of a work item, the local Technical Authority will submit a minor or major DFS, depending on the severity **or** risk of the cumulative out-of-specification conditions.
- J. Unless otherwise specified, action to "document" an out-of-specification condition requires submittal of the NAVSEA Standard Item 009-32 QA inspection forms (included in the appendices of 009-32). These forms become part of the Objective Quality Evidence and **must** be retained.
- K. Submarines must document all deviations with the appropriate DFS, no exceptions.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE A

Surface Preparation					
QA Element	Requirement	Level of Authority Required			
		NAVSEA		Local CHENG	
		Major DFS	DFS	DL, DR, ESR, etc.	Mitigation Only
A. Surface Profile					
1. Critical-Coated Areas (except nonskid)					
a. Average (mils)	$2 \leq \text{profile} \leq 4$	$< 2^{(2)}$	> 6	$5 \leq \text{profile} \leq 6$	$4 < \text{profile} < 5$
b. Individual gage readings (mils)	$1 \leq \text{gage reading} \leq 5$	$< 0.6^{(2)}$	> 6	$0.6 \leq \text{profile} \leq 1$ and $5 \leq \text{profile} \leq 6$	n/a
2. Nonskid (flight deck, hangar bay and weather decks only)					
a. Average (mils)	$3 \leq \text{profile} \leq 4.5$	< 3	> 6	$4.5 < \text{profile} \leq 6$	n/a
b. Individual gage readings (mils)	None	< 2	> 6	$5.5 < \text{profile} \leq 6$	n/a
3. QA Readings	(1)	$\geq 10\%$ missing	$5\% < \text{missing} < 10\%$	$0\% < \text{missing} < 5\%$	n/a
Notes: 1. Documentation Requirement: measurements are to be taken per Method "C" of American Society for Testing and Materials (ASTM) D 4417 with a sampling rate of five (5) readings for the first 1000 ft ² or portion thereof; two (2) for each additional 1000 ft ² or portion thereof. For individual areas of less than 25 ft ² two (2) readings are required. If several small areas are combined on one QA record, at least one (1) tape is required from each area not to exceed five (5) readings per 1000 ft ² . per Method "C" of ASTM D 4417 one "reading" is defined as the average of three (3) tapes taken in one area. 2. Only when discovered during a record review; otherwise the condition should be corrected as it represents extremely high risk.					

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

Surface Preparation

Rationale for Allowing Departure:

- **Profiles below the limit:** The greatest risk of coating failure due to improper profile is if the profile is insufficient. If an inspection reveals that a profile is too low, local engineering or the inspector **must** direct the area to be reblasted. A major departure will be written for a low profile only if the low profile is discovered during a record review. NAVSEA will then be consulted to weigh the various factors contributing to the decision and to determine if the risk of premature failure is justified based on the known schedule impact and cost of rework.
- **Profiles above the limit:** There is low risk of coating failure due to an excessively thick profile, but it does indicate that Quality Control has failed. With solvent based coatings, however, the risk of solvent entrapment increases with excessive profile as more coating must be applied to cover the high peaks with the proper WFT. Excessive profile may indicate a poor choice of abrasive and typically increases the cost of the job due to additional raw materials (paint and abrasive) and labor hours for blasting and clean up. When Dry-Film-Thickness (DFT) readings are performed per Society for Protective Coatings (SSPC)-PA 2, one of the requirements is to “zero” the gage on a blasted, unpainted area. This ensures that the gage readings reflect the coating thickness above the top of the profile peaks, which ensures that the coating thickness is adequate regardless of the surface profile.

Mitigation:

- When high profiles are allowed, mitigation efforts **must** be documented and **must** include: increased frequency of WFT gage use, special attention to DFT gage calibration, and increased primer thickness when deemed necessary. For paints with lower solids (e.g., MIL-DTL-24441), additional cure time may be necessary to ensure the complete release of solvent as the film cures.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE B

Surface Preparation					
QA Element	Requirement	Level of Authority Required			
		NAVSEA Major DFS	DFS	Local CHENG DL, DR, ESR, etc.	Mitigation Only
1. Staining a. SSPC-SP 10, SSPC-WAB 10 (L) and SSPC-SP 12 WJ-2 (L)	random staining of an area $\leq 5\%$	n/a	random staining of an area $> 15\%$	10% < random staining of an area $\leq 15\%$	5% < random staining of an area $\leq 10\%$
2. Tightly Adherent Coating ⁽¹⁾ a. SSPC-SP 10, SSPC-WAB 10 (L) and SSPC-SP 12 WJ-2 (L)	none remaining	$> 0.05\%$ remaining or size of largest tightly adherent area $> 5\text{in}^2$	Area Affected $\leq 0.05\%$ and Size of Largest Area $< 5\text{in}^2$	Area Affected $\leq 0.02\%$ and Size of Largest Area $< 2\text{in}^2$	n/a
3. Flash Rusting a. SSPC-WAB 10 (L) and SSPC-SP 12 WJ-2 (L)	flash rust no greater than "L" on entire surface ⁽²⁾	5% < not "L"	2% < not "L" $\leq 5\%$	0.5% < not "L" $\leq 2\%$	not "L" $< 0.5\%$
Notes: 1. As defined by SSPC-SP 7. 2. NAVSEA allows SSPC-WJ-2 and SSPC-WAB-10 surfaces to flash rust to "L" or "Light" for application of coatings on Naval vessels. SSPC defines flash rust as discoloration that develops within a few hours of completion of blasting as the surface dries. Any rust that develops over several hours or days after the surface has completely dried is defined as rust-back, not flash rust. Immediately after the surface has dried, the amount of flash rust that has developed must be determined, and must not be greater than "Light", as defined in this appendix . Immediately prior to painting, however, if rust-back has occurred such that rust is present in excess of the amounts allowed by SP-10, WJ-2, or WAB-10 (whether tightly adherent or not), the surface must be re-blasted to remove this rust and bring the surface back into the required condition. Rust-back is also an indication that chlorides remain present on the surface, which will directly negatively impact the final coating system performance, even if the rust itself is tightly adherent.					

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

Surface Preparation

Rationale for Allowing Departure:

- **Staining:** Paragraph 5.4.7.3 of NSTM 631 states in part that SSPC-SP-6 (which allows 33% random staining) will result in a degree of cleaning that is adequate for the majority of conventional coating systems under normal exposure conditions. The current requirement for dry abrasive blasted areas is SSPC-SP 10 (which allows 5% random staining) - allowing up to 15% staining with adjudication and mitigation at the local level does not represent a high risk.
- **Staining and Productivity:** If a small area of out-of-specification cleanliness is discovered prior to complete cleaning of the tank or area, the inspector or local engineering code normally direct further blasting. If the condition is discovered after completion of the final cleaning, reblasting would normally involve the loss of two to three production days (as much as 60% of the original production blasting cost) to reblast and reclean the area. The cost of reblasting and recleaning generally is not cost effective since the small amount of surface prepared to SSPC-SP-6 is not expected to impact the coating performance.
- **Tightly Adherent Coating:** Paragraph 7.2.4.4 of NSTM 631 states in part, "Brush-off blasting (SSPC-SP-7) may be used instead of blasting to bare metal in those instances where an epoxy coating is in good condition and has been applied over a well-prepared surface. This method should result in a surface retaining all paint films, but free from all corrosion products, scale, and foreign matter". SSPC-SP-7 is considered an adequate surface preparation method when the remaining coating is in good condition.
- **Excessive Flash Rust:** During preparation of a large area with wet abrasive or Ultra high pressure, some of the adjoining area will flash to "M" or "H". Recovery from flash rusting often requires an effort equivalent to the initial preparation of the surface. In cases where a small area has excessive flash rust bloom adjoining a larger area of acceptable surface, the rework to recover the required surface condition will result in contamination of the adjoining surface with water, "mud" from the removed surface corrosion, grit and dust if an abrasive is used. Once an area is contaminated, the potential to leave some contaminant on the surface is increased, regardless of the recovery actions to clean the surface. The allowance requires the area to be generally within specification with small areas of flash rusting in excess of "L", resulting in a very low risk of coating failure.

Mitigation:

- **Tightly Adherent Coating:** Mitigation of this condition consists of: 1) documenting the size and general location of remaining coating, 2) ensuring that the remaining coating is truly "tightly adherent" as defined by SSPC-SP 7, 3) ensuring remaining coating has a visible profile, and 4) ensuring that the estimates of size and percent area covered are as accurate as possible.
- **Excessive Staining:** Documentation of the extent of staining.
- **Excessive Flash Rust:** Flash rust must be minimized in areas that are prone to coating failure, e.g., edges, beneath overboard discharges, weld beads, etc. Document extent and location of flash rust.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE C

Surface Preparation					
QA Element	Requirement	Level of Authority Required			
		NAVSEA	Local CHENG		Mitigation Only
		Major DFS	DFS	DL, DR, ESR, etc.	
A. Surface Contamination					
1. Conductivity					
a. All Immersed Areas	<30μS	>35μS	30μS< conductivity ≤35μS	n/a	n/a
b. Flight Decks, Weather Decks, Hangar Bay and All Other Areas	<70μS	>85μS	70μS conductivity ≤85μS	n/a	n/a
2. Hydrocarbons					
a. SSPS-SP 1 (before and after surface preparation)	none visible	when mitigation efforts fail and area contaminated >0.03%	when mitigation efforts fail and area contaminated ≤0.03%	n/a	n/a
3. Dust (ISO 8502-3)	dust quantity ≤2 dust particle size ≤2	dust quantity >3 dust particle >3	n/a	2< dust quantity <3 2< dust particle <3	n/a
4. QA Readings	(1)	missing >25%	10%≤ missing ≤25%	missing ≤10%	
Notes:					
1. Documentation requirement for conductivity: five (5) readings for each 1000ft ² of surface being prepared. Documentation requirement for dust test: three (3) tapes for the first 1000ft ² , one (1) tape per 1000ft ² thereafter, minimum of three (3) tapes per area being preserved.					

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

Surface Preparation

Rationale for Allowing Departure:

- **Conductivity:** Excessive chloride contamination can result in blistering of the coating in an immersion area, and can accelerate corrosion under the coating in immersion or non-immersion areas. Because chloride contamination presents a significant risk for premature spot coating failure there is very little tolerance for an out of specification condition. The values that will be resolved by NAVSEA approach a level where premature coating failure may occur, therefore NAVSEA involvement is required to ensure adequate recovery actions, process control and inspection is invoked.
- **Hydrocarbon Contamination:** Hydrocarbon contamination on a surface is a more significant cause for premature spot coating failure than chlorides. When contamination is discovered prior to surface preparation or upon completion of surface preparation, the surface will be rejected and recleaned. Local engineering codes and the inspectors will not authorize surface preparation or coating in cases where there is known contamination. The only time a DFS (local or off station) will be processed is if the contaminant is discovered after the surface preparation is completed and there is suspicion that the contaminant has been driven into the surface during surface preparation.
- **Dust:** Dust remaining on the surface prior to coating can significantly impact the long-term adhesion of the coating. The rationale for the high percentage of missing readings allowed prior to NAVSEA involvement is that normally very few readings are required. 25% missing readings may be only 1 reading less than the required number of readings.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE D

Surface Preparation and Coating Application					
QA Element	Requirement	Level of Authority Required			
		NAVSEA	DFS	Local CHENG	Mitigation Only
		Major DFS		DL, DR, ESR, etc.	
A. Environmental Conditions (times are cumulative)					
1. % Relative Humidity					
a. Tanks	RH ≤50%	>55% for >2 hours	n/a	50%< RH ≤55% for ≥2 hours	50%< RH ≤55% for <2 hours
b. Other Areas	RH ≤85%	>90% for >2 hours	n/a	85%< RH ≤90% for ≥2 hours	85%< RH ≤90% for <2 hours
2. Substrate Temperature					
a. High, Out of Specification	varies by application	temperature during painting <i>or</i> curing >110% of maximum allowed ⁽³⁾	n/a	100%< temperature during painting <i>or</i> curing ≤110% ⁽³⁾	n/a
b. Low, Out of Specification	varies by application	temperature during painting <i>or</i> curing <90% of minimum required ⁽³⁾	n/a	90%≤ temperature during painting <i>or</i> curing <100% with no mitigation ^(2, 3)	90%≤ temperature during painting <i>or</i> curing <100% ⁽³⁾
c. Flight Deck Temperature	varies by application	any noncompliance	n/a	n/a	n/a
d. At or Close to Dew Point	substrate temperature >5°F above the dew point	at or below dew point during painting <i>or</i> curing	n/a	temperature <5°F above the dew point with no mitigation ⁽²⁾	temperature <5°F above the dew point (<i>not</i> allowed on submarines)
3. QA Readings	(1)	missing >25%	10%< missing ≤25%	missing ≤10%	n/a

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

Surface Preparation and Coating Application

Notes:

1. Varies by application, review technical documentation for specific documentation requirements.
2. This would occur when the condition was discovered during a record review of completed or in-process preservation.
3. Temperature in °F only.

Rationale for Allowing Departures:

- **Substrate Temperature:** When the substrate temperature is out of specification (except for high temperature), additional cure time within specification can be added prior to application of the next stripe or full coat of paint to mitigate “out of specification” conditions (additional cure time required is the amount of time the environmental conditions were out-of-specification). This additional cure time must be documented properly. Additional cure time after application of a subsequent coat of paint does not satisfy the curing requirement. For excessive temperature conditions, local engineering resolution is required.

Mitigation:

- **Substrate Temperature, At Or Close To Dew Point:** Painting or blasting when the substrate temperature is less than 5°F above the dew point may be acceptable in some circumstances, e.g., during the early morning when temperatures are clearly rising. Proper mitigation for this condition is a documented increase in dew point or substrate temperature measurement to ensure that the substrate temperature does not fall below the dew point and frequent visual inspection to ensure that moisture has not condensed on the surface.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE E

Coating Application					
QA Element	Requirement	Level of Authority Required			
		NAVSEA	DFS	Local CHENG	Mitigation Only
		Major DFS		DL, DR, ESR, etc.	
A. Receipt Inspection	(1)	product applied, no receipt inspection possible	n/a	coating applied and sufficient coating remaining to perform receipt inspection	n/a
B. Shelf Life	verify coating shelf life not expired prior to application of coating	product applied, no shelf life extension possible	n/a	coating applied and sufficient coating remaining to perform shelf life extension inspection	n/a
C. Mixing (mixing temperature and ratio)					n/a
1. All Paint (except nonskid)	varies by application	improperly mixed or off-ratio paint applied	n/a	mixing temperature out of- specification ⁽²⁾	n/a
2. Nonskid	varies by application	any noncompliance	n/a	n/a	n/a
Notes: 1. Receipt inspection requirements: 1) surface ships require Certificate of Conformance for all coatings, and 2) submarine requirements are covered in NSTM Chapter 631, Table 11-1. 2. This would occur when the condition was discovered during a record review of completed or in-process preservation.					
Rationale for Allowing Departure: • Shelf Life: Coatings must be certified based on receipt inspection for submarines per NSTM Chapter 631, or based on receipt inspection or a Certificate of Compliance for surface craft per SI 009-32. In some cases due to logistical problems, the coating is received without receipt inspection, or with an expired shelf life, just prior to when it must be applied.					

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE E (CON'T)

Coating Application					
QA Element	Requirement	Level of Authority Required			
		NAVSEA	DFS	Local CHENG	Mitigation Only
		Major DFS		DL, DR, ESR, etc.	
D. DFT (measured IAW SSPC-PA 2)					
1. Ultra-High Solids (UHS) Coatings (per coat or full system) ⁽³⁾	varies by application	overall average coating applied >30mils	system maximum< overall average coating applied ≤30mils	localized average coating applied ≤50mils on ≤20% of the surface ⁽²⁾ and area covered by runs, drips, and sags >1% or of thickness >50mils	area covered by runs, drips, and sags ≤1% of thickness ≤50mils
2. Solvent Based Coatings (per coat or full system) ⁽³⁾	varies by application	measured DFT >150% of maximum allowed	n/a	100%< measured DFT ≤150% of maximum allowed	n/a
3. All Coatings					
a. Total System	varies by application	low, out-of-specification	n/a	n/a	n/a
b. Individual Coat DFT	varies by application	n/a	n/a	low, out-of-specification	
4. QA Readings	(1.)	missing >25%	0%< missing ≤25%	n/a	n/a

Notes:

- SSPC-PA 2 requires five (5) DFT measurements over the first 100 ft², and, for areas up to 300 ft², each 100ft² area **must** be measured. For areas up to 1000ft², three (3) 100ft² areas **must** be measured. For areas larger than 1000ft², measure three (3) 100ft² areas in the first 1000ft², and one (1) 100ft² for each additional 1000ft² thereafter.
- This is intended to allow for film thickness variations caused by stripe coating and overspray during coating adjacent areas, not for poor workmanship.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

Coating Application

Notes:

3. Film thickness indicated does not include stripe coat thickness unless specifically referenced.

Rationale for Allowing Departure:

- **High Solids Coatings:** Currently NSTM 631 Table 11-1 Note 7 allows coatings to be applied to 150% of the required coating thickness. Based on discussions with representatives, “required” thickness refers to the range if a range is stated. The result is that coatings can be applied up to 150% of the maximum range identified by the manufacturer. This interpretation has been common practice by the Naval Shipyards as well as contractors, **per** the understanding with NAVSEA.
- **Solvent Based Coatings:** For solvent-based coatings, there is a potential for solvent entrapment when a coating is applied at a higher DFT than the manufacturer recommends. The change in interpretation requires closer control for excessive thickness of solvent-based coatings. The risk of solvent entrapment may be mitigated by ventilation, temperature, humidity and the amount of cure time between coats. The new interpretation is somewhat more restrictive for solvent-based coatings, and requires engineering review if the coating is not applied within manufacturer’s recommendations.

Mitigation:

- **High DFT Readings:** Mitigation of high DFT values is mitigated by taking additional DFT readings (as necessary) to identify the extent of the nonconforming condition, documenting these findings, reducing the thickness of follow-on coats when appropriate, and increased attention to application processes (nozzle sizes, stand-off distances, etc.) to prevent recurrence.

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE E (CON'T)

Coating Application					
		Level of Authority Required			
QA Element	Requirement	NAVSEA		Local CHENG	
		Major DFS	DFS	DL, DR, ESR, etc.	Mitigation Only
E. Overcoat Window	see ASTM F-718 datasheet	time for cure insufficient <i>or</i> >125% of maximum time allowed	time for cure insufficient <i>or</i> 115%< of maximum time allowed ≤125%	time for cure insufficient <i>or</i> 100%< of maximum time allowed ≤115%	n/a
F. Cure to Service	see ASTM F-718 datasheet	insufficient	n/a	n/a	n/a
G. Amine Bloom					
1. Prime, Intermediate or Stripe Coat	none present	no corrective action taken	n/a	corrective action taken	n/a
2. Topcoat	n/a	n/a	n/a	condition documented	n/a
Rationale for Allowing Change: • Overcoat Windows: Temperature changes during curing can change the minimum and maximum overcoat windows. Local engineering oversight is directed for overcoat window problems because often the contractor or paint shop believes that there is an overcoat window problem in cases where close scrutiny of the environmental records shows that there is additional overcoat window remaining. If there is an overcoat window problem the recovery may be to solvent wipe the coating, abrade the coating, or abrasive blast the coating. The local engineering code is to consult with the coating manufacturer to determine the appropriate recovery action, if recovery is possible.					

PRESERVATION DEPARTURES FROM SPECIFICATIONS PROCESS DECISION TREE

TABLE F

Surface Preparation					
QA Element		Level of Authority Required			
		NAVSEA Major DFS	DFS	Local CHENG DL, DR, ESR, etc.	Mitigation Only
A. Blasters	SSPC-C 7	no certification	out of date certification	n/a	n/a
B. Equipment Operators and Sprayers Utilizing Plural Component Equipment	MPCAC	no certification	out of date certification	n/a	n/a
C. Contractors Performing Preservation Work	QP-1	no certification	out of date certification	n/a	n/a
D. Coating Inspectors	NPBI or NACE CIP Level 1	no certification	out of date certification	n/a	n/a

VOLUME VI
CHAPTER 14
CANNIBALIZATION

REFERENCES.

- (a) COMSUBLANT/COMSUBPACINST 4406.1 - Submarine Supply Procedures Manual
- (b) NWP 1-03.1 - Naval Warfare Publication Operational Report
- (c) OPNAVINST 4440.19F - Policies and Priority Rules for Cannibalization of Operational Equipment and Diversion of Material at Contractor Plants to Meet Urgent Operational Requirements

LISTING OF APPENDICES.

- A Sample Cannibalization Request Message (Aircraft Carriers and Surface Force Ships Only)
- B Sample Cannibalization Request E-mail (Surface Force Ships only – based on TYCOM guidance)

14.1 PURPOSE. To provide guidance for active ship cannibalization and the resultant payback process between ships and Type Commander (TYCOM) cannibalization reporting requirements.

14.2 POLICY. Cannibalization between active Fleet units is not a normal peacetime practice and will not occur unless:

- a. A significant degraded readiness condition has been reported.
- b. All possible actions have been taken to satisfy the material requirement through other means.
- c. The impact on maintenance personnel has been considered.

14.2.1 Commander Naval Surface Force Ships.

- a. Cannibalization Not Involving Ships in Overhaul. When a system asset is not available and if the degree of readiness degradation (normally a CASREP) warrants such action, the only remaining alternative is to cannibalize from an active ship. Approval of active ship cannibalization request (not involving ships in overhaul) required to satisfy CASREP requirements will be authorized by the appropriate TYCOM.
- b. Cannibalization Involving Ships in Availabilities. Cannibalization from ships in availabilities will be minimized since such actions often affect maintenance **or** operational schedules for several ships. Cannibalization may be initiated only after non-availability of materials through the supply system or alternate sources has been ascertained. Cannibalization from ships in overhaul **or** availability must be approved through the appropriate TYCOM. Requests must be submitted via the normal chain of command.
- c. COMNAVSURFLANT **or** COMNAVSURFPAC will be included as information addressees for tracking purposes on all cannibalization request messages.

Cannibalization requests may be sent as Naval messages or e-mails, per TYCOM guidance.

14.2.2 Naval Air Force Ships. All cannibalization **must** be requested from and authorized by the TYCOM. The request and authorizations will be via message. The requesting message will specify the source of replacement parts, and will reference communications indicating the cannibalized ship's Commanding Officer's concurrence with the cannibalization action. The message **must** further specify the method of replacement.

14.2.3 Submarine Force Ships. In all cases, cannibalization actions **must** be in strict compliance with Appendix K of reference (a).

14.3 DEFINITIONS.

14.3.1 Self-Cannibalization. When a component is available on board the ship, but in a less essential or already inoperative piece of equipment, it may be desirable for the ship to disable the equipment **or** system to correct a casualty to a more critical piece of equipment or system. Such self-cannibalization is the prerogative of the Commanding Officer. Self-cannibalization is a temporary measure to return a more critical piece of equipment to an operational status. Replacement of the cannibalized component may or may not be required.

14.3.2 System Cannibalization. System cannibalization is cannibalization of system assets beyond the TYCOM's purview, including other TYCOM end-use material and inactive ship equipment and components. System cannibalizations are a supply system action whereas active cannibalizations are a maintenance action. TYCOM expeditors will initiate all system cannibalizations.

14.3.3 Active Ship Cannibalization. Active ship cannibalization is removal of component(s) **or** equipment installed in an active ship (or component(s) **or** equipment removed for overhaul from an active ship) for installation in another active ship. Because of the adverse effects of active ship cannibalization, such action will be taken as a last resort and only in exceptional cases when all other sources have been exhausted. When active ship cannibalization is authorized, the primary source for cannibalization is ships in Chief of Naval Operations Maintenance Availabilities, with recourse to operational ships only as a last resort.

14.4 CRITERIA FOR AUTHORIZATION (Active Ship Cannibalization). Conditions upon which authorization decisions are based include the following criteria:

- a. There is an urgent operational requirement for the equipment and the existing degradation to the equipment **or** system is considered to be unacceptable to meet the specific operational commitments.
- b. A Casualty Report (CASREP) and a Not Operationally Ready Supply requisition for the material or component to be cannibalized have been issued. The scheduled or estimated delivery date must be such that the parts will not be available from the designated supply stocking point in time to achieve satisfactory material readiness at least seven days prior to an underway date or operational commitment. The required part must not be available from other equipment on board the ship, where such equipment is not essential for the ship to accomplish its mission.
- c. All other sources, including screening of all ashore supply support sources, afloat inventory assets, local fabrication and system cannibalization have been exhausted.

- d. Operational alternatives such as delays in deployment and gaging requirements have been considered. Routine operations may not be sufficient cause to justify active ship cannibalization.
- e. Immediate Superiors in Command (ISIC) will normally initiate the cannibalization when special circumstances or urgent operational commitments exist.

14.5 REQUEST PROCEDURE (Active Ship Cannibalization). The following procedures apply when requesting authorization for active ship cannibalization:

14.5.1 Requesting Ship.

- a. Submit a CASREP **per** reference (b) on equipment involved.
- b. Submit a Not Operational Ready Supply requisition for the parts.
- c. Specify the required delivery date. Verify, through the supply system, the part will not be available in time to correct the casualty.
- d. Determine that the required parts are not available from on board stock, other ships of the force in the same port, or other non-essential equipment on board the requesting ship.
- e. Initiate an active ship cannibalization request via naval message. Appendix A of this chapter contains a sample cannibalization message with specific reporting requirements. This format must be utilized when requesting cannibalization.
- f. (Surface Force only) Initiate an active ship cannibalization request via naval message or e-mail per TYCOM guidance. Cannibalization correspondence should be addressed to TYCOM via ISIC. Appendix A of this chapter contains a sample cannibalization Naval message and Appendix B contains a cannibalization e-mail format.
- g. (Submarines only) INFO the following Plain Language Address Directory (PLAD) for all components that have a Last Maintenance Action Date assigned in the Planned Maintenance Requirements Inventories and Schedule: SUBMEPP PORTSMOUTH NH//DDS/SS//.

14.5.2 ISIC (Surface Force only)

- a. Ensure the criteria, specific reporting requirements and proper correspondence format for active ship cannibalization has been met.
- b. Nominate possible sources of cannibalization from ships within the force.
- c. Confirm that cannibalization is necessary and that all prerequisites for active ship cannibalization, including attempts to supply the components from afloat storeroom spares and system cannibalization, have been met.

NOTE: APPROVAL PROCESS AND AUTHORITY FOR ACTIVE SHIP CANNIBALIZATION IN SUPPORT OF FORWARD-DEPLOYED NAVAL FORCES (FDNF) PATROL COASTAL (PC) SHIPS IS DELEGATED TO COMMANDER, PATROL COASTAL SQUADRON ONE (PCRONONE). PCRONONE WILL PROCEED FROM HERE TO EXECUTE TYPE COMMANDER (TYCOM) RESPONSIBILITIES IN PARAGRAPH 14.6.1 WITH INFORMATIONAL REPORTING TO TYCOM.

- d. Request authorization from the TYCOM, as appropriate, to cannibalize from a ship within the force by endorsing the ship's request for cannibalization.
- e. Transmit concurrence **or** non-concurrence Naval message or e-mail to TYCOM.

14.6 CANNIBALIZATION AUTHORIZATION AND EXECUTION (Active Ship Cannibalization).

14.6.1 Type Commander.

- a. Monitor all cannibalization actions being carried out by subordinate units.
- b. Adjudicate and authorize **or** disapprove all requests for cannibalizations from ships within the force and provide direction concerning the method of payback to the cannibalized ship.
- c. If cannibalization is not feasible from a ship within the force, request assistance from other TYCOMs.
- d. Meet the reporting requirements contained in reference (c) by producing a monthly cannibalization report (format **or** template to be provided by U.S. Fleet Forces Command N41). This monthly cannibalization report is due to the Deputy Chief of Staff, Fleet Ordnance and Supply (N41), U.S. Fleet Forces Command no later than the 10th of the following month.

14.6.2 Type Commander **or** Immediate Superior In Command. TYCOM (or ISIC when assigned) will perform the actions listed:

- a. Monitor the delivery of cannibalized part(s) to the ship to ensure the parts are received as soon as possible.
- b. Request the appropriate Regional Maintenance Center to assist in performing the cannibalization, to include the removal of the cannibalized parts and providing rigging services, as appropriate.

14.6.3 Requesting Ship. When directed, the ship requesting the cannibalized part will:

- a. Assist the cannibalized ship, as requested, with the removal of the parts from the equipment.
- b. Ensure the outstanding requisition for the cannibalized parts remains active unless otherwise directed by the TYCOM or the supply inventory control point. This requisition is the payback and will be diverted to the cannibalized ship.

14.6.4 Cannibalized Ship. When directed, the cannibalized ship will:

- a. Remove the requested parts, prepare shipping documents, package the parts for shipment and deliver the items to the shipping activity, or deliver directly to the requesting ship, as appropriate.
- b. Keep the chain of command advised of the supply status of the required parts. The cannibalized ship should follow-up the outstanding requisition(s) and acknowledge receipt of payback material.

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APPENDIX A**SAMPLE CANNIBALIZATION REQUEST MESSAGE****(AIRCRAFT CARRIERS AND SURFACE FORCE SHIPS ONLY)**

FM USS (SHIP'S NAME)/(CANNIBALIZING SHIP)
TO TYCOM/ISIC/(AS APPROPRIATE)
INFO TYCOM/ISIC/(AS APPROPRIATE)
NAVSUP WEAPON SYSTEMS SUPPORT MECHANICSBURG PA/
(APPROPRIATE RMC AND/OR RMC DET)
SUBMEPP PORTSMOUTH NH/ (PARA 14.4.1.G) (AS APPROPRIATE)
SURFMEPP PORTSMOUTH VA/(AS APPROPRIATE)
USS (SHIP'S NAME)/(CANNIBALIZED SHIP PLAD)
BT
UNCLAS/N04400/
PASS TO OFFICE CODES: (AS APPROPRIATE)
SECINFO/U/-/
SUBJ/ACTIVE SHIP CANNIBALIZATION REQUEST//
MSGID/GENADMIN/USS (ORIGINATING SHIP'S NAME AND HULL NO.)//
REF/A/CASREP/USS (SHIP'S NAME)/(DTG)/
REF/B/DOC/COMUSFLTFORCOMINST 4790.3/
REF/C/DOC/OPNAVINST 4440.19F/
NARR/REF A IS CANNIBALIZING SHIP'S CASREP. REF B IS JOINT FLEET
MAINTENANCE MANUAL VOLUME VI, CHAPTER 14, PROVIDING TYCOM POLICY
ON ACTIVE CANNIBALIZATION. REF C IS POLICIES AND PRIORITY RULES FOR
CANNIBALIZATION OF OPERATIONAL EQUIPMENT AND DIVERSION OF
MATERIAL AT CONTRACTOR PLANTS TO MEET URGENT OPERATIONAL
REQUIREMENTS./
GENTEXT/REMARKS/1. TO CORRECT CASREP PER REF A ON BOARD USS
(CANNIBALIZING SHIP'S NAME) REQUEST ACTIVE SHIP CANNIBALIZATION PER
REF B AND REPORT CANNIBALIZATION DATA PER REF C. THE FOLLOWING
INFORMATION IS REQUIRED PER CANNIBALIZATION REQUEST/REQUISITION:
A. REQUISITION NUMBER (UIC-JULIAN DATE-SERIAL NUMBER) AND
CURRENT STATUS
B. REQUISITION REQUIRED DELIVERY DATE (RDD):
C. EQUIPMENT NOMENCLATURE/EQUIPMENT IDENTIFICATION CODE (EIC)
D. CASREP SERIAL NUMBER
E. COG SYMBOL/NSN/FSCM-PART NUMBER/NOMENCLATURE
F. APL NUMBER.
G. CIRCUIT SYMBOL (IF APPLICABLE OR N/A)
H. JOB CONTROL NUMBER (JCN) USED IN THE CASREP PARTSID/DATA SET
I. REQUIRED QTY/ALLOWANCE QTY/ON HAND QTY
J. PART SUPPORTS INTERMEDIATE MAINTENANCE OR REPAIR, YES OR NO
K. PART CARRIED ONBOARD THE OPERATIONAL UNIT, YES OR NO (SHOULD
COINCIDE WITH THE ALLOWANCE QTY)

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- L. PART AVAILABLE IN SUPPLY SYSTEM WHOLESALE, YES OR NO
YES=ASSETS ARE AVAILABLE IN THE SUPPLY SYSTEM BUT WILL NOT MEET RDD.
NO=ASSETS ARE NOT AVAILABLE IN THE SUPPLY SYSTEM.
 - M. IF ASSETS ARE AVAILABLE IN THE SUPPLY SYSTEM, PROVIDE THE ESTIMATED SHIPPING OR DELIVERY DATE.
 - N. PROVIDE JUSTIFICATION FOR CANNIBALIZATION WHEN ASSETS ARE AVAILABLE IN THE SUPPLY SYSTEM.
 - O. REASON PART NOT IN STOCK AT OPERATIONAL UNIT (E.G., CONSUMED, INSUFFICIENT QUANTITY, NOT CARRIED, ETC.)
 - P. REASON FOR NOT REPLENISHING (E.G., INSUFFICIENT FUNDING, NOT CARRIED, ETC.)
2. RECOMMENDED SOURCE IS (CANNIBALIZED SHIP'S NAME).
3. CANNIBALIZATION ACTION NECESSARY FOR (CANNIBALIZING SHIP'S NAME) TO MEET (E.G., UNDERWAY OPERATIONAL COMMITMENT, LIGHT OFF, ETC.)//

BT

NNNN

NOTE: PROVIDE HEADER DESCRIPTION IN ACTIVE CANNIBALIZATION REQUEST MESSAGE FOR LINE ITEMS 1.A THRU 1.P (E.G., D. CASREP SERIAL NUMBER).

NOTE: ENSURE MESSAGES ARE **FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.**

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APPENDIX B**SAMPLE CANNIBALIZATION REQUEST E-MAIL
(SURFACE FORCE SHIPS ONLY – BASED ON TYCOM GUIDANCE)**FM CO@DDGXX.NAVY.MIL (requesting ship)TO usff_cnsl_nrfk_acann@navy.mil

CC ISIC N4

DONOR ISIC N4 (ISIC of suggested cannibalized ship, if identified)

CO@DDGXX.NAVY.MIL (suggested cannibalized ship, if identified)PMOHQ.CDO@NAVY.MILDSCC-DMS-ColumbusOH@dla.milSURFMEPP.SYSTEMSENGINEERING@NAVY.MILOTHER STAKEHOLDER@ORIGINATORSDISCRETION.MILSUBJ USS *SHIPNAME* ACTIVE SHIP CANNIBALIZATION REQUEST

Body

1. To correct CASREP 15XXX, request active ship cannibalization for (system nomenclature and part nomenclature (i.e., 1A GTM Fuel Oil Purifier)):
 - A. Requisition number (UIC-Julian date-serial number) and current status
 - B. Requisition required delivery date (RDD): (Julian date)
 - C. Equipment system nomenclature **or** equipment identification code (EIC)
 - D. CASREP DTG
 - E. Cognizant symbol, NSN, cage-part number, part nomenclature
 - F. Acquisition advice code (single digit) **or** SM&R code (up to 7 digits)
 - G. APL number
 - H. Circuit symbol (if applicable or n/a)
 - I. Job control number (JCN) used in the CASREP PARTS ID **or** data set
 - J. Required QTY, allowance QTY **or** on hand QTY
 - K. Part carried onboard: yes or no (should coincide with the allowance QTY listed)
 - L. Part available in the supply system wholesale: yes or no (yes = assets are available in the supply system but will not meet RDD, no = assets are not available in the supply system)
 - M. Part supports intermediate maintenance or repair: yes or no: (intermediate maintenance: cannibalization was performed to support intermediate level maintenance or repair. Ships must check the SM&R code to validate the appropriate maintenance level)
 - N. If assets are available in the supply system, provide the estimated shipping or delivery date (ESD or EDD Julian date)
 - O. Provide justification for cannibalization when assets are available in the supply system (reason **or** justification or n/a)
 - P. Reason part not in stock at operational unit (e.g., consumed, insufficient QTY, not carried, etc.)
 - Q. Reason for not replenishing (e.g., insufficient funding, not carried, etc.)
2. Recommended source is (proposed donor ship's name)
3. Cannibalization action necessary for (cannibalizing ship's name) to meet (e.g., underway operational commitment, light off, etc.). (This justification must match the CASREP)

NOTE: DEFAULT TO NAVAL MESSAGE IF NECESSARY E-MAIL ADDRESSES ARE NOT KNOWN.

VOLUME VI
CHAPTER 15
AMMUNITION OFF-LOAD

REFERENCES.

- (a) NAVSEA OP-4 - Ammunition Afloat
- (b) NAVSEA S9086-CH-STM-030 - NSTM Chapter 074 V3 (Gas Free Engineering)

15.1 PURPOSE. This chapter provides guidance and actions to be taken concerning the status of shipboard ammunition and explosives for ships and craft entering an availability whose duration will be in excess of 6 weeks. Except for those instances where operational requirements dictate the exception, the policies of reference (a) **must** be adhered to. Operational requirements dictating non-compliance with reference (a) will be addressed in a Type Commander (TYCOM) request for waiver.

15.2 ACTION. Pyrotechnics (except those within life raft containers) and any ammunition which cannot be stowed in sprinkler-protected magazine spaces will be off loaded. Such magazine spaces need not be located below the main deck or waterline of the ship. All ammunition and pyrotechnics must be removed from ready service locations, launchers, and boats. Retention of other ammunition on board may be authorized on a case basis by the Naval Base Commander, Shipyard Commander or Supervisor of Shipbuilding (SUPSHIP), as applicable, provided the following mandatory requirements are met:

NOTE: TYCOM CONCURRENCE IS REQUIRED BEFORE AMMUNITION OFF-LOAD FOR AN AVAILABILITY.

- a. If an overriding operational requirement exists, precluding the off-load of all ammunition, the TYCOM will certify that requirement to the cognizant Shipyard Commander, SUPSHIP or Naval Base Commander, as applicable.
- b. Concurrence of the cognizant Shipyard Commander, SUPSHIP or Naval Base Commander must be obtained. This concurrence is based on an evaluation of the work to be done, the spaces involved, the security and damage control capabilities to be maintained on board during the availability, as well as other environmental factors.
- c. Within the ship, hot work of any type will not be performed in a space or compartment containing ammunition, or adjacent to a compartment or space containing ammunition. If either condition is expected to exist during the availability, the ammunition in the affected compartment must be off-loaded before starting the availability. For hot work required on external parts of the ship, the requirement for one intervening compartment may be waived by the Shipyard Commander **or** SUPSHIP, as applicable, if satisfied with the safety precautions to be taken. For all hot work in the ship, observe the safety and fire precautions in reference (b).
- d. Notification **must** be made to the base or industrial activities emergency services, including fire, security, safety and medical organizations, that ammunition remains on board.

- e. There **must** be no handling, re-stowage, test sampling or on **or** off-loading of ammunition while the ship is within an industrial activity.
- f. The ship's fire prevention and damage control organizations must remain in effect at all times throughout the availability.
- g. Placards and warning signs **must** be properly posted per reference (a) for specific spaces containing ammunition.

15.3 NOTIFICATION. When a ship or craft is scheduled to enter a commercial industrial activity, and approval has been granted to allow ammunition to remain on board, the United States Coast Guard Captain of the Port within whose jurisdiction the industrial activity is located, **must** be informed as to name and hull number of the ship, and the types and quantities of ammunition remaining on board. Should there be no cognizant Captain of the Port office, notify the cognizant Coast Guard District Commandant.

VOLUME VI
CHAPTER 16
HABITABILITY

REFERENCES.

- (a) OPNAVINST 9640.1 - Shipboard Habitability Program
- (b) NAVSEA S9600-AD-GTP-010 - U.S. Navy Shipboard Furniture Catalog
- (c) NAVSEA S6161-Q5-CAT-010 - Naval Shipboard Food Service Equipment Catalog
- (d) NAVSEA S6152-B1-CAT-010 - Laundry and Dry Cleaning Equipment Catalog
- (e) NAVSEAINST C9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships
- (f) NAVSEAINST 9210.14 - Changes to Submarine Tenders and Destroyer Tenders with Nuclear Support Facilities, Requirements Concerning
- (g) NAVSEA SL720-AA-MAN-030 - Navy Modernization Process Management and Operations Manual
- (h) COMNAVAIRFORINST 9640.1 - Control of Habitability Improvements in Aircraft Carriers

LISTING OF APPENDICES.

- A Table of Habitability Project Technical Requirements and Actions
- B Sample Habitability OPTAR Augment Funding Request
- C Advance Planning Milestones

16.1 PURPOSE. To provide guidance in the requirements for implementing various habitability programs, and to identify the sources of assistance available for these programs.

16.1.1 Policy. The Chief of Naval Operation's shipboard habitability policy, as set forth in reference (a), sets specific minimum standards for new construction and commissioned naval ships, establishes procedures for attainment, and assigns responsibility for implementation.

- a. Expenditure of ship's Operating Target (OPTAR) on habitability improvements, tools, and shipboard furniture and fixtures is considered a part of this program. Funds allocated to habitability must be obligated wisely to ensure the maximum, positive impact on shipboard quality of life.
- b. Procurement of furnishings, food service equipment and laundry equipment **must** conform to references (b), (c) and (d).
- c. Unauthorized alterations and rearrangements are prohibited.
- d. Changes to spaces or systems covered by references (e) and (f) **must** be approved by Naval Sea Systems Command (NAVSEA) and conform to the requirements of Chapter 3 section 3.8 of this volume.
- e. (Surface Force Ships and Aircraft Carriers only) All changes to Ship Configuration as a result of habitability improvements, repair or replacement, regardless of the

accomplishing activity, must meet the requirements of reference (g), Section 2 and Appendix A of this chapter.

16.1.2 Discussion. Shipboard habitability encompasses ship's systems and facilities which satisfy the basic human needs of the crew. Included are facilities and systems for eating, sleeping, personal hygiene, ventilation, climate control, and recuperative or leisure activity. Since funds are severely limited, a well-managed habitability program is essential to ensure ships conform to the minimum standards of shipboard habitability.

16.2 HABITABILITY IMPROVEMENT PROGRAMS.

16.2.1 Ship's Force Habitability Improvement Projects. A short-range program, initiated, planned and scheduled by the ship. This program uses ship's OPTAR funds, not to exceed \$25,000 per project, with the majority of the work being accomplished by Ship's Force.

- a. These projects are intended to be practical, workable, short-range projects representing the individual Commanding Officer's strategy for the enhancement of living quarters and personnel services areas on board ship.
- b. The emphasis of this program is to improve existing living conditions and the quality of life to meet the standards of reference (a) using Ship's Force labor and, when approved, special habitability fund augmentation. Allocation of these limited funds will be on a "fair share" basis in relation to Force requirements.
- c. Not all livability items fall within the purview of ship's habitability improvement projects or qualify for special habitability fund augmentation. Items of the following nature are not within the scope of this program.
 - (1) Replacement of consumable items such as mattresses, pillows, or utensils. These items should be programmed for regular OPTAR funding on an incremental basis.
 - (2) Improvements such as furnishings and lighting in working spaces and passageways which are more properly categorized as improvements in safety or operations.
 - (3) Unauthorized modifications or alterations. These modifications include alterations which affect compartment size or location, adding false bulkheads, overheads, or new equipment not previously installed.
 - (4) Normal ship maintenance and organizational repair responsibilities.
 - (5) The Deck coverings such as tile, terrazzo, etc. which are available via the Regional Maintenance Center (RMC) or Immediate Superior In Command (ISIC) Commercial Industrial Services contracts.
- d. Ship's OPTAR funds may be used to renew existing bulkhead sheathing and false overheads in food preparation, medical, dental, flag, Commanding Officer, Executive Officer, chapel, wardroom, and Chief Petty Officer (CPO) messing and lounge areas. Existing sheathing and false overheads in crew messing areas may be replaced when unserviceable. Sheathing and false overheads in all other areas will be removed when unserviceable and will not be replaced. There will be no new installations of bulkhead sheathing or false overheads.

- e. Due to the fiscal and physical limitations on this program, individual ships should develop a sensible, realistic and continuing plan for improving overall living conditions, with most of the work to be accomplished by Ship's Force.
- f. Commanding Officers may request funds to support an emergent Habitability Improvement Project through the chain of command at any time. The request should contain an itemized listing, in prioritized order, with location, nomenclature, National Stock Number (NSN), cost estimate, and other clarifying information.
- g. When requesting funds to replace food service equipment, comply with Type Commander (TYCOM) supply procedures. All requests must have clear and concise justification. Appendix B of this chapter provides a sample request letter.

16.2.2 Habitability Programs Under the Technical Sponsorship of Naval Sea Systems Command. These are programs under various titles that have evolved from the NAVSEA Habitability Program originally established in 1975. The common program element is approved NAVSEA title block drawings that define the scope and details for projects accomplished there under. These formalized programs are executed **following** long-range plans with the established goal of achieving and maintaining the Habitability Standards **issued** by reference (a) over the life of each ship.

- a. The TYCOM **must** authorize and fund individual habitability upgrade **and** refurbishment projects. For aircraft carriers, projects are **per** reference (h). Contractor services may be utilized for design and engineering support, procurement development and monitoring, and on board installation support. Installation support may be provided in the form of a Customer Contract Team (CCT) that accomplishes the full scope of the project or as professional technical advisor who assists untrained and inexperienced Ship's Force personnel with accomplishment of the work.
- b. The TYCOM is responsible for developing and maintaining the long-range five-year NAVSEA Habitability Life Cycle Program plan. Ships are selected for initial induction into the Program based on years in-service. Specific ensuing projects are based on non-compliance with criteria specified by reference (a), the general scope of habitability deficiencies as noted by the Board of Inspection and Survey, planned life cycle furniture replacement schedules, and other available documentation. Ship's Force input is encouraged.
- c. Design surveys are normally accomplished during Chief of Naval Operation's maintenance availabilities. Follow-on installation projects will be scheduled during subsequent maintenance availabilities until all designated compartments in each ship have been upgraded or received new furniture. Once all the designated compartments in any ship have been upgraded or refurnished, the process will repeat itself. That is, each compartment, after the initial upgrade, will be, **per** the TYCOM life cycle plan, scheduled for second and subsequent upgrades at specified intervals until such time that ship is removed from the program pending decommissioning.
- d. While the routine replacement of habitability hardware usually does not generate the requirement for changes to arrangements for ventilation, power and lighting, steam, support foundations, etc., more extensive projects such as upgrades may well generate these requirements. Where these changes result in requirements to increase the

capacity of the “hotel” systems providing support, a concurrent Ship Change Document (SCD) **per** reference (g) for upgrade of the “hotel” systems must be executed at TYCOM expense concurrent with the individual Program project. More detailed guidance in this area is provided by Appendix A of this chapter. Verification of whether or not SCDs are required to support individual projects may be made via the following TYCOM Codes:

- (1) COMNAVAIRPAC Shipboard Habitability Manager, Code N434A8.
 - (2) COMNAVAIRLANT Shipboard Habitability Manager, Code N431HE.
 - (3) COMNAVSURFPAC Shipboard Habitability Manager, Code N43TH.
 - (4) COMNAVSURFLANT Shipboard Habitability Manager, Code N436E6.
- e. Program projects should be prioritized in the following order.
- (1) Crew **and** CPO Berthing.
 - (2) Crew **and** CPO Sanitary Spaces.
 - (3) Troop Spaces.
 - (4) Food Preparation and Service Spaces.
 - (5) Laundry Spaces
- f. Per the authority of reference (a), the TYCOM may task and fund various agents including an RMC to accomplish the following:
- (1) Design habitability improvements for accomplishment by Forces Afloat or a CCT.
 - (2) Procure installation materials.
 - (3) Perform other management and engineering services.
 - (4) Provide installation or installation support services.

16.2.2.1 Program Responsibilities.

16.2.2.1.1 Chief of Naval Operations.

- a. Authorize Program.
- b. Establish shipboard habitability standards based on recommendations of Habitability Working Groups.

16.2.2.1.2 Naval Sea Systems Command.

- a. Establish technical policy.
- b. Approve furnishings, fixtures, materials, food service equipment and laundry equipment.
- c. Develop installation procedures.

16.2.2.1.3 Type Commander.

- a. The Habitability Program Manager **must** follow the Technical Requirements of Appendix A.

- b. Develop the Long Range Plan and establish priorities for attainment of standards. Provide these plans to the appropriate Expanded Planning Yard (EPY) updating plans as required.
- c. Plan, schedule, coordinate and monitor projects.
- d. Authorize, budget and fund the Program.

16.2.2.1.4 Regional Maintenance Center or Other Agent as Tasked and Funded by Type Commander.

- a. Solicit, award and administer contracts to support Program requirements for design, engineering and technical support and installation. Perform the duties of a Contracting Officer's Representative for the monitoring and oversight of Program contractors.
- b. Provide project coordination throughout the life of each project.
- c. Provide liaison with Fleet and TYCOMs, COMNAVSEASYSCOM, Naval Surface Warfare Center, Philadelphia Division (NAVSEAWARCEN PD) In-Service Engineering Agents (ISEA), Life Cycle Managers (LCM), Planning Yards, other RMCs and other naval activities.
- d. Upon induction of the first ship of each class into the Program, submit preliminary habitability space arrangement concepts or drawings to COMNAVSEA's NAVSEAWARCEN PD ISEA or LCM for verification of conformance to applicable ship habitability specifications and criteria (e.g., reference (a)). Submittal of concepts or drawings for follow-on ships of the class is not required, unless different space arrangements are proposed. Submit final habitability space arrangement drawings for NSWCPD ISEA review (prior to Planning Yard signature).
- e. Prepare, approve or task approval by the EPY NAVSEA drawings for the Program as required by Appendix A of this chapter. Provide copies of locally approved drawings to the EPY. (For nuclear-powered ships, drawings are submitted to the Hull Planning Yard or Reactor Planning Yard for review and approval.)
- f. Maintain a chronological record of all projects accomplished on each ship from the induction of the ship into the Program through decommissioning. This record includes initial ship check data, copies of all installation drawings, red-line drawings (if any) and other pertinent data.
- g. Identify and oversee the procurement of all required installation material. Maintain a material commodity database identifying all material approved for use under the Program.
- h. Prepare and update procurement specifications for habitability material.
- i. Identify requirements for Indefinite Delivery Indefinite Quantity Contracts to provide material for frequently used material items. (Contracts are normally awarded and administered by the Fleet Logistics Centers.)
- j. Operate material staging centers for the receipt, staging and shipping of project material.

- k. Perform quality assurance checks at material staging centers and onboard ships of new material and hardware. Prepare Quality Deficiency Reports and Reports of Discrepancy on requisitioned material as needed.
- l. Provide administrative assistance to the TYCOM in the preparation of long-range habitability improvement plans and related correspondence.
- m. Maintain a habitability web site to facilitate the dissemination of Program information.
- n. Respond to fleet requests for habitability assistance or support.
- o. Use NAVSEAWARCEN PD's web site to access Navy approved furniture, food service and laundry equipment of references (b), (c) and (d) at:
<http://usnhabeqptcatalog.gdit.com>.
- p. When required, request NAVSEAWARCEN PD ISEA or LCM support for approval of alternative food service, laundry equipment and furniture not found in references (b), (c) and (d). When required, request NAVSEAWARCEN PD ISEA or LCM to conduct equipment selection, evaluation and testing. Also, request NAVSEAWARCEN PD support for equipment Integrated Logistics Support packages (parts support via Allowance Parts Lists, Tech Manuals and Maintenance Index Pages, Maintenance Requirement Cards) and Coordinated Shipboard Allowance List support.

16.2.2.1.5 Supply Activity.

- a. Prepare, contract, and procure materials.
- b. Administer other associated contracts.

16.2.2.1.6 Ship Commanding Officer. (When projects are accomplished by Ship's Force.)

- a. Assign project manager and petty officer supervision for projects.
- b. Assign an adequate labor force for removal, space preparation, installation and required fire watches working under technical advisor supervision.
- c. Conduct training programs.
- d. Account for, coordinate all movement of, and store all project material as it is received on board.
- e. Coordinate all required tag-out or in paperwork and Work Authorization Forms.
- f. Dispose of all retrograde material generated by the project.
- g. Report changes affecting repair parts support to Naval Inventory Control Point. Technical data will be provided to the ship by the Agent preparing installation drawings.
- h. Report completion to the TYCOM with summary of lessons learned.
- i. Ensure Ship's Selected Records are updated, as appropriate. Technical data will be provided to the ship by the Agent preparing installation drawings.

16.2.2.2 Project Milestones. Advanced Planning milestones for scheduled projects are listed in Appendix C of this chapter for aircraft carriers and submarine forces and Volume II, Part II, Chapter 2, Appendix D of this manual for surface force ships.

16.2.2.2.1 Advance Planning Notice (Surface Force Ships only). This TYCOM generated notice identifies Projects proposed for accomplishment, and provides work scope details including, if applicable, Ship's Force manpower requirements. This notice also requests Commanding Officer's comments, concurrence, and commitment of resources to the proposed projects.

16.2.2.2.2 Advance Planning Notice (Aircraft Carriers only). Habitability projects are entered into the Availability Work Package. Volume II, Part I, Chapter 3 of this manual provides guidance in the development and revision of the Availability Work Package.

16.2.2.2.3 Project Confirmation Notice. Following receipt of the Commanding Officer's concurrence with the proposed work scope and commitment of resources, the TYCOM confirms the projects. Thereafter, any modification or change to the scope of the projects will adversely affect scheduled milestones and could result in project deferral or cancellation.

16.2.2.2.4 Project Authorization. (Applicable to projects accomplished by Ship's Force.) Upon receipt of the Commanding Officer's project start request, normally about two weeks before the start of the maintenance availability, the TYCOM evaluates readiness to begin the project and authorizes the project to be started. Rip-out **must** not proceed until receipt of this authorization.

16.2.2.3 Project Completion Report. (Applicable to projects accomplished by Ship's Force.) Following completion of the project, the Commanding Officer **must** prepare a letter describing the project experience, which will be used by the TYCOM to update planning and installation practices. The letter should include the name and designation of the project, funds expended, certification that Integrated Logistics Support procedures have been followed, and any significant problems encountered, improvement recommendations, or lessons learned. Completion letters on all authorized projects should be forwarded via the chain of command to the TYCOM.

16.2.2.4 Integrated Logistics Support Reporting. For projects accomplished by Ship's Force, the ship is responsible for submitting any necessary OPNAV 4790/CK forms for Coordinated Shipboard Allowance List support. Technical data will be provided to the ship by the Agent preparing installation drawings. For projects accomplished by a CCT, the requirements of NAVSEA Standard Item 009-21 **must** be invoked.

16.3 NEW CONSTRUCTION SHIPS. U.S. Navy ships are built to meet the habitability standards of reference (a). Prior to certifying the ship's readiness for In-Service, the ISIC will conduct a Habitability Inspection to determine that the ship is materially ready for the crew to move aboard. The results of the Habitability Inspection **must** be reported to the TYCOM by message per Volume I, Chapter 3 of this manual.

16.4 NAVAL AIRPAC AND AIRLANT SPECIFIC HABITABILITY IMPROVEMENT PROGRAMS.

16.4.1 Aircraft Carrier Climate Control Improvement Team.

- a. The Aircraft Carrier Climate Control Improvement Team (ACCCIT) provides technical assistance to improve aircraft carrier habitability through specific improvements to air conditioning, heating, and ventilation systems serving manned spaces. The TYCOM schedules an ACCCIT visit every 12 to 15 months, but no greater than 24 months.

- b. 30 days prior to the visit, the ship will provide a list of 50 spaces the ship requests to be inspected to the Commander, Naval Air Force Program Manager. Criteria for the spaces to be nominated are:
 - (1) Normally manned.
 - (2) Spaces are being utilized as designated. Voids **and** storerooms that have been converted to offices **or** workshops by Ship's Force without alteration authorization will not be investigated.
 - (3) Space has not been investigated during a previous ACCCIT unless all discrepancies were corrected and a problem still exists.
 - (4) Main Propulsion and Auxiliary machinery spaces.
 - (5) Food Device and Laundry Spaces.
- c. During the visit, the team will provide On the Job Training for Ship's Force, validate alteration requirements, validate Planned Maintenance System coverage and assist in the preparation of Current Ship's Maintenance Project (CSMP) deferrals to document discrepancies found. Additionally, with Ship's Force assistance, the team will correct deficiencies as they are discovered if within their capability. Upon completion of the visit, a formal report will be issued listing discrepancies discovered, status of each, correction responsibility and recommended alterations. All corrected and uncorrected discrepancies identified during each survey will be submitted in electronic format (M0001 file) for submission into the ship's CSMP. The TYCOM will utilize this report to conduct follow-up shipchecks to track completion of discrepancies.

16.4.2 Food Service and Laundry (Commander Naval Air Force Pacific) **and** Enhanced Quality Of Life Program (Commander, Naval Air Force Atlantic).

- a. The Food Service and Laundry (FS&L) and the Enhanced Quality Of Life (EQOL) Programs were developed to achieve and maintain high standards of material and operational readiness of food and hotel services equipment through intensified work definition, configuration analysis, corrective maintenance, and programmed and emergent equipment replacements.
- b. The FS&L **and** EQOL programs are a cooperative teaming effort involving the Aircraft Carrier TYCOM and Ship's Supply Department. The TYCOM will provide program management, labor funding and administer material procurement. The TYCOM will provide funding and oversight for material procurement. Ship's Force is instrumental in determining the requirements and opportunity for correction of material deficiencies. The FS&L **and** EQOL programs key objectives are:
 - (1) Advance planning.
 - (2) Technical expertise and continuity.
 - (3) Standardization of approved shipboard food service **and** laundry equipment.
 - (4) Achievement of full Allowance Parts List supportability.
 - (5) Maintenance and grooming support planning.
 - (6) Maintenance training for Ship's Force personnel.

- c. The replacement of food service or laundry equipment usually does not generate the requirement for changes to arrangements of ventilation, electrical, piping systems, and support foundations, etc. However, where changes result in net compartment increase to the capacity of the “hotel” systems providing support, or change the physical configuration of the ship’s structure, an SCD **per** reference (g) for upgrade of the “hotel” systems must be executed at TYCOM expense. The FS&L **and** EQOL programs are not intended to supplant the SHIPMAIN Entitled Process. All equipment replacements will consist of equipment that has been approved for shipboard use **per** references (b), (c) and (d) or by NSWCPD ISEA **or** LCM, including the interchangeability of like equipment.
- d. Not all food service or laundry equipment falls within the purview of the FS&L **and** EQOL programs. Items of the following nature are not within the scope of this program.
 - (1) Repair **or** replacement of non-approved equipment.
 - (2) Unauthorized modifications or alterations. These modifications include alterations which affect compartment size or location, adding false bulkheads, overheads, or new equipment not previously installed.
 - (3) Normal ship maintenance and organizational repair responsibilities.
 - (4) Deck coverings in spaces other than food service and laundry spaces.

APPENDIX A

TABLE OF HABITABILITY PROJECT TECHNICAL REQUIREMENTS AND ACTIONS

REQUIREMENT ATTRIBUTE	HABITABILITY IMPROVEMENT PROJECT TYPE			MODERNIZATION SCD REQUIRED	MINIMUM ACTION REQUIRED
	REPAIR	UPGRADE	REPLACEMENT		
Requires change in berthing capacity below CNO requirements		X	X	X	Process and execute SCD
Requires new berthing arrangement or design within existing compartment		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Requires new Head arrangement or design within existing compartment		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Requires new Lounge Area arrangement or design within existing compartment		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Replace lockers, berths, furniture, fixtures, food service or laundry equipment of exact same design within same frames, power supply and footprint	X				Use existing drawings to generate Bill of Material
Requires increased ventilation capacity to compartment		X	X	X	Process SCD, install in conjunction with Habitability Improvement Project
Requires rerouting of ventilation within existing capacity		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Requires increased electrical capacity to compartment		X	X	X	Process and execute SCD
Requires use of spare breaker		X	X		Task Expanded Planning Yard to review and approve drawings

TABLE OF HABITABILITY PROJECT TECHNICAL REQUIREMENTS AND ACTIONS

REQUIREMENT ATTRIBUTE	HABITABILITY IMPROVEMENT PROJECT TYPE			MODERNIZATION SCD REQUIRED	MINIMUM ACTION REQUIRED
	REPAIR	UPGRADE	REPLACEMENT		
Requires rerouting of electrical cables within existing capacity		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Requires increased steam capacity, chill water capacity, etc. to compartment		X	X	X	Process and execute SCD
Requires rerouting of steam piping, chill water piping, etc. within existing capacity		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Requires modification of living space sprinkler system within existing capacity		X	X		For non-nuclear powered ships, provide drawings to Planning Yard. For nuclear powered ships, comply with NAVSEAINST C9210.4A.
Requires additional sprinkler heads(s) to maintain adequate coverage (Per PY review)		X		X	Process SCD, install in conjunction with Habitability Improvement Project

16 Oct 2019

APPENDIX B**SAMPLE HABITABILITY OPTAR AUGMENT FUNDING REQUEST**

From: Commanding Officer, USS (Ship's Name and Hull No.)

To: TYCOM (as appropriate)

Subj: HABITABILITY OPTAR AUGMENT FUNDING REQUEST

Ref: (a) (Cognizant Fleet and TYCOM Instructions)

1. Request approval of a special OPTAR augmentation per reference (a) in the amount of (dollar amount) for the quality of life improvement project(s) as **listed**:

PRIORITY	NOMENCLATURE or NSN	QTY	COST EST

1	(Item description, location, etc.)		

2			

3			

TOTAL COST EST:

2. JUSTIFICATION (Conditions necessitating accomplishment of projects)

3. POINT OF CONTACT (Name, DSN **or** Comm telephone number, e-mail address, etc.)

COPY TO:

ISIC (as appropriate)

APPENDIX C

ADVANCE PLANNING MILESTONES

<u>MILESTONE (A-MO)</u>	<u>ACTION</u>	<u>EVENT</u>
A - 23	TYCOM	ESTABLISH PLANNING ESTIMATE. TASK RMC WITH DESIGN SHIPCHECK
A - 22	RMC or AGENT	SHIP VALIDATION AND COMMENCE DESIGN
A - 14	TYCOM	SEND HABITABILITY PROJECT ADVANCE PLANNING NOTICE (SURFACE SHIPS)
A - 13	SHIP	INDICATE CONCURRENCE OR COMMITMENT TO PROJECT(S) TO TYCOM. ENTER PROJECTS(S) IN CSMP
A - 12	TYCOM	CONFIRM PROJECT
A - 9	TYCOM (AIRCRAFT CARRIERS)	ENTER PROJECTS IN AVAILABILITY WORK PACKAGE (AWP)
A - 8	PMS 312C (CVNs), SHIP, TYCOM (AIRCRAFT CARRIERS)	PROJECT REVIEW CONFERENCE (PRC)
A - 8	RMC OR AGENT	PREPARE SPECIFICATION DEVELOPMENT PACKAGE AND FORWARD TO APPROPRIATE PLANNING ACTIVITY
A - 8	RMC OR AGENT	PREPARE MATERIAL REQUISITIONS
A - 7	RMC OR AGENT	SEND REQUISITIONS TO FLEET LOGISTICS CENTER
A - 6	RMC OR AGENT (SURFACE SHIPS)	ISSUE DRAWINGS TO EPY
A - 2	RMC, AGENT OR SHIP	PROJECT KICK-OFF BRIEFING
A	SHIP OR RMC AGENT	START AVAILABILITY OR PROJECTS
COMP	SHIP (APPLICABLE TO PROJECTS ACCOMPLISHED BY SHIP'S FORCE)	SEND COMPLETION REPORT

VOLUME VI

CHAPTER 17

IMPRESSED CURRENT CATHODIC PROTECTION

REFERENCES.

- (a) NAVSEA S9086-VF-STM-010 - NSTM Chapter 633 (Cathodic Protection)

17.1 PURPOSE. To provide guidance for the submission of Cathodic Protection Logs, as required by reference (a) and post dry-docking system activation. The contents of this chapter are applicable to all classes of ships that are outfitted with Impressed Current Cathodic Protection (ICCP).

17.2 CATHODIC PROTECTION LOGS. Logs **must** be maintained as part of the system operating procedures and be retained by the ship for a period of two years.

17.2.1 Surface Force Ships. All ships with installed ICCP systems **must** submit logs monthly per reference (a), using Naval Sea Systems Command (NAVSEA) Form 9633/1 or equivalent, no later than 15 days after the last day of the reporting month to the Cathodic Protection In-Service Engineering Activity (**ISEA**), Naval Surface Warfare Center, Philadelphia Division (**NAVSEAWARCEN PD**). **NAVSEAWARCEN PD** will review the ICCP log data and provide an electronic mail response to each ship within 15 working days indicating log receipt and system operational status.

17.2.2 Naval Air Force Ships. All aircraft carriers with installed ICCP systems **must** submit logs monthly per reference (a), using NAVSEA Form 9633/1 or equivalent, to the Cathodic Protection **ISEA NAVSEAWARCEN PD** no later than 15 days after the last day of the reporting month. **NAVSEAWARCEN PD** will review the ICCP log data and provide a naval message response to each ship within 15 working days indicating ICCP log receipt and system operational status.

17.2.3 Submarine Force Ships. All submarines with installed ICCP systems **must** submit monthly logs using NAVSEA form 9633/2 or equivalent to the Performance Monitoring Team (PMT) no later than 10 days after the last day of the reporting month, or upon return to homeport. PMT will then upload data to **Submarine Maintenance Monitoring Information Systems (SMMIS)**. **NAVSEAWARCEN PD** Code 332 will review the data and provide feedback to PMT to initiate the OSAR process to correct any necessary deficiencies or optimize system operational status.

17.3 POST DRYDOCKING ACTIVATION. Guidance on the activation of the ICCP systems after undocking:

- a. The Cathodic Protection System should be activated as soon as electrical power is available. Early activation is encouraged to counteract stray electrical currents from waterborne welding or other industrial activity evolutions which may cause hull deterioration by electrolysis. If the ICCP system cannot be actuated within two hours following undocking, the Type Commander **or** Immediate Superior In Command must be notified.

- b. If the cathodic protection components have been removed or power to all components is not available within 24 hours after undocking, alternate provisions should be made for activating part of the system if possible. Hull potentials can be monitored using the ship's controller reference electrode (silver-silver chloride) in conjunction with a portable volt-ohm meter.

NOTE: ALL VOLTAGES REFERENCED ARE DIRECT CURRENT.

- c. If the system cannot be activated within three days of undocking, provisions should be made to ensure hull integrity by taking daily hull potential readings. Without cathodic protection, the acceptable hull potential range is 0.60 to 0.80 volts with respect to a silver-silver chloride reference cell. If daily readings are more electropositive than 0.55 volt or if changes in hull potentials greater than 0.1 volt occur, welding practices should be checked or a temporary system capable of maintaining the hull at 0.85 plus or minus 0.05 volts should be provided.
- d. Where major underwater hull painting (not including touch up) has been performed less than seven days before undocking, caution should be exercised to avoid hull potentials greater than 1.00 volt to a silver-silver chloride reference cell until after the seven-day curing period. During the seven-day curing period, if the hull potential exceeds 1.00 volt, secure part or all of the system to avoid any effect on the hull coating. After a seven-day cure, proper navy hull coating systems are not affected by the higher hull voltages attainable with ICCP systems.

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CHAPTER 18
INFLATABLE LIFE RAFTS

REFERENCES.

- (a) NAVSEA S9086-TX-STM-010 - NSTM Chapter 583 (Boats and Small Craft)
- (b) NAVSEA S9008-AA-PRO-010 - Lifeboat, Inflatable, MK6, MK7 and MK8 Inspection, Test and Repair Procedures
- (c) NAVAIR 13-1-6.1 - Aviation Crew Systems, Chapter 7 (LRU 13/A)
- (d) NAVSEA TW024-AA-ORD-010 - Unserviceable, Suspended, and Limited Use Ammunition
- (e) NAVSUP Publication 485 - Afloat Supply Procedures

18.1 PURPOSE. To provide guidance for the maintenance, repair, certification and procurement of life rafts used onboard naval ships and craft. An inflatable life raft is one constructed of a coated fabric and inflated to its design shape by air or other gas. The raft is stowed aboard ship for use only as a life raft, when and as directed by the Commanding Officer or Officer In Charge.

18.2 FLEET LIFE RAFT PROGRAM. The United States Fleet Forces Command Maintenance Officer has delegated Fleet Life Raft Program management responsibilities to the Type Commanders (TYCOM) including the establishment of policy guidelines. Policy will be disseminated to the Fleet and Naval Sea Systems Command certified Regional Maintenance Centers (RMC), Ship Repair Facilities (SRF) and Fleet Maintenance Activities (FMA) for the scheduling, planning, and recertification of life rafts. For Surface Force Ships only, TYCOMs will have a designated Life Raft Program Manager (LRPM) assigned. Commander Naval Surface Force Atlantic (Code N43E) and Commander Naval Surface Force Pacific (Code N43SB) are designated Fleet Life Raft Program Managers.

18.3 TYPES OF INFLATABLE LIFE RAFTS. There are 3 basic Navy type inflatable life rafts for use throughout the fleet (ships and aircraft):

- a. 25-Person (MK-7 Mod 1 and Mod 2) air inflated life raft - currently carried by surface force ships, aircraft carriers and service craft, encapsulated in a fiberglass container.
- b. 50-Person (MK-8 Mod 1 and Mod 2) air inflated life raft - currently carried by aircraft carriers, encapsulated in a fiberglass container.
- c. Person (LRU 13/A (formerly MK-2)) CO₂ inflated life raft currently carried by aircraft, certified to Naval Air Systems Command (NAVAIR) requirements.

18.4 COMMERCIAL LIFE RAFTS. Various commercial Coast Guard approved life rafts are installed on board certain craft, aircraft and Navy ships for service and in-service evaluation testing. The cognizant command is responsible for recertification requirements for their commercial life rafts.

18.5 RECERTIFICATION. The periodicity of recertification will be as designated by **Planned Maintenance System** requirements.

- a. Recertification is based on **Planned Maintenance System** periodicity starting from the recertification date **stamped** on the outside of the life raft container.
- b. If the certification date is not **present on the data plate** on the outside of the life raft container or verified from the ship's life raft log inspection, recertification records, or unavailable by scanning and electronic remote identification, life raft certification will be considered expired.

18.6 LRU 13/A LIFE RAFTS. The responsible NAVAIR command will provide guidance for the procurement, certification, and disposition of LRU 13/A life rafts (aircraft).

18.7 AUTOMATED TRACKING SYSTEM. A **U.S. Navy life raft** data base is maintained by Naval Surface Warfare Center, Carderock Division Detachment, Norfolk VA (**NAVSURFWARCEN CDDN**), for tracking the Navy MK-7 and MK-8 life raft population **and** certification. Life raft records and information may be accessed at https://watercraft.dc3n.navy.mil/cbss21/cbss21_default.asp. Submit e-mail request to "CRDR_LC_WatercraftAdmins@navy.mil" for access.

18.8 RESPONSIBILITIES.

18.8.1 Commanding Officer or Officer In Charge.

- a. Submitting an OPNAV 4790/2K to the **Regional Maintenance Center (RMC), Ship Repair Facility (SRF) or Fleet Maintenance Activity (FMA)** for any life raft requiring replacement or recertification. For recertification, the OPNAV 4790/2K should be submitted no sooner than 6-months prior to the expiration date **present** on the outside of the life raft container (or date verified by the ship's life raft log). Arrange with the **RMC, SFR or FMA** for transfer and shipping of rafts to facilitate schedules.
- b. Maintaining a log of all life rafts on board **per PMS**.
- c. Send a report to **NAVSURFWARCEN CDDN**, at "CRDR_LC_WatercraftAdmins@navy.mil", the **respective** Type Commander (**LRPM**) and the recertification **or** repair facility **upon receipt of new life rafts**, if any life raft is lost, **unaccounted for, damaged**, or transferred to another ship. Reports should include the life raft serial number, manufacturer's name, recertification facility and a description of the circumstances.
- d. Ensure life raft fiberglass containers are handled with care using appropriate **certified lifting** slings. Life rafts are not to be rolled or stood on-end. Life rafts will be placed with the top up, in racks, with the container seal or canister joint in the horizontal position.
- e. Upon notification of decommissioning, **contact** the **respective** TYCOM **LRPM**, for **life raft** disposition instructions.

NOTE: ONLY AUTHORIZED LIFE RAFT REPAIR FACILITIES ARE APPROVED TO MAINTAIN AND OPERATE A LIFE RAFT CONTINGENCY POOL.

18.8.2 Fleet RMC, SRF, and FMA Life Raft Repair Facility.

- a. Manage and dispose of life raft contingency pool assets. A contingency pool is not to exceed 100 life rafts unless approved by TYCOM LRPM. Restock life rafts for the contingency pool from decommissioning assets, as available. If no assets are available, procure life rafts using Repair Other Vessel funds as a last option to facilitate scheduling.
- b. Life rafts lost or considered beyond economical repair may be replaced with contingency pool assets. If contingency pool assets are not available, notify the ship to requisition replacement life rafts.
- c. Interface with the TYCOM LRPM, as required, in support of scheduling, coordinating recertification, repair and the contingency pool.
- d. Upon receipt of screened OPNAV 4790/2K, repair or recertify life rafts to a Level "C" Plan in accordance with references (a), (b), PMS or Volume V of this manual, as applicable.
- e. Maintain an equipped Life Raft Facility with qualified repair personnel to conduct repairs or recertification of life rafts as indicated below:

NOTE: FACILITY CAPABILITIES AND PERSONNEL QUALIFICATIONS WILL BE AUDITED BY NAVSURFWARCEN CDDN AND TYCOM REPRESENTATIVES ON AN ANNUAL BASIS OR AS A SITUATION DICTATES.

- (1) A minimum of 75 percent of all personnel assigned to the life raft shop **must** have received formal NAVSURFWARCEN CDDN training and certification in Level "C" repair.
- (2) Conduct and document annual training and the level of On-the-Job Training in Level "C" repair of all shop personnel.
- (3) Appoint in writing, 2 life raft repair coordinators, E-6 or above, **or equivalent civilian grade**, who has received formal NAVSURFWARCEN CDDN training in Level "C" repair.
- (4) Appoint in writing, a signal flare coordinator, E-4 or above, **or equivalent civilian grade**, who is trained in handling ordnance and is responsible for the coordination and installation of signal flares in all life rafts.
- (5) Maintain copies of all technical manuals, maintenance bulletins, correspondence and messages pertaining to life raft maintenance and repair.
- (6) Maintain accountability of signal flare kits **per** reference (d).

18.8.3 TYCOM Life Raft Program Manager.

- a. Establish contingency pool requirements for MK-7 and MK-8 life rafts and communicate fleet requirements to respective Fleet RMC, SRF, or FMA.
- b. Set priorities for the disposition of life rafts throughout service life.
- c. Interface, and coordinate with United States Fleet Forces Command, NAVSURFWARCEN CDDN, RMC, SRF, FMA, NAVSUP WSS, and Ship's maintenance in the management of the Fleet Life Raft Program.

- d. Resolve issues requiring final decisions involving TYCOM ships and crafts.

18.9 UNSERVICEABLE OR REJECTED LIFE RAFTS. RMC, SRF, FMA life raft repair facility, ship or craft will process unserviceable or rejected life rafts in this manner:

- a. Life rafts that have reached the end of service life are considered unserviceable per reference (a) and should be turned in to respective RMC, SRF or FMA for disposal. Procure new life rafts using ship or craft OPTAR funds. Ships and crafts are not authorized to dispose of life rafts.
- b. Mark-7 and Mark-8 life rafts typically have a 25-year service life. Mark-7 and Mark-8 life rafts manufactured by Inflatable Survival Systems Inc. (ISSI)/RFD Beaufort prior to July 2015 will be removed from service upon reaching 15-years of age or a total of four repacks, whichever occurs first.
- c. Report survey results to NAVSURFWARREN CDDN.

18.10 DEPARTURES FROM SPECIFICATIONS. Departures from Specifications will be submitted per Volume V, Part I, Chapter 8 of this manual. Departures greater than six months beyond certification periodicity will be classified as major.

18.11 RECORDS. The RMC, SRF or FMA life raft repair facility must maintain an auditable record for 5 years of all life raft transactions, including repairs, replacements, and recertification. These records must include:

- a. Copies of all **Inflatable Life Raft Recertification Records** issued for recertified life rafts.
- b. Job Sequence Numbers, serial numbers, and the manufacturer's name of each rejected life raft.
- c. The condition of the rejected life rafts.
- d. The disposition of the rejected life rafts and components salvaged.
- e. **Lot Sample Record**.

VOLUME VI**CHAPTER 19****MAINTENANCE AND MATERIAL MANAGEMENT****REFERENCES.**

- (a) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ship's Maintenance and Material Management (3-M) Manual
- (b) NAVEDTRA 43241 - Personnel Qualification Standard for Ship's Maintenance and Material Management (3-M) System
- (c) NAVSEA 0989-LP-043-0000 - Commissioned Surface Ship General Reactor Plant Overhaul and Repair Specification
- (d) NAVSEA 0989-LP-037-2000 - Commissioned Submarine General Reactor Plant Overhaul and Repair Specifications

LISTING OF APPENDICES.

- A 3-M System Inspection Procedures
- B Format for Reporting 3-M Assessments
- C Listing of Standard Work Center Codes
- D Listing of Standard Work Center Codes for Master Job Catalog Items Contained in Ship's CSMP (Surface and Submarine Forces only)
- E Job Originator Values
- F Shipyard Alteration Certification Letter and Ship's Endorsement Examples
- G Preparation Instructions Configuration Change Form (OPNAV 4790/CK)
- H Preparation Instructions Maintenance Action Form (OPNAV 4790/2K)
- I Preparation Instructions Supplemental Form (OPNAV 4790/2L)
- J Work Candidate and JSN Log Example

19.1 **PURPOSE.** To provide guidance for the implementation of policies for the Maintenance and Material Management (3-M) system as set forth in reference (a).

19.2 **POLICY.** Material Readiness, a key component of Warfighting Readiness must be supported throughout the Chain of Command with clear and concise directives, maintenance requirements and maintenance procedures. The foundation of a positive shipboard or unit maintenance culture, a precursor to sound Material Readiness is proactive leadership. Senior leadership (Commanding Officer or Officer In Charge, Executive Officer, Command Master Chief or Chief of the Boat and the 3-M Coordinator) is responsible for establishing this culture by promoting critical Self-Assessments, faithfully conducting Zone Inspections, accurately reporting accomplishment of maintenance and maintaining an accurate Current Ship's Maintenance Project (CSMP) to include aggressively working to correct CSMP reported deficiencies.

19.3 **SCOPE.** This chapter applies to all ships, service craft, small boats, Type Commander (TYCOM) cognizant shore activities and non-aviation fleet test and support equipment, except as exempted in paragraph 19.3.b and c of this chapter. This includes, but is not limited to, Navy Meteorological Equipment, Naval Air Traffic Control Equipment, Air Navigation and Landing Systems Equipment, Aviation Launch and Recovery Equipment and activities under the

cognizance of Commander Naval Expeditionary Combat Command (NECC). This chapter also applies to Commander Naval Information Forces (CNIF), Commander Navy Installations Command (CNIC), Commander Naval Reserve Force, Naval Personnel Development Command, Training Commands and Mission Package Support Facility (MPSF).

- a. Any departure from the policies, procedures or responsibilities delineated in reference (a) are not authorized without prior Naval Sea Systems Command (NAVSEA) approval and Chief of Naval Operations (CNO) concurrence.
- b. This chapter does not apply to:
 - (1) Fleet Ballistic Missile systems under the cognizance of Strategic Systems Programs (SSP).
 - (2) Nuclear power plants and associated test equipment under the cognizance of Naval Sea Systems Command Nuclear Propulsion Directorate (NAVSEA 08).
 - (3) Aeronautical equipment used in support of the aviation maintenance mission.
 - (4) Civilian operated and maintained ships, small boats and service craft, unless specifically included in a Base Operating Contract or other similar document.
- c. NECC damage control equipment. In instances where damage control equipment is not under contract for maintenance from civil entities and falls under the responsibility of a given Work Center, it must be maintained per command-generated instruction.

19.4 SHIP MAINTENANCE AND MATERIAL MANAGEMENT.

19.4.1 Responsibilities.

19.4.1.1 In-Service Engineering Activity. An In-Service Engineering Activity (ISEA) is an activity designated by NAVSEA as the technical expert for specific systems and equipment. Naval Surface Warfare Center (NAVSURFWARCEN) Philadelphia Detachment, for example, is the ISEA for the majority of non-nuclear Hull, Mechanical and Electrical equipment. ISEA responsibilities include but are not limited to the following:

- a. Development of Planned Maintenance System (PMS) documentation to include validation of newly developed or changed procedures.
- b. Maintenance of PMS documentation.
- c. Timely responses to Feedback Reports (FBRs).
- d. Providing copies of urgent FBR resolutions to all holders of the affected Maintenance Index Page (MIP) or Maintenance Requirement Card (MRC). All other resolutions will be integrated into the next available Force Revision (FR).

19.4.1.2 Naval Sea Logistics Center Detachments. Naval Sea Logistics Center (NAVSEALOGCEN) Detachments responsibilities include but are not limited to the following:

- a. Maintain the Navy PMS Database.
- b. Receive, screen and process FBRs.
- c. Resolve FBRs within their technical capability.
- d. Develop and distribute FRs as required.

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19.4.1.3 Submarine Maintenance Engineering, Planning and Procurement Activity. Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) is a NAVSEA engineering activity chartered to support NAVSEA and the submarine TYCOMs in their effort to maintain a high degree of Submarine Force Material and Operational Readiness. In support of 3-M, SUBMEPP is tasked by NAVSEA, SUBLANT and SUBPAC with the following:

- a. Act as the TYCOM screening activity for FBRs submitted by Submarine Force activities.
- b. Maintain the Submarine Force Technical Feedback Report History Tracking (TFBR HT) Program.
- c. Establish, maintain, update and distribute all requirements as Master Job Catalog (MJC) Items in support of TYCOM Alteration Management System, Periodic Maintenance Requirements (PMR), Baseline Overhaul Work Packages, Selected Restricted Availability (SRA) Routines and Standard Availability Routines.
- d. Liaison with ISEAs and **NAVSEALOGCEN** Detachments to ensure submarine FBRs receive accurate and timely responses.
- e. Assist with the installation of PMS on all new construction submarines.

19.4.1.4 TYCOM. Exercises primary responsibility for the effective operation and support of the 3-M System. Areas of responsibility include but are not limited to the following:

- a. Afloat Maintenance Data System (MDS).
 - (1) Ship's Non-Tactical Automated Data Processing System (SNAP) I/II/III Organizational Maintenance Management System (OMMS).
 - (2) Optimized Ship's Non-Tactical Automated Data Processing System (Optimized SNAP) (R-Admin, R-Supply, Organizational Maintenance Management System – Next Generation (OMMS-NG)).
 - (3) Mission Readiness Assessment System.
- b. Ashore MDS.
 - (1) Maintenance Figure of Merit (MFOM) Family of Systems.
 - (2) Advanced Industrial Management for Regional Maintenance Centers (RMC).
 - (3) Regional Maintenance Information System (RMAIS). To be replaced by Validation, Screening and Brokering (VSB).
 - (4) Maintenance Resource Management System (MRMS).
 - (5) TRIDENT Logistical Data System.
- c. PMS Scheduling (SKED software).
- d. Alteration Management System.
 - (1) Navy Data Enterprise.
 - (2) Type Commander Alteration Management System.
- e. Current Ship's Maintenance Project.

- f. Master Job Catalog.
- g. The screening and processing of FBRs.
- h. Maintaining an Inspection Data File per Appendix A.
- i. Providing program enhancement requirements to the respective Fleet Commander via N43.
- j. Ensuring ships and units are manned with a Ship's Maintenance Management Officer (SMMO) (Surface Force ships).
- k. Ensuring ships and units are manned with NEC qualified 3MCs.
- l. Analyzing 3-M Inspection and Self-Assessment data, identifying common concerns, conducting root cause analysis, development and implementation of solutions.
- m. Ensuring TYCOM inspection team members are qualified to inspect assigned areas.

19.4.1.5 TYCOM 3-M Regional Representatives (Submarines only). TYCOM 3-M Regional Representatives have been established at all submarine homeports. These positions were established to provide for the continuous monitoring of the 3-M program on submarine assets and to assist Submarine Force Activities and Squadron Commanders in the operation and administration of the 3-M Program. Areas of responsibility include but are not limited to the following:

- a. Acting as team "lead" for all 3-M Inspections conducted on activities under their cognizance and using the format of Appendix B, provide inspection results to the ship or activity via the Immediate Superior In Command (ISIC).
- b. Originating all correspondence relating to 3-M Inspections, Periodic Monitoring and reporting of non-compliance with CNO WASHINGTON DC/YMS: 941107/4790.4C and COMUSFLTFORCOMINST 4790.3.
- c. Carrying out the duties and responsibilities of the TYCOM during PMS installations.
- d. Monitoring MDS documents and reporting deficiencies to the ISIC for corrective action.
- e. Providing the following support to the ISIC:
 - (1) 3-M System monitoring.
 - (2) TYCOM 3-M Assist Visits as described by reference (a).
 - (3) PMS and MDS technical assistance.
 - (4) On-site training in PMS, MDS and PMS Scheduling.
 - (5) Assistance with the preparation and submission of FBRs.
 - (6) Assistance in obtaining prompt correction to faulty PMS documentation (liaison with ISEA).
 - (7) On a case basis, providing the authorization to use modified (red lined) PMS documentation.

- (8) The review the ship's K-MRC plan for all Continuous Maintenance Availabilities (CMAV) to ensure compliance as discussed in Volume II, Part I, Chapter 4 of this manual.

19.4.1.6 Squadron or ISIC. Areas of responsibility include but are not limited to the following:

- a. Designating a 3-M Officer in writing. The 3-M Officer is responsible for the satisfactory administration of 3-M programs, per reference (a) and this chapter, for subordinate Commands or activities.
- b. Monitoring and evaluating 3-M program for all assigned units.
- c. Ensuring 3-M Inspections are current.
- d. Ensuring subordinate commands conduct rigorous quarterly 3-M Self-Assessments and report results to the TYCOM 3MC.
- e. Monitoring the status of troubled systems and Top Management Attention (TMA) items using the quarterly 3-M Self-Assessment.
- f. Ensuring subordinate commands comply with standard Work Center, Division and Department structure.
- g. Tracking and monitoring 3-M major milestones and Training Events, overseeing or providing Inspection Teams and conducting 3-M spot checks during ISIC or staff visits.

19.4.1.7 Inspection Teams. Each TYCOM has a unique construct for their Inspection Team. Areas of responsibility include but are not limited to the following:

- a. Scheduling and conducting 3-M Inspections and Training events as directed.
- b. Reporting of training status and certification recommendations to the TYCOM to include any perceived barriers to effective and timely completion of 3-M events.
- c. Ensuring material failures are adequately examined to detect 3-M system inadequacies.
- d. Providing a 30-day event schedule updated weekly to the TYCOM (Surface Force ships ATG).

19.4.1.8 Commanding Officer and Officer In Charge. The Commanding Officer or Officer In Charge (CO or OIC) is responsible for establishing an aggressive Self-Assessment program that validates the administration and execution of maintenance and detects improperly conducted maintenance or falsely reported accomplishments.

19.4.1.9 Executive Officer. The Executive Officer (XO) is the Command's 3-M System Manager responsible to the CO for the overall management of the 3-M Program. The XO will:

- a. Chair quarterly 3-M System meetings with Department Heads (DH) and the 3-M Coordinator (3MC).
- b. Brief the CO on the status of 3-M.
- c. Integrate 3-M System training into the command's training and qualification program.
- d. Ensure personnel receive adequate and effective 3-M System training.

- e. Ensure the effectiveness of the command's 3-M Self-Assessment program.
- f. Act as the final review officer for shifts of maintenance responsibility between Departments.
- g. Establish a command Zone Inspection program.

19.4.1.10 Command Master Chief or Chief of the Boat. The Command Master Chief or Chief of the Boat (CMC or COB) will:

- a. Attend the XO's quarterly 3-M system meetings providing senior enlisted feedback.
- b. Conduct PMS Spot Checks following the Command's policy to ensure required maintenance is being properly performed and documented.

19.4.1.11 Command 3-M Coordinator. The 3MC will:

- a. Serve as the key 3-M System assistant to the XO.
- b. Maintain a file of 3-M System directives, newsletters, notes and correspondence containing current 3-M program information and ensure distribution to Work Center personnel.
- c. Maintain copies of the current Force Revision (FR) NAVY PMS DVD, List of Effective Pages (LOEP) for every Work Center, changes issued between FRs in their original format and Classified MRCs. Digital copies are allowed unless there have been changes between FRs.
- d. Advise, monitor and assist DHs, Division Officers (DIVO), Leading Chief Petty Officers (LCPOs) and Work Center Supervisors (WCS) in matters concerning the 3-M System.
- e. Monitor the Ship's 3-M Personnel Qualification Standard (PQS) Program and maintain an auditable record of personnel qualified in 3-M PQS.
- f. Maintain a master accountability log of all PMS changes.
- g. Develop and maintain a Split MIP Log.
- h. Administer the configuration management program onboard the ship or unit.
- i. Supervise the command's 3-M Self-Assessment program and provide a weekly status to the XO.
- j. Develop and administer the Ship or Unit's PMS Spot Check Program.
- k. Generate a weekly PMS spot check assignment matrix for Officers, Chief Petty Officers (CPOs) and designated supervisory personnel.
- l. Ensure corrective actions are taken on all unsatisfactory PMS Spot Checks and report them to the XO as part of weekly PMS reporting.
- m. Ensure a complete back up of the SKED system is made on removable media (e.g. DVD/CD) following completion of the FR update and retain as part of the PMS Master File.

- n. Ensure Situational Requirements are triggered in SKED and completed based on unit events such as flight quarters, drills or underway replenishment.
- o. Ensure that Global States and Triggers are properly set at the Command level.
- p. Screen all FBRs, verify content, validity, serialize and forward within seven (7) days of origination.
- q. Maintain accountability of all submitted FBRs and actions taken until a corrected or new PMS documentation is received.
- r. Ensure the FBR originator and all applicable Work Centers are apprised of action taken and that changes or corrections are implemented when received.
- s. Ensure 3-M documents such as Ship's Maintenance Action Form OPNAV 4790/2K (2-Kilos), Ship's Configuration Change Forms OPNAV 4790/CK (CKs), etc. that require forwarding to a data processing activity are forwarded within 7 days of origination or as operationally feasible.
- t. Validate 3-M MDS data elements following the 3-M validation specifications.
- u. Ensure 3-M documents returned for the correction of data are promptly revised and resubmitted.
- v. Track the reporting of Completed Maintenance Actions related to an Alteration or as a result of a Configuration Change with timely processing of Automated Shore Interface (ASI) configuration and logistic data.
- w. Report up-line CSMP maintenance transactions and Command's Equipment File corrections at least once a week.
- x. Ensure current external backups of the Command's Configuration Management Database are created on removable media (e.g. DVD or CD).
- y. Maintain any outstanding paper copies of message Work Candidates and 2-Limas.

19.4.1.12 Littoral Combat Squadrons and Zumwalt Class Squadrons, Mission Package Support Facility. The Littoral Combat Ship (LCS) Squadron (LCSRON), *Zumwalt* Class (DDG 1000) Squadron (ZRON) and Mission Package Support Facility (MPSF) must have dedicated 3MCs, Maintenance Managers, Advanced Planners, CSMP Managers and Hull Managers responsible for the effective implementation of the 3-M Program of all assigned ships. Responsibilities also include:

- a. Review, update, schedule, off unit PMS.
- b. Ensure Location Guide Lists (LGLs) are fully developed and all MRCs are assigned to the correct equipment.
- c. Maintain and update the master PMS SKED ensuring that ship and sustainment contractor data are current.
- d. Receive update files from the sustainment contractor, mission modules or sea-frames for maintenance status reporting FBR submissions and equipment association changes.
- e. Review and analyze all exception or error reports generated by SKED when importing data from the contracted maintenance provider that guide corrective actions for the

RMC who provides the government oversight on sustainment contractor performed PMS.

- f. Initiate situational and state triggered maintenance by activating Global Events.
- g. Review and approve or reject submitted FBRs.
- h. Review and analyze all Condition Found Reports (CFR) providing corrective actions to the RMC who provides the government oversight on sustainment contractor performed maintenance.
- i. Perform the duties of paragraphs 19.4.1.14 and 19.4.1.15 of this chapter.

19.4.1.13 Reactor Maintenance Officer. On Aircraft Carriers, the Reactor Maintenance Officer (RMO) has cognizance of the Reactor Plant. The RMO will:

- a. Notify the Ship's Maintenance Manager (SMM) of cross boundary maintenance.
- b. Coordinate industrial and shipboard maintenance during designated availabilities.
- c. Monitor the Configuration Validation Program; ensuring all departments submit required documentation to support updates to the Configuration Management Database.
- d. Ensure timely review and approval of deferrals concerning newly created, unreported Job Control Numbers (JCN).
- e. Monitor the operation of MDS.

19.4.1.14 Ship's Maintenance Manager or Ship's Maintenance and Material Officer. The Ship's Maintenance Manager (SMM) for Aircraft Carriers, and the Ship's Maintenance and Material Officer (SMMO) for Surface Force ships will:

- a. Notify the RMO of cross boundary maintenance. The SMM has cognizance of the material condition of the ship except for the Reactor Plant.
- b. Coordinate industrial and shipboard maintenance during availabilities.
- c. Monitor the Configuration Validation Program; ensure all Departments submit required documentation to support updates to the Configuration Management Database.
- d. Ensure timely review and approval of deferrals concerning newly created, unreported JCN.
- e. Monitor the operation of MDS.
- f. (LCSTRON, MPSF, and ZRON only) Provide oversight of the MDS and PMS program along with all availabilities.

19.4.1.15 Command Maintenance Availability Coordinator. The Command Maintenance Availability Coordinator will be responsible for the coordination of all Fleet Maintenance Activity (FMA) repairs and coordinate closely with the 3-M Coordinator. The Command Maintenance Availability Coordinator will also provide a single working level point of contact and coordinate the command's requirements with the requirements of the FMA. These duties include:

- a. Technical review of work requests submitted for FMA accomplishment.
 - (1) Ensure readability and technical correctness.
 - (2) Prevent duplication of work requests for Ship Alterations, Unrestricted Operation and other MJC originated deferrals.
 - (3) (Submarines only) Ensure corrective maintenance described in Block 35 (Remarks) of the 2-Kilo includes reference to the associated Maintenance Standard when applicable.
 - (4) Collect supplemental 2-LIMA requests for routine work (i.e., lagging, painting, label plates, tiling, etc.) from all Work Centers (WC) and prepare an integrated priority list for each type of routine work to maximize the FMAs effectiveness.
- b. Ensure Command preparations for an FMA availability are conducted per Volume II, Part I, Chapter 4 of this manual.
- c. Meet daily, during an availability, with the assigned Ship Superintendent to discuss the status of all active jobs.
- d. Attend all FMA production, night work and management meetings.
- e. Provide a daily FMA job status to each Department Head, Division Officer and Leading Petty Officer.
- f. (Submarines only) Prior to Work Package Execution Review, conduct a joint meeting with the PMT, TYCOM 3-M representative and ISIC (typically at A-40) to review current K-MRC status, ensure the ship's records match that of PMT and develop a K-MRC execution plan.

19.4.1.16 3-M Officer (Aircraft Carriers). The 3-M Officer (3MO) will:

- a. Act as the XO's principle assistant regarding 3-M matters.
- b. Coordinate all administrative facets of the 3-M Program.
- c. Evaluate command's 3-M program and keep the 3-M Manager advised of operational effectiveness.
- d. Monitor the Spot Check program and report program's effectiveness weekly to the 3-M Manager.
- e. Manage 3-M Training Team (3MTT) and designate members in writing.
- f. Coordinate, maintain, train and monitor the performance of the 3MTT.
- g. Generate and maintain Accomplishment Confidence Factor (ACF) comparison reports.
- h. Provide 3-M Program advice and assistance to DHs, DIVOs, Departmental 3-M Assistants (3MAs), LCPOs and WCSs.
- i. Maintain a file of current 3-M instructions and directives; disseminate changes.
- j. Ensure timely submission of FBRs.

- k. Maintain a master file of submitted FBRs, Responses, Advance Change Notices (ACN) and Document Information Transmittals (DIT).
- l. Conduct 3-M Self-Assessments.
- m. Coordinate and conduct 3-M training.
- n. Coordinate and conduct 3-M qualification program.
- o. Ensure that PMS improvement plans are prepared and executed.
- p. Ensure that quality audits are completed and maintained for every Work Center.

19.4.1.17 3-M Assistant (Aircraft Carriers). The 3MA will:

- a. Assist the DH in coordinating and supervising all administrative aspects of the Department's 3-M Program.
- b. Serve as the Department's 3-M program technical expert and advisor.
- c. Assist the 3MC in the proper execution of the 3-M program within the Department.
- d. Supervise and coordinate quarterly Departmental 3-M Self-Assessments.
- e. Assist the 3MO and 3MC in administering an effective 3-M Certification Program for the qualification of 3-M personnel.
- f. Assist in the development and execution of the short and long-range 3-M training plan.
- g. Assist the 3MC in maintaining a high quality Spot Check program.
- h. Monitor the Department's CSMP for accuracy and effectiveness, review and report job status to the DIVO and DH.
- i. Coordinate repair activities within the Department to ensure timely resolution of material deficiencies.
- j. Provide the DH with a weekly status of the Department's:
 - (1) 3-M Self-Assessment Program.
 - (2) CSMP.
 - (3) PMS Performance Report (from SKED)
 - (4) Equipment File Validations (as scheduled by Maintenance Support Center)
- k. Provide the DH with quarterly PMS Performance Reports (from SKED).
- l. Use SKED's Revision Editor to ensure that all PMS changes have been properly annotated and applied to the schedule prior to DH review and finalization.
- m. Oversee and assist WCSs in the implementation of FRs, updates and changes.
- n. Review each Work Center's lineouts and all 3-M documentation supporting PMS and MDS prior to submission to the DH.
- o. Ensure all equipment changes, adds and removals, regardless of whether the action is performed by Command personnel or outside activities, is reflected in the

Configuration Management Database; if not, report via 4790/CK to the CDM and utilize a PMS FBR to affect LOEP changes.

- p. Manage the Departmental TSIMS and MODES program requirements. (Aircraft Carriers only)

19.4.1.18 Department Head. The DH is responsible to the Executive Officer the 3-M System Manager for the operation and execution of the 3-M System within the Department. The DH will:

- a. Designate Departmental 3-M personnel as applicable.
- b. Ensure maintenance is prioritized to facilitate accomplishment.
- c. Review and approve all Department PMS schedules and revisions.
- d. Review maintenance action annotations.
- e. Acknowledge weekly alerts. (Submarines accomplish at the DIVO and LCPO level)
- f. Implement a Self-Assessment program within the Department to validate properly accomplished and reported maintenance.
- g. Take corrective action on all “UNSATISFACTORY” PMS Spot Checks and report to the 3-M Manager via 3MC as part of weekly PMS reporting.
- h. Ensure all material deficiencies are documented and promptly reported.
- i. Review and verify the content and validity of all FBRs, digitally sign FBRs within five (5) days of origination.
- j. Ensure the Configuration Management Database accurately reflects equipment changes whether the action is performed by Command personnel or outside activities.
- k. Authorize placement of equipment into an Inactive Equipment Maintenance (IEM) status, ensure PMS scheduling is annotated accordingly.
- l. The review and approval of all Department Work Candidates within four days of creation; ensure completeness, accuracy and the correct assignment of priority.
- m. Review all Work Candidates in the Departmental CSMP every 90 days.
- n. Ensure that no classified data or Navy Nuclear Propulsion Information (NNPI) is reflected on 3-M documents designated for off hull distribution.
- o. Conduct quarterly meetings with DIVOs, LCPOs and WCS and provide status of Departmental 3-M System to the XO3-M System Manager.

19.4.1.19 Department Leading Chief Petty Officer. The Department Leading Chief Petty Officer (LCPO) is responsible for the proper operation of the 3-M System within their Department. The Department LCPO will:

- a. Provide 3-M System guidance and training to DIVOs and Division LCPOs within their Department.
- b. Participate in quarterly Self-Assessments.

- c. Review all quarterly Self-Assessments and promptly correct discrepancies found within the department. (For submarines and CNIF, the Division LCPO performs this duty.)
- d. Ensure the proper testing and inspection of work done by outside activities prior to job acceptance.

19.4.1.20 Division Officer. The DIVO is responsible to the DH for the execution of maintenance within the Division. The DIVO will:

- a. Ensure all PMS scheduling changes have been properly annotated and applied prior to DH review and finalization.
- b. Review the 13-Week Accountability Log at the beginning of the PMS week and sign at the end of the week (if not using electronic accountability in SKED or when SKED is not available).
- c. Review and verify the content and validity of PMS FBRs within three (3) days of origination.
- d. Review, approve and close out weekly schedules. (Surface Force ships)
- e. Ensure 3-M documents generated within the Division are complete, accurate and promptly submitted to the DH.
- f. Conduct 3-M Self-Assessments as directed by the Command's policy.
- g. Provide weekly updates to the DH concerning the status of the 3-M System within the Division.
- h. Incorporate 3-M System training into the Divisional Training Plan.
- i. Review Divisional Work Candidates and the CSMP for validity and accuracy.
- j. Conduct monthly briefings for the DH on the status of all Work Candidates.

19.4.1.21 Division Leading Chief Petty Officer. The Division LCPO is responsible for the proper operation of the 3-M System within their Division. The Division LCPOs will:

- a. Supervise WCSs in the execution of daily maintenance.
- b. Ensure WCSs are properly trained, equipped and are knowledgeable of all Work Center Divisional equipment maintenance requirements.
- c. Ensure Divisional personnel are properly trained and qualified to conduct maintenance.
- d. Verify all Divisional Work Center equipment is covered by PMS.
- e. Ensure PMS is properly scheduled and conducted, including all underway/special evolution Situational "R" checks.
- f. Review Work Center PMS records (e.g. FRs, ACNs and PMS FBRs and Responses), approve all lineouts and additions on the LOEP, MIP, Situational Reference Sheets and PMS schedules prior to DIVO and DH reviews. Ensure proper justification is noted on each lineout.

- g. Review and approve non-applicable procedural steps lined-out on MRCs.
- h. Review and sign the 13-Week Accountability Log at the end of the PMS week (if not using electronic accountability in SKED or when SKED is not available). Ensure checks added that week are hand written into the blank accountability log.
- i. Review the PMS Scheduling Forecasting Report to ensure that all Tools, Parts, Material and Test Equipment are available to support upcoming maintenance actions.
- j. Provide the DIVO a weekly status of the Division's Self-Assessment program, CSMP and PMS.
- k. Ensure the Configuration Management Database reflects current ship's configuration.
- l. Ensure FBRs are submitted requesting LOEP changes to reflect system, equipment and component installs or removals.
- m. Review and verify the content and validity of PMS FBRs within three (3) days of origination.
- n. Ensure the Divisional CSMP accurately reflects material conditions.
- o. Review and approve Work Candidates, act as the second point of contact for Work Candidates and provide the DIVO a weekly brief on the status of all Work Candidates in the CSMP.
- p. Ensure proper testing and inspection of work done by outside activities prior to job acceptance.
- q. Coordinate repair activities within the Division.
- r. Be solely responsible for placing PMS scheduling in revision mode. (Surface Force ships)
- s. Conduct quarterly Self-Assessments and promptly correct discrepancies. (Surface Force ships)
- t. Review all quarterly Self-Assessments and promptly correct discrepancies found within the department. (Submarines and CNIF)
- u. Review, approve and close out weekly schedules. (Submarines, Aircraft Carriers, CNIF and NECC)

19.4.1.22 Work Center Supervisor. The WCS will:

- a. Maintain a detailed working knowledge of all equipment deficiencies within the Work Center.
- b. Ensure work center personnel have completed 3-M PQS training commensurate with position held.
- c. Ensure PMS covers all maintenance worthy equipment in the Work Center.
- d. Maintain an accurate and current LOEP.
- e. Ensure 3-M System Work Center files and publications are complete, current and available to Work Center personnel.

- f. Ensure Work Center initiated 3-M documentation is correct, legible, promptly prepared and submitted.
 - g. Maintain a 13-Week Accountability Log containing the current and previous 13-Week Log (if not using electronic accountability in SKED or when SKED is not available).
 - h. Prepare weekly Work Center schedule, obtain required approval, assign maintenance personnel and update schedule to reflect status.
 - i. Ensure equipment changes, adds and removals are reflected in the Configuration Management Database and, if not, report via 4790/CK to the Configuration Data Manager (CDM).
 - j. Provide MRCs reflecting procedural step lineouts and a listing of non-applicable R-Checks for review by the Division LCPO or Lead Petty Officer (LPO).
 - k. Ensure FBRs are submitted whenever maintenance requirements are:
 - (1) Not fully understood.
 - (2) Errors are believed to exist.
 - (3) Entries in the Tools, Parts, Material and Test Equipment (TPMTE) block are wrong or inadequate.
 - (4) Additional coverage is needed.
 - (5) Performance of the maintenance requirement would cause a hazardous condition to exist.
 - l. Ensure prompt reporting of all material deficiencies and completed maintenance actions.
 - m. Ensure Periodic Maintenance Requirements (PMRs) scheduled for command accomplishment are completed and reported as required.
 - n. Ensure test and measurement equipment or other portable support equipment is delivered for test/calibration as scheduled.
 - o. Ensure the DIVO and Division LCPO or LPO are advised of all 3-M System activity within the Work Center.
 - p. Spot check completed equipment file validations; ensure accuracy of the information and PMS scheduling equipment associations. Submarine and Aircraft Carrier activities are not required to perform equipment validations.
 - q. Review PMS Scheduling Forecasting Report to ensure that all Tools, Parts, Material and Test Equipment are available to support upcoming maintenance actions.
 - r. Ensure all Work Center weekly schedules are updated daily.
- 19.4.1.23 Damage Control Assistant. The Damage Control Assistant (DCA) will:
- a. Provide a comprehensive weekly training and qualification program for DCPOs.
 - b. Schedule and control the performance of planned and corrective maintenance of DC equipment requiring outside or off hull assistance.

- c. Advise DHs of scheduled dates for maintenance actions requiring coordination between Departments or throughout the ship.
- d. Coordinate PMS on DC gear not assigned to a WC, DIV or DEPT.

19.4.1.24 Maintainer. Maintenance personnel will:

- a. Perform assigned maintenance.
- b. Notify Work Center Supervisor when:
 - (1) MRC is not fully understood, appears to be incorrect or cannot be accomplished as written.
 - (2) There are issues with the TPMTE block of the MRC.
 - (3) The maintainer has doubts concerning his or her ability to perform the maintenance.
 - (4) Equipment deficiencies or casualties are discovered.
 - (5) Factors exist which would make performance of the maintenance unwise or dangerous.
- c. Initiate FBRs when discrepancies are discovered during the performance of an MRC.
- d. Inform the Work Center Supervisor when planned maintenance requirements are complete.
- e. Annotate PMS schedule to reflect accomplishment of maintenance.
- f. Sign 13-Week Accountability Log (if not using electronic accountability in SKED or when SKED is not available).

19.4.2 Qualifications. All personnel assigned to billets associated with the 3-M system must be 3-M PQS qualified for the assigned billet per reference (b).

19.5 MAINTENANCE AND MATERIAL MANAGEMENT OPERATION AND ADMINISTRATION.

19.5.1 Standard Force Work Center Numbering System. The production of automated products in support of the 3-M system, as well as the various Maintenance Automated Information Systems, dictate that a standard force WC organization be maintained. Commanding Officers will designate their Command organization and applicable WC codes as listed in Appendix C of this chapter. Additionally:

- a. Commands must not allow the use of any WC codes not authorized by reference (a) or this manual.
- b. Requests to change WC designation codes will not be approved unless they are applicable to all ships of a class and supported by detailed justification. This does not affect the re-assignment of a MIP to another WC (shift of maintenance responsibility). Reference (a) provides guidance for the shift of maintenance responsibility.
- c. (Submarine Force only) Small boat, tug, receiver and service craft managers will use the specific WCs identified in Appendix C3 of this chapter for MDS documentation, however, for PMS management they may assign a "***00" WC to consolidate PFRs,

MIPs, scheduling, etc., (e.g., PY30 through PY84 may consolidate PMS under WC PY00 or PY01-Mechanical, PY02-Electrical, etc.). The Unit Identification Code will be that of the parent command.

- d. (Surface Force and Submarines only) Standard MJC assigned WC codes are reflected in Appendix D of this chapter.

19.5.2 Job Control Number. The JCN is the key identifier for maintenance actions and related supply documents. The JCN is used to identify the maintenance action and to relate all of the parts used when a ship reports a maintenance action and it links all associated reporting of a maintenance action. The JCN is comprised of three blocks as defined by the Ship's 3-M manual. Block 1 is the Ship's Unit Identification Code (UIC) (5 numeric characters), Block 2 is the WC (4 alphanumeric characters, left justified) and Block 3 is the Job Sequence Number (JSN) (usually 4 numeric characters).

19.5.3 Job Sequence Number. The first position of the JSN is used to identify the tool or organization that created the 2-Kilo. In the case of activities other than the ship creating jobs for the ship, this first character of the JSN will be an "ALPHA" character. The control over which organizations or tools "OWN" which "ALPHA" character(s) is provided by the Job Originator Values, Appendix E of this chapter, developed within the Maintenance and Modernization Business Unit and is available through the NAVSEALOGCEN web site under Maintenance and Modernization Business Unit look up tables. The specific value contained within the first position of the JSN provides enhanced data mining capabilities and facilitates data aggregation and analysis.

19.6 PLANNED MAINTENANCE SYSTEM FEEDBACK REPORTS. PMS FBRs are used to identify problems with PMS documentation or to request the addition or deletion of PMS coverage. Issues with the Periodicity, Rates, Man-hours, TPMTE and Procedure may all be reported via an FBR. An FBR is also used to request copies of classified MRCs, request the addition or deletion of an MRC (maintenance requirement) to or from a MIP, splitting a MIP between WCs, shifting of maintenance responsibility or to request PMS coverage for newly installed systems or equipment. Paragraphs 19.6.1 through 19.6.10 provide amplifying information dealing with the issues that may prompt the submission of an FBR..

19.6.1 Periodicity. An FBR can be used to request the increase or decrease in the frequency of a maintenance action, i.e., an MRC. However, the originator needs to keep in mind that the ship or unit has the prerogative to increase the frequency as a result of harsh weather, unusual operating conditions or corrective maintenance and associated testing requirements. A 726 Class submarine submitted an FBR requesting the frequency of cleaning a specific electronics cabinet filter be increased from Quarterly to Monthly. Research revealed this MRC was applicable to all 726 Class units and no other ship had submitted a similar request. In fact, two other units had requested the frequency be decreased to Semi-annual. It was determined that the submitting unit was in an extended upkeep period and increased foot traffic by shipyard personnel in close proximity to the electronic cabinet was the most likely cause of the filter becoming clogged. The ship was authorized to increase the frequency to support the extended upkeep period and the periodicity of the MRC was not changed.

19.6.2 Rates. The Rates block on the MRC represents the developer's recommendation of the skill level (rate and rank) best suited to accomplish the maintenance action. The key word is

recommendation. Qualified personnel other than the rate and ranking specified may be assigned. When a Navy Enlisted Classification (NEC) is assigned or DCPO/SPO, substitution of other personnel is not allowed other than those exceptions as noted in reference (a). An FBR requesting the rate on an MRC be changed from an ET2 to an FT2 will probably not pass TYCOM screening, yet an FBR requesting the addition or deletion of personnel will generally pass to the cognizant technical activity for review.

19.6.3 Man-hours. The MRC reflects the average time per equipment, per person. It does not reflect or account for gathering and putting away tools, tag-outs or time removing and replacing interferences. From a maintainer's perspective, this is not an accurate representation of the time required to accomplish the maintenance action. The Future of PMS (FoPMS) initiative will attempt to do a better job of accounting for this additional time but until then, FBRs should be submitted only when the allotted time per equipment is significantly out of synch with the actual time required. For example, an MRC calls out 0.5 Man-hours per equipment but it actually takes 1.0 Man-hours.

19.6.4 Tools, Parts, Material and Test Equipment. Tools, Parts, Material and Test Equipment FBRs should be submitted when the procedure calls for an item not listed in the TPMTE block or when the TPMTE block lists an item not called out in the procedure. Updating the MRC to reflect common hand tools, administrative or office supplies and basic housekeeping items is addressed in paragraph 19.6.11.a of this chapter.

19.6.5 Procedure. Procedures are written at a level of detail based on the assumption maintenance personnel are trained, qualified and supervised by experienced leadership to consistently and expertly execute the maintenance. MRCs exist to provide standardized proven procedures, specify consistent acceptance criteria and to communicate Warnings and Cautions relative to the specific maintenance action. They are not intended to specify every possible action of the maintainer. There may be instances where an obvious typographical error exists on the MRC (example: Turn Switch to ON; however, switch may already be ON and the intent of the step is to turn unit off, the card should read Turn Switch to OFF). This type of error should not prevent the scheduling or performance of maintenance. However, in this situation, the accomplishment of the MRC is not possible until the Work Center Supervisor reviews the error and concurs that it is safe to proceed. A temporary notation including the reason for the correction must be made on the MRC, initialed by the Work Center Supervisor and an FBR submitted. Extreme caution will be taken when reviewing MRCs for this type of error. Errors must be obvious typographical errors and a PMS FBR must be submitted immediately upon discovered. Do not permanently alter the MRC until authorized by the applicable SYSCOM, ISEA or **NAVSEALOGCEN** Detachment. If a step is missing that is necessary to complete the task, and that step is not obvious to the maintenance person, submit an FBR to have it added. An FBR submitted to request procedural changes should include the originators contact information and supporting rationale or justification. If, however, a step is missing that is clearly obvious (a ladder was used to install a fixture but steps were not provided to put the ladder back in stowage) an FBR only serves to overload a process that should be focused on more technical issues.

19.6.6 Duplicate MRCs. Unclassified MIPs and MRCs are now available from the DVD. Copies of classified MRCs still require an FBR request due to handling requirements.

19.6.7 Addition or Deletion of an MRC. During the life cycle of a system, equipment or component it may become necessary to add a maintenance action to prevent an age related

functional failure or to delete a maintenance action due to inherent reliability not foreseen during maintenance development. An FBR submitted to request the addition or deletion of an MRC should include the originator's contact information and supporting rationale or justification.

19.6.8 Newly Installed or Removed Equipment. While an FBR request for PMS coverage will provide initial maintenance coverage or deletion of MIP(s) as a result of equipment removal, submission of an OPNAV 4790/CK is still required to initiate the rest of the logistic support change process. This point cannot be overstressed; the submission of the FBR does not relieve the ship or unit from initiating a CK. The CK initiates supply support, CDMD-OA changes, ship selected record drawing updates and class maintenance plan updates.

19.6.9 Splitting a MIP. There are instances in which a MIP includes MRCs for more than one Work Center to perform. When this occurs, a decision is required by the Command as to whether the MIP will be split or will be scheduled singly by one Work Center. Only the XO can authorize the splitting of a MIP if a MRC requires another Work Center to perform the entire maintenance action. If the decision is made not to split the MIP, then the MRs will be accomplished through the coordination of WCSs.

- a. If the MIP is split, the following procedures apply:
 - (1) Submit to the XO a Non-Technical PMS FBR requesting approval to split the maintenance responsibility.
 - (2) Upon receipt of the XO's concurrence, the 3-M Coordinator will make an annotation in the remarks block of the FBR stating, "XO concurs with splitting MIP maintenance responsibility".
 - (3) For LCS class ships, LCSRON N4 (vice the unit's XO) provides concurrence with the splitting of maintenance responsibility and the FBR must be so annotated.
- b. Upon receipt of the FBR approval:
 - (1) Utilizing the SKED Revision Editor, delete the MRC from the MIP and show the reason for deletion as the designation of the Work Center assuming responsibility (e.g., EE01).
 - (2) If the Work Center assuming responsibility does not reflect the MIP and maintenance items, utilize the SKED Revision Editor to add them. Schedule only the MRC(s) that pertain to the Work Center reflecting remaining as deleted with reason for deletion the designation of the parent (lead) Work Center (e.g., EA01).
- c. If the situation occurs where a Work Center removes a split MIP, the following procedures apply:
 - (1) Submit an XO approved, Non-Technical PMS FBR reporting the decision to remove the split maintenance responsibility. Upon receipt of the XO's concurrence, the 3-M Coordinator will make an annotation in the remarks block of the FBR "XO concurs with removing split MIP maintenance responsibility". For LCS class ships, LCSRON N4 (vice the unit's XO)

approves the removal of splitting maintenance responsibility and the FBR must be so annotated.

- (2) Upon receipt of FBR approval, utilize the SKED Revision Editor, remove the MIP, MRC(s) and maintenance item(s) from the Work Center no longer involved. Ensure that the lead Work Center assumes full responsibility for the MIP and MRC(s) and annotates their schedules accordingly.

19.6.10 Shift of Maintenance Responsibility. Individual ships or units sometimes consider it necessary to shift maintenance responsibility from one Work Center to another, to combine two or more existing Work Centers or to split an existing Work Center. These requests for changes of PMS maintenance responsibility require XO concurrence and may require final approval by the applicable TYCOM. Request for this type of change should not be submitted to accommodate a temporary situation such as short-term assignment of two Work Centers to one supervisor due to the considerable administrative burden.

- a. The following factors should be carefully considered before submitting such requests:
 - (1) Composition of Work Centers by size and ratings.
 - (2) Scope of maintenance responsibilities.
 - (3) Work Center workload.
 - (4) Ease of administration of a Work Center as a cohesive maintenance group.
 - (5) Importance of Work Center Grouping to equipment maintenance responsibilities, PMS scheduling, MDS reporting and CSMP listings.
- b. When changes in maintenance responsibility are considered necessary, the following procedures apply:
 - (1) Submit a PMS FBR (Non-technical). Indicate from which Work Center(s) equipment is to be deleted and to which it is to be transferred. Upon receipt of the XO's concurrence, the 3-M Coordinator will make an annotation in the remarks block of the FBR "XO concurs with the shift of maintenance responsibility." For LCS class ships, LCSRON N4 (vice the unit's XO) provides concurrence with the shifting of maintenance responsibility and the FBR must be so annotated.
 - (2) Work Center or equipment changes will also be reported in the OMMS/SNAP system via a Configuration Change request (4790-CK) through the CSMP up-line reporting process.
- c. Upon receipt of the FBR approval, perform the following actions:
 - (1) The PMS Master File is updated to reflect deletion of the MIP from one Work Center and addition to the Work Center receiving the responsibility. The originating FBR serial number is annotated on the affected line item on the LOEP for both Work Centers. The PMS Master File must contain a record of deleted equipment until the change is reflected in a future FR.

- (2) Utilizing the SKED Revision Editor, load the affected MIP(s) and MRC(s) to the Work Center receiving maintenance responsibility. Delete the MIP(s) and MRC(s) from Work Center shifting responsibility.
- (3) Utilizing SKED, perform a revision to move the equipment from the original Work Center's current schedule to the Work Center receiving the maintenance responsibility. Data is exported from one and imported to the other maintaining equipment history.

19.6.11 MRC Changes Not Requiring Feedback Reports. The only MRC modifications shipboard or unit personnel may make without submitting a PMS feedback report are as listed in subparagraphs 19.6.11.a. and b.

- a. Tools, Parts, Materials and Test Equipment Block (TPMTE).
 - (1) Common hand tools, administrative or office supplies and basic housekeeping items may be substituted or added by the Work Center Supervisor. The Work Center Supervisor may add notes to the MRC to reflect these substitutions. In the case where specific common tools are called out by description, substitutions are not authorized. For example, substitutions such as using synthetic fiber brushes in place of animal hairbrushes or rags and paper towels in place of lint free cloths are not allowed.
 - (2) Approved parts, materials and miscellaneous item substituted from the supply system, technical manual or MIL-SPEC, etc., which meet or exceed the requirements may be used. Ensure that substitutions satisfy both the basic maintenance and safety requirements of the MRC. If there is any doubt, a PMS Feedback Report (FBR) should be submitted specifying substitution desired and reason.
 - (3) Test equipment or certified tools, which meet or exceed the SCAT code requirement, may be used.
 - (4) When an MRC pertains to multiple configurations of equipment and the TPMTE block contains tools, parts, test equipment and materials for each unique configuration, the TPMTE block may be tailored for the particular configuration by lining out the items that do not pertain to that particular configuration.
 - (5) Exception to TPMTE block change: If an item listed in the TPMTE block is not called for in the Procedures block, submit an FBR explaining the circumstances. Conversely, if a tool, piece of test equipment, part or material is called for in the Procedure block and is not listed in the TPMTE block an FBR should be submitted.
- b. In the Procedure block, Work Center Supervisors may lineout the non-applicable line items (alternate procedures) that do not pertain to current equipment or configuration when the step includes the words "if applicable" or a note identifies steps to be omitted. These items must be reviewed and approved by the Division LCPO. As these changes are Work Center and maintenance item specific, submission of a FBR is not required. If a step or steps in the procedure block have been lined out and Tools,

Parts, Materials and Test Equipment in the TPMTE block pertain only to that step or steps, then they will be lined out as well with a reference to the step or steps lined out and approved by the Division LCPO. Warnings, Cautions and Notes associated with the lined out step or steps will also be lined out.

19.6.12 Types of Feedback Reports. There are two types of FBRs, Technical and Non-Technical.

- a. Technical - These FBRs are used to report technical discrepancies inhibiting PMS performance. Technical feedbacks normally adjudicated by an ISEA responsible for the system or equipment covered by the PMS documentation require all the supporting information the originator can provide. The originator should identify the issue, providing as much supporting technical information (Allowance Parts List (APL), Reparable Identity Code (RIC), Drawing or Hierarchical Structure Code) as available and a proposed response or solution if known. Most importantly, provide POC information (Name and phone number) so that the ISEA can contact the originator should they have questions. Bottom line, the FBR must be accurate and complete so as to “stand alone”, that is, the FBR will be understood without additional explanation. The better the FBR describes the problem, the more likely the originator will receive a timely response. There are two sub-categories of technical FBRs:
 - (1) Routine. An FBR will be considered routine when it relates to the technical requirements of PMS. It is used to report technical discrepancies or request clarification of procedures.
 - (2) Urgent FBR. An FBR will be considered URGENT when it relates to the technical requirements of PMS and involves safety of personnel, safety of ship or the potential for equipment damage. Urgent FBRs will be forwarded by Naval message containing a PMS Feedback Serial Number, to both **NAVSEALOGCEN** Detachments Norfolk and San Diego, with info to the cognizant SYSCOM, TYCOM and the Naval Safety Center. The message must describe the unsafe procedure(s) or condition(s), must identify the MIP and MRC involved and reflect the serial number of the FBR generated in SKED or PMSMIS. Once the message has been sent, include the date time group of the message in the FBR and submit.
- b. Non-technical - These FBRs are intended to support PMS requests that do not require technical review, including Work Center changes (shift of maintenance responsibility). Non-technical FBRs are submitted to request classified or other PMS documentation which cannot be obtained locally or to request clarification of issues not of a technical nature.

19.6.13 Feedback Report Submission.

- a. All SKED users will submit FBRs via SKED using the Feedback Report Wizard. Non-SKED users may submit FBRs via the Planned Maintenance System Management Information System (PMSMIS) web site at <https://algol.pmsmis.navy.mil/PMSMIS> by selecting the Feedback tab and Feedback Report Wizard from the drop down tab. Non-SKED users accessing this web site for the first time will need to request an account. Click on File Manager and select New

User Account Request. This displays options to select a form and readme file, which can be downloaded, filled out and sent via e-mail as directed in the readme file. An e-mail will be sent confirming your account and providing access to the main screen. The Anchor Desk web site can also be used to submit FBRs.

- b. Submarines transmit FBRs to their TYCOM 3-M Representative on “navy.smil.mil” via SIPERNET. (Submarine 3MCs should be aware of the default SEAJAX e-mail address that is programmed into SKED. 3MCs should ensure that FBRs are e-mailed via SIPERNET to the TYCOM 3-M Representative in their homeport).

19.6.14 Feedback Report Screening (Shipboard or Activity).

- a. Initial screening is accomplished by the originator or WCS who is responsible for ensuring all data is accurate and complete.
- b. The Division LCPO or DIVO accomplishes the second level screening and verifies the content and validity of the FBR within three (3) days of origination.
- c. The Department Head, next to screen the FBR, is responsible for verifying the content and validity of the FBR and digitally signing FBRs within five (5) days of origination.
- d. The 3MC is responsible for screening, serializing and forwarding FBRs within seven (7) days of origination. The 3MC will also:
 - (1) Maintain accountability for all PMS FBRs submitted and actions taken until corrected PMS documentation is received.
 - (2) Ensure that the originator and all applicable WCs are kept apprised of action taken and ensure the originating and other applicable WC Supervisors implement the changes or corrections when received.

19.6.15 Feedback Report Screening (External to Hull or Activity).

- a. FBRs are next processed by the TYCOM. The TYCOM will verify the content and validity of the FBR and either return the document to the originator or pass it on for further processing and resolution. Naval Surface Force FBRs are reviewed following Type Commander direction and Submarine Force FBRs are screened by SUBMEPP.
- b. SUBMEPP will return an FBR to the originator under the following conditions:
 - (1) An answer currently recorded in the Submarine TFBR HT Program satisfies the proposed FBR. The FBR will be returned with authorization to implement the previously received response or rationale is provided justifying the non-concurrence.
 - (2) A similar request has already been submitted and submission of another duplicative request will add no value to the process.
 - (3) The FBR requests actions contrary to the direction of this manual or reference (a).
 - (4) The request does not adequately address or identify the problem. In cases of this nature, the FBR is returned to the originator for amplifying information. This will be a last resort for submarine force units, as SUBMEPP will attempt to contact the originator to better define the issue.

19.6.16 Feedback Processing Activities.

- a. Preventive Maintenance System Coordinating Activities. The central control points for processing FBRs are the Planned Maintenance System Coordinating Activities (PMSCA). Depending on the type of FBR and level of technical authority necessary to answer the FBR, PMSCAs will either respond to the originator with a resolution or forward the FBR to the appropriate technical authority for action.
- b. In-Service Engineering Activities. ISEAs are those activities designated by NAVSEA as the technical experts for specific systems or equipment. Naval Surface Warfare Center, Philadelphia Detachment (NAV SURFWARCEN-PD) is the ISEA for the majority of Non-Nuclear Hull, Mechanical and Electrical equipment installed on most ships. ISEAs under the direction of the NAVSEA Technical Warrant Holder (TWH) adjudicate the FBR request and forward the response to the PMSCAs. The PMSCAs provide the final response to the originator and update the PMS database to reflect ISEA changes. PMS changes are **issued** with the next available Force Revision.

19.6.17 Feedback Processing. FBRs are processed per NAVSEA policy:

- a. Urgent FBRs.
 - (1) PMSCAs will provide a message response to all Urgent FBRs within one (1) working day of receipt. If the FBR is forwarded to a Design Activity or ISEA for resolution, then the Design Activity or ISEA will provide a message response informing the originator of specific actions or required changes as a result of the adjudication of the FBR within one (1) working day of receipt. This message response must be addressed to the originator and distributed to all TYCOMs of units holding the affected documentation. TYCOMs will forward this message to all commands that could be affected by the PMS change.
 - (2) PMSCAs will distribute revised PMS documentation to all affected users within 30 calendar days of receipt of the FBR, via special issue or Advance Change Notice.
- b. Routine FBRs.
 - (1) PMSCAs will perform technical review, research and provide a response to routine FBRs where resolution does not require technical authority action.
 - (2) FBRs that PMSCAs cannot resolve will be sent to the cognizant Design Activity or ISEA. The cognizant Design Activity or ISEA will provide the response to the appropriate PMSCA describing the action taken. The PMSCAs will provide the response to the originator by electronic means.
 - (3) Distribution of the revised MRC to the originator and other affected users will be accomplished via Advanced Change Notices or the next available Force Revision.
 - (4) NAVSEA's existing policy calls for Technical Review Activities and ISEAs to provide FBR responses in less than 21 working days from time of receipt. In addition to that, NAVSEA has established a goal of providing answers to

FBRs in one day. While some FBRs will require extensive research and days, weeks or in some cases months to resolve, the vast majority of FBRs can and should be answered much sooner. One day may be overly optimistic but the intent is to put the emphasis back on the timely resolution of FBRs.

- (5) If no revision to PMS documentation is required, pertinent comments will be provided in the response to the PMSCA. When not concurring with the feedback report, the rationale for the non-concurrence must be provided to the PMSCA.

NOTE: IT IS POSSIBLE AN FBR RESPONSE MAY NOT MAKE A SPECIFIC FR BASED ON THE DATE THE RESPONSE WAS RECEIVED BY NSLC. PROCESSING TIME AND HANDLING MAY CAUSE THE REVISED DOCUMENTATION TO MISS AN FR CUTOFF DATE. HOWEVER, SINCE ALL FORCE REVISIONS ARE NOW RECEIVED QUARTERLY, IF A REVISION MISSES THE CURRENT FR CUTOFF WINDOW, THE REVISED DOCUMENTATION WILL BE AVAILABLE WITHIN THE NEXT 3 MONTHS.

19.6.18 Feedback Response Implementation. Units will implement responses to Feedback Reports based on the category and content as determined by the unit's 3-M Coordinator.

- a. Urgent FBR – within 24 hours of receipt of FBR response.
- b. Routine FBR:
 - (1) Technical – The response deals with content such as a revision to technical specifications, tolerances, test equipment, materials, acceptance criteria or the sequence of procedural steps. These changes need to be implemented within 2 weeks of receipt of the FBR response or prior to the next scheduled accomplishment date should that date fall within the two-week window.
 - (2) Administrative – The response deals with issues that do not affect the technical content or procedural steps. Administrative changes might be added steps to provide a better degree of clarity, formatting revisions to tables or figures that do not change technical content, or updating of Notes, Warnings or Cautions that do not impact the performance of the MRC. These changes do not need to be implemented prior to receipt of the next FR. If the next FR does not reflect the revised documentation, implementation is required before the next scheduled accomplishment date of the MRC.

19.7 INACTIVE EQUIPMENT MAINTENANCE.

- a. Inactive Equipment. A piece of equipment or system intentionally placed in a hibernated state for a specific period of time with the intention of reactivating that equipment or system at the end of that period.
 - (1) Status I. Equipment that will:
 - (a) remain onboard,
 - (b) is not scheduled for corrective maintenance or overhaul, or

- (c) will be inactive during extended shutdown periods and maintenance availabilities as determined by the Department Head.

Example: Submarine CO₂ Removal Plant in wet or dry Lay-up.

NOTE: PERFORM A “WET LAY-UP” (CO₂ REMOVAL PLANT FILLED WITH DISTILLED OR DEMINERALIZED WATER) PRIOR TO ENTERING PORT WHEN THE SHIP IS EXPECTED TO BE IN PORT FOR 7 TO 45 DAYS OR A “DRY LAY-UP” (CO₂ REMOVAL PLANT LEFT EMPTY AFTER FLUSHING AND DRAINING), PRIOR TO ENTERING PORT WHEN THE SHIP IS EXPECTED TO BE IN PORT FOR GREATER THAN 45 DAYS, OR PRIOR TO ENTERING PORT WHEN MAINTENANCE REQUIRING THE REMOVAL OF ALL CO₂ REMOVAL PLANT FLUID IS EXPECTED.

- (2) Status II. Equipment that is inactive and:
 - (a) subject to corrective maintenance, overhaul or removal for safe storage, or
 - (b) temporarily transferred to another activity for maintenance responsibility for extended shutdown periods as determined by the Department Head.

Example: Submarine Refrigeration Compressor removed for Depot level overhaul.

- b. Implementation and Responsibility. While inactive, minimum maintenance is performed in order to ensure the success of the reactivation. The Inactive Equipment Maintenance (IEM) section of the MIP will cover this maintenance.

- (1) To implement procedures for the accomplishment of PMS for equipment declared in an inactive status, current PMS schedules are modified to annotate the requirements listed in the IEM section of the MIP. For advance planning and scheduling of maintenance to take place, it is necessary to determine and identify the extent to which unit or ship force personnel will conduct PMS during an inactive period. MIPs in each Work Center will be reviewed to determine if equipment has IEM coverage (e.g., LU, PM, SU and OT), if the coverage is adequate, and what procedures to follow if there is no IEM coverage on the MIP in question or provided coverage appears inadequate. The Department Head is responsible for determining equipment IEM status. When placing a system or equipment in IEM status, the Department Head will also determine the IEM start date to be reflected in SKED. The IEM end date will not be applied in SKED until the system or equipment is ready to be brought out of IEM status. All periodic PMS scheduled at the end of IEM should be reviewed for applicability, with applicable maintenance accomplished prior to operating equipment.
- (2) IEM procedures are listed on MIPs and separated from operational PMS by a horizontal line. The IEM section is titled “Inactive Equipment Maintenance” and is prefaced by the following statement: “The following requirements will be scheduled when equipment is inactivated for periods of prolonged idleness.” When there are no IEM requirements the words “None required” will appear

under the Inactive Equipment Maintenance Section of the MIP. When IEM procedures are inadequate, submit an FBR. The unit or ship should consider all factors that affect equipment deterioration and take necessary precautionary measures. These factors include environmental conditions, equipment location, susceptibility to damage or other factors that cannot be anticipated when IEM procedures were originally developed by the cognizant ISEA or design activity.

- (3) The lack of IEM requirements on a MIP does not prohibit placing that system or equipment into an inactive state. Additionally, certain locations require precautions and maintenance not required force-wide. The unit or ship should consider all factors that affect equipment deterioration and take necessary precautionary measures. The WCS or LCPO for Surface Force ships is responsible for identifying factors that are inadequate and may require additional preparation and maintenance of the inactive equipment while reporting them to the Department Head for approval. Factors may include environmental conditions, equipment location or susceptibility to damage. For those actions that are recurring in nature, the WCS should submit an FBR for possible MRC development.
- (4) IEM periodicity codes (LU, PM, SU, OT) are assigned to all IEM actions available on the MIP.
 - (a) Lay-Up Maintenance (LU). Lay-Up maintenance actions prepare the equipment for periods of prolonged idleness and are usually performed only once at the beginning of the inactive period.
 - (b) Periodic Maintenance (PM). Periodic maintenance actions are accomplished on a recurring basis during the inactive period to prevent equipment deterioration. These maintenance actions are usually operational PMS requirements performed either at the same periodicity with a note specifying the MRC to be used, or at a different periodicity with a note specifying the modified periodicity.
 - (c) Start-Up Maintenance (SU). Start-Up maintenance actions ensure that equipment is in a condition suitable for operation, or to reactivate an equipment or system that has been inactivated for a prolonged period. Start-up maintenance consists of performing turn-on procedures and restoring the equipment to its ready-for-service condition.
 - (d) Operational Test (OT). Operational test actions are those conducted to determine the operational condition of the equipment, its ability to function as designed and to be integrated with other equipment to form a system.
- c. IEM MRCs. IEM MRCs are assigned SYSCOM MRC control numbers in the same manner as operational MRCs. When an IEM MRC is utilized to refer to an operational MRC, the periodicity indicator will be its IEM requirement. The skill level will reflect the most senior person required on the operational MRC(s) and man-

hours block will reflect an appropriate amount of time for that person to review the requirements for the task(s) identified (normally 0.1 or 0.2 M/H).

- d. IEM Scheduling. SKED provides the capability to perform IEM scheduling.
- (1) Status I. The scheduling of maintenance for Status I inactive equipment utilizes conventional PMS scheduling techniques. LU checks will automatically be added to the schedule at the beginning of IEM by SKED. PM checks will be manually added to the schedule by the WCS for the period of IEM following the guidelines of the MIP. At the conclusion of IEM, SU checks and routine PMS will automatically be added to the schedule by SKED. SU checks must be accomplished the week IEM ends. All periodic checks added at the end of IEM, can be moved to the right, not to exceed the allowable date range. Since the MRC date range cannot be applied to the left (into the IEM period), the MRC date range can only be moved to the right and therefore only the plus value of the specific range, i.e., the date range for a monthly is 21-41 days. The requirement can only be moved (scheduled) 10 days to the right and will not go into "alert" until after the 10th day. This allows the Maintenance Person or WCS scheduling flexibility within the plus side of the date range of the MRC.
 - (2) Status II. The scheduling of maintenance for Status II inactive equipment utilizes conventional PMS scheduling techniques, however, not all scheduled IEM PMS may need to be accomplished by the unit or Ship's Force. LU checks will automatically be added to the schedule at the beginning of IEM by SKED and may be marked "N/A" if the LU check did not support the equipment being removed from the ship or unit or "Accomplished by Higher Authority" symbol if completed by the Intermediate or Depot level maintenance activity. PM checks may be required to be schedule during the IEM period. At the conclusion of IEM, SU checks and routine PMS will automatically be added to the schedule by SKED. SU checks must be accomplished the week IEM ends and may be marked with the "Accomplished by Higher Authority" symbol if they were completed by the Intermediate or Depot level maintenance activity. Routine PMS added at the end of IEM may also be marked with the "Accomplished by Higher Authority" symbol if they were completed by the Intermediate or Depot level maintenance activity. All periodic checks added at the end of IEM, can be moved to the right, not to exceed the allowable date range. Since the MRC date range cannot be applied to the left (into the IEM period), the MRC date range can only be moved to the right and therefore only the plus value of the specific range, i.e., the date range for a monthly is 21-41 days. The requirement can only be moved (scheduled) 10 days to the right and will not go into "alert" until after the 10th day. This allows the Maintenance Person or WCS scheduling flexibility within the plus side of the date range of the MRC.

NOTE: UPON RECEIPT OF PROGRAM OFFICE OR PLATFORM MANAGER DIRECTION TO DEACTIVATE EQUIPMENT OR SYSTEM, SUBMIT AN FBR REQUESTING THE LOEP BE UPDATED TO REFLECT NMR FOR

THE SUBJECT EQUIPMENT. UNTIL DEACTIVATED EQUIPMENT IS PHYSICALLY REMOVED FROM THE SHIP OR UNIT, THE ASSOCIATED MIP WILL REMAIN ON THE WORK CENTER'S LOEP. MAINTENANCE OF MIP AND ASSOCIATED MRCS IS NOT REQUIRED AFTER LOEP HAS BEEN UPDATED TO NMR STATUS.

19.8 DEACTIVATED EQUIPMENT. Deactivated equipment is defined as a piece of equipment or system intentionally placed out-of-service with no intention of reactivating the equipment or system.

- a. Occasionally, in preparation for removal from the ship or when retired in place due to obsolescence equipment may be deactivated. The Program Office or Ship Platform Manager will provide direction to deactivate a piece of equipment or system to the TYCOM. The Program Office or Ship Platform Manager will provide specific direction concerning placement of the equipment in a deactivated state. This guidance could be as simple as direction to tag-out physical and electrical isolations or as complex as a formal configuration change for the physical divorcing of the equipment or system from other equipment or systems on the ship or unit. No maintenance will be performed after it has been deactivated.
- b. Should the ship or unit seek to deactivate a system or equipment, the Commanding Officer or Officer In Charge will provide the request to the TYCOM via Naval Message. The TYCOM will contact the Program Office or Ship Platform Manager for guidance concerning the deactivation and respond to the requesting ship or unit by Naval Message with specific direction concerning placement of the equipment in a deactivated state.

19.9 RELATED MAINTENANCE.

19.9.1 Related Maintenance from MIP. Related maintenance, so designated by the ISEA or TWH, is determined from the MIP. The RELATED MAINT column of the MIP reflects related maintenance requirements. Related requirements are positioned on the MIP to line up directly across from the MRC to which they are related. Related Maintenance requirements are also identified in the TPMTE section of the MRC under Miscellaneous. Related Maintenance is **categorized as:**

NOTE: MANDATORY RELATED REQUIREMENTS MUST BE LINKED IN SKED TO BE AUTOMATICALLY SCHEDULED.

- a. Mandatory Related; maintenance requirement(s) that must be accomplished concurrently with another maintenance requirement. The mandatory relationship is indicated with the use of the # sign. If the Mandatory Related maintenance resides on the same MIP, it will be reflected in the RELATED MAINT column as "Periodicity#" (e.g., M-3#). If the related maintenance resides on another MIP, it will be reflected as "MIP:Periodicity#" (e.g., IC-013/033:M-4#). Mandatory Related maintenance is automatically scheduled by SKED.
- b. Convenience Related; maintenance requirement(s) that can be accomplished concurrently with another maintenance requirement in an effort to save time (preliminary steps and tag-outs already accomplished) or for work force considerations. If the Convenience Related maintenance resides on the same MIP, it

will be reflected in the RELATED MAINT column as “Periodicity” (e.g., M-5). If the related maintenance resides on another MIP, it will be reflected as “MIP:Periodicity” (e.g., EL-010/001:M-4)). In both cases, the # symbol is omitted. **The Work Center Supervisor manually schedules convenience related maintenance.**

- c. Conditional Related; the related MRC is performed when specific conditions are present or not met on the referencing MRC. Conditional related maintenance will appear on the MIP **in the same manner** as convenience related maintenance. **The Work Center Supervisor manually schedules conditional related maintenance.**
- d. No related maintenance; this is reflected as “None” in the RELATED MAINT column.

19.9.2 Work Center Supervisors. Work Center Supervisors are encouraged to review their schedules on a regular basis for opportunities to perform other PMS when an equipment or system has maintenance actions scheduled. Rescheduling of PMS to take advantage of other system maintenance (convenience related) is highly recommended.

19.9.3 MRC Related Maintenance. If an MRC has related maintenance from another MIP, review the related MIP and MRC and determine if it requires assistance from another Work Center.

- a. If the related MIP and MRC does not require assistance from another Work Center and is not on the lead Work Center LOEP, submit a FBR to have it added to the LOEP.
- b. If the related MIP and MRC requires assistance or completion by another Work Center and is Mandatory, Convenience or Conditional related then it should also be on the lead Work Center LOEP. If it is not on the lead Work Center LOEP, submit a FBR to have it added to the LOEP. If the related MRC requires technical assistance, a special NEC or another rating, that is not part of the lead Work Center, then the person with the technical training, special NEC or required rating should be temporarily added to the lead Work Center “Crew List” and assigned the related maintenance in either an assist or performance role. All Work Center Supervisors involved will collaboratively plan the required maintenance and may adjust schedules based upon individual workload. When the maintenance is completed, the lead Work Center Supervisor will mark the MRC as completed.

19.10 SUBMARINE SAFETY, SCOPE OF CERTIFICATION AND SURVIVABILITY AND ESCAPE (SUBMARINES ONLY).

- a. MRCs **that** direct work or entry within the Submarine Safety (SUBSAFE) Certification Boundary require Re-Entry Controls to be invoked. In order to ensure that these controls are initiated, Ship’s Force personnel must over stamp those MRCs requiring such work or entry with the word “SUBSAFE” in red ink. SUBSAFE MRCs are annotated on the MIP with either an “**RS**” or “**XS**” in the “OTHER” column. New PMS MRC editing programs are being developed where watermarking of MRCs will begin to show up on published PMS MRCs. If a “SUBSAFE” MRC has a “SUBSAFE” watermark, over stamping in red ink as described is not required.

- b. MRCs **that** direct work or entry within the Scope of Certification (SOC) Certification Boundary also require Re-Entry controls to be invoked. SOC documentation is applicable and governing to Dry Deck Shelter (DDS) host platforms and must be loaded to Work Center WK02 for those platforms. SOC MRCs are annotated on the MIP with either an “RD” or an “XD” in the “OTHER” column. Non-DDS platforms need not establish WK02 nor are they governed by SOC directives.
- c. MRCs which work within the Submarine Flight Critical Component (SFCC) Boundary where Re-Entry Control (REC) documentation is required are annotated on the MIP with an “RF” in the “OTHER” column.
- d. Survivability and Escape Equipment and supporting maintenance has come under increased scrutiny since the loss of the Russian submarine KURSK. All MIPs and associated MRCs dealing with Survivability and Escape equipment are to be loaded to Work Centers (WC) per Table 19-1.

MIP	SYSTEM	REQUIRED WC
5940/908	Submarine Escape and Immersion Equipment (SEIE), Escape Trunk	EA01 (SSN 688 Class)
5940/906	Submarine Escape and Immersion Equipment (SEIE), Escape Trunk	EA01 (SSBN and SSGN 726 Class)
5940/905	Submarine Escape and Immersion Equipment (SEIE), Escape Trunk	EA01 and WK02 (SSN 774 Class, SOF)
5940/904	Submarine Escape and Immersion Equipment (SEIE), Escape Trunk	EA01 (SSN 774 Class, non-SOF)
5940/901	Submarine Escape and Immersion Equipment (SEIE), Escape Trunk	EA01 (SSN 21 Class)
5940/007	Backup Oxygen Redistribution System	EA01 (SSBN/SSGN 726 Class)
5940/006	Submarine Survivability Life Support Systems ExtendAir	EA01 (SSN 774 Class only)
5940/005	Submarine Escape, Rescue, and Survival Equipment SEIE and Crash Bags	WK01 (WF01 for SSN 774 Class)
5940/003	Manual Reverse Osmosis Desalinators (MROD)	RL01 (SSBN and SSGN 726 Class and 21 Class only)
5940/002	Atmospheric Sampling, Submarine Survivability Life Support Systems DISSUB	NE01

MIP	SYSTEM	REQUIRED WC
5940/001	Lithium Hydroxide (LiOH) Curtain Kits, DISSUB Submarine Survivability Life Support Systems	EA01
4413/015	Submarine Emergency Position Indicating Radio Beacon (SEPIRB)	OC01
5882/021	Helicopter Transfer Kit,(Submarine)	WK01 (WQ01 for SSN 774 Class)

Table 19-1**19.11 PMS FUNCTIONAL OPERATION.**

19.11.1 Minimum Standards. MRC accomplishment is critical for maintaining equipment in a ready state and achieving expected service life. The maintenance tasks directed by MRCs are the minimum standards for organizational (shipboard) preventative maintenance and therefore equipment degradation can be assumed if maintenance is deferred. The following provisions are provided to maximize on time performance of PMS and provide increased Fleet latitude in maintaining equipment.

- a. MRCs are prepared as instructions to complete a maintenance task based upon the premise that the personnel assigned to perform the task have sufficient knowledge of the rate listed on the card and are qualified to perform maintenance as directed by the MRC. The MRC will be accomplished in sequential order, adhering to all Warnings, Cautions and Notes. Routine sub-steps (e.g., fastener removal, steps to don and remove Personnel Protective Equipment (PPE), turning on a vacuum) may or may not be included in the MRC and their absence should not prevent the maintainer from completing the maintenance task.
- b. Per NAVSEA, procedures are written at a level of detail based on the assumption maintenance personnel are trained, qualified and supervised by experienced leadership to consistently and expertly execute the maintenance. They exist to provide a common standard, specify acceptance criteria, communicate Warnings and Cautions specific to the maintenance and provide proven maintenance practices. They are not intended to:
 - (1) Supplement or duplicate rules and procedures that must be followed for Hazards generally associated with the equipment (Hazardous Material Handling, Electrical Shock Risk Management, etc.) but not specifically associated with a step of the procedure.
 - (2) Identify every process and every Warning associated with the maintenance environment of the component being maintained (Aloft, In Tanks, Near an Active Flight Deck, In a Heat Stress area, etc.)
 - (3) Specify every possible action of the maintainer.
- c. Leadership will uphold standards for complying with maintenance procedures. This standard does not mean the maintainer is expected to robotically follow the MRC word-by-word. Leadership, trainers, monitors, auditors and inspectors should not

expect it. The key word here is intent. The objective is to perform the intent of each step (step-by-step) performance.

- d. If a step is missing that is necessary to complete the task, and that step is not obvious to the maintenance person, an FBR should be submitted.
- e. MRC completion status is dependent on the accomplishment of all procedural steps on all of the equipment listed on the MRC or its accompanying Equipment Guide List (EGL) or items listed on the Location Guide List section of the MRC.
- f. The performance of additional rational actions during the accomplishment of an MRC is authorized. Examples of such actions include turning on and off items utilized during the performance of the MRC (Vacuum cleaners, test equipment, etc.) and general housekeeping (cleaning up or containing spilled fluids or dirt) as experiences gained from prior accomplishments warrant and in no way detracts from the accomplishment status.
- g. The substitution of any tools, materials or test equipment not held by the activity should be considered prior to deciding to defer the maintenance until the exact tools, materials or test equipment listed on the MRC are procured. This is especially critical for frequently required maintenance where several performance cycles can be missed while waiting for supply to provide the correct items. Substitution requirements are provided by reference (a) and other technical documents.

19.11.2 SKED. The use of SKED Version 3.2 or subsequent versions for PMS Scheduling constitutes full compliance with all administrative provisions of the 3-M Manual. Guidance for use of SKED is provided via the SKED Users Guide with Help menus, Wizards associated with SKED functionality and the SKED Master Computer Based Training (CBT). The Navy PMS DVD or CD-ROM is used to update the command or unit's SKED PMS data. Electronic backup of the command or unit's SKED database will be used to restore SKED databases.

- a. COMNECC units are unique in structure consisting of deployable sea and shore components. The PMS cycle schedule must not be more than 20 quarters. Each maintenance worthy piece of equipment within a Work Center will be listed on its own component row on the cycle schedule. Cycle schedules may only be restarted with written authorization of the ISIC. All Work Centers within the NECC enterprise will be on common "quarter after overhaul" regardless of when 3-M was implemented or when a command was stood up. While in Data Entry Mode or Revise Mode, great care must be exercised to ensure that Mandatory and Convenience Related Maintenance is appropriately entered. Additionally, when scheduling semi-annual (and greater) maintenance, the WCS will ensure that all similar maintenance actions are scheduled concurrently to the maximum extent possible. A current paper copy of the cycle board will be maintained in the Work Center.
- b. The SKED program uses days to schedule and keep track of calendar periodicities. MRCs are displayed as out of periodicity when they fall outside the established date ranges in the SKED program. These date ranges are as reflected in Table 19-2:

Periodicity	Date Range
Daily	None
2D	None
3D	None
Weekly	None
2W	9 - 19 days
3W	14 - 28 days
Monthly	21 - 41 days
2M	41 - 83 days
Quarterly	61 - 121 days
4M	83 - 165 days
Semi-Annually	121 - 243 days
8M	165 - 331 days
9M	+ or - 90 days from scheduled date
Annual	+ or - 90 days from scheduled date
Multi-month after annual	+ or - 90 days from scheduled date

Table 19-2

19.11.3 Scheduling. PMS is a portion of the Command's 3-M program that provides, in one authoritative system, the scheduling information and technical procedures governing planned maintenance. PMS provides a simple method for scheduling and documenting the execution of planned maintenance procedures. Fleet policy is listed in paragraph 19.2 with the scope identified in paragraph 19.3 of this chapter.

NOTE: WHERE THE GOAL OF 100% ACCOMPLISHMENT CANNOT BE REACHED, THE UNIT'S CHAIN OF COMMAND MUST BE KEPT INFORMED OF THE CIRCUMSTANCES THAT PREVENT ACCOMPLISHMENT OF SCHEDULED MAINTENANCE.

- a. (Submarine Force only) An asterisk (*) will be inserted in SKED against any Maintenance Requirement (MR) which is a "Safety of Ship" item. A "Safety of Ship Item" is defined as any maintenance action vital to the maintenance of a submarine's watertight integrity or its ability to return safely to the surface. "Safety of Ship" MRs, so designated by the cognizant technical authority, are annotated on the MIP with a

single asterisk (*) in the periodicity code column. Commanding Officer notification is required for non-accomplishment of any “Safety of Ship” designated MR.

- b. Situational reference sheets will be maintained or posted in the WC PMS Manual. These sheets will contain a brief description of the situation and the maintenance action for all situational requirements listed in the right hand column of the weekly schedule. Appendix F of this chapter provides a typical situational reference sheet.
- c. Situational maintenance scheduling will be managed utilizing the tools provided by the computer based PMS scheduling software employed by the activity. All event driven situational requirements will be “triggered” when required and performed per reference (a).
- d. (LCS and DDG 1000 only) A plus sign (+) denotes PMS to be performed by the sustainment contractor or other Maintenance Personnel not assigned to Ship’s Force.

19.11.4 Accountability. The credibility of the Navy PMS program relies heavily on the individual accomplishing the maintenance. The required dedication and integrity of that individual cannot be overstressed. To maintain accountability, personnel are required to sign for the completion of assigned maintenance in an Accountability Log. The Work Center Supervisor (WCS) is required to review and sign the Accountability Log weekly to verify the accuracy and completeness of entries. Accountability sheets will be maintained in the WC PMS Manual for a period of not less than 13 weeks. (SKED 3.2 users see paragraph c).

19.11.5 Accomplishing PMS. Maintenance personnel use MRCs to accomplish assigned planned maintenance as described in subparagraphs 19.11.5.a through 19.11.5.g.

- a. From SKED My Task view, review the 13-week report.
- b. Determine maintenance task(s) assigned.
- c. Determine when the maintenance task(s) are due.
- d. Determine what tools, parts, material, test equipment or supplies are needed. For MRCs that contain inspections and then maintenance actions based upon the inspection findings, the TPMTE needed to perform the follow-on maintenance caused by the inspection findings does not need to be obtained prior to performing the MRC but rather, may be obtained as needed.
- e. Perform the maintenance on schedule.
- f. Notify the Work Center Supervisor immediately whenever one or more of the following conditions exist:
 - (1) Anything on a MRC is not fully understood, appears to be incorrect or cannot be accomplished as written.
 - (2) Tools, Parts, Materials or Test Equipment prescribed by the MRC are not available, are not correct or questions about substitutions arise.
 - (3) Any doubt exists about your capability, training or experience to properly perform the maintenance requirement as prescribed.

- (4) Factors exist which would make performance of the maintenance requirement unwise or dangerous (e.g., disassembly of equipment needed for operations, radiation when prohibited, situations causing safety hazard to exist, etc.).
 - (5) Equipment deficiencies or casualties are discovered.
 - (6) Any provisions or requirements on the MRC cannot be accomplished as prescribed. (see para. 19.11.1 for clarification)
- g. Report completed planned maintenance actions to the Work Center Supervisor. Update the PMS Schedule, annotate and sign the 13-Week Report. If multiple maintenance persons are assigned to a single maintenance action, the most senior person assigned must update the PMS Schedule, annotate and sign the 13-Week Report or check note if using SKED 3.2 Electronic Accountability. Maintenance actions not fully completed will be reported to the WCS. Enter detailed remarks to document the reason for incompleteness or non-accomplishment (use "Check or Alert Note" in SKED 3.2). However, if material deficiencies or casualties, which are unrelated to that MR, are discovered, the MR can be checked off (provided the MR was fully completed) but the discrepancy must be reported via the MDS.

19.11.6 Non-Accomplished Categories. The WCS or LCPO will add a brief description for each check note or alert for non-accomplished categories using subparagraphs 19.11.6.a through 19.11.6.g.

- a. System/Equipment Failure – System or Equipment is not operational or in a reduced operational status thus preventing maintenance from being accomplished. CSMP JSN required in additional text description.
- b. Inadequate Maintenance Procedures - MRC procedure or steps cannot be accomplished to a point where the maintenance can be considered accomplished. FBR number required in additional text description.
- c. Ship/Unit Operational Requirements - Operations prevent the maintenance from being accomplished. Requires additional text description.
- d. System/Equipment Operational Requirements - Required operation of system or equipment prevents maintenance from being accomplished. Requires additional text description.
- e. Lack of HAZMAT - Correct HAZMAT not available at the time maintenance was to be performed. CSMP JSN required in additional text description.
- f. Missing/Incorrect TPMTE – Correct or calibrated TPMTE was not available at the time maintenance was to be performed. CSMP JSN required in additional text description.
- g. Other - Requires additional text description.

19.11.7 Weekly Status Report. The weekly PMS Monitoring status reports will be retained (electronically if desired) by the 3MC for 6 months (12 months for NECC). Surface Force Ships only require 13-weeks of reports to be maintained by 3MC. These reports from the 3MC to the 3-M System Manager will contain, as a minimum, the following information:

- a. Completed Spot-Check and Monitored MRC results.
- b. Completed Work Center Audits and results.
- c. The number of FBRs over seven days old that have not been reviewed by the Chain of Command.
- d. Abatement and corrective actions completed as a result of a monitoring program finding.
- e. Inactive Equipment Maintenance Summary.
- f. Overdue (past periodicity) MRCs and plan of corrective action.

19.11.8 Electronic Accountability. Electronic Accountability update of a Maintenance Requirement Card (MRC) will be utilized by ships employing SKED 3.2. When an individual updates the disposition of a check, this is the same as signing and dating a check completion on a 13-Week Accountability Sheet. The disposition of a check will become permanent when the weekly closeout is performed. All PMS maintenance assigned to a maintenance person is presented to them immediately upon SKED 3.2 log-on; and Chain of Command review can be tracked on the Weekly Closeout Signature Sheet. Therefore, there is no need to print and sign the 13-Week Accountability Form.

19.11.9 Informational MRCs. MRCs under the cognizance or requiring the participation of outside activities are listed on ship's force MIPs and may be indicated by a letter code designation in the "Other" column. When these MRs are completed, the affected Work Center Supervisor will schedule and mark accordingly. These MRCs do not have to be printed out and stored in the PMS Master File or in the applicable Work Center file because they are available on the FR DVD or CD-ROM. These MRCs are provided for informational purposes, to facilitate the scheduling of maintenance actions related to ship visits.

19.11.10 Assessment Procedure MRCs. Assessment Procedure (AP) Maintenance Requirement Cards need not be scheduled within SKED, but they will be maintained "active" through the Force Revision and TFR process. Assessment Procedures need only be printed on an "as needed" basis for use by assessment personnel or Ship's Force. The record of completed Assessment Procedures by off-ship personnel is recorded on the Work Candidate and Ship's Force participation is recorded in their completion remarks of that Work Candidate. There is no need for recording Ship's Force participation in an assessment event on their PMS schedule within SKED. FBRs submitted requesting deletion of a MIP that only contains AP checks will be disapproved and returned to the originator.

19.11.11 Interim MRC Procedures. The ship may develop interim MRC procedures based on experience and applicable technical manuals in support of equipment or systems without PMS coverage until formal documentation is received. Before scheduling preliminary MIP requirements, the Work Center Supervisor and the Department Head must verify their applicability to installed equipment.

19.11.12 Command Implementation of a Force Revision.

- a. The 3-M Coordinator will:
 - (1) Route the Service Brief to the Chain of Command for review.

- (2) Enter the FR number from the ALID in the PMS Supersedure and New Issue Accountability Log.
- (3) Update PMS data into SKED prior to routing the change documentation to Work Centers.
- (4) Route the FR to WCS for implementation. (See Figures 19-1 and 19-2 for an example of a Routing Memorandum and an FR implementation checklist respectively.)

NOTE: GUIDANCE FOR USE OF SKED IS PROVIDED VIA SKED USER'S GUIDE WITH HELP MENUS, WIZARDS ASSOCIATED WITH SKED FUNCTIONALITY AND THE SKED MASTER COMPUTER BASED TRAINING (CBT).

16 Oct 2019

MEMORANDUM

From: 3-M Coordinator

To: _____ Work Center Supervisor

Subj: FORCE REVISION PACKAGE X-XX

Encl: (1) Force Revision Implementation Checklist
(2) List of Effective Pages (LOEP)

1. Force Revision Serial: X-XX has arrived from NAVSEALOGCEN.
2. The SKED Force Revision (FR) update is complete. Begin your Work Center FR implementation using enclosures (1) and (2); complete through your Department Head no later than (Day Month Year).
3. Corrections, including those to LOEP, MIP and MRC, should be made immediately. Make certain ACNs and FBR responses are reflected in the FR. If not, maintain the copies and changes to your MIP(s) and MRC(s) until reflected in a subsequent FR.
4. MRCs with procedural lineouts previously approved by the LCPO must again be reviewed by the LCPO to confirm they continue to meet the requirements of the JFMM Volume VI, Chapter 19. Specifically, in the Procedure block, Work Center Supervisors may lineout the non-applicable line items (alternate procedures) that do not pertain to current equipment or configuration when the step includes the words “if applicable” or a note identifies steps to be omitted. These items must be reviewed and approved by the Division LCPO. As these changes are Work Center and maintenance item specific, submission of an FBR is not required.

R/

3MC

Figure 19-1

MEMORANDUM

From _____ Work Center Supervisor
To: 3-M Coordinator
Subj: FORCE REVISION IMPLEMENTATION CHECKLIST COMPLETION

1. The following actions have been accomplished in SKED to implement Force Revision X-XX.

Task Description	Initial
Verified all equipment is listed under each MIP.	
Verified new or changed MRCs (green or yellow) are added to the correct Maintenance Item (equipment).	
Verified all applicable MRCs for each piece of equipment are active.	
Verified all MRC's have associated "Related Maintenance" attached.	
Verified that Safety of Ship is toggled to "YES" if applicable.	
Verified that all MIP lineout's have a technical reason documented for deletion. (Select the "Pencil" Icon on top row)	
Verify Maintenance Item Serials & Locations are correct.	
Upon completion of implementation Marked Complete for digital approval by: LCPO, Division Officer and Department Head.	LCPO
	DIVO
	DH

2. After Dept. Head approval:

LCPO run SKED report PMS Documents and Customized MRCs – Line-outs. Verify each procedural lineout meets JFMM Volume VI Chapter 19, paragraph 19.6.11 requirements.	
WCS create an excel spread sheet from the Maintenance Outlook Report as a minimum electronic backup forecasting as many quarters in advance as available and store it on your hard drive (not a LAN drive) in the event of the LAN crashing.	
WCS select "Work Center" from the upper menu and "Update Unassigned Slots." Initially, any MRC without ownership will be assigned to the WCS. Reassignment by the WCS or LCPO will follow.	

3. Printing requirements for MRCs are determined by individual command policy. Printed MRCs must come from "PMS Documents" (not PMS Viewer).

4. The only required documentation in the Work Center PMS space manuals are:

- Classified MRCs.
- MRCs required by the Command.
- MRCs with pen & ink changes authorized by ACNs or answered FBRs.
- KMRC performance data (if no digital record). (Submarines only)

5. Approval Signatures:

Position	Signature
LCPO	
DIVO	
Dept. Head	
3MC	

Figure 19-2

- b. The WCS, upon receipt of the change document from the 3-M Coordinator, will:
 - (1) Make the appropriate entry in the Work Center Record of Change Log. (Not Applicable to Submarine Force)
 - (2) Make appropriate LOEP, MIP, MRC, etc. changes to the Work Center PMS Manual. (Not Applicable to Submarine Force)
 - (3) Apply changes to the Work Center PMS schedule utilizing SKED Revision Editor.
 - (4) Route revision changes to Division LCPO for review and concurrence.
- c. The Division LCPO will:
 - (1) Verify that all PMS changes have been properly applied to the Work Center schedule utilizing SKED Revision Editor.
 - (2) Review line outs on LOEPs, MIPs and MRCs. Initial all such lineouts to indicate concurrence. (Not Applicable to Submarine Force)
 - (3) Submit PMS schedule to Division Officer for review and concurrence.
- d. The Division Officer will:
 - (1) Verify that all PMS changes have been properly applied to the Work Center schedule utilizing SKED Revision Editor.
 - (2) Review and concur with the lined out MIPs on the LOEP, MRCs on the MIPs. (Not Applicable to Submarine Force)
 - (3) Submit PMS schedule to Department Head for review and approval.
- e. The Department Head will:
 - (1) Verify that all PMS changes have been properly applied to the Work Center schedule utilizing SKED Revision Editor.
 - (2) Review and approve with the lined out MIPs on the LOEP, MRCs on the MIPs. (Not Applicable to Submarine Force)
 - (3) Review and approve Work Center PMS Schedules.
- f. The Work Center Supervisor makes final entries in the Work Center Record of Change Log, completes the PMS Change Documentation Routing Memorandum and returns it to the 3-M Coordinator.
- g. The 3-M Coordinator updates the Change Service Accountability Log and notifies the XO that the FR has been installed after receiving all FR PMS Change Documentation Routing Memorandums from the Work Centers.

19.11.13 Change Service Accountability Log. The Change Service Accountability Log (CSAL) (Figure 19-3) provides a definitive record of all changes to a command's 3-M program. Whenever a change to a command's 3-M program is directed (be it from Force Revision, Feedback Report, ISIC direction, etc.), the change will be routed to the concerned Work Center Supervisor(s) via a memorandum. Whenever such a memorandum is issued, it must be recorded

in the CSAL. Once the WCS reports the directed change has been completed, the 3MC will file the WCS response and annotate the CSAL that the action is complete.

- a. The CSAL is comprised of the actual log sheet, a copy of all memos routed to the WCS and the memo from the WCS to the 3MC indicating completion.
- b. The importance of the CSAL cannot be overstated. In essence, it provides for a day-to-day, year-to-year record of changes to a command's preventive maintenance program. It is also a turnover document at deployment sites, allowing a current command to quickly identify all changes from a previous command. Finally, it will be inspected during all command 3-M assessments and inspections, providing visibility to how well a command manages 3-M from one inspection to another.

19.11.14 PMS Master File. The Master File, maintained by the units 3MC, contains information relative to PMS requirements that are specific to equipment for which the command is responsible. The Master File provides for duplicate issue of missing MIPs and MRCs, contains supplementary information provided by **NAVSEALOGCEN** Detachments Norfolk or San Diego and serves as a repository for changes received between Navy Force Revision distributions, which must be retained on file until the changes are reflected in a subsequent FR. The content of the master file will vary between TYCOMs due to enterprise specific requirements. Master File content is delineated in Appendices A1 through A5, Section I-B the COMMAND LEVEL EFFECTIVENESS REVIEW.

19.11.15 Work Center PMS File. The Work Center File is designed to provide a ready reference of planned maintenance requirements and information to be retained in the working area for use by the WCS and maintenance personnel. The Work Center File reflects that portion of the Master File that contains only the documents and information applicable to a particular Work Center. The content of the Work Center File is delineated in Appendices A1 through A5, Section I-A of this chapter (SCHEDULING and EXECUTION EFFECTIVENESS REVIEW).

CHANGE SERVICE ACCOUNTABILITY LOG

FR Change Number or Authority	Date RCVD	Cognizant Dept. or WC	Date Cover Sheet Issued	Date Cover Sheet Returned	Date Master File Updated or Item Closed	Summary of Change

FR Change Number or Authority	Date RCVD	Cognizant Dept. or WC	Date Cover Sheet Issued	Date Cover Sheet Returned	Date Master File Updated or Item Closed	Summary of Change

Figure 19-3

19.12 MAINTENANCE DATA SYSTEM. Maintenance Data System (MDS), per the requirements of reference (a), provides maintenance and material managers throughout the Navy with the means to plan, acquire, organize, direct, control and evaluate manpower and material resources expended or planned for expenditure in support of maintenance. It allows for information collected by maintenance personnel to be recorded only once, and thereafter, the maintenance database will provide information to all who have a need for it. O-level MDS requirements require the reporting of maintenance actions and configuration changes on all categories of equipment.

19.12.1 Specific Requirements and Policy.

- a. A Configuration Data Manager (CDM) is designated as the control authority for accuracy and completeness of the configuration information for each unit. A CDM may perform this function for multiple units. Prior to MDS delivery, the SYSCOM and the delivering activity are responsible for the initial accuracy and completeness of data provided to the CDM. After delivery (initial CDM validation), each unit will maintain and update its configuration data in the Weapons System File through the submission of configuration change reports.
- b. An item is considered to be a Configuration Worthy Item (CWI) if one or more of the following criteria are met:
 - (1) Any item that is bought from an outside activity.
 - (2) Any item, including software that has a separate specification.
 - (3) Any item that has a separate drawing.
 - (4) Any item that is a separate line item or sub line item on a purchase order or contract.

- (5) Any item that has or requires any form of separate technical or logistics document.
- (6) Any maintenance worthy item included in a Table of Allowance (TOA).
- (7) Any item needed to support software tracking.

19.12.2 Databases. Automated systems have been developed to reduce the administrative workload associated with shipboard reporting of maintenance, to provide users with responsive and flexible databases for on-line management of maintenance and to improve the accuracy and timeliness of existing up-line reporting.

- a. 3-M System Central Database. The **NAVSEALOGCEN** 3-M System Central Database is the focal point for receipt and distribution of **UNCLASSIFIED** maintenance and material data. Each reporting activity must ensure that narrative data sent up-line to this database does not contain any classified or Navy Nuclear Propulsion Information (NNPI).
- b. Configuration Data Managers Database – Open Architecture (CDMD-OA). This database serves as the Navy's central repository for Ship Configuration and Logistic Support Information System (SCLSIS). Updates via the Automated Shore Interface (ASI) are made available to the ship on a continuous basis and enables the supply department to easily maintain its Consolidated Shipboard Allowance List (COSAL) and order repair parts as an automated process. The CDMD-OA database identifies all of the items, components, equipment, subassemblies, assemblies, sub-systems, and systems requiring integrated logistics support.
- c. Propulsion Organizational Maintenance Management System (P-OMMS). Ships equipped with P-OMMS should refer to the Naval Nuclear Material Management Manual NAVSEA S9213-45-MAN-000(U) for P-OMMS operating requirements.
- d. Automated and non-automated units maintain a copy of their own configuration and logistics database. This database is the same as the unit's section of the master CDMD-OA database. The two databases are kept in synchronization through the SCLSIS management process.

19.12.3 Data. Reported maintenance action information is used for material history purposes and is the basis for the material and logistics support necessary to maintain equipment. Maintenance and material information in numerous reports and formats are available through the 3-M Central Database. These reports yield information concerning equipment maintainability, reliability, man-hour expenditures, material usage, costs and material condition. Refer to Section III Chapter 1 of reference (a) for information on obtaining 3-M data reports from **NAVSEALOGCEN**.

- a. Configuration and Logistics Data. The accuracy of the ship's configuration information affects the quality of the logistics support that the ship receives. Inaccurate data will result in the ship being supplied with incorrect component parts or technical documents necessary for the operation and maintenance of equipment. This will ultimately hinder battle damage repair efforts.
- b. Ship Configuration and Logistics Support Information System. The SCLSIS process allows ships to maintain an on-line source of their configuration information allowing

them to locate and determine configuration, logistics and supply data associated with all installed equipment. This information can then be used to fill in OPNAV 4790/2K and OPNAV 4790/CK Forms without having to refer to a series of manuals or off-line reference books and files. The on-line system also allows maintenance personnel to identify the repair parts associated with the equipment and systems that they are maintaining and to order these parts on-line. Since the configuration data in the Organizational Maintenance Management System – Next Generation (OMMS-NG) and Shipboard Non-Tactical Automation Program (SNAP) databases is provided, the shipboard or unit personnel need only select the correct equipment and report the information relevant to the actual maintenance of the equipment.

19.12.4 Reporting. Reference (a) requires all afloat activities to report deferred and completed maintenance actions, configuration changes and configuration file corrections. Ashore 3-M Work Centers are to report corrective maintenance and configuration changes on all installed shipboard-identical equipment and equipment installed in service crafts and boats. One Work Candidate (OPNAV 4790/2K or equivalent) will be submitted for each job action. Do not bundle multiple pieces of equipment on one Work Candidate.

19.12.4.1 Reporting Methods.

a. The configuration and maintenance forms used for manual reporting are:

- (1) Configuration Change Form OPNAV 4790/CK
- (2) Maintenance Action Form OPNAV 4790/2K
- (3) Supplemental Form, OPNAV 4790/2L
- (4) Maintenance Planning and Estimation Form OPNAV 4790/2P

NOTE: THE MAINTENANCE PLANNING AND ESTIMATING FORM IS USED ALONG WITH THE OPNAV 4790/2K FOR DEFERRING MAINTENANCE TO BE DONE BY AN INTERMEDIATE MAINTENANCE ACTIVITY (IMA). AS THIS DOCUMENT IS PRIMARILY USED BY THE IMA TO SCREEN AND PLAN THE JOB IN DETAIL, REFER TO REFERENCE (a) IF FURTHER INFORMATION IS REQUIRED.

b. Non-Automated. Appendix G provides preparation guidelines for documenting configuration changes (CKs), Appendix H provides preparation guidelines for documenting maintenance actions (2Ks), and Appendix I provides preparation guidelines for providing supplemental information (2Ls).

c. Automated.

- (1) MDS automated data reporting is basically the same as in the non-automated 3-M program. The terms “2K”, “CK” and “Work Candidate” are perpetuated in supporting software even though the paper forms are not filled out (with the exception of the OPNAV 4790/2L). Transactions are entered into the computer and up-line reported using applicable software.
- (2) Software instructions are developed and distributed by the 3-M Central Design Activities (CDAs). CNAL developed an OMMS-NG user guide. In the past, this guide has been provided to the other TYCOMs to use and distribute at

their discretion. Options are available in the system to print simulated 2Ks, CKs or Work Candidates when desired. (Check the applicable system's user manual or ONLINE HELP for additional information).

- (3) With an automated information system, the computer will provide on-line access to the data for identifying equipment and ordering parts. When documenting requirements, many of the data elements required for corrective maintenance and configuration change reporting such as the APL, EIC, Equipment Name and Location, are pre-filled and displayed when the subject equipment is identified. Reference (a), Appendix A provides the data elements and allowed values for each type of reporting.

19.12.4.2 Configuration Change Form OPNAV 4790/CK

- a. Ship or Unit responsibility. To ensure timely receipt of accurate configuration, logistics support, COSAL and supply support data, ship and activity personnel must:

- (1) Promptly report equipment installed, removed or modified using an OPNAV 4790/CK.
- (2) Review all configuration change maintenance actions, equipment file corrections and logistics support transactions in a timely manner and transmit them for processing.
- (3) Process all ASI data promptly by following the SCLSI Technical Specification and as described in 19.4.2.a.(3)(a) and (b).
 - (a) Surface Force ships ASI download and processing is required when the ASI record count in RADWEB is 3,000 records for Guided Missile Cruiser (CG), Guided-Missile Destroyer (DDG), Mine Countermeasure Ship (MCM), Amphibious Transport Dock (LPD), Dock Landing Ship (LSD), Patrol Craft (PC) or shore facilities. Download and processing for Landing Helicopter Assault (LHA), Landing Helicopter Dock (LHD) and Amphibious Command (LCC) ships is required when the ASI record count in RADWEB reaches 10,000 records. Littoral Combat Ships (LCS) will download and process ASI records monthly, at a minimum. Download and processing of all available ASI records in RADWEB is required when the unit is getting underway for a period of two weeks or longer, monthly at a minimum, or as directed by the TYCOM. Ship's ASI data available in RADWEB will be downloaded and processed into the ship's MDS within seven (7) days of ASI creation.
 - (b) NECC requires processing of all ASI data into their automated system promptly following the SCLSI technical specification. Unit's must report configuration changes to COMNECC via the respective ISIC in the form of a completed OPNAV 4790/CK Configuration Change form. Units will conduct up-line reporting and ASI processing within seven (7) working days of the ASI posting to RADWEB.

- (4) Report equipment or component changes detected or accomplished by Ship's Force and Intermediate Maintenance Activities (IMAs). While the Equipment Technical Authority is responsible for reporting Alteration Installation Team (AIT) installations, the ship is ultimately responsible for its own configuration accuracy. If these AIT configuration changes have not been properly reported by the Technical Authority, the ship is responsible for reporting them.
- (5) NECC commands will use OMMS-NG to process CKs. For temporary issue of equipment exceeding six (6) consecutive months a CK will be processed by the releasing and gaining commands.
- b. Shipyard Installed Alterations. A certification of alteration accomplishment is provided by the Navy Supervising Activity (NSA) to the recipient ship and the appropriate CDM when the Shipyard accomplished the installation. This certification includes the Work Center JSN assigned to the alteration and the Final Action taken. The certification will be in the format shown in Appendix F. The ship will endorse the shipyard's certification letter and forward to the support activity managing the Unit's Master CSMP. The endorsement provides authorization for information transmitted to be processed as completed deferrals in the Master CSMP; refer to Appendix F. This eliminates the need for documenting multiple configuration changes to close the CSMP deferral.
- c. Configuration File Corrections. In addition to reporting configuration changes as a result of accomplishing a maintenance action, it is necessary to correct deficiencies in the configuration file to obtain support for equipment that is onboard but is not identified in the COSAL, or to delete from the COSAL equipment that is not onboard but is supported. There are six categories of actions that must be reported. A configuration change record is submitted to:
 - (1) Correct ship controlled data elements in an existing record of the ship's configuration baseline. For additional information concerning the data elements, refer to the SCLSIS Technical Specification 9090-700 series, Part B.
 - (2) Correct erroneous data previously submitted.
 - (3) Obtain support for equipment that is onboard, but not identified as such.
 - (4) Identify equipment that is supported but is not onboard.
 - (5) Report the turn-in or receipt of Portable Electrical and Electronic Test Equipment (PEETE).
 - (6) Report the completion of Ship's Force equipment configuration validations.

NOTE: FOR NON-AUTOMATED SITES, THE OPNAV 4790/CK IS USED. IF USING THIS FORM REFER TO APPENDIX G FOR FORM PREPARATION INSTRUCTIONS. FOR AUTOMATED SITES, REFER TO THE APPLICABLE SYSTEM'S USER MANUALS OR GUIDES FOR THE PROCEDURES USED TO CHANGE, ADD OR DELETE FILE INFORMATION.

19.12.4.3 Maintenance Action Form OPNAV 4790/2K.

- a. When Required. A 4790/2K or Fleet approved equivalent is required:
 - (1) To document a material deficiency.
 - (2) For a CMP maintenance action.
 - (3) When ordering parts or materials.
 - (4) For Selected Level Reporting.
 - (5) When requesting special support or test equipment (hydrostatic pumps, rigging equipment, etc.).
 - (6) For documenting a completed maintenance action (corrective or preventative).
 - (7) When submitting a CASREP.
 - (8) When submitting a temporary Departure From Specifications (DFS).
 - (9) For any change in system or equipment configuration (i.e., 4790/CK).
 - (10) For documenting the results of an inspection or assessment.
 - (11) For installation of a Ship Alteration (SHIPALT).
 - (12) For support services during a maintenance availability.
 - (13) When requesting help from outside activities (technical assistance, repair, calibration, etc.).
- b. Work Candidate Documentation.
 - (1) Aircraft Carriers, CNIF, Submarine and Surface Force ships specific requirements and policy:
 - (a) Problem Description and Recommended Solution. Problem description must give a detailed description of what the problem is and why it is being deferred. The recommended solution will describe, in detail, what and who will be required to correct the deferred maintenance.
 - (b) Maintenance Level Assignment. The maintenance level assigned to the Work Candidate will match the maintenance activity requirements of the problem description and recommended solution. Maintenance Level assignment is sometimes referred to as the “Level of Effort”.
 - (c) First and Second Contact. The first contact field will contain the name of the senior person engaged in the maintenance action. The second contact field will contain the name of the supervisor of the first contact or maintenance person.
 - (d) Work Candidate or CSMP Summary. The Work Candidate summary is a condensed summary of the problem. It will not contain the recommended solution, the equipment name, identification or serial number, or compartment location.
 - (e) Deadline Date. All Work Candidates which require assistance from a Type 2 or 3 Maintenance Activity will have a valid deadline date

assigned. If a deadline date is used on Type 1 or Type 4 Work Candidate, the deadline date will be a valid date.

- (f) Priority Code. Reference (a), Appendix A contains guidance for assigning appropriate priority codes.
 - (g) Configuration. Work Candidates must be written against the correct ship's configuration item.
 - (h) Equipment Status Code. Equipment Status Code will reflect the actual condition of the equipment at the time the Work Candidate is created. The Equipment Status Code is used in determining the mission operational capabilities of the ship, as reported off ship to DRRS-N.
 - (i) Safety Hazard Code. When used, the Safety Hazard code must have a supporting write up in the Problem Description field. The Safety Hazard Code is used in determining the mission operational capabilities of the ship, as reported off ship to DRRS-N.
 - (j) Deferral Reason Code. The Deferral Reason Code must have a supporting write up in the Recommended Solution field.
- (2) Submarine specific requirements and policy: Classified information or NNPI is not to be included on any Work Candidate entered into MDS. Should this information be required to adequately document a material deficiency, the following action will be taken:
- (a) Create a Work Candidate in MDS.
 - (b) For the Block 35 narrative (Problem Description), indicate the unclassified summary and Date Time Group (DTG) of a classified message that fully describes the problem.
 - (c) Transmit a classified message to the appropriate activities to supplement the Work Candidate.
- c. Deferred Maintenance Action. A deferred maintenance action is a maintenance requirement that meets one or more of the following criteria:
- (1) Requires assistance from an activity external to the ship to accomplish (for example, IMA, Depot, Technical Support Unit, etc.), or is a Ship's Force job requiring assistance from outside the originating Work Center (for example parts required).
 - (2) Is not expected to be accomplished by Ship's Force within the time frame prescribed by the TYCOM (seven (7) calendar days for NECC units).
 - (3) Is an uncorrected deficiency reported by INSURV; refer to Section II Chapter 1 of reference (a) or other inspecting activity (CMAT, C5RA, TSRA, OSAR, MRA etc.).
 - (4) Is required to correct a condition **that** has caused, or has the potential to **cause injury to personnel or damage to material**.

NOTE: FOR NON-AUTOMATED SITES, THE OPNAV 4790/2K IS USED TO REPORT A DEFERRED MAINTENANCE ACTION. REFER TO APPENDIX H FOR MANUALLY COMPLETING THE 4790/2K. FOR AUTOMATED SITES, REFER TO THE APPLICABLE SYSTEM'S USER MANUALS AND GUIDES.

- (5) NECC unique requirements and policy. Whenever creating a Deferred Maintenance Action ensure the blocks listed contain the following information.
 - (a) Block 6: The When Discovered Code identifies when the need for maintenance was discovered. Typically, Deferred Maintenance Actions are written to document defects or failures on the command's equipment. However, Deferred Maintenance Actions are also required to procure materials in support of PMS. To assist in data collection, all Deferred Maintenance Actions generated in support of PMS will use option code "9 -No Failure, PMS Accomplishment Only". The correct use of this field will greatly enhance NECC's ability to distinguish between maintenance actions that are written due to equipment defects or failures and those written to procure materials in support of PMS.
 - (b) Block 35: Will begin with the serial number of the equipment, a complete description of the malfunction, followed by three capital X's (XXX). Next a detailed statement stating the required actions to correct the malfunction. For Civil Engineering Support Equipment (CESE), an additional entry of miles or hours of the equipment at the time of failure will be documented.
 - (c) Block 37: Will be a short description of the problem.
- d. Completed Maintenance Action. The ship is responsible for submitting a completed maintenance action to report:
 - (1) Completion of maintenance actions previously deferred. If no further work is required by Ship's Force, higher authority may allow an outside activity to report its completion. This is referred to as an "automatic close-out".
 - (2) Completion of maintenance actions not previously deferred.
 - (3) Completion of maintenance actions for Selected Level Reporting (SLR) equipment. See reference (a) for the definition of SLR.
 - (4) Accomplishment of an alteration, i.e., Ship Alteration (SA), Ordnance Alteration (OA), Field Change (FC), etc. Policy and implementation are provided in NAVSEA TECHNICAL SPECIFICATION 9090-310.
 - (5) Addition of any new equipment or system.
 - (6) Relocation of any equipment.
 - (7) Replacement or exchange of any equipment.
 - (8) Deletion, removal or turn-in of any installed equipment.

- (9) Completion of maintenance actions considered significant for material history purposes such as:
 - (a) Maintenance actions **that** alter the design or operating characteristics of an equipment or system.
 - (b) Other maintenance actions or conditions that are considered significant for future reference purposes.
- (10) Accomplishment of maintenance that required parts.

NOTE: FOR NON-AUTOMATED SITES, THE OPNAV 4790/2K IS USED TO REPORT A COMPLETED MAINTENANCE ACTION. REFER TO REFERENCE (A), APPENDIX A FOR THE DATA ELEMENTS AND ALLOWED VALUES AND APPENDIX H FOR THE INSTRUCTIONS FOR MANUALLY COMPLETING AN OPNAV 4790/2K.

- e. Completed maintenance action related to an Alteration or **that** resulted in a Configuration Change.
 - (1) For the purpose of reporting configuration changes, all alterations, deletions, turn-ins, modifications, additions, installations or replacements of equipment are included in the term “maintenance action” whether or not corrective maintenance is actually performed.
 - (2) The responsibility for identifying and reporting configuration changes exists at all levels of the command. For emergent requirements (when an ILS requirements waiver has been granted by higher authority, and the installing activity has not pre-loaded the data in CDMD-OA), the installing activity will provide the ship or unit with properly filled out and complete OPNAV 4790/CKs and will promptly report the completion of the installation to the CDM.
 - (3) During Depot Level availability, the installing activity must ensure that configuration changes are promptly and properly reported. Alteration certification letters must be provided to the ship by the Depot-level activity. Reporting is required for the:
 - (a) Addition, installation or ownership changes of any equipment.
 - (b) Deletion, removal or turn-in of any installed equipment.
 - (c) Replacement or exchange of any equipment. Non-serialized exact replacements do not change configuration records or logistics support and do not require a configuration change to be reported unless required by an alteration directive. Particular emphasis must be placed on “form, fit, function” equipment. Replacements such as any change in manufacturer, model or part number or serial number requires configuration change reporting.
 - (4) Modification of any installed or “in use” equipment. A modification occurs when a maintenance action alters the design or operating characteristics of the equipment. Equipment is considered modified and reporting is required when

non-standard replacement parts (not identified on the APL or in the technical manual) are used in the accomplishment of the maintenance. A Departure From Specification (DFS) may be required as specified in Volume V, Part 1, Chapter 8 of this manual.

- (5) Relocation of any equipment to a different deck, frame or compartment or, if it affects ship drawings or other logistic support data. Any other relocation of equipment is considered a maintenance action and requires a completed maintenance action to be reported (for non-automated ships or commands, use the OPNAV 4790/2K Form).
- (6) Re-designation of any space or compartment.
- (7) Accomplishment of any alteration.

NOTE: FOR NON-AUTOMATED ACTIVITIES, THE OPNAV 4790/CK CONFIGURATION CHANGE FORM IS USED TO REPORT THE ACCOMPLISHMENT OF MAINTENANCE ACTIONS THAT ARE RELATED TO AN ALTERATION OR RESULT IN A CONFIGURATION CHANGE. REFER TO REFERENCE (A), APPENDIX A FOR THE DATA ELEMENTS AND ALLOWED VALUES AND APPENDIX G FOR THE INSTRUCTIONS FOR MANUALLY COMPLETING THE OPNAV 4790/CK.

NOTE: REPORTING OF REACTOR PLANT CONFIGURATION CHANGES AND MODIFICATIONS PERFORMED TO EQUIPMENT OR COMPONENTS UNDER NAVSEA (SEA 08) COGNIZANCE ARE REPORTED PER REFERENCES (c), (d) AND VOLUME VI, CHAPTER 3 OF THIS MANUAL.

- f. Documenting changes, additions, or deletions to previously reported maintenance actions. Any information previously reported on a deferred maintenance action, with the exception of the JCN and the deferral date, can be added, deleted, or changed. Care should be taken not to make changes to jobs that have already been reported up-line. This will require additional screening by outside activities. Automated sites may have additional fields that cannot be modified.

NOTE: ONCE A JCN DEFERRAL HAS BEEN PROCESSED, IT REMAINS ON EACH PROCESSING ACTIVITY'S CSMP (I.E., S/F OMMS, THE ISIC, SSSU OR RSG MRMS OR RMAIS, THE TYCOM MASTER CSMP AND THE OPEN ARCHITECTURAL RETRIEVAL SYSTEM (OARS) DATABASE) UNTIL THE COMPLETED DEFERRAL IS PROCESSED. WHEN 3-M COORDINATORS OR ISIC OR RMC MDCO OR ARRS SHIP SUPERVISOR PERSONNEL "DELETE OR PURGE" THE JCN WILL REMAIN ON ALL OTHER AFFECTED CSMPs IF THE REPORTING COMPLETION OR CANCELLATION IS NOT REPORTED UP-LINE.

19.12.4.4 Current Ship's Maintenance Project. The purpose of the CSMP is to provide shipboard maintenance managers with a consolidated listing of deferred **maintenance that** reflects the material condition of the ship. The master CSMP is held in the shore MDS (i.e. RMMCO, RMAIS, VSB).

- a. **CSMP Content.** The CSMP includes, but is not limited to:

- (1) The “automated CSMP” is the computer-produced listing of deferred maintenance and alterations that have been identified through the submission of OPNAV 4790 documents. In addition to the maintenance actions added by Ship’s Force, outside activities may request that they be allowed to add items to the CSMP.
 - (2) The suspense file of OPNAV 4790 documents for maintenance items that have been submitted but are not reflected in CSMP reports, or have not appeared in the MDS Transaction and Error Identification Report as having been accepted.
 - (3) The Work Candidate or JSN Log which is the Work Center’s list of all material discrepancies to be corrected either by Ship’s Force or an outside activity. **All non-automated units or ships use work Candidate or JSN logs.** The WCS will maintain a Work Candidate or JSN Log using the format as shown in Appendix J. The Unit Identification Code (UIC) and WC Code must be entered on each page of the log. A separate JSN for each maintenance action reported from that WC must be assigned. The JSNs must be in sequential order. The WCS will ensure that the JCN assigned to a specific maintenance action is reflected on any material request associated with that maintenance action.
- b. Surface Force Ships Unique Requirements and Policy for Bulk Loads and Database Transfer. A bulk load is a CSMP load (Work Candidate(s) provided as an external file to be loaded into the ship’s CSMP) produced by any outside activity (e.g. Combat Systems, Command, Control, Communication, Computer Readiness Assessment (CSRA), Board of Inspection and Survey (INSURV), SURFPAC Enhanced Capability to Assess Programs (SECAP), Surface Warfare Enterprise Assessment Process (SWEAP). COMNAVSURFPAC **or** COMNAVSURFLANT N43 3-M will review and approve all bulk loads prior to being loaded into any afloat or ashore database. COMNAVSURFPAC **or** COMNAVSURFLANT N43 3-M is the only authorizing activity for bulk load reviews. Commands will not transfer, copy, or allow the direct access to or copying of the MDS database by any outside activity without COMNAVSURFPAC **or** COMNAVSURFLANT N43 3-M written permission.
- c. Aircraft Carriers Unique Requirements and Policy for Bulk Loads and Database Transfer. A bulk load is a CSMP load (Work Candidate(s) provided as an external file to be loaded into the ship’s CSMP) produced by any outside activity (e.g. Combat Systems, Command, Control, Communication, Computer Readiness Assessment (CSRA), Board of Inspection and Survey (INSURV), Inspections, Certifications, Assessments and Assist Visits (ICAV). COMNAVAIRLANT **or** COMNAVAIRPAC N432 MDS Managers will review and approve all bulk loads prior to being loaded into any afloat or ashore database. COMNAVAIRLANT **or** COMNAVAIRPAC N432 MDS Managers is the only authorizing activity for bulk load reviews. Commands will not transfer, copy or allow the direct access to or copying of the MDS database by any outside activity without COMNAVAIRLANT **or** COMNAVAIRPAC N432 MDS Managers written permission.
- d. Submarine Unique Requirements or Policy.
- (1) The 3MC will perform CSMP up-lines as follows:

- (a) Whenever a CASREP is transmitted, the corresponding CSMP JSN must be up-lined at the same time.
 - (b) Whenever a job is “walked through” during an availability, the corresponding CSMP JSN must be up-lined at the same time.
 - (c) At a minimum once a week regardless of availability or operational status, this includes running the “inactivate” and “archive” functions in OMMS, as well as the up-line.
 - (d) Special Provisions. Submarines operate in varied environments and circumstances, which may result in a ships’ inability to comply with reference (a) and certain paragraphs of this instruction.
- (2) (OMMS-NG Only) CSMP up-line files (.uru) must be accompanied by the corresponding parts utilization files (.pts). The Maintenance Document Control Office (MDCO) will reject any .uru up-line file that does not include the corresponding .pts file.
- (3) The CSMP will not be replaced with any software required for use by a repair activity to track material condition of the ship or ongoing work. When use of these systems is required, the CSMP will be maintained parallel to the other required system.
- (4) As the Master CSMP resides ashore and is maintained by the local maintenance support activity, the shipboard CSMP and shore CSMP must be reconciled at the beginning and end of each availability or quarterly if no availability was conducted.
- (5) To ensure proper documentation of material deficiencies that are within the SUBSAFE (SS), Fly-by-Wire (FBW) or Scope of Certification (SOC) boundaries, the following guidance is provided. For any new 4790/2K, properly annotate all material deficiencies that are within the SS, FBW or SOC boundaries in the CSMP using the Special Requirements Tab in OMMS-NG or RMAIS as appropriate. Additionally, “SS”, “FBW” or “SOC” must be entered into the beginning of the CSMP Summary.
- (a) The maintenance brokers will ensure the SS, FBW and SOC Work Candidates are appropriately marked in RMAIS following up-lines.
 - (b) At the end of every scheduled Continuous Maintenance Availability (CMAV), the ships and ISIC will verify all SS, FBW and SOC deficiencies have been corrected or have an appropriate DFS submitted.
 - (c) ISICs will verify the ships are appropriately using the special purpose block to annotate the SS, FBW and SOC deficiencies in the CSMP during 3MI using Appendix A2, Section IV-A2, CSMP Validity Factor form.
- e. Unit or Ship Use. The CSMP is utilized as follows:
- (1) The ship’s Commanding Officer and Executive Officer use CSMP reports to:

- (a) Determine the effects of deferred maintenance that limit the ship's capability.
 - (b) Evaluate potential CASREP situations.
 - (c) Evaluate the material condition of each individual Work Center.
 - (d) Determine what kind and how much outside assistance is needed to complete the deferred maintenance.
 - (e) Evaluate weakness or shortages in skill levels or resources required to do the deferred maintenance.
 - (f) Determine the type of upkeep and "cold iron" time needed by the ship to perform maintenance.
- (2) The Department Head or Division Officer uses the CSMP reports for the same information as the Commanding Officer and Executive Officer, but are primarily interested in their specific department or division rather than the entire ship. CSMP reports can assist them in determining plans of action for accomplishing the deferred maintenance and evaluating the performance of Work Center Supervisors in the management of their Work Centers.
- (3) The Work Center Supervisor uses the CSMP reports for managing Work Center maintenance. Each Work Center Supervisor (WCS) is responsible for ensuring that the CSMP accurately describes the material condition of the Work Center. NECC WCS are responsible to review their CSMP on a weekly basis, ensuring that completed jobs are closed, new equipment failures are properly documented and that materials required to repair or maintain equipment are on order.
- (4) NECC requires that any open job in the CSMP that exceeds 6 months must be researched by the chain of command. The appropriate actions will be taken to expedite the repair or replacement of the equipment. Any job that exceeds 6 months and cannot be resolved at the command level will be forwarded to the ISIC for assistance and direction.
- f. CSMP Reports. Current automated systems produce both summary and detail printed CSMP reports. Since software applications may differ, check the applicable system's user manuals and guides for available report formats. CSMP reports are produced in a variety of options with selected sequences and totals. Summary reports are single-line summaries of the uncompleted deferred maintenance actions in the CSMP and are available by type availability, Work Center, INSURV number, safety-related deficiencies and EIC. Detail reports show the complete record for these actions. CSMP detail reports can be sorted by JCN, EIC or SWAB.
 - (1) Summary Reports. CSMP Report 1 (produced in seven options). Each option presents a single line summary of each non-completed deferred maintenance action:
 - (a) "Summary by Type Availability" is provided on an "as requested" basis. This report provides a single-line description of each deferred

maintenance action sequenced by Ship, Work Center, Type Availability and JSN. A Work Center summary line on the CSMP provides the number of man-hours by IMA, Depot and Ship's Force. At the end of the report is a summary of estimated man-hours by type availability for each Work Center and Department and a line for the ship total.

- (b) "Summary by Work Center" available on an "as requested" basis contains the same information as Option (1), but sorted by Ship, Work Center and JSN.
 - (c) "Summary by INSURV Number" is provided routinely to the ship as directed by TYCOM after an INSURV inspection. It is restricted to only those items on the CSMP that have been assigned an INSURV number. Sequenced by Ship, INSURV Number, Work Center and JSN. It contains similar information to Option (1). Man-hour estimates and summaries are not shown.
 - (d) "Summary by Safety Related Deficiencies" available on an "as requested" basis is restricted to only those actions listed on the CSMP which have been assigned a safety hazard code. Sequenced by Ship, Work Center, Type Availability and JSN, it contains the same information as Option (1) for safety related deferred maintenance actions. No man-hour estimates, summaries or list of additions and deletions are shown.
 - (e) "Summary by EIC" available on an "as requested" basis is sequenced by Ship, EIC, Work Center, JSN and contains the same information as Option (1). This report includes man-hour estimates summarized in EIC sequence at the system level.
 - (f) "Summary by INSURV Number and Type Availability" available on an "as requested" basis contains the same information as Option (3) sorted in Ship, INSURV Number and Type Availability sequence.
 - (g) "Summary by SWAB/SWLIN" available on an "as requested" basis contains the same information as option (1) including only those JCNs that have a SWAB/SWLIN assigned. The information is sorted by Ship, SWAB/SWLIN and Work Center or JSN.
- (2) Detailed Reports. CSMP Report 2 (produced in three options). Each option presents detailed information regarding the ship's deferred maintenance.
- (a) "Detail Listing by JCN" displays a detailed record of the ship's deferred maintenance by JSN within the Work Center. If a deferred maintenance action has been documented as a safety hazard, the words "SAF HAZ" appear in the "comment" column. If the maintenance action has been assigned an INSURV Number, this number will appear in the "comment" column.
 - (b) "Detail Listing by SWAB" displays a detailed record of the ship's deferred maintenance by SWAB. If a deferred maintenance action has

been documented as a safety hazard, the words “SAF HAZ” appear in the “comment” column. If the maintenance action has been assigned an INSURV Number, this number will appear in the “comment” column.

- (c) “Detail Listing by EIC” is sequenced by JSN within a Work Center within an EIC.

19.13 EVALUATION.

19.13.1 Inspections.

- a. Planned maintenance is the foundation of a well-executed, effective maintenance program. Therefore, PMS must be vigorously prosecuted and thoroughly monitored. The standards of PMS performance must remain high. The goal or intent of 3-M Inspections (3MIs) is to ensure that the Command’s 3-M program is functioning at maximum efficiency and per the requirements of reference (a) and this chapter.
- b. The TYCOM or ISIC (command exercising administrative control) will conduct a complete inspection of each command under their cognizance as follows:
 - (1) Every Fleet Response Plan (FRP) or Optimize Report Plan (ORP) cycle.
 - (2) SSBNs, Forward Deployed Naval Forces (FDNF) (except the Forward Deployed CVN) and LCS Units will execute Inspections every 24 months.
 - (3) When deemed necessary by the TYCOM, ISIC or the unit’s Commanding Officer.
 - (4) Not to exceed 36 months.

The governing factor is that every unit will be inspected during the FRP period or every 24 months whichever is appropriate.
- c. Time spent in CNO Maintenance Availabilities will be counted when determining when inspections are to be scheduled. However, the availability of maintenance data required for review purposes needs to be considered prior to scheduling an inspection. Submarine assets undergoing a CNO availability will have their 3MI deferred until the second quarter following completion of the availability.
- d. The ISIC will submit a 3MI periodicity extension request to the TYCOM if a 3MI will exceed the FRP or ORP cycle or 24 months has elapsed since the last Inspection. The TYCOM, when replying to the request for extension, will include Commander, United States Fleet Forces Command (USFFC) N43 or Commander Pacific Fleet (CPF) N43 (as applicable) as information addressees. Only the TYCOM can authorize such an extension.
- e. TYCOMs are to maintain an inspection data file for each unit. As each command is evaluated, the individual evaluation standards and calculated values identified Appendices A1 through A5 will be recorded in the data file with a copy of the inspection report provided to the inspected command. Sections I through VI of each TYCOM Appendix provides specific criteria to be used in the assessment of each command.

- f. Method for Assignment of Numerical Evaluations. The minimum performance requirements are as identified below:

(1) Formula Acronyms:

- ACF = Accomplishment Confidence Factor
- CASREP = Casualty Report
- CLER = Command Level Effectiveness Review
- CSMP = Current Ship's Maintenance Project
- CTS = Command Total Score
- CVF = CSMP Validity Factor
- DFS = Departure From Specification
- DTS = Department Total Score
- MAR = Maintenance Accomplishment Rate
- MCF = MDS Confidence Factor
- MDS = Maintenance Data System
- MPR = MDS Performance Rate
- OSAR = On Site Analysis Report
- PAR = Periodic Accomplishment Rate
- PMR = Periodic Maintenance Requirement
- PPR = PMS Performance Rate
- RAF = Reporting and ASI Processing Confidence Factor
- RAR = Recorded Accomplishment Rate
- SAR = Situational Accomplishment Rate
- SEER = Scheduling and Execution Effectiveness Review
- SCAR = Spot Check Accomplishment Rating
- SMG = Ship Material Grade
- SRE = Self Repair Efficiency
- WCS = Work Center Score
- ZIDL = Zone Inspection Deficiency List

(2) Command Total Score (CTS) must 80 percent or higher.

- Aircraft Carrier CTS = Average of DTS
- CNIC CTS = TBD
- CNIF CTS = $(SCAR \times .50) + (MAR \times .10) + (SEER \times .30) + (CLER \times .10)^*$
- NECC CTS = $PPR + MPR \div 2$
- Surface Force Ship CTS = $(DTS \times .80) + (CLER \times .20)$
- Submarine CTS = $(DTS \times .80) + (CLER \times .10) + (SMG \times .10)$

For commands without a billeted or collateral duty 3MC:

$$CTS = (SCAR \times .50) + (MAR \times .20) + (SEER \times .30)$$

Commands, Departments and Work Centers will be evaluated as "Above Standards" overall in 3-M if the unit's total score is 90% or higher.

Commands, Departments and Work Centers will be evaluated as "At Standards" overall in 3-M if the unit's total score is between 80% and 89.99%.

Commands, Departments and Work Centers will be evaluated as “Below Standards” overall in 3-M if the unit’s total score is less than 80%.

- (3) Each Department is required to meet the DTS minimum of 80 percent.
 - $DTS = WCS \times \text{Weighted Factor}$
 - $WCS = (PPR \times .50) + (CVF/MDS \times .50)$
 - $PPR = 50\% \text{ of the Work Center Score}$
 - $CVF/MDS = 50\% \text{ of the Work Center Score}$
 - $PPR = MAR \times SCAR \div 100$
- (4) Each TYCOM has their own specific criteria for grading MDS and CSMP.
 - Aircraft Carrier criteria: $MCF 20\% + CVF 30\% + RAF 5\% + SRE 20\% + ZIDL 25\% = MDS$
 - Submarine criteria: $CVF 40\% + OSAR 10\% + PMRs 10\% + CASREPS 10\% + SHIPALTS/A\&Is 10\% + DFS 10\% + Calibration 10\% = MDS$
 - Surface Force Ship criteria: CVF will consist of: (1) Grading of CSMP content, (2) Verifying CSMP to the equipment. (3) Space walk-through.
 - NECC criteria: CSMP review using NECC modified (modifications provided) JFMM CVF work sheets = MDS
 - CNIF criteria: CSMP review using current JFMM CVF work sheets = MDS
 - CNIC criteria: TBD
- g. Inspection Procedures. Appendix A (A1 through A5) provides a standard means for evaluating the 3-M program aboard ship and shore commands. These procedures, centered on a set of core attributes applicable to all, are used to conduct 3-M Inspections. Inspection procedures are divided into six (6) major areas:
 - (1) Section I - Work Center **and** Command Effectiveness Reviews
 - (a) Scheduling and Execution Effectiveness Review (SEER).
 - (b) Command Level Effectiveness Review (CLER).
 - (c) Equipment Verification Validation (EVV) **Surface Force Ships Only.**
 - (2) Section II – Spot Check Accomplishment Rating (SCAR) (Spot Checks).
 - (3) Section III - Assessment of Maintenance Accomplishment Rate (MAR) formerly RAR or PAR.
 - (4) Section IV - Maintenance Data System.
 - (5) Section V – Proficiency (“N/A” for Submarines or NECC)
 - (6) Section VI - 3-M Inspection Command Total Score.
- h. Inspection Reporting. Significant deficiencies and numerical assessments are reported to the assessed unit’s Commanding Officer, ISIC and TYCOM using the format shown in Appendix B of this chapter. Reporting may be accomplished on the entire unit or on a departmental basis.

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- (1) Significant deficiencies require a report of corrective actions taken by the unit to be forwarded to the TYCOM via the ISIC within 30 days following the inspection.
- (2) Any Command or Department receiving an overall evaluation of below standard in either PPR or CVF and MDS must be re-evaluated within a reasonable period (not to exceed six months) to ensure below standard areas have been corrected. (Submarines also reevaluate Work Centers).
- (3) Each TYCOM will report the findings of the previous year's inspections to USFFC or CPF N43 (as applicable) at the end of the calendar year.
- (4) Annually, USFFC N43 will convene a 3-M Summit with Commander, Pacific Fleet and all TYCOMs to review the previous year's 3-M Inspection trends, concerns and future direction.

19.13.2 Self-Assessments. The ability of an activity to perform critical self-assessments is instrumental to the success of the command's PMS program. The PMS Self-Assessment Program needs to address all aspects of PMS. TYCOM Self-Assessment policies are as follows:

- a. Aircraft Carriers. Each ship must perform a quarterly Self-Assessment utilizing the shipboard 3-M Training Team (3MTT) and onboard 3-M Organization per Appendix A-1. The completed report will be retained by the 3-M Officer for 12 months. The 3-M Manager via the 3-M Officer will ensure that personnel performing the audits have adequate 3-M knowledge to ensure a thorough review. The Commanding Officer will receive a formal briefing of the findings of the Self-Assessment and intended corrective actions. The results must be forwarded to TYCOM per TRAMAN.
- b. Submarine Force. Normally, each activity must perform a complete 3-M Self-Assessment at the mid-point of the 3-M Inspection cycle and retain results until the next 3-M Inspection. The 3-M checklists contained in Appendix A-2 will be utilized and retained until the next formal 3-M Inspection. Utilization of TYCOM, ISIC and 3-M Representative personnel to assist the command is encouraged and should be requested. As the Self-Assessment senior member, the 3-M Manager will ensure that personnel performing the audits have adequate knowledge of 3-M practices and procedures to ensure a thorough review. The Commanding Officer will receive a formal briefing of the findings of the Self-Assessment and intended corrective actions.
- c. Surface Force. Each activity must perform a full command Self-Assessment as exit criteria for each phase of the unit's OFRP. The Departmental 3MA will assist in the Self-Assessment. 3MCs will ensure a quarterly 3-M Health Status report is forwarded to the ISIC with POAM for discrepancies identified. TORIS/TFOM will reflect 100 percent when ISIC has the Health status report and will be entered into the TORIS/TFOM system by the 20th day of the first month of the new quarter. The results of the command Self-Assessment will be documented in electronic enclosures, sent to the ISIC and retained by the 3MC for a period not less than one year. ISICs will track the results of the Self-Assessments and quarterly Health Status reports and perform regular validation to ensure commands are conducting a thorough Self-Assessment. The 3-M Inspection checklists contained in Appendix A-3 will be utilized and retained within the PMS Self-Assessment Program. Utilization of the

TYCOM, ATG and 3-M Inspection Team members to assist the command is encouraged and should be requested. As the Self-Assessment senior member, the 3-M Manager will ensure that personnel performing the audits have adequate knowledge of 3-M practices and procedures to ensure a thorough review. The Commanding Officer will receive a formal briefing of the findings of the Self-Assessment and intended corrective actions.

- d. NECC. 3-M Self-Assessments will be conducted at least once during the command's O-FRP, or once every 24 months where commands do not operate under an O-FRP. 3-M Self-Assessments will not be completed within two calendar months of a 3MA nor within four calendar months of a 3MI. Additional 3-M Self-Assessments may be conducted at the Commanding Officer's discretion, but are neither required nor reported to the TYCOM Maintenance Officer. 3-M Self-Assessment events are not limited to a set duration, but will have a set completion date when originally directed by the Commanding Officer. Commands must conduct a 3-M Self-Assessment within the first 90 days of deployment to a Remain in Place Table of Allowance (RIP/TOA) site. NECC 3-M Inspection checklists are contained in Appendix A-4.
- e. CNIF. Each command and subordinate command(s) must conduct a rigorous quarterly 3-M Self-Assessment. The 3-M checklists contained in Appendix A-5 will be utilized and retained for 12 months. In addition, MAR and SCAR percentages will be reported to CNIF no later than the 25th day of January, April, July and October. The Commanding Officer will receive a formal briefing of the findings of the Self-Assessment and intended corrective actions.
- f. CNIC. – TBD

19.13.3 Self-Assessment Elements. The major program elements of a Self-Assessment include an evaluation of the PMS Performance Rate (PPR) and CSMP Validity, monitoring MRC performance (Monitored MRC), and conducting PMS Spot-Checks, Work Center Audits, and Deficiency Abatement. 3MCs will retain Monitored PMS, Spot Checks and Work Center Audits from the last completed quarter in either hard copy or digital format for review supporting the self-assessment.

- a. PMS Performance Rate. The PMS Performance Rate (PPR) is made up of the Maintenance Accomplishment Rate (MAR) multiplied by the Spot-Check Accomplishment Rating divided by 100.

$$PPR = \text{MAR} \times \text{SCAR} \div 100$$

The MAR is comprised of the Periodic Accomplishment Rate (PAR) and Situational Accomplishment Rate (SAR) scores automatically generated from SKED.

Surface Force PPR

$$PPR = ((\text{ACF AVG} \times \text{MAR}) \times 20\%) + (((\text{ACF AVG} + \text{MAR}) \div 2) \times 80\%)$$

- b. CSMP Validity. The CSMP Validity factor is evaluated utilizing the check sheets provided via section IV (MDS) of the TYCOM's 3-M Inspection Appendix.

- c. **Monitored MRC.** Supervisory personnel must periodically monitor the performance of PMS to provide feedback and training to maintenance personnel and to enforce command maintenance standards. Personnel charged with monitoring must be SMEs for the system, equipment or component for which the MRC applies. LCPOs, LPOs or personnel with similar system knowledge are appropriate. Monitored checks can be used like OJT to teach the “right way” to conduct maintenance. These monitored MRCs will be documented as a monitored evolution and findings will be provided to the Work Center’s Chain of Command for inclusion into training and deficiency abatement. The value of monitor maintenance cannot be overstated and commands are encouraged to establish a robust monitored maintenance program.
- d. **PMS Spot Check.** PMS Spot Checks are utilized to validate that previously scheduled and accomplished MRCs were actually performed and the degree to which they were performed. The checklist contained in each TYCOM specific Appendix, (A-1 – A-5) Section II, is the tool supervisory personnel utilize to determine the accomplishment status of a completed MRC. Deficiencies noted and the final grade will be provided to the Work Center’s Chain of Command for abatement. The Work Center Supervisor will record the Spot Check grade into SKED to generate the Spot Check Accomplishment Rating (SCAR) for the quarterly PMS Performance Report. Spot Checks will involve all elements of the Chain of Command to include the CO, Chief of the Boat, Command Master Chief, XO, 3MC, Department CPOs, DHs, DIVOs, Divisional CPOs, and first class petty officers. By following the checklist, the inspector can determine if the sailor is competent, the maintenance was accomplished, required TPMTE was available and used, and safety precautions were followed. The focus should be less on admin and more on the gear.
 - (1) Avoid Spot-Checks of MRCs with insufficient complexity. Performing a Spot-Check on a 3 or 5 step MRC does not provide the Chain of Command an accurate picture of the health of the command’s maintenance program. Selected MRCs should be of sufficient content to provide the auditor with evidence of satisfactory performance (e.g. tag-outs, QA packages, parts required, off-hull reporting, test equipment, safety equipment, etc.).
 - (2) Spot-Checks evaluated as “below standards” will require immediate training and re-performance as determined by the 3-M Manager. Any re-accomplishment of the MRC must be monitored by the LCPO to ensure noted deficiencies are not repeated.
 - (3) SURFOR Specific Spot Check Guidance. Each unit is required to have an aggressive spot check program involving all levels of the chain of command from the LPO to the CO. Individual MRs will be spot checked periodically to determine the effectiveness of PMS accomplishment and to ensure the maintenance was completely and correctly performed. All CPO and above will conduct historical or maintenance validation spot checks. All First Class Petty Officer (FCPO) will conduct Monitored maintenance spot checks. Work Centers will only perform one Khaki and one FCPO spot check weekly, except ER09. During the 3-M certification and recertification, PV, 3-M training events, historical spot checks, and maintenance validation spot checks will be

assessed. Five percent of the total command spot checks will be maintenance validations during 3-M certification, 3-M recertification, and 3-M training events.

- (4) SUBFOR's minimum number of Spot Checks or Monitored evolutions conducted per quarter will be based on Tables 19-9 and 19-10. Spot Checks and Monitored maintenance shall involve all elements of the chain of command to include the CO, Chief of the Boat, XO, 3MC, department chief petty officers, DHs, DIVOs, divisional chief petty officers, and first class petty officers. WCS Spot Checks/Monitors (E-5 & above) may be used to meet these requirements only when no LCPO/DIVO is available.
- (5) Tables 19-3 through 19-8 represent the minimum number of Spot Checks per TYCOM. SUBFOR's tables reflect both Spot Checks and Monitored Checks.

Aircraft Carriers		
Management Level	Number of Checks	Interval
CO	1	Weekly
XO	1	Weekly
CMC	1	Weekly
HOD*	1	Weekly
DLCPO	1	Weekly
3MO	1	Weekly
3MC**	1	Weekly
1/3 of 3MTT	1	Weekly
LCPO	1	Weekly
DIVO	1	Weekly
* If PA is designated as 3-M DH for the department, then the PA will be assigned a spot check along with the HOD. The HOD cannot delegate the weekly spot check requirement. ** The number of spot checks to be conducted by the 3MC is set by the number of 3MCs assigned to the 3M Office.		

Table 19-3 AIRCRAFT CARRIERS SPOT CHECKS

CNIF		
Management Level	Number of Checks	Interval
CO or OIC	1	Monthly
XO or AOIC	2	Monthly
DH	2	Monthly
DIVO	2	Monthly
3MC	1	Weekly
LCPO	2	Monthly

Table 19-4 CNIF SPOT CHECKS

NECC Active Duty or Mobilized Command		
Management Level	Number of Checks	Interval
CO, XO, CMC or CSE	1	Weekly
Detachment OIC or DET 3MA	1	Weekly
DH or LCPO	1 per department	Weekly
DIVO	1 per division	Weekly
3MC	1	Weekly
WCS	1	Weekly

Table 19-5 NECC ACTIVE DUTY OR MOBILIZED COMMANDS SPOT CHECKS

NECC Non-Mobilized Reserve Unit		
Management Level	Number of Checks	Interval
CO	1	Quarterly
XO or CSO	1	Quarterly
CMC or CSE	1	Quarterly
DH or DET OIC	1 per department	Quarterly
DIVO or LCPO	1 per division	Quarterly
3MC or 3MA	1	Monthly
WCS	1	Monthly

Table 19-6 NECC NON-MOBILIZED RESERVE UNITS SPOT CHECKS

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Surface Force Ships		
Management Level	Number of Checks	Interval
CO	1	Weekly
XO	1	Weekly
CMC or SEA	1	Weekly
3MC	2*	Weekly
KHAKI	1	Weekly
FCPO	1	Weekly
* One of these checks will be ER09		

Table 19-7 SURFACE FORCE SPOT CHECKS

Surface Force Ships DDG 1000 and LCS		
Management Level	Number of Checks	Interval
CO	1	Weekly
XO	1	Weekly
CMC or SEA	1	Weekly
3MC	1	Weekly
KHAKI	1	Weekly
FCPO	1	Bi-Weekly

Table 19-8 DDG 1000 AND LCS SPOT CHECKS

Submarines							
DIVISION	NUMBER		DIVISION	NUMBER		DIVISION	NUMBER
DS01*	3/1		DS02*	3/1		DS03*	3/1
DS04*	3/1		DS05*	3/1		DS06*	3/1
DV01	2/1		EA01	9/3		EDC1	6/2
EE01	9/3		EM01	9/3		MA01	2/1
ME01	2/1		MH01	2/1		MN01	2/1
MV01	2/1		MV02	2/1		NE01	6/2
OC01	8/2		OC02	3/1		OC03	3/1
RC01	2/1		RC01 (774CL)	4/1		RL01	2/1
SS02	1/1		WF01	5/1		WF02	2/1
WI01	8/2		WK01	6/2		WK02	3/1
WM01	2/1		WQ01	8/2			

* Only when shelters are installed on host unit greater than 30 days.

Table 19-9 SUBMARINE SPOT CHECKS AND MONITORING PER QUARTER

# of MIPs in Work Center	Minimum # of Spot Checks	Minimum # Monitoring
2	1	1
2-4	2	1
5-7	3	1
8-9	4	1
10-11	5	1
12	6	2
13	7	2
14	8	2
>15	9	3

Table 19-10
SUBMARINE FORCE SURFACE SHIPS
AND SHORE COMMANDS SPOT CHECKS AND MONITORING

- (6) CNIF command 3MCs can request modification of the Spot Check matrix if it is believed that due to the size of the command and location of their Work Centers, they are unable to accomplish that requirement. Requests must be submitted in writing to CNIF 3-M staff (via Echelon IV 3MC if applicable) and include their proposed Spot Check matrix for review. If approved by CNIF, the command 3MC will retain a copy of the request approval.

- (7) NECC Command 3MCs can request modification of the Spot Check matrix due to the amount of PMS completed by a Work Center. Requests must be submitted in writing to their Echelon IV with copy to NECC N43. The request must include the reason and their proposed Spot Check matrix. If approved, the command 3MC will retain a copy of the request approval.

19.13.4 Work Center Audits. Each Work Center must receive an audit once per quarter by a supervisory individual, (E7) or above. For NECC, the individual will be E6 or above and must be qualified at 3-M 304. Deficiencies noted from this audit will be reported to the Work Center's Chain of Command for abatement. The 3MC will report recurring deficiencies to the Executive Officer for further investigation and corrective action.

19.13.5 Deficiency Abatement. The status of discovered deficiencies will be kept current within the monitoring program. Recurring deficiencies must be reported to the 3-M Manager for further investigation and corrective action. Deficiencies that have been reported as corrected will be subject to follow up monitoring to ensure corrective action was effective and results of the follow up monitoring will be reported to the 3-M Manager. The ship's 3-M Abatement Program will include the previous quarter's audits (4 quarters for NECC), Spot-Checks, Monitored evolutions and CSMP validity audits noting trends and corrective actions.

APPENDIX A

3-M INSPECTION PROCEDURES

- A₁ Inspection Procedures for Naval Air Forces
- A₂ Inspection Procedures for Naval Submarine Forces
- A₃ Inspection Procedures for Naval Surface Forces
- A₄ Inspection Procedures for Navy Expeditionary Combat Command Forces
- A₅ Inspection Procedures for Commander Naval Information Forces

APPENDIX A1
INSPECTION PROCEDURES FOR NAVAL AIR FORCES

APPENDIX A1

SECTION I

WORK CENTER COMMAND EFFECTIVENESS REVIEWS

APPENDIX A1 SECTION I-A
SCHEDULING AND EXECUTION EFFECTIVENESS REVIEW (SEER)

Command		Department	Division	Work Center	Date		
General Attributes					Value	Points	
1.	Does the Work Center PMS file contain:						
	a. *	Current Service Brief?			1		
	b. *	Current and applicable 3-M messages and notices?			2		
2.		Do MIPs and MRCs accurately reflect equipment configuration; are non-applicable MRCs correctly lined out and are applicable MRCs active? (May be MIP standardization violations)			10		
3.	*	Does the Work Center retain an auditable record of personnel PMS qualifications and designation letters?			5		
Maintenance Requirement Card (MRC) Deck							
4.	*	Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current? (Per TYCOM direction)			2		
5.		Are classified MRCs complete and current?			3		
6.		Are blanks requiring Ship's Force data filled in prior to use?			3		
Chain of Command SKED Administration							
7.		Are all administrative changes approved at the appropriate level?					
	a.	FR approved by DEPT Head. (Verify using journal tab.)			2		
	b.	Weekly Closeouts performed by COB on the first workday of the week at the appropriate level?			2		
	c.	All lineouts and MRC customization approved at the appropriate level.			2		
	d.	Check notes reviewed and alerts approved by the DIVO?			2		
Location Guide Lists (LGL)							
8.	a. *	Do LGLs contain required information (e.g., equipment name, equipment location, equipment serial number or unique identifier)?			3		
	b. *	Are Maintenance Items in SKED associated to the existing equipment configuration?			3		
Situational Requirements							
9.	*	Are all situational (states, triggers, metered) events being scheduled and executed in SKED?			8		
PMS Execution and Accountability							
10.		Are check note entries accurate, valid and complete?			3		
11.	*	Was maintenance assigned only to qualified maintenance personnel?			4		
12.		Was currently scheduled, previously completed, situational requirements and unscheduled maintenance entered into SKED?			10		
13.		Is a unique ESOMS identifier or tag-out serial number recorded in “check notes” for maintenance actions marked as complete that required Tag-outs?			2		
14.		Have the minimum number of spot checks and monitored checks been accomplished?			3		
FBR File							
15.		Are Feedback Reports being tracked in SKED, “Action Taken” block update by WCS?			2		
Inactive Equipment Maintenance (IEM)							
16.		Is the start of an inactive period correctly annotated and approved by Department Head?			2		
17.		Are IEM requirements properly scheduled?			5		
18.		Is the completion of the inactive period correctly annotated?			2		

Totals (Attributes evaluated as "N/A" are not calculated)	Total Points Available: 81	Total Points Awarded _____
SAT ☐ (SAT = 65 points or better) UNSAT ☐		
Inspector Name and Command (Print and Sign)		

*** Electronic Versions Acceptable**

Sat = 80 percent or better

Attribute Scoring:

> 85% = Satisfactory = Full Credit

< 85% = Unsatisfactory = No Credit

Example - Attribute 17: If 85% or better of IEM requirements were properly scheduled, points awarded would be five (5). If less than 85% of IEM requirements were properly scheduled, points awarded would be zero (0).

SEER REMARKS

Provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.

APPENDIX A1 SECTION I-B**COMMAND LEVEL EFFECTIVENESS REVIEW (CLER)**

Using the attributes and grading criteria described [here](#), determine the CLER for the ship.
Provide amplifying information for deficiencies causing point reduction on the remarks page.

Command:			Date:	
General Attributes			Value	Points
1.	Does the 3MC maintain:			
a.		A Change Accountability Log?	2	
b.	*	A log (approved by the XO) tracking the assignment of MRCs from split MIPs to ensure all applicable MRCs are assigned?	3	
c.		A Master Classified MRC File?	2	
d.	*	A current PMS (and where applicable TFR) DVD or downloaded file?	3	
2.		Does the Command have a reliable system for backing up MDS and PMS data?	5	
3.	*	Does the 3-M Coordinator have an effective system in place to track, route and explain externally provided PMS changes?	3	
4.		Is there an effective system in use (Spot Check Program) whereby supervisory personnel periodically and routinely monitor PMS performance?	8	
5.		Have all FBRs entered in SKED been properly reviewed by the chain of command and submitted off hull within seven (7) days?	3	
6.	*	Does the ship or activity conduct internal audits (Quarterly Self-Assessments) of all Work Centers? (Retain latest copies of deficiencies, corrections and abatement for current & previous quarter)	15	
7.	*	Does the 3MC provide weekly status reports to the 3-M Manager per specific TYCOM directive?	3	
8.	*	Does the 3MC have an approved master copy of 3-M PQS specifically tailored for the command?	3	
9.	*	Does the 3MC maintain an auditable record of PMS PQS for the command (e.g., copy of service record entries, signed copy of PQS cover letter, officer verified divisional training record, RADM)?	3	
10.		Does the 3MC maintain the status of command FBRs, responses and follow up actions taken in SKED?	3	
11.		Does the 3MC track assessment MRCs (800/AP series) and verify completion with the local agency?	10	
12.		Is the 3MC triggering GLOBAL events and STATES across the unit? Does the 3MC have an updated Major Events Listing?	10	
13.		Does the ship or activity conduct 3-M program training per directives?	8	
3-M Training Team				
14.		Does the ship's 3-M Officer (3MO) serve as manager of the 3MTT and designate members in writing?	3	
15.		Does the ship's 3MO maintain copies of 3MTT designation letters on file?	3	
16.		Does the 3-M Coordinator (3MC) serve as the 3MTT Coordinator?	3	
17.		Does the 3MC maintain a matrix to select and track spot checks to be performed by the 3MTT?	4	
18.		Does the 3-M office track spot check trend data for Hazmat, PPE, Tag-out, Safety, and keep this data for 24 months?	4	
19.		Is the 3MTT led by the Executive Officer with the 3MO and 3MC as primary assistants?	3	
20.		Is the 3MTT composed of a minimum of 30 members from officers, chiefs, and departmental 3M Assistants?	5	

21.		Are there a proportionate number of members from the 4 major departments?	4	
22.		Are 3MTT members qualified 3-M 304 LCPO or Division Officer, and designated in writing?	7	
23.		Do 3MTT members provide divisional training and PQS support as requested or directed by the 3MO based on 3MTT trends?	10	
24.		Does the 3MTT support the 3MO in conducting self-assessments?	5	
25.		Does the 3MTT meet monthly to discuss performance trends, improvement recommendations, and conduct training?	10	
26.		Does the 3MTT conduct quarterly training for the E-7 and above?	10	
Totals (Attributes evaluated as "N/A" are not calculated)				
Total Points Available		155	Total Points Awarded	
SAT ☐ (SAT = 124 points or better) UNSAT ☐				
Inspector Name and Command (Print and Sign)				

*** Electronic Version Acceptable**

Sat = 80 percent or better

Attribute Scoring:

All scoring will be done in a "yes" or "no" format.

Example: If yes to the block, all points will be awarded. If no to the block, zero points will be awarded.

COMMAND LEVEL EFFECTIVENESS REVIEW (CLER) REMARKS

[illegible]

APPENDIX A1
SECTION II
SPOT CHECK ACCOMPLISHMENT RATING (SCAR)

1. Using the basic definitions and guidelines described, determine the PMS Spot Check Accomplishment Rating (SCAR) for each Work Center. Enter the values determined on the SCAR Check Sheet, Section II-A of this Appendix.
 - a. Approximately 250 spot checks are accomplished during a 3MI (100 of those are DCPO “40 Work Center” type checks). EVERY Work Center gets a FULL SEER review and at least one (1) spot check (144 Work Centers). The Aircraft Carrier inspection team determines the number of spot checks to be conducted per Work Center based on PAR and SAR reports exported from the ship prior to inspection. Numbers reflect the Work Center accomplishment load. The four (4) “majors” (Combat, Air, Reactor and Engineering) receive the most while the rest are spread out according to the numbers.
 - b. Complete a SCAR Check Sheet for each MRC selected. Based on the results, evaluate the overall effectiveness of the accomplishment of each MR selected. Enter a numeric evaluation of each assessment attribute and provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.
2. The SCAR Check Sheet is a series of inspection attributes to determine the accomplishment status of an MRC that had previously been reported as accomplished. Although the sheet may be used as a reference for conducting a real time monitored MRC for the purposes of conducting a 3-M Inspection, to determine SCAR, all spot checks will be conducted on accomplished (historic) MRCs.
3. Due to the nature of MRC completion, supporting programs such as Tag-Outs and Hazardous Material (HAZMAT) are encountered. Care should be taken to avoid expanding the SCAR to a review of the processes of those programs thereby preventing the assessor from determining the accomplishment status of the MRC under review.
4. The following is expanded guidance for completion of the assessment attributes of the SCAR Check Sheet. Best practices or other policies not supported by source documentation must not be included in evaluating compliance:
 - a. (block 1-a) Determine if the maintenance person is qualified to perform the maintenance task. PQS 301 is required for all MRCs but attention should also be paid to other qualifications required such as Quality Maintenance (see Volume 5, Part I, Chapter 3, paragraph 3.4 of this manual) or graduation from a required school such as gage calibration technician.
 - b. (block 1-b) Determine if the correct Tools, Parts, Material and Test Equipment (TPMTE) were used during the performance of the MRC. If the maintenance person did not have the required TPMTE, it is unlikely that he or she would have been able to complete all the procedural steps of the MRC as required. If an item of TPMTE was required to perform a conditional step and that step was not required to be accomplished, it is not considered deficient. If the required test equipment required calibration, ensure that the calibration is within date and the equipment is of sufficient scale to accomplish the MRC.
 - c. (block 1.c) Determine if the maintenance person maintained the correct equipment.
 - d. (block 1.d) Examine the MRC to determine that any locally applied changes are authorized by procedural notes, external correspondence or allowed by reference (a).

- e. (block 1.e) Determine applicability of the MRC to the component that the maintenance person signed for completion.

NOTE: IF A PROCEDURAL STEP WAS NOT COMPLETED, THE MRC SHOULD NOT HAVE BEEN REPORTED AS COMPLETE AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- f. (block 2.a) From a variety of potential techniques, determine if the maintenance person performed all the required steps of the MRC. The inspector should come away with a clear impression that all the steps of the MRC were either fully accomplished or not. This may be accomplished via re-enactment or re-performance.

NOTE: IF A REQUIRED TAG-OUT WAS NOT CONDUCTED IN SUPPORT OF ACCOMPLISHING THE MRC, THE MRC SHOULD NOT HAVE BEEN CONDUCTED AND REPRESENTS A SERIOUS SAFETY VIOLATION AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- g. (block 2.b) If required by the MRC, verify that a tag-out was hung on the day the maintenance was performed. Ensure the isolation boundaries were appropriately identified and correctly positioned to ensure complete isolation of the maintained equipment. If no Tag-Out was required, write “N/A” on the sheet.

NOTE: FAILURE TO ADHERE TO A SAFETY PRECAUTION PROVIDED ON THE MRC CONSTITUTES A SERIOUS SAFETY VIOLATION AND THE FAILURE TO PERFORM THE MRC AS WRITTEN. THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- h. (block 2.c) Determine compliance with all specific safety precautions listed on the MRC. If no safety requirements were invoked, write “N/A” on the sheet.
- i. (block 3.a) By physical examination of the maintained equipment, determine if maintenance of the nature required by the MRC had been performed. Take note of fasteners that would have had to be disturbed, dirt in filters, fresh oil, etc., to make a judgment as to whether or not the maintenance has been performed. If unable to make this determination with absolute certainty, write “N/A” on the sheet.
- j. (block 3.b) Determine through questioning and record verification that HAZMAT was properly used and disposed of as a means of determining whether or not the MRC was accomplished. Once the inspector has determined that the HAZMAT was used and disposed of correctly, this attribute is considered fulfilled. If no HAZMAT was required to be utilized, write “N/A” on the sheet.
- k. (block 3.c) Determine if the maintenance person could have performed the MRC from a standpoint of being trained and proficient in the tasks called out for by the procedure.

- l. (block 4.a) Determine if the maintenance person filled out the 13-Week Accountability Log or annotated proper disposition of maintenance in SKED correctly for the accomplished MRC with the appropriate accomplishment date. If a tag-out isolation was used, ensure the tag serial number is recorded in the space allowed or as a check note in SKED. Ensure that the printed name and legal signature of the maintenance person who actually performed the maintenance is recorded or, in case of group performed PMS, the maintenance person in charge of the group.
 - m. (block 4.b) From reviewing the discussions and findings during the course of the spot check, determine if a FBR had been submitted if required. If no FBR was required, write "N/A" on the sheet.
 - n. (block 4.c) Determine if a material deficiency was noted during the PMS; if so, examine the CSMP to ensure the deficiency was documented. If no material deficiency was noted, write "N/A" on the sheet. If material discrepancies are properly documented in the CSMP attribute graded as a two (2). Material discrepancies **that are not documented in the CSMP** will receive an automatic grade of zero.
5. When a Spot Check is determined to be below standards, comments will be made in the "additional remarks" section of the sheet. Detailed descriptions will facilitate root cause analysis, the formulation of an effective corrective action plan and assist to clearly identify factors contributing to deficiencies that led to the conclusion that the MRC was not conducted as written or not conducted at all.

APPENDIX A1 SECTION II-A
SPOT CHECK ACCOMPLISHMENT RATING (SCAR) CHECK SHEET

Planned Maintenance System (PMS) 3-M Spot Check Form						
SHIP	DEPARTMENT	EQUIPMENT	WORK CENTER	DATE PERFORMED	MIP EVALUATED	MRC EVALUATED
Maintenance Person:				Spot Check Date:		
NOTES: If an attribute marked with an “*” is evaluated as unsatisfactory, all subsequent attributes will be graded as “0”. Attribute marked with a pound sign “#” - Due to the potential liability incurred by improper use and disposal of HAZMAT, some Work Centers have assigned specially trained personnel to provide HAZMAT and disposal services for surplus material instead of the Maintenance Person. This is acceptable provided the inspector can determine full compliance.						
Inspection Attribute			Value	Grade	Notes	
Contact the maintenance person assigned responsibility for the accomplishment of the MRC, have the individual deliver MRC and determine the following by questions, personal observation, or both.						
1.	a.*	Is the maintenance person qualified (PQS) to perform the MR?	2			
	b.	Did the maintenance person present the correct tools, Personal Protective Equipment (PPE), parts (NSN), material (Military Specification (MIL-SPEC) and calibrated test equipment?	3			
	c.	Did the maintenance person properly identify the equipment (location, equipment validation)?	4			
	d.	Are there unauthorized changes or corrections to the MRC?	3			
	e.	Is the MRC correct for the equipment maintained?	3			
Demonstrated all steps of MR including all Notes, Warnings and Cautions according to the MRC.						
2.	a.*	Followed all steps of the MRC.	5			
	b.*	Correctly performed equipment Tag-Out.	5			
	c.*	Followed all safety precautions.	5			
Does the equipment condition reflect accomplishment of the MRC?						
3.	a.	Is it apparent that maintenance was performed recently?	10			
	b.#	Correctly demonstrated use and disposal of Hazardous Material.	3			
	c.	Was the MRC within the capability of the assigned individual?	5			
PMS Reporting						
4.	a.	Maintenance Person reported status of MR to the WCS if Completed or Not Fully Accomplished and made appropriate updates.	2			

APPENDIX A1
SECTION III
MAINTENANCE ACCOMPLISHMENT RATE (MAR)

1. The Maintenance Performance formula has been redefined to more effectively capture maintenance that was not scheduled. The maintenance execution term is changed from PAR to MAR.
2. The PAR and SAR reports are automatically generated by SKED.
3. The MAR grade will be determined utilizing the formula reflected and a date range consisting of the previous 13 weeks of maintenance.

$$\text{MAR} = (\text{PAR.5} + \text{SAR.5})$$

$$\text{PAR} = \text{Comp (Divided by Comp + Lost + Alerts + Omitted)}$$

$$\text{SAR} = \text{Comp Divided by (Comp + Lost + Omitted)}$$

4. Omitted is defined as any maintenance action that should have been performed on any and every maintenance item and no matter the reason did not get scheduled. For example: Situational or State Maintenance that didn't get scheduled when the situation dictated, improperly lined out periodic checks, non-accomplished IEM checks, non-accomplished maintenance added via ACN, FBR, Preliminary PMS, etc.

APPENDIX A1
SECTION IV
MAINTENANCE DATA SYSTEM (MDS)

APPENDIX A1 SECTION IV-A1
CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF)
CHECKLIST

SHIP	DEPARTMENT	DIVISION	WORK CENTER	DATE
CSMP VALIDITY (RAW DATA)				
ASSESSMENT ATTRIBUTE				VALUE
1.	Number of TA-1 Work Candidates.			
2.	Number of TA-2 Work Candidates.			
3.	Number of TA-3 Work Candidates.			
4.	Number of TA-4 Work Candidates.			
5.	Total Number of Work Candidates (WC) Sum of 1 – 4.			
6.	Number of TA-2WC over 180 days old.			
7.	Number of TA-4WC over 180 days old.			
8.	Aged Work Candidates (WCO) Sum 6 and 7.			
9.	Material Correction Rate: WCO/3 (Aged TA-4). (#7/3)/#4			
10.	CSMP Validity review results from CVF Sheet. Enter score from CVF Worksheet.			
11.	Ship's Force WC over 7 days old that require parts and the parts are not ordered.			
12.	Open Ship's Force WC over 30 days old, not up-lined to the Master CSMP			
13.	Total Work Candidate Deficiencies (WCD) Sum. (#11 - #12)/#4			
14.	Work Candidate Multiple Average #9, #10 and #13			
15.	Material deficiencies noted by MRC spot checks that were not documented in the CSMP.			
16.	Deductions #15/#5			
17.	CSMP Validity Average #14 and #16			
CSMP Validity ☐ Above Standards ☐ At Standards ☐ Below Standards				

Above Standards (> 90%), At Standards (80-89.99%), Below Standards (< 80%)

WORK CANDIDATE WORKSHEET

[illegible]

	f.	MJB516 CSMP report printed incorrectly, missing information or did not have RPPO Log. (MJB512 Report or parts status included on MJB516)	2
	g.	Was not aware of any IUC or TYCOM remarks on CSMP report.	2
	h.	Was not aware that a Lead or Assist Work Center had been assigned.	2
	i.	Was not proactive in seeking repair (an extended period of time on the CSMP with no action taken).	2
	j.	No parts on order for SF JSN within a reasonable amount of time. (1 week)	2
Notes: (1) TYCOM Off-Site Evaluation: Items 1 – 11 apply to each JCN evaluated. (2) TYCOM On-Site Evaluation: Items 1 – 12 apply to each JCN evaluated.			
Ships Force - Name and Rank			
Work Centers: _____			

CSMP Validity Factor (CVF). This is a targeted review of shipboard CSMP entries - 10 percent of EVERY Work Center's CSMP (minimum of 2, maximum of 15 JCNs) and accomplished ashore prior to a visit by TYCOM MDS specialists. Targeted JCNs consist of TA 1, 2 and 3, Safety and EOCs of 2, and TA 4s. As per the items listed on the CVF form, the TYCOM inspection team checks for accuracy to include problem description, recommended solution blocks, does the maintenance level requested match the write up, EOC and Safety codes match write up, etc.? Finally, for each JCN selected, the ship is required to demonstrate knowledge of the deficiency and status. This is accomplished by asking a series of questions to all WCS and DIVO as listed on the CVF form. The answers to these questions (presented as an open book practical exam) are listed on the CSMP, MJB516 report, Repair Parts Petty Officer (RPPO) log or ships availability listing.

**APPENDIX A1 SECTION IV-B
SELF-REPAIR EFFICIENCY (SRE) REVIEW**

ADMINISTRATIVE SECTION GUIDELINE FOR PROGRAM EVALUATION:													
Trouble Call Program (TCP) 30%													
												Points Available	Points Awarded
1.	Total Number of trouble calls submitted from last evaluation _____ Total Number of trouble calls completed from last evaluation _____											20	
	NOTE: TCP – THE CONVERSION OF DELINQUENT TROUBLE CALL DISCREPANCIES MUST NOT EXCEED 5 PERCENT OF THE TOTAL OPEN TROUBLE CALL DISCREPANCIES EVALUATED DURING THE INSPECTION PERIOD PER 4790.1 INST, GUIDELINES.												
2.	Are any trouble calls older than 7 days?											20	
3.	Are Repair Technicians creating a work candidate at least monthly to account for trouble call hours? (Repair Officer maintain 6 months)											20	
4.	Are Repair Technicians reviewing open and completed trouble calls in MODES daily?											20	
5.	Are Engineering Duty Officers (EDO) conducting daily audits?											10	
6.	TC MODES database has adequate information describing the deficiency or problem of the equipment. Fields display the correct type of information required.											10	
TCP													
Ship Self Repair Periods (SSRP) 50%													
1.	Are JCNs completed at Ship Level Approval with Lead and Assist hours taken?											15	
2.	Are JCNs in the Repair Organizations queue, reviewed within 7 days of SHIP level approval?											15	
3.	Are Work Center codes (SHOP) listed on the planning list correct?											15	
4.	Are completed work candidates signed and kept by repair organization for one quarter?											5	
5.	Is there a long-range master repair schedule developed?											5	
6.	Are repair period EXCEL spreadsheets kept by the Repair Officer for one quarter?											5	
7.	Is the Repair Officer conducting arrival conferences two weeks prior to the start of a Department's availability period that includes training on proper documentation of material deficiencies and assigning priority to the work request?											20	
8.	Is the Repair officer conducting daily production meetings with departments in avail to include discussions of scheduling of work, parts status, completion and acceptance of work?											20	
SSRP													
NOTES:													
Practical (PRAT) 20%													
	1	2	3	4	5	6	7	8	9	10			
ADCA or Fire Marshall											100		

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A-Tech											100	
E-Tech											100	
R-Tech											100	
Deck Bos'n or Tech											100	
EA Repair Work Center											100	
EE Repair Work Center											100	
ER Repair Work Center											100	
PRAT												
1. Create list of assigned JCNs using the Maintenance Assignment filter.											10	
2. Process JCNs utilizing the Maintenance Assignment drop down list.											10	
3. Add, Update and complete Lead and Assist Work Center data.											10	
4. Reject JCNs with rejection remarks.											10	
5. Generate and print single and multiple AWR's											10	
6. Create Planning List based on Repair Work Center assigned.											10	
7. Export a Planning or Work Candidate list.											10	
8. Utilize Variations Tab to add planning information when creating list.											10	
9. Identify Ship Level approved, completed JCN's with no Task Total MN-HRS documented.											10	
10. Utilize Parts Tab to review part status.											10	
SRE Total = (TCP x .3) + (SSRP x .5) + (PRAT Avg. x .2) SRE = _____												
ADMINISTRATIVE SECTION GUIDELINE FOR PROGRAM EVALUATION:												
EFFECTIVE: PROGRAM IS WORKING CORRECTLY WITH FEW MINOR DEFICIENCIES AND IS ADMINISTERED BY PERSONNEL COMPLETELY FAMILIAR WITH THEIR RESPONSIBILITIES.												
(GRADE > 88 POINTS)												
PARTIALLY EFFECTIVE: PROGRAM HAS A FEW SIGNIFICANT DEFICIENCIES BUT IS MEETING THE BASIC GOAL OF THE PROGRAM.												
(GRADE 76-87 POINTS)												
NOT EFFECTIVE: PROGRAM HAS NOT BEEN PROPERLY IMPLEMENTED; A PROGRAM THAT HAS THE APPROPRIATE DIRECTIVES PUBLISHED WITH SHIPBOARD INFRASTRUCTURE IN PLACE, BUT NOT CORRECTLY EXECUTED, OR A PROGRAM WITH SIGNIFICANT DEFICIENCIES.												
(GRADE < 75 POINTS)												

Ships Information Management System. Within this program is a module called MODES (Maintenance On-board Data Exchange System). MODES is a program on the ships LAN that provides command wide visibility and tracks all shipboard trouble calls through a central watch. This watch prescreens all trouble calls, and if determined to be valid, is entered into MODES and farmed out to a repair Work Center for disposition. If trouble calls cannot be rectified within 30 days, they must be entered on the CSMP. TSIMS tracks material deficiencies by displaying past repairs that would not normally be entered in the CSMP (SFWL). Man-hours are captured by entering a man-hour roll up at the end of the month, utilizing special XSYSTEMITM APLs created by CNAL and CNAP. This input to the CSMP is captured and graded using an SRE grading form.

APPENDIX A1 SECTION IV-C**REPORTING AND ASI PROCESSING CONFIDENCE FACTOR (RAF) REVIEW**

	OMMS-NG OR P-OMMS SYSTEM MAINTENANCE REVIEW	Points Available	Points Awarded
1.	Is the Import Correction queue empty?	5	
2.	Has Archive been run in the last 15 days?	5	
3.	Has Inactive been run in the last 15 days?	5	
4.	Have Work Candidates been removed from past availabilities C+30 Days?	5	
5.	Is the REJ availability used to track jobs rejected or questioned by the TYCOM TRIAD empty?	5	
6.	Have old availabilities been removed from OMMS-NG or P-OMMS?	5	
7.	Is a current, up to date, Ship Availability Listing readily available to the ship?	5	
8.	Does FAS have a tracking system for up-line reporting? Is last 13 weeks of .uru and .pts on file?	5	
9.	Does FAS have a tracking system for bulk loaded MM0001 files? Is last 13 weeks of bulk loads on file?	5	
10.	Does FAS have a tracking system for customer feedback files? Is last 13 weeks of feedbacks on file?	5	
11.	Does FAS maintain a log tracking significant OMMS-NG or P-OMMS down time?	5	
12.	Are current OMMS DAPs installed, and does the FAS know under what conditions they are utilized?	5	
13.	Is the Reports Release queue being managed and cleared of obsolete reports? (Any reports over 14 days)	5	
14.	Are values in the Site Parameter set per TYCOM directives?	5	
15.	Is the Maintenance Assignment dropdown list populated per TYCOM directives?	5	
16.	Is the Work Candidate Status dropdown list populated per TYCOM directives?	5	
17.	Are Work Centers per the Joint Fleet Maintenance Manual, Vol VI Chapter 19?	5	
18.	Is there an effective process in place that deletes users as they transfer from the command?	5	
19.	Does the Review and Approval queue have Work Candidates older than 7 days below Ship Level Approval?	5	
20.	Does the FAS have the current TYCOM directives and are they readily available to the ship?(i.e. Current; CNAL User Guide ,CNAP OMMS-NG User Guide, Ships Force Resource Manual for Aircraft Carrier Availability Planning; TSIMS/MODES User Guide; CNAF 3M Gazette News Letter (4 Quarters)).	5	
Total Points Available		100	
Total Points Awarded			
Inspector Notes:			

APPENDIX A1 SECTION IV-D
ZONE INSPECTION ASSESSMENT

OVERALL PROGRAM EVALUATION: Each attribute valued at 4 points.

GUIDELINE FOR PROGRAM EVALUATION:

ABOVE STANDARDS: Program is working correctly with few minor deficiencies and is administered by personnel completely familiar with their responsibilities (scoring 86-100 points).

AT STANDARDS: Program has a few significant deficiencies but is meeting the basic goal of the program (scoring 80-85 points).

BELOW STANDARDS: Program has not been properly implemented; a program that has the appropriate directives published with shipboard infrastructure in place, but not correctly executed, or a program with numerous significant deficiencies (scoring < 79 points).

Notes:

1. The CNAF 3-M Team Senior Inspector can determine BELOW STANDARD based on a single major repair level-one safety discrepancy noted during assessment.
2. The conversion of delinquent zone inspection discrepancies to work candidates will not exceed 5% of the total open zone inspection discrepancies evaluated during the inspection period per 4790.1 guidelines.
3. CNAF 3-M Team will randomly select Zone Inspectors for observation during the zone inspection. Eighty percent (80%) of the selected Inspectors and spaces should meet the criteria required in order to receive a satisfactory in line items 9, 13, 14, 15, 20 and 21.

Zone Inspection Assessment Checklist			
#	ATTRIBUTE	SAT	UNSAT
1.	Are all spaces of the ship inspected at least once a quarter?		
2.	Does the Commanding Officer participate in zone inspections as an inspector?		
3.	Are the ZIDLs in TSIMS/MODES database correctly prioritized?		
4.	Are ship's Officers and Chief Petty Officers trained in the conduct of zone inspections?		
5.	Does the Executive Officer participate in zone inspections as an inspector?		
6.	Does the Executive Officer maintain an auditable record for the last 12 months indicating that all spaces have been inspected at least once a quarter?		
7.	Does the 3MO designate zones, zone boundaries, number of zones and the spaces assigned to each zone?		
8.	Does the 3MO furnish inspecting party with inspection binders containing blank ZIDLs Encl (6), zone inspection material guide Encl (7) and a copy of the last inspection ZIDLs?		
9.	Are all compartments, gear lockers, drawers, stowage lockers & other enclosures unlocked?		
10.	Do XO, DCA, Safety Officer, Electrical Officer or designated representative (E-7 or above) provide specific direction on points of interest or other inspection criteria prior to commencement of zone inspection?		
11.	ZIDLs in MODES database have adequate information describing the deficiency or problem of the equipment (s).		
12.	Do HODs, DIVOs or LCPOs ensure all repair level one safety discrepancies are resolved immediately and reported to XO within 24hrs?		
13.	Do inspectors document all discrepancies on ZIDL (Encl 6)		
14.	Do inspectors show up on time with flashlight and conduct inspection properly?		
15.	Do inspectors understand inspection criteria?		
16.	Does the 3-M Office collect, review and maintain completed ZIDLs and enter them into MODES module located in TSIMS program?		
17.	Does the 3-M Office and DEPT 3MAs correctly document discrepancies into MODES?		
18.	Are open ZIDLs in MODES older than 30 days for originating Work Center deficiencies or older than 7 days for discrepancies beyond the division's capabilities?		
19.	Does the 3-M Office and 3MAs take hours on closed ZIDLs in MODES?		
20.	Does each division have a ZIDL folder or binder containing ZIDLs from the last year's inspections and blank ZIDL forms for each space assigned?		
21.	Does each division have a CSMP that reflects current condition and discrepancies for each space assigned?		
22.	Does the 3MO forward the MODES and the Zone Inspection Discrepancy Report to the XO, HODs, PAs DCA, ELO, Safety Officer, DEPT LCPOs, DIVOs and LCPOs for review?		
23.	Does the XO, HODs, DCA, ELO and Safety Officer review MODES and the Zone Inspection Discrepancy Report for action routed by the 3-M Officer?		
24.	When corrections are complete, does the department ensure the MODES database is routinely updated to reflect the status of corrective action via the 3-M Office?		
25.	Does the ship maintain a copy of the ship's force assessment for one year and the last three CNAF assessments?		
FINAL GRADE			
Printed Name:		Signature:	
Command:		Date:	

APPENDIX A1
SECTION V
PROFICIENCY

APPENDIX A1 SECTION V-A
OMMS-NG PRACTICAL (MCF)

SHIP:	DEPARTMENT:	
WORK CENTER:	LEVEL of ACCESS:	
If the results of line item 1 or 2 = NO, Automatic Failure ZERO points awarded.		
1. 3-M PQS Qualified.	YES	NO
2. Can user log into OMMS-NG or P-OMMS Application using own login?	YES	NO
	Points	Awarded
3. Display a list of Configuration Items (Equipment).	10	
4. Display a list of Work Candidates.	10	
5. Demonstrate adding a Work Candidate.	10	
6. Demonstrate changing or updating a Work Candidate.	10	
7. Demonstrate closing a Work Candidate.	10	
8. Review Work Candidate history.	10	
9. Order and approve maintenance parts.	10	
10. Generate and print CSMP reports.(MJB516 or MJB512)	10	
11. Review and approval of work candidates - able to distinguish the following:		
a. Configuration Item - is JCN written against correct CI? Does it match the write up?	2	
b. Problem description and recommended solution - Remarks sufficient?	2	
c. Maintenance level - Does it match what was requested by OWC in the write up?	2	
d. Deferral Reason Code - Appropriate (Justified in the write up)?	2	
e. 1st and 2nd contacts - Correct?	2	
f. Equipment Operational Code - Appropriate and Accurate?	2	
g. CSMP summary – Does the summary state a problem?	2	
h. Deadline Date - Invalid or missing for TA 2 and 3, invalid for TA 1 or 4 if assigned?	2	
i. Safety Code - Appropriate (Justified in the write up)?	2	
j. Priority Code - Appropriate (Justified in the write up)?	2	
	Totals	100
	Percentage	
Ship's Force Name and Rate:		
Inspector's Name: Date:		

APPENDIX A1
SECTION VI
COMMAND TOTAL SCORE

APPENDIX A1 SECTION VI**3-M INSPECTION COMMAND TOTAL SCORE**

1. The FINAL GRADE consists of two (2) parts and weighted as:

- a. PPR (PMS Performance Rate). **PPR = (MAR x SCAR) divided by 100.**
- b. This is overall MAR (combination of PAR and SAR) multiplied by total SCAR (spot check validation) divided by 100 and expressed as a RATE. In other words, if a ship is properly scheduling only 90% of the checks assigned from NAVSEA, and then properly accomplishing those checks at a grade of 90%. Then PPR would be $90 \times 90 = 8100$ **divided by 100** = 81 PMS Performance RATE. The PMS side counts as HALF of the overall grade.

2. MPR (MDS Performance Rate). The MDS portion gets an overall 50% weight of the overall 3M Inspection grade. This comes from the weight fleet commanders (CNAL or CNAP) place on CSMP accuracy and validity. This leads to proper planning and budgeting for complex refueling overhauls, extensive yard periods and getting CVNs out on time and at the lowest cost. The 5 sections detailed in section IV are weighted as:

$$\text{MPR} = (\text{MCF} \times .20) + (\text{ZIDL} \times .25) + (\text{CVF} \times .30) + (\text{SRE} \times .20) + (\text{RAF} \times .05).$$

3. OVERALL GRADE is computed as **(PPR x .50) + (MPR x .50)**. A minimum grade point of 80 is required for a passing score. **In addition, a CVN WILL FAIL if any of the following are true:**

- a. Two (2) or more “major departments” (Combat, Air, Reactor, Engineering) fail.
- b. The overall RAR, SCAR or MPR score is under 80.
- c. The overall Damage Control (DCPO type checks in “40” Work Centers) SCAR is under 80.

APPENDIX A2
INSPECTION PROCEDURES FOR NAVAL SUBMARINE FORCES

APPENDIX A2

SECTION I

WORK CENTER COMMAND LEVEL EFFECTIVENESS REVIEWS

APPENDIX A2 SECTION I-A
SCHEDULING AND EXECUTION EFFECTIVENESS REVIEW (SEER)

Command		Department	Division	Work Center	Date		
General Attributes					Value	Points	
1.	Does the Work Center PMS file contain:						
	a.*	Current Service Brief?			1		
	b.*	Current applicable 3-M messages and notices?			2		
2.		Do MIPs and MRCs accurately reflect equipment configuration; are non-applicable MRCs correctly lined out and are applicable MRCs active? (May be MIP standardization violations)			10		
3.	*	Does the Work Center retain an auditable record of personnel PMS qualifications and designation letters?			5		
4.		Are K-MRC data sheets maintained?			4		
Maintenance Requirement Card (MRC) Deck							
5.	*	Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current? (Per TYCOM direction)			2		
6.		Are classified MRCs complete and current?			3		
7.		Are blanks requiring Ship's Force data filled in prior to use?			3		
Chain of Command SKED Administration							
8.	Are all administrative changes approved at the appropriate level?						
	a.	FR approved by DEPT Head. (Verify using journal tab.)			2		
	b.	Weekly Closeouts performed by close of business on the first workday of the week by the LCPO.			2		
	c.	All lineouts and MRC customization approved by the LCPO.			2		
	d.	Check notes reviewed and approved by the LCPO.			2		
	e.	PMS alerts acknowledged by DIVO or Dept. Head within 3 days of weekly closeout.			2		
Location Guide Lists (LGL)							
9.	a.*	Do LGLs contain required information (e.g., equipment name, equipment location, equipment serial number or unique identifier)?			3		
	b.*	Are Maintenance Items in SKED associated to the existing equipment configuration?			3		
Situational Requirements							
10.	*	Are all situational (states, triggers, metered) events being scheduled and executed in SKED?			8		
PMS Execution and Accountability							
11.		Are check note entries accurate, valid and complete?			3		
12.	*	Was maintenance assigned only to qualified maintenance personnel?			4		
13.		Was currently scheduled, previously completed, situational requirements and unscheduled maintenance entered into SKED?			10		

14.		Is a unique ESOMS identifier or tag-out serial number recorded in “check notes” for maintenance actions marked as complete that required Tag-outs?	2	
15.		Have the minimum number of spot checks and monitored checks been accomplished?	3	
16.		Is K-MRC completion rate within periodicity at 90% or above?	10	
17.		Record number of omitted checks. ()		
FBR File				
18.		Are Feedback Reports being tracked in SKED, “Action Taken” block update by WCS?	2	
Inactive Equipment Maintenance (IEM)				
19.		Is the start of an inactive period correctly annotated and approved by Department Head?	2	
20.		Are IEM requirements properly scheduled?	5	
21.		Is the completion of the inactive period correctly annotated?	2	
Totals (Attributes evaluated as “N/A” are not calculated)		Total Points Available: 97	Total Points Awarded _____	
SAT ☐ (SAT = 77 points or better) UNSAT ☐				

*** Electronic Versions Acceptable**

Sat = 80 percent or better

Attribute Scoring:

85% or above = Satisfactory = Full Credit

Less than 85% = Unsatisfactory = No Credit

Example - Attribute 20 - If 85% or better of IEM requirements were properly scheduled, points awarded would be five (5). If less than 85% of IEM requirements were properly scheduled, points awarded would be zero (0).

SEER REMARKS

[illegible]

Date:

APPENDIX A2 SECTION I-B

COMMAND LEVEL EFFECTIVENESS REVIEW (CLER)

Using the attributes and grading criteria described, determine the Command Level Effectiveness Review for the ship. Provide amplifying information for deficiencies causing point reduction on the remarks page.

Command:			Date:	
PMS Attributes			Value	Points
1.		Does the 3MC maintain:		
a.		A Change Accountability Log?	3	
b.	*	A log tracking the assignment of MRCs from split MIPs to ensure all applicable MRCs are assigned?	3	
c.	*	A Master Classified MRC File?	2	
d.	*	A current PMS (and where applicable TFR) DVD or downloaded file?	3	
2.		A complete back up of the SKED system must be created on removable media (DVD or CD-R) following completion of the FR.	5	
3.	*	Does the 3-M Coordinator have an effective system in place to track, route and explain externally provided PMS changes?	3	
4.		Is there an effective system in use (Spot Check Program) whereby supervisory personnel periodically and routinely monitor PMS performance?	8	
5.		Have all FBRs entered in SKED been properly reviewed by the chain of command and submitted off hull within seven (7) days?	3	
6.		Have CSMP reconciliations been conducted per JFMM and TYCOM instructions?	5	
7.	*	Does the command conduct quarterly SEER internal audits of all Work Centers? (Retain latest copies of deficiencies, corrections and abatement for current & previous quarter)	10	
8.	*	Does the 3MC provide weekly status reports & EOQ Summaries to the 3-M Manager per specific TYCOM directive?	3	
9.	*	Does the 3MC have an approved master copy of 3-M PQS specifically tailored for the command?	3	
10.	*	Does the 3MC maintain an auditable record of PMS PQS for the command (e.g., copy of service record entries, signed copy of PQS cover letter, officer verified divisional training record, RADM)?	3	
11.		Does the 3MC maintain the status of command FBRs, responses and follow up actions taken in SKED?	3	
12.		Is the 3MC capturing GLOBAL TRIGGERS and STATES?	10	
13.		Does the command conduct 3-M program training per TYCOM directives?	10	
14.		Was maintenance completed with all Safety Precautions accomplished?	10	
15.		Is the 3-M Functional Area Supervisor (FAS) ensuring all 3-M databases are being routinely maintained? (Use the RAF computation sheet)	8	
16.		Did the command conduct a mid-term 3-M self-assessment?	10	
17.		Does the command track K MRCs and verify completion with the local agency?	10	

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18.		Does the Commanding Officer provide a quarterly K-MRC summary report to the ISIC?	5	
Totals (Attributes evaluated as "N/A" are not calculated)				
Total Points Available		120	Total Points Awarded	
SAT		☐	(SAT = 96 points or better)	
			UNSAT ☐	

* **Electronic Version Acceptable****Sat = 80 percent or better****Attribute Scoring:**

85% or above = Satisfactory = Full Credit

Less than 85% = Unsatisfactory = No Credit

APPENDIX A2 SECTION I-B1

CLER REMARKS

Provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.

[illegible]

APPENDIX A2
SECTION II
SPOT CHECK ACCOMPLISHMENT RATING (SCAR)

APPENDIX A2 SECTION II-A1

SPOT CHECK ACCOMPLISHMENT RATING (SCAR)

Using the basic definitions and guidelines described, determine the PMS Spot Check Accomplishment Rating (SCAR) for each Work Center. Enter the values determined on the SCAR Check Sheet, Section II-A of this Appendix.

Division	Number	Division	Number	Division	Number
DV01	2	EA01	4	DEC1	3
EE01	4	EM01	4	MA01	2
ME01	2	MH01	2	MN01	2
MV01	2	MV02	2	NE01	3
OC01	3	OC02	3	OC03	3
RC01	2	RC01 (774CL)	3	RL01	2
SS02	2	WF01	2	WF02	2
WI01	4	WK01	2	WK02	2
WM01	2	WQ01	3		

Specifically: Periodic and situational for all completed maintenance (including Daily, Weekly and Bi-weekly) from the last 13 weeks. Every Work Center will receive at least one documented periodic and one situational spot check. If a Work Center did not perform any maintenance in the last 13 weeks, the SCAR portion will be marked “N/A”.

1. Complete a MRC Evaluation, SCAR Check Sheet for each MRC selected. Based on the results, evaluate the overall effectiveness of the accomplishment of each MR selected. Enter a numeric evaluation of each assessment attribute and provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.
2. The SCAR Check Sheet is a series of inspection attributes to determine the accomplishment status of an MRC that has previously been reported as accomplished. Although, the sheet may be used as a reference for conducting a real time monitored MRC, for the purposes of conducting a 3M Inspection, to determine SCAR, all spot checks will be conducted on accomplished (historic) MRCs.
3. Due to the nature of MRC completion, supporting programs such as Tag-Outs and Hazardous Material (HAZMAT) are encountered. Care should be taken to avoid expanding the Spot Check to a review of the processes of those programs thereby preventing the assessor from determining the accomplishment status of the MRC under review.
4. The following is expanded guidance for completion of the assessment attributes of the SCAR Check sheet. Best practices or other policies not supported by source documentation must not be included in evaluating compliance:
 - a. (block 1.a) Determine if the maintenance person is qualified to perform the maintenance task. PQS 301 is required for all MRCs but attention should also be paid to other qualifications required such as Quality Maintenance (see Volume 5, Part I, Chapter 3, paragraph 3.4 of this manual) or graduation from a required school such as gage calibration technician.

- b. (block 1.b) Determine if the correct Tools, Parts, Material and Test Equipment (TPMTE) were used during the performance of the MRC. If the maintenance person did not have the required TPMTE, it is unlikely that they would have been able to complete all the procedural steps of the MRC as required. If an item of TPMTE was required to perform a conditional step and that step was not required to be accomplished, it is not considered deficient. If the required test equipment required calibration, ensure that the calibration is within date and the equipment is of sufficient scale to accomplish the MRC.
- c. (block 1.c) Determine if the maintenance person maintained the correct equipment.
- d. (block 1.d) Examine the MRC to determine that any locally applied changes are authorized by procedural notes, external correspondence or allowed by reference (a).
- e. (block 1.e) Determine applicability of the MRC to the component that the maintenance person signed for completion.

NOTE: IF A PROCEDURAL STEP WAS NOT COMPLETED, THE MRC SHOULD NOT HAVE BEEN REPORTED AS COMPLETE AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- f. (block 2.a) From a variety of potential techniques, determine if the maintenance person performed all the required steps of the MRC. This may be accomplished via re-enactment, a discussion regarding the steps or re-performance. The inspector should come away with a clear impression that all the steps of the MRC were either fully accomplished or not.

NOTE: IF A REQUIRED TAG-OUT WAS NOT CONDUCTED IN SUPPORT OF ACCOMPLISHING THE MRC, THE MRC SHOULD NOT HAVE BEEN CONDUCTED AND REPRESENTS A SERIOUS SAFETY VIOLATION AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- g. (block 2.b) If required by the MRC, verify that a tag-out was hung on the day the maintenance was performed. Ensure the isolation boundaries were appropriately identified and correctly positioned to ensure complete isolation of the maintained equipment. If no Tag-Out was required, write “N/A” on the sheet.

NOTE: FAILURE TO ADHERE TO A SAFETY PRECAUTION PROVIDED ON THE MRC CONSTITUTES A SERIOUS SAFETY VIOLATION AND THE FAILURE TO PERFORM THE MRC AS WRITTEN. THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- h. (block 2.c) Determine compliance with all specific safety precautions listed on the MRC. If no safety requirements were invoked, write “N/A” on the sheet.
- i. (block 3.a) By physical examination of the maintained equipment, determine if maintenance of the nature required by the MRC had been performed. Take note of

fasteners that would have had to be disturbed, dirt in filters, fresh oil, etc., to make a judgment as to whether or not the maintenance has been performed. If unable to make this determination with absolute certainty, write "N/A" on the sheet.

NOTE: DUE TO THE POTENTIAL LIABILITY INCURRED BY IMPROPER USE AND DISPOSAL OF HAZMAT, SOME WORK CENTERS HAVE ASSIGNED SPECIALLY TRAINED PERSONNEL TO PROVIDE HAZMAT AND DISPOSAL SERVICES FOR SURPLUS MATERIAL INSTEAD OF THE MAINTENANCE PERSON. THIS IS ACCEPTABLE PROVIDED THE INSPECTOR CAN DETERMINE FULL COMPLIANCE.

- j. (block 3.b) Determine through questioning and record verification that HAZMAT was properly used and disposed of as a means of determining whether or not the MRC was accomplished. Once the inspector has determined that the HAZMAT was used and disposed of correctly, this attribute is considered fulfilled. If no HAZMAT was required to be utilized, write "N/A" on the sheet.
 - k. (block 3.c) Determine if the maintenance person could have performed the MRC from a standpoint of being trained and proficient in the tasks called out for by the procedure.
 - l. (block 4.a) Determine if the maintenance person filled out the 13-Week Accountability Log or annotated proper disposition of maintenance in SKED correctly for the accomplished MRC with the appropriate accomplishment date. If a tag-out isolation was used, ensure the tag serial number is recorded in the space allowed or as a check note in SKED. Ensure that the printed name and legal signature of the maintenance person who actually performed the maintenance is recorded or, in case of group performed PMS, the maintenance person in charge of the group.
 - m. (block 4.b) From reviewing the discussions and findings during the course of the spot check, determine if a TFBR had been submitted if required. If no TFBR was required, write "N/A" on the sheet.
 - n. (block 4.c) Determine if a material deficiency was noted during the PMS; if so, examine the CSMP to ensure the deficiency was documented. If no material deficiency was noted, write "N/A" on the sheet. If material discrepancies are properly documented in the CSMP attribute graded as a two (2). Material discrepancies which are not documented in the CSMP will be entered with an automatic grade of zero.
5. When a Spot Check is determined to be below standards, comments will be made in the "additional remarks" section of the sheet. Detailed descriptions will facilitate root cause analysis, the formulation of an effective corrective action plan and assist to clearly identify factors contributing to deficiencies that led to the conclusion that the MRC was not conducted as written or not conducted at all.

APPENDIX A2 SECTION II-A2
SPOT CHECK ACCOMPLISHMENT RATING (SCAR) CHECK SHEET

Planned Maintenance System (PMS) 3-M Spot Check Form						
COMMAND	DEPARTMENT	EQUIPMENT	WORK CENTER	DATE PERFORMED	MIP EVALUATED	MRC EVALUATED
Maintenance Person:				Spot Check Date:		
NOTES: 1. If an attribute marked with an “*” is evaluated as unsatisfactory, all subsequent attributes will be graded as “0”. 2. Attribute marked with a pound sign “#” – Due to the potential liability incurred by improper use and disposal of HAZMAT, some Work Centers have assigned specially trained personnel to provide HAZMAT and disposal services for surplus material instead of the Maintenance Person. This is acceptable provided the inspector can determine full compliance.						
Inspection Attribute				Value	Grade	Notes
Contact the maintenance person assigned responsibility for the accomplishment of the MRC, have the individual deliver MRC and determine the following by questions, personal observation, or both.						
1.	a.*	Is the maintenance person qualified (PQS) to perform the MR?	2			
	b.	Did the maintenance person present the correct tools, Personal Protective Equipment (PPE), parts (NSN), material (Military Specification (MIL-SPEC) and calibrated test equipment?	3			
	c.	Did the maintenance person properly identify the equipment (location, equipment validation)?	4			
	d.	Are there unauthorized changes or corrections to the MRC?	3			
	e.	Is the MRC correct for the equipment maintained?	3			
Demonstrated all steps of MR including all Notes, Warnings and Cautions according to the MRC.						
2.	a.*	Followed all steps of the MRC.	5			
	b.*	Correctly performed equipment Tag-Out.	5			
	c.*	Followed all safety precautions.	5			
Does the equipment condition reflect accomplishment of the MRC?						
3.	a.	Is it apparent that maintenance was performed recently?	10			
	b.#	Correctly demonstrated use and disposal of Hazardous Material.	3			

	c.	Was the MRC within the capability of the assigned individual?	5		
PMS Reporting					
4.	a.	Maintenance Person reported status of MR to the WCS if Completed or Not Fully Accomplished and made appropriate updates in SKED.	2		
	b.	Work Center generated FBR for any problem with MRC.	2		
	c.	Material deficiencies detected by the PMS action were recorded in MDS.	2		
Attributes Evaluated as "N/A" are not Calculated					
Total Points Available:			Total Points Awarded:		
Spot Check (SCAR) (Grade = Points Awarded Divided by Points Available): SCAR =					
Above Standard (90% or greater) At Standard (80-89.99%) Below Standard (less than 80%)					
Above Standards ☐ At Standards ☐ Below Standards ☐					
Below Standard grade requires immediate accomplishment monitored by a Chief Petty Officer.					
Additional Remarks:					
Print Name:			Signature:		
Command:			Date:		

APPENDIX A2
SECTION III
MAINTENANCE ACCOMPLISHMENT RATE (MAR)

1. The Maintenance Performance formula has been redefined to more effectively capture maintenance that was not scheduled. The maintenance execution term is changed from PAR to MAR.
2. The PAR and SAR reports are automatically generated by SKED.
3. The MAR grade will be determined utilizing the formula reflected and a date range consisting of the previous 13 weeks of maintenance.

$$\text{MAR} = (\text{PAR}.5 + \text{SAR}.5)$$

$$\text{PAR} = \text{Comp} \text{ Divided by } (\text{Comp} + \text{Lost} + \text{Alerts} + \text{Omitted})$$

$$\text{SAR} = \text{Comp} \text{ Divided by } (\text{Comp} + \text{Lost} + \text{Omitted})$$

4. Omitted is defined as any maintenance action that should have been performed on any **and** every maintenance item and no matter the reason did not get scheduled, e.g., Situational **or** State Maintenance that didn't get scheduled when the situation dictated, improperly lined out periodic checks, non-accomplished IEM checks, non-accomplished maintenance added via ACN, FBR, Preliminary PMS, etc.

APPENDIX A2
SECTION IV
MAINTENANCE DATA SYSTEM (MDS)

APPENDIX A2 SECTION IV-A1
CURRENT SHIP'S MAINTENANCE PROJECT
VALIDITY FACTOR (CVF) CHECKLIST

CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF) CHECKLIST						
COMMAND:		DATE:	Work Center:			
			E A 0 1			
CSMP Validity (Raw Data)		Value				
1.	Number of TA-1 Work Candidates					
2.	Number of TA-2 Work Candidates					
3.	Number of TA-3 Work Candidates					
4.	Number of TA-4 Work Candidates					
5.	Total Work Candidates (sum 1,2,3,4)					
6.	Number of TA-2 WC over 180 days' old					
7.	Number of TA-4 WC over 180 days' old					
8.	Aged Work Candidates (WCO): Sum of 6-7					
9.	Ship's Force Material Correction Rate: WCO/3 (Aged TA4) (#7/3)/#4					
10.	CSMP Validity review results from CVF Sheet.					
11.	Number of Ship's Force (TA-4) WC over 7 days old that require parts and the parts are not ordered.					
12.	Total Work Candidate Deficiencies (WCD): #11/#4					
13.	Work Candidate Multiple Average: #9,#10					
14.	Number of material deficiencies noted on ship spot-checks not documented in CSMP or number of jobs in the CSMP that require controlled system marking (SS, FBW, SOC) that are not appropriately marked.					
15.	Spot-check Deductions #14/#5					
16.	CSMP Validity Average #13 & #15					
		SAT OR UNSAT				

Above Standards (90% or greater), At Standards (80-89.99%), Below Standards (less than 80%)

APPENDIX A2 SECTION IV-A2
CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF)
WORK CANDIDATE WORKSHEET

CSMP VALIDITY FACTOR (CVF) WORK CANDIDATE WORKSHEET												
COMMAND:										DATE:		
DEPARTMENT:										WORK CENTER:		
JCN	CSMP Summary	MNO*	1	2	3	4	5	6	7	8	9	CVF
												100.00
CVF												
CSMP entry was reviewed with the following results: Jobs Reviewed: _____ MNO* _____												Minus Points
1. Was the work candidate written against the correct configuration item?									#1 Qty:			20
2. Problem Description and Recommended Solution inadequate. [PARTIAL CREDIT]									#2 Qty:			20
3. Deferral Reason correct.									#3 Qty:			5
4. Current Status not updated.									#4 Qty:			10
5. Write up does not reflect maintenance level assigned. [PARTIAL CREDIT]									#5 Qty:			10
6. Incorrect CSMP Summary.									#6 Qty:			10
7. Priority code incorrect. [PARTIAL CREDIT]									#7 Qty:			5
8. Does the Work Candidate equipment status code match problem description?									#8 Qty:			10
9. When required, was the correct special purpose or safety block selected?									#9 Qty:			10
*MNO = Material Not Ordered > WEEK Enter YES, NO or N/A												

NOTE: ENTER ONLY NUMERIC PORTION OF JSN AFTER ENSURING THAT DEPARTMENT AND WORK CENTER HEADER IS FILLED IN.

- One hundred percent of CSMP jobs for review not to exceed 25 jobs.**
- Work Centers with Controlled Systems (SS, FBW, SOC) all JSNs must be 100% reviewed, specifically looking for correct SS, FBW or SOC marking.**

REPORTING AND ASI PROCESSING CONFIDENCE FACTOR (RAF) REVIEW

APPENDIX A2

APPENDIX A2 SECTION IV-C
SHIP'S MATERIAL GRADE (SMG)

COMMAND:		DATE:		
		ASSESSMENT ATTRIBUTES	VALUE	GRADE
1.		TOTAL WORK CANDIDATES IN RMAIS in Return Status >30 days. Total of Active TA-2 and TA-3 divided by the Number of Returned >30 days =% (Ship's Force Work Centers Only)	5	
2.		Internal and External Inspection Deficiencies in last 45 days not entered in CSMP. These inspections include but are not limited to INSURV, ORSE, SMI, TSRA, TRE and Command Zone Inspection Program and General Inspector Observations.	5	
3.		Number of outstanding OSARS greater than 180 days old. 0=100%	10	
4.		Overdue I-Level PMRs; more than 100=0, more than 90=1 et cetera.	10	
5.		Number of CASREPS per SUBS more than 45 days old; more than 10=0, more than 9=1 et cetera.	10	
6.		Number of authorized Non-NUKE SHIPALT and A&Is authorized for accomplishment older than 3 years; more than 10=0, more than 9=1 etc.	10	
7.		Number of Temp DFSs (minus number of DFSs used to track TEMP Alts); more than 10=0, more than 9=1 etc.	10	
8.		Status of S&E Calibration (CURRENT CAL %)	10	
Totals (Attributes Evaluated)		Total Points Available	Total Points Awarded	
		70		
Ship's Material Grade (SMG) = TP Awarded Divided by TP Available			SMG	0.00%
☐ Above Standards		☐ At Standards	☐ Below Standards	
Above Standards (90% or greater)		At Standards (80-89.99%)	Below Standards (less than 80%)	

SMG REMARKS[illegible]

APPENDIX A2
SECTION V
PROFICIENCY
(Not applicable to Submarines)

APPENDIX A2
SECTION VI
COMMAND TOTAL SCORE

APPENDIX A2 SECTION VI

3-M INSPECTION COMMAND TOTAL SCORE

1. The FINAL GRADE consists of three (3) parts and weighted as:
 - a. Department Total Score accounts for 80% of the final grade.
 - b. CLER accounts for 10% of the final grade.
 - c. SMG accounts for 10% of the final grade.
2. OVERALL GRADE is computed as:
 - $CTS = DTS.8 + CLER .1 + SMG .1$
 - $CLER = (Section\ I-B \times .1)$
 - $SMG = (Section\ IV-C \times .1)$
 - $DTS = WCS \times Weight\ Factor$
 - $WCS = PPR.5 + MPR.5$ PMS Performance Rate (PPR)
 - $PPR = MAR.5 + SCAR.5$ MDS Performance Rate (MPR)
 - $MAR = PAR.5 + SAR.5$

A minimum grade point of 80 is required for a passing score.

This table will be used to determine divisional weighting factor for submarine commands. Non-submarine commands will use scheduled maintenance from the last 13 weeks to determine divisional weighting factor:

The following divisional weighting factor will be used:

Work Centers	688	774	SSBN	SSGN
DV01	1	1	1	1
EA01	13	13	14	13
EDC1	4	4	4	4
EE01	13	9	12	12
EM01	13	13	11	11
MH01	1	1	2	2
NE01	8	8	6	6
OC01	6	6	3	3
OC02	10	10	10	10
OC03	2	2	1	1
RC01	1	5	2	2
RL01	2	2	3	3
SS02	0	0	1	0
WF01	4	4	4	3
WF02	0	0	0	2
WM01	0	0	3	3
WI01	11	11	10	10
WK01	3	0	5	5

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WK02	0	3	0	1
Work Centers	688	774	SSBN	SSGN
WQ01	8	8	8	8
Total	100	100	100	100

APPENDIX A3
INSPECTION PROCEDURES FOR NAVAL SURFACE FORCES

APPENDIX A3

SECTION I

**WORK CENTER COMMAND LEVEL EFFECTIVENESS REVIEW
EQUIPMENT VERIFICATION VALIDATION**

APPENDIX A3 SECTION I-A1
SCHEDULING AND EXECUTION EFFECTIVENESS REVIEW (SEER)

SKED 3.1

Command		Department	Division	Work Center	Date		
General Attributes					Value	Grade	
1.	Does the Work Center PMS file contain:						
	a.	A correction sheet that indicates all changes?			1		
	b.*	Supplementary information (e.g., current and applicable 3-M messages and notices, forecasting report)			1		
	c.	Current List of Effective Pages (LOEP)? (Verify Force Revision (FR) number.)			1		
	d.	Current Maintenance Index Pages (MIPs)? (Verify MIP control numbers against the LOEP and against SKED.)			1		
	e.*	Current Service Brief?			1		
2.		Are all pen and ink changes on the LOEP, MIPs and MRCs (except where allowed by scheduling aid) annotated with the reference for the change (Technical Feedback Report (TFBR) serial, Advanced Change Notice, etc.) and properly noted by the correct authority initialed by LCPO?			5		
3.		On MIPs, are any applicable MRCs incorrectly lined out or not lined out? (Split MIP log will be verified against the LOEP per MIP.) Was all maintenance scheduled correctly?			10		
4.	*	Does the Work Center retain an auditable record of 3-M PMS (RADM) and designation letters?			3		
Maintenance Requirement Card (MRC) Deck							
5.		Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current?			2		
6.		Are classified MRCs complete and current?			5		
7.		Are blanks requiring Ship’s Force data filled in prior to use?			3		
Equipment Guide Lists (EGL) or Location Guide Lists (LGL)							
8.		Are EGLs entered and associated in SKED for all applicable equipment?			5		
9.		Are EGLs or LGLs current and a paper copy attached to the parent MRC? (Verify MRC control number on the EGL or LGL against MRC).			3		
10.	a. *	Are EGLs or LGLs properly filled out (e.g., equipment name, equipment location, equipment unique identifier)?			5		
	b. *	Do EGLs or LGLs contain applicable information (e.g., equipment name, equipment location, equipment serial number or unique identifier) for equipment association?			2		
11.		Are separate EGLs prepared for items that require more than 8 hours’ worth of work?			1		
Situational Requirements							
12.		Does the situational requirements listing reflect the most current FR? (List is available on PMS CD under R-Check header.)			2		
13.		Does the situational requirements listing reflect the current status of the Work Center MIPs? (Lineouts on MIP transferred to the situational requirements listing.) Are lineouts initialed by the LCPO?			3		
14.	*	Does the R-Check event manager reflect situational maintenance properly entered?			3		
15.	*	Are ALL situational events being triggered in SKED?			5		

PMS EXECUTION AND ACCOUNTABILITY				
16.		Have accountability logs been reviewed by the WCS, LCPO and Division Officer?	3	
17.		Was maintenance assigned only to qualified maintenance personnel (MP) for MRCs requiring unique qualifications, NECs or billet?	5	
18.		Is all applicable information entered (e.g., MP assigned, MP signature, date completed) on the accountability log?	2	
19.		Are 13-week accountability logs retained for the current week and 13 previous weeks?	3	
20.		Is the responsible MP listed on the logs signing for completion of the maintenance action?	2	
21.		If multiple MPs are assigned, is the petty officer in charge or the most senior person the individual who signed for completion of the maintenance action?	2	
22.		Was the maintenance (e.g., currently scheduled, previously completed, situational requirements and unscheduled maintenance added) on the accountability log and entered into SKED?	10	
23.		Is a flip page entry made for items not completed and or rescheduled outside of the scheduled week?	2	
24.		Were deferred MRCs within periodicity placed into the Reschedule column and carried over into the next quarter?	5	
25.		Is a unique SOMS identifier, tag-out serial number or "N/A" entered in the tag-out block for checks marked as complete?	2	
26.		Is a standard means being used to identify mandatory related maintenance items with their parent periodic maintenance in the accountability logs to ensure that the MP completes all related maintenance items at the same time? (numeric or alpha numeric code will be used and uniform throughout the command)	5	
27.		EVV spot-check (from EVV spot check form).	6	
FBR File				
28.		Does the Work Center retain applicable feedback report accountability logs?	2	
29.	*	Does the Work Center retain copies of outstanding Work Center FBRs?	3	
Inactive Equipment Maintenance (IEM)				
30.		Is the start of IEM approved and signed by DH and correctly annotated?	2	
31.		Are all IEM requirements properly scheduled (e.g., LU, PM, SU, OT)?	5	
32.		Is the completion of the inactive period correctly annotated?	2	
Totals (Attributes evaluated as "N/A" are not calculated)		Total Points Available:	Total Points Awarded:	
SAT ☐		UNSAT ☐		
Inspector Name and Command (Print and Sign)				

* Electronic Versions Acceptable

Sat = 85 percent or better

SKED 3.1 SEER CHECKLIST GRADING ATTRIBUTES

1. **Attribute 1:** Does the Work Center PMS file contain:
2. **Attribute 1a:** A correction sheet that indicates all changes?
 - a. Are applicable changes to Work Center space manual (FR, ACN, Feedback, DIT) correctly annotated?
 - b. Are changes to Revision History Log in SKED documented on correction sheet correctly annotated?
 - c. If FR was not implemented on first Monday of the quarter, did the XO authorize late implementation with TYCOM approval?
3. **Attribute 1b (*):** Supplementary information (e.g., current and applicable 3M messages and notices, forecasting report)?
 - a. Are all applicable messages and bulletins that provide additional guidance, information or areas of focus that pertain to Maintenance Index Pages/Maintenance Requirement Card (MIP/MRCs) retained in the space manual?
4. **Attribute 1c:** Current List of Effective Pages (LOEP)? (Verify Force Revision number)
 - a. Does LOEP Force Revision number match the entry in the correction sheet?
 - b. Is the LOEP the most current one issued?
5. **Attribute 1d:** All MIPs current? (Verify MIP control numbers against the LOEP and against SKED.)
 - a. Do the MIP date codes on the LOEP for each MIP listed (including any that were authorized to be added) match the MIP date codes in SKED and the Space manual?
6. **Attribute 1e (*):** Current Service Brief?
 - a. Is the latest installed Force Revision PMS Service Brief contained in the Work Center space manual or available electronically?

NOTE: CHANGES THAT REFERENCE A FBR MUST BE FULLY APPROVED. THE INITIAL SUBMISSION OR TRANSMITTAL OF AN FBR IS NOT AN AUTHORIZATION.

7. **Attribute 2:** Are all pen and ink changes on the LOEP, MIPs and MRCs (except where allowed by scheduling aid) annotated with the reference for the change (Feedback Report (FBR) serial number, ACN, etc.) and properly noted by the correct authority and initialed by LCPO?
 - a. Are all additions or deletions on LOEP noted in SKED with the most applicable authorization for the change?

NOTE: APPLICABLE REFERENCES INCLUDE THE MOST APPLICABLE SCHEDULING AID AS LISTED ON MIP, FBR, AND ACN OR IN CASES OF SPLIT OR SHARED MIP, OTHER WORK CENTER CODE THAT IS CONDUCTING THE MAINTENANCE.

- b. Are all additions, deletions, and changes on each MIP noted with the reference for change?
- c. Are all additions, deletions, changes on LOEP or MIPs initialed by LCPO?

8. Attribute 3: On MIPs, are any applicable MRCs incorrectly lined out or not lined out? (Split MIP log will be verified against the LOEP and MIP). Was all maintenance scheduled correctly?

- a. Does Work Center meet TYCOM MIP standardization requirements? Are any MRCs listed on MIP lined out that are applicable to installed equipment configuration and within the cognizance of the Work Center to perform maintenance? (Split MIP log will be verified against the LOEP and MIP.)
- b. Are any MRCs listed on MIP that should be lined out that are not applicable to installed equipment configuration within the cognizance of the Work Center to perform maintenance?
- c. Are all maintenance requirements correctly associated with all applicable component rows?
- d. Do Space Manual line outs match SKED?

9. Attribute 4 (*): Does the Work Center retain an auditable record of personnel PMS qualifications and designation letters?

- a. Does the Work Center space manual have record of the following: Dept. 3M Assistant and WCS designation letters; 3M (301) Maintenance Person PMS, 3M 304 Division Officer Qualifications?

NOTE: RADM PQS QUALIFICATION FINDER REPORT, IF AVAILABLE, WILL BE USED. IF RADM IS NOT AVAILABLE, SIGNED PQS WATCH STATION COVER SHEET WILL BE USED.

- b. Work Center ER09 or Work Centers with DCPO related MIPs: DCPO designation by Executive Officer; Basic DC (301-306) PQS; Quality Assurance (301) Craftsman PQS; Damage Control (303) DCPO PQS; DCPO NKO course.

NOTE: RADM PQS QUALIFICATION FINDER REPORT, IF AVAILABLE, WILL BE USED. IF RADM IS NOT AVAILABLE, PQS WATCH STATION COVER SHEET WILL BE USED.

10. Attribute 5: Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current?

- a. Does Work Center MRC deck contain all MRCs that are not lined out on MIP? The minimum of all quarterly checks and below, all “R” checks and all MRCs with fill in the blanks or pen and ink changes.

NOTE: LOCATION BLOCKS OF “U” CHECKS PER CNSP OR CNSLINST 4790.1 ENCLOSURE 2.

- b. Does MRC location block contain one of the following entries, as appropriate? (one) Space Number; “See Location Guide List”, “See MCMS”, “See PCMS Key listing or

plan”, “Location guide list attached”, “See Equipment Guide List” or “Equipment guide list attached”.

- c. Is MRC SYSCOM correct, and match the SYSCOM number on the MIP?

11. Attribute 6: Are classified MRCs complete and current?

- a. Does information on classified MRC locator card match location of where classified MRC is kept?

12. Attribute 7: Are blanks requiring Ship’s Force data filled in prior to use?

- a. Are all Work Center MRCs with blank fields or tables within the MRC procedure block completed?

13. Attribute 8: Are EGLs entered in SKED for applicable equipment? If EGL is not utilized, mark “N/A”.

- a. Work Centers with EGLs: Does the number of EGLs entered in SKED 3.1 match the number of EGLs on the Cycle board for the associated system or equipment?
- b. Work Centers with EGLs: Does the equipment listed on each EGL match the equipment listed for associated EGL in SKED?
- c. Work Centers with LGLs: Does the equipment listed on each LGL match the equipment listed in SKED?

14. Attribute 9: Are EGLs or LGLs current and a paper copy attached to the parent MRC? (Verify MRC control number on the EGL or LGL against MRC.) If EGL or LGL is not utilized, mark “N/A”.

NOTE: EGL BINDER IS FOR WORK CENTERS WITH LARGE VOLUMES OF EGLS ASSOCIATED TO A SINGLE MRC.

- a. Work Centers with EGLs: Is EGL either attached to MRC or retained in an EGL binder?
- b. Work Centers with LGLs: Is LGL attached to MRC?
- c. Does MRC Library Control Number (LCN) match the LCN on the EGL or LGL?

15. Attribute 10.a (*): Are EGLs or LGLs properly filled out (e.g., equipment name, equipment location, equipment unique identifier)? If EGL or LGL is not utilized, mark N/A.

NOTE: LOCATION WILL BE A COMPARTMENT NUMBER AND NOT A GENERIC DESCRIPTION SUCH AS “04 WEATHER DECK.” QUANTITIES WILL NOT BE USED. SERIAL NUMBERS MUST MATCH EQUIPMENT MANUFACTURER’S NAME PLATE SERIAL NUMBER IF ASSIGNED.

- a. Work Centers with EGLs or LGLs: Does the EGL have equipment nomenclature, serial number or unique identifier and location block completed for each line item?

16. Attribute 10.b (*): Do EGLs or LGLs contain applicable information (e.g., equipment name, equipment location, equipment serial number or unique identifier) for equipment association? If EGL or LGL is not utilized, mark “N/A”.

17. Attribute 11: Are separate EGLs prepared for items that require more than eight hours worth of work? If EGL or LGL is not utilized, mark “N/A”.

NOTE: IF MRC HAS MANDATORY RELATED MAINTENANCE ASSOCIATED, THE MRC ELAPSED TIME FOR THE MANDATORY RELATED MRC MUST ALSO BE TAKEN INTO ACCOUNT.

- a. Does the total of (number of equipment listed on EGL times MRC Elapsed Time) hours exceed eight hours.

18. Attribute 12: Do the situational requirements listing reflect the most current force revision? (List is available on PMS CD under R-Check header). If there are no R checks, mark "N/A".

- a. Does the situational requirements list (R-check sheet) match the currently published Force Revision?

19. Attribute 13: Does the situational requirements listing reflect the current status of the Work Center MIPs? (Line outs and scheduling aid on MIP transferred to the situational requirements listing.) Are lineouts initialed by the LCPO? If there are no "R" checks, mark "N/A".

- a. Are all applicable situation requirements on MIPs listed on R-Check Report?
- b. Are all situational requirements lined out or added to the R-check sheet initialed by LCPO?

20. Attribute 14 (*): Does the R-check event manager reflect situational maintenance properly entered? If there are no R checks, mark "N/A".

NOTE: GLOBAL EVENTS ARE EVOLUTIONS THAT INVOLVE TWO OR MORE WORK CENTERS, SUCH AS: PRE-UNDERWAY, PRIOR TO DEPLOYMENT, UNREP. LOCAL EVENTS INVOLVE A SINGLE WORK CENTER, SUCH AS: CIWS PAC-FIRE. THESE EXAMPLES ARE NOT ALL INCLUSIVE.

- a. Does Event Manager reflect Global and Local events, as appropriate, to the work center?

21. Attribute 15 (*): Are ALL situational events being triggered in SKED? If there are no R checks in the last 13 week, mark "N/A".

- a. Are all required R Checks listed on the Accountability Logs and in SKED?

22. Attribute 16: Have accountability logs been reviewed by the WCS, LCPO and Division Officer?

- a. Does the 13 Week Accountability log annotate the review and initial of Division Officer and Work Center Supervisor at the beginning of the week?
- b. Does the 13 Week Accountability log annotate the review and signature of the WCS, LCPO and Division Officer at the end of each week?
- c. Does the 13 Week Accountability log annotate the date of review after the completion of all documented or conducted maintenance for each week?

23. Attribute 17: Was maintenance assigned only to qualified Maintenance Person (MP) for MRCs requiring unique qualifications or NECs?

NOTE: UTILIZE SCHOOL COMPLETION CERTIFICATES, RADM, FLTMPS OR EDVR FOR VERIFICATION.

- a. For MRCs that indicate or require unique qualifications, billets or NECs, such as: CHENG; Dept. Head; DIVO; SAR Swimmer; Safety Petty Officer (SPO), DCPO; gauge calibration or NECs does the name listed on the 13 Week Accountability log MP responsible block and signature block hold that qualification, billet or rank?

24. Attribute 18: Is all applicable information entered (e.g., MP assigned, MP signature, date completed) on accountability log?

- a. Is the MP that completed the assigned MRC annotated in the MP Responsible block?
- b. Does the date block annotate the day, month and year of the day the MP completed the maintenance?

25. Attribute 19: Are 13-week accountability logs retained for the current week and 13 previous weeks?

- a. Is the Work Center current weeks' 13-Week Accountability log posted in the workspace or readily available in a Work Center space?
- b. Does the Work Center retain the most current consecutive 13 weeks of Accountability logs?

26. Attribute 20: Is the responsible MP listed on the logs signing for completion of the maintenance action?

- a. Does the signature in the signature block match the person annotated in the MP Responsible block?
- b. Is the MP Responsible block filled in with the person's name that completed the maintenance?

27. Attribute 21: If multiple MPs are assigned, is the petty officer in charge or the most senior person who signed for completion of the maintenance action?

- a. Are all personnel involved with the maintenance listed?
- b. Is the MP that signed for completion of maintenance, the senior or most knowledgeable MP indicated by circling the name?

28. Attribute 22: Was the maintenance (e.g., currently scheduled, previously completed, situational requirements and unscheduled maintenance added) on the accountability log and entered into SKED?

- a. Do all entries in the Work Center's 13 Week Accountability logs match all entries for that week in SKED?

NOTE: FLIP PAGE ENTRY FORMAT DEFINED IN ENCLOSURE (2) CNSP OR CNSL 4790.1.

29. Attribute 23: Is a flip page entry made for items not completed and or rescheduled outside of the scheduled week?

- a. For all entries in Work Center's 13 Week Accountability logs that are not marked with an "X" as fully accomplished, are corresponding flip page entries annotated?

30. Attribute 24: Were deferred MRCs within periodicity placed into the reschedule column and carried over into the next quarter?

- a. Do all entries in SKED indicate deferred MRCs within periodicity were placed into the reschedule column and carried over into the next quarter? If no checks are rescheduled to the next quarter, mark as “N/A”.

31. Attribute 25: Is a unique SOMS identifier, tag-out serial number or “N/A” entered in the tag-out block for checks marked as complete?

- a. Do all entries on the Work Center’s 13 Weeks Accountability logs annotate eSOMS identifier (LIRS numbers), TOR’s serial number or “N/A”? “N/A” is not required for maintenance not completed.

32. Attribute 26: Is a standard means being used to identify mandatory related maintenance items with their parent periodic maintenance in the accountability logs to ensure that the MP completes all related maintenance items at the same time?

- a. Is a unique identifier (Numeric or Alpha-Numeric: 1, 2, 3 or A1, A2, A3) used to annotate all mandatory related maintenance to its parent check?

33. Attribute 27: EVV spot check (from EVV spot check form).

- a. The score will automatically populate from EVV spot check spreadsheet tab.

34. Attribute 28: Does the Work Center retain applicable feedback report accountability logs?

- a. If Command utilizes SKED FBR Manager to manage FBRs, this attribute will be annotated as “N/A”.
- b. Does the Work Center retain feedback report accountability logs?

35. Attribute 29 (*): Does the Work Center retain copies of outstanding Work Center FBRs?

- a. Does the WC retain copies of FBR responses requiring changes to PMS documents until reflected in the Force Revision (FR)?
- b. If no outstanding FBR, mark as “N/A”.

NOTE: IEM STATUS IS DEFINED PER CNSP OR CNSLINST 4790.1 ENCLOSURE (2).

36. Attribute 30: Is the start of IEM approved and signed by Department Head and correctly annotated?

- a. Does the Work Center Quarterly board annotate the proper IEM status?
- b. If Work Center has system or equipment in IEM status II, are JSN or Work Documentation and Outside Activity Repair Work Center annotated?
- c. Does the Department Head authorize IEM status (I or II)?
- d. Does the Work Center maintain a list of all equipment in IEM within the last 13 weeks?
- e. If there is no equipment in IEM in the last 13 weeks, mark as “N/A”.

37. Attribute 31: Are all IEM requirements properly scheduled (e.g., LU, PM, SU, OT)?

- a. Does the Work Center Quarterly board annotate the proper scheduling of all applicable IEM maintenance?
- b. If there is no equipment in IEM in the last 13 weeks, mark as “N/A”.

38. Attribute 32: Is the completion of the inactive period correctly annotated?

- a. Does the Work Center Quarterly board annotate the completion of the IEM period?
- b. If there is no equipment in IEM in the last 13 weeks, mark as “N/A”.
- c. Did the WCS reschedule all maintenance within periodicity once out of IEM?

APPENDIX A3 SECTION I-A2
SCHEDULING AND EXECUTION EFFECTIVENESS REVIEW (SEER)
SKED 3.2

Command		Department	Division	Work Center	Date	
General Attributes					Value	Points
1.	Does the Work Center PMS file contain:					
	a.*	Current Service Brief?			1	
	b.*	Current or applicable 3-M messages and notices?			2	
2.		Do MIPs and MRCs accurately reflect equipment configuration; are non-applicable MRCs correctly lined out and are applicable MRCs active? (May be MIP standardization violations)			10	
3.	*	Does the Work Center retain an auditable record of personnel PMS qualifications and designation letters?			5	
Maintenance Requirement Card (MRC) Deck						
4.	*	Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current? (Per TYCOM direction)			2	
5.		Are classified MRCs complete and current?			3	
6.		Are blanks requiring Ship's Force data filled in prior to use?			3	
Chain of Command SKED Administration						
7.		Are all administrative changes approved at the appropriate level?				
	a.	FR approved by DEPT Head. (Verify using journal tab.)			2	
	b.	Weekly Closeouts performed by COB on the first workday of the week at the appropriate level?			2	
	c.	All lineouts and MRC customization approved at the appropriate level.			2	
	d.	Check notes reviewed and alerts approved by the Department Head?			2	
Location Guide Lists (LGL)						
8.	a.*	Do LGLs contain required information (e.g., equipment name, equipment location, equipment serial number or unique identifier)?			3	
	b.*	Are Maintenance Items in SKED associated to the existing equipment configuration?			3	
Situational Requirements						
9.	*	Are all situational (states, triggers, metered) events being scheduled and executed in SKED?			8	
PMS Execution and Accountability						
10.		Are 13-Week accountability logs retained for the current week and previous 13 weeks? (Only applicable when SKED is down)			3	
11.		Are check note entries accurate, valid and complete?			3	
12.		Was maintenance assigned only to qualified maintenance personnel?			4	
13.		Was maintenance reflected on the accountability logs (e.g. currently scheduled, previously completed, situational requirements and unscheduled maintenance added) entered into SKED? (Only applicable when SKED is down)			10	
14.		Are related maintenance items clearly paired with their parent Maintenance Requirements (MRs) on accountability logs to ensure that the maintenance person completes all related maintenance at the same time (Only applicable when SKED is down)			5	
15.		Is a unique ESOMS identifier or tag-out serial number recorded in “check notes” for maintenance actions marked as complete that required Tag-outs?			2	

16.		Have the minimum number of spot checks and monitored checks been accomplished?	3	
FBR File				
17.		Are Feedback Reports being tracked in SKED, "Action Taken" block update by WCS?	3	
Inactive Equipment Maintenance (IEM)				
18.		Is the start of an inactive period correctly annotated and approved by Department Head?	2	
19.		Are IEM requirements properly scheduled?	5	
20.		Is the completion of the inactive period correctly annotated?	2	
Work Center Management				
21.		EVV spot checks (from EVV spot check form).	4	
Totals (Attributes evaluated as "N/A" are not calculated)		Total Points Available:	Total Points Awarded _____	
SAT ☐		UNSAT ☐		
Inspector Name and Command (Print and Sign)				

* Electronic Versions Acceptable

Sat = 85 percent or better

SKED 3.2 SEER CHECKLIST GRADING ATTRIBUTES

- 1. Attribute 1:** Does the Work Center PMS file contain:
- 2. Attribute 1a (*):** Current Service Brief?
 - a. Is the latest Force Revision PMS Service Brief available?
- 3. Attribute 1b (*):** Current and applicable 3-M messages and notices?
 - a. Are all applicable messages and bulletins that provide additional guidance, information or areas of focus that pertain to MIP or MRCs available?
- 4. Attribute 2:** Do MIPs and MRCs accurately reflect equipment configuration; are non-applicable MRCs correctly lined out and are applicable MRCs active? (May be MIP standardization violations.)
 - a. Does Work Center meet TYCOM MIP standardization requirements? Are any MRCs listed on MIP lined out that are applicable to installed equipment configuration and within the cognizance of the Work Center to perform maintenance? (Split MIP log will be verified against the LOEP and MIP)
 - b. Are all applicable MRCs active on all applicable maintenance items?
 - c. Are any MRCs listed on MIP that should be lined out that are not applicable to installed equipment configuration within the cognizance of the Work Center to perform maintenance?
 - d. Are line out justifications on MIPs accurate?
- 5. Attribute 3 (*):** Does the Work Center retain an auditable record of personnel PQS qualifications and designation letters?
 - a. Does the Work Center have record of the following: Dept. 3M Assistant and WCS designation letters; 3M (301) Maintenance Person PQS, 3M (303) WCS PQS, and 3M (304) Division Officer PQS? NOTE: RADM PQS Qualification Finder Report, if available, will be used. If RADM is not available, PQS watch station cover sheet will be used.
 - b. Work Center ER09 or Work Centers with DCPO related MIPs. Requirements include: DCPO designation by Executive Officer; Basic DC (301-306) PQS; Quality Assurance (301) Craftsman PQS; Damage Control (303) DCPO PQS; DCPO NKO or CD Step-course. NOTE: RADM PQS Qualification Finder Report, if available, will be used. If RADM is not available, signed PQS watch station cover sheet will be used.
- 6. Attribute 4:** Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current? (Per TYCOM direction)
 - a. Does Work Center MRC deck contain all MRCs that are not lined out on MIP? The minimum of all quarterly checks and below, all R checks and all MRCs with fill in the blanks or pen and ink changes. Verified SYSCOM MRC control number against MIPs per the 3-M Manual or TYCOM Guidance?

NOTE: LOCATION BLOCKS OF U CHECKS PER CNSP OR CNSLINST 4790.1 ENCLOSURE (2).

- b. Does MRC location block contain one of the following entries, as appropriate? (one) Space Number; “See Location Guide List”, “See MCMS”, “See PCMS Key listing or plan”, “Location guide list attached”.
 - c. Is MRC SYSCOM correct, and match the SYSCOM number on the MIP?
- 7. Attribute 5:** Are classified MRCs complete and current?
- a. Does information on classified MRC locator card match location of where classified MRC is kept?
- 8. Attribute 6:** Are blanks requiring Ship’s Force data filled in prior to use?
- a. Are all Work Center MRCs with blank fields or tables within the MRC Procedure block completed?
- 9. Attribute 7:** Are all administrative changes approved at the appropriate level?
- 10. Attribute 7a:** FR approved by DEPT Head. (Verify using Journal tab.)
- a. Has the final approval of revisions (FR, ACNs, FBR, DITs and Admin change) been completed by Dept. Head?
- 11. Attribute 7b:** Weekly Closeouts performed by COB on the first workday of the week at the appropriate level?
- a. Is the weekly closeout completed on the first workday of the week?
 - b. Is the weekly closeout completed by Division Officer?
- 12. Attribute 7c:** All lineouts and MRC customization approved at the appropriate level?
- a. Are all lineouts approved and initialed by LCPO?
- 13. Attribute 7d:** Check notes reviewed and alerts approved by the Department Head?
- a. Are check notes and alert details approved by Dept. Head?
- 14. Attribute 8a (*):** Do LGLs contain required information (e.g., equipment name, equipment location, equipment serial number or unique identifier)?
- a. Work Centers with LGLs: Does the LGL have equipment nomenclature, serial number, unique identifier and location (Space Tac number or compartment number) block completed for each line item?
 - b. If equipment manufacture serial number is available, it must be used.
- 15. Attribute 8b (*):** Are Maintenance Items in SKED associated to the existing equipment configuration?
- a. Are maintenance items in SKED correctly associated with equipment configuration?
- 16. Attribute 9 (*):** Are all situational (states, triggers, metered) events being scheduled and executed in SKED?
- a. Are all local triggers and states executed as required?
 - b. Are all required R Checks listed on the Accountability Logs or scheduled in SKED?
 - c. Are metered readings entered and tracked in SKED (if applicable)?

17. Attribute 10: Are 13-Week accountability logs retained for the current week and previous 13 weeks? (Only applicable when SKED is down).

- a. Is the Work Center current weeks' 13 Week Accountability log posted in the workspace or readily available in a Work Center space?
- b. Does the Work Center retain the most current consecutive 13 weeks of Accountability logs?

NOTE: FORMAT FOR STANDARD CHECK NOTE ENTRIES IS DEFINED IN CNSP OR CNSLINST 4790.1 ENCLOSURE (2).

18. Attribute 11: Are check note entries accurate, valid and complete?

- a. For all entries on Work Center schedule that are not accomplished, is there a corresponding check note entry?
- b. Does check note entry begin with either: rescheduled; out of periodicity; or non-accomplished; not applicable (N/A) for situational checks; and with the date the check re-scheduled, the reason why the MR was rescheduled or the reason check was not applicable.
- c. Cent sign entries will begin with "Performed by" followed by detailed information of the organization completing the maintenance, JSN, work order or applicable documentation. Proof of completion will be maintained in the Work Center PMS manual.

19. Attribute 12: Was maintenance assigned only to qualified maintenance personnel?

NOTE: UTILIZE SCHOOL COMPLETION CERTIFICATES, RADM, OR FLTTPS FOR VERIFICATION.

- a. For MRCs that indicate or require unique qualifications, such as: SAR Swimmer; Safety Petty Officer (SPO), DCPO; gauge calibration or NECs, does the assigned personnel hold that qualification, billet or rank?

20. Attribute 13: Was maintenance reflected on the accountability logs (e.g. currently scheduled, previously completed, situational requirements and unscheduled maintenance added) entered into SKED? (Only applicable when SKED is down.)

- a. Do all entries on the 13 Week Accountability Logs match all entries in SKED? (Only applicable when SKED is down.)

21. Attribute 14: Are related maintenance items clearly paired with their parent Maintenance Requirements (MRs) on accountability logs to ensure that the maintenance person completes all related maintenance at the same time. (Only applicable when SKED is down.)

- a. Is a unique identifier (Numeric or Alpha-Numeric: 1, 2, 3 or A1, A2, A3) used to annotate all mandatory related maintenance to its parent check?

22. Attribute 15: Is a unique eSOMS identifier or tag-out serial number or "N/A" recorded in "check notes" for maintenance actions that have tag-out indicated in SKED.

- a. Do all entries on the Work Center's 13 Weeks Accountability logs annotate eSOMS identifier (LIRS numbers), TORS serial number or "N/A"? "N/A" is not required for maintenance not completed.

23. Attribute 16:

- a. Have the minimum number of spot checks and monitored checks been accomplished?
- b. Are all required spot checks completed per CNSP **or** CNSLINST 4790.1 (Enclosure 2).

24. Attribute 17: Are Feedback Reports being tracked in SKED, “Action Taken” block update by WCS?

- a. Does the WC retain copies of FBR responses requiring changes to PMS documents until reflected in the Force Revision (FR).
- b. Are FBRs being tracked in SKED?
- c. Are FBR responses entered in SKED when received and action taken updated within seven days?
- d. If no outstanding FBR, mark as “N/A”.

25. Attribute 18: Is the start of an inactive period correctly annotated and approved by Department Head?

- a. Does Work Center IEM tab annotate the proper IEM status?
- b. If Work Center has system or equipment in IEM status II, is a JSN, Work Documentation, Department Head authorization and outside activity or repair Work Center annotated?
- c. Did the WC obtain Department Head written authorization prior to placing equipment in IEM?
- d. If there is no equipment in IEM in the last 13 weeks, mark as “N/A”.

26. Attribute 19: Are all IEM requirements properly scheduled?

- a. Does the Work Center schedule and annotate the proper scheduling of all applicable IEM maintenance (i.e., LU and PM)?
- b. If there is no equipment in IEM in the last 13 weeks, mark as “N/A”.

27. Attribute 20: Is the completion of the inactive period correctly annotated?

- a. Does the Work Center schedule annotate the proper scheduling when removing equipment from IEM (i.e., SU and OT)?
- b. If there was no equipment removed from IEM in the last 13 weeks, mark as “N/A”.

28. Attribute 21: EVV spot checks (from EVV spot check form)

- a. The score will automatically populate from EVV spot check spreadsheet tab.

SEER REMARKS

[illegible]

APPENDIX A3 SECTION I-B

COMMAND LEVEL EFFECTIVENESS REVIEW (CLER)

Using the attributes and grading criteria described [here](#), determine the Command Level Effectiveness Review (CLER) for the ship. Provide amplifying information for deficiencies causing point reduction on the remarks page.

Command:			Date:	
General Attributes			Value	Points
1.	Does the 3MC maintain:			
	a.	A Change Accountability Log?	2	
	b.*	A log tracking the assignment of MRCs from split MIPs to ensure all applicable MRCs are assigned?	3	
	c.	A Master Classified MRC File?	2	
	d.*	A current PMS (and where applicable TFR) DVD or downloaded file?	3	
2.	*	Does the Command have a reliable system for backing up MDS and PMS data?	5	
3.	*	Does the 3-M Coordinator have an effective system in place to track, route and explain externally provided PMS changes?	3	
4.		Is there an effective system in use (Spot Check Program) whereby supervisory personnel periodically and routinely monitor PMS performance?	8	
5.		Have all FBRs entered in SKED been properly reviewed by the chain of command and submitted off hull within seven (7) days?	3	
6.		Have CSMP reconciliations been conducted per JFMM and TYCOM instructions?	3	
7.	*	Does the ship or activity conduct internal audits (Quarterly Self-Assessments)? (Retain latest copies of deficiencies, corrections and abatement for one year and forward copies to the ISIC on a quarterly basis.)	15	
8.	*	Does the 3MC provide weekly status reports to the 3-M Manager per specific TYCOM directive?	3	
9.	*	Does the 3MC have an approved master copy of 3-M PQS specifically tailored for the command?	3	
10.	*	Does the 3MC maintain an auditable record of PMS PQS for the command (e.g., copy of service record entries, signed copy of PQS cover letter, officer verified divisional training record, RADM)?	3	
11.		Does the 3MC maintain the status of command FBRs, responses and follow up actions taken in SKED?	3	
12.		Is the 3MC triggering GLOBAL events and STATES across the unit? Does the 3MC have an updated Major Events Listing?	10	
13.		Does the ship or activity conduct 3-M program training per directives?	8	
14.		Is the 3-M Functional Area Supervisor (FAS) ensuring all 3-M databases are being routinely maintained? (Use the RAF computation sheet)	8	
15.		Equipment Verification validation Program		
	a.	Program Management. Does the 3MC ensure validations are conducted per TYCOM directives?	10	
16.		ER09 score (Insert ER09 Work Center score).	25	
Totals (Attributes evaluated as "N/A" are not calculated)				
Total Points Available			120	Total Points Awarded
Reduced by 50% when Work Center, Division or Department structure not per JFMM. 50% reduction ☐				
SAT ☐ (SAT = 96 points or better)			UNSAT ☐	
Inspector Name and Command (Print and Sign)				

* Electronic Version Acceptable

Sat = 85 percent or better

CLER CHECKLIST GRADING ATTRIBUTES

- 1. Attribute 1:** Does the 3-M Coordinator maintain:
- 2. Attribute 1a:** Change Accountability Log (including TFBR Accountability Log in SKED)?
 - a. Is the Accountability Log and TFBR record in SKED updated?
- 3. Attribute 1b:** A log tracking the assignment of MRCs from split MIPs to ensure all applicable MRCs are assigned?
 - a. Is a log available and approved by the XO to track the assignment of MRC from split MIPs?
- 4. Attribute 1c:** A Master Classified MRC File?
 - a. Does 3MC maintain a Master Confidential PMS card file?
 - b. Ships that do not have classified MRCs mark as "N/A".
- 5. Attribute 1d (*):** A current PMS (and where applicable TFR) DVD or downloaded file?
 - a. Is the latest PMS FR and TFR loaded and finalized on the first Monday of the quarter or on the later date as authorized by TYCOM?
 - b. Is the latest version of SKED implemented?
- 6. Attribute 2 (*):** Does the Command have a reliable system for backing up MDS and PMS data?
 - a. Are back-ups and daily systems checks conducted?
 - b. Are external back-ups available?
 - c. Is NIAPS replicating as required?
- 7. Attribute 3 (*):** Does the 3-M Coordinator have an effective system in place to track, route and explain externally provided PMS changes?
 - a. Does 3MC route, maintain and track externally provided PMS changes?
- 8. Attribute 4:** Is there an effective system in use (Spot Check Program) whereby supervisory personnel periodically and routinely monitor PMS performance?
 - a. Does the 3MC maintain a Spot Check Matrix for the current week and the past 13 weeks?
 - b. Is the SKED PIN permissions updated with the latest TYCOM guidance?
- 9. Attribute 5:** Have all FBRs entered in SKED been properly reviewed by the chain of command and submitted off hull within seven (7) days?
 - a. Are all FBRs entered in SKED?
 - b. Are all FBRs reviewed and processed off ship (RADWEB) within seven days?
- 10. Attribute 6:** Does the 3MC maintain the status of command FBRs, responses and follow up actions taken in SKED?
 - a. Are the FBR response actions noted in SKED Feedback Report Manager?

- b. Does ship generated FBR response status in SKED and follow up action tracked?
- c. Is the latest PMS 22 available? (Reports issued monthly.)

11. Attribute 7 (*): Does the ship or activity conduct internal audits (Quarterly Self-Assessments) and retain for a one year period the copies of deficiencies, corrections and abatement and forward copies to the ISIC on a quarterly basis?

- a. Does the Unit conduct quarterly internal audits or self- assessments of all Work Center PMS?
- b. Are quarterly self-assessments retained for one year?
- c. Are complete quarterly self-assessment deficiencies and POAM submitted to ISIC?

12. Attribute 8 (*): Does the 3MC provide weekly status reports to the 3-M Manager per specific TYCOM directive?

- a. Does 3MC provide weekly status report to 3M Manager as per CNSP **or** CNSLINST 4790.1 enclosure 8?
- b. Does 3MC retain the last 13 weeks of weekly reports?
- c. Does 3MC retain the cover pages of one year's weekly report signed by the chain of command?

13. Attribute 9: Does the 3MC have an approved master copy of 3-M PQS specifically tailored for the command?

- a. Does 3MC have a master copy of 3-M PQS specifically tailored for the command that is approved by the Commanding Officer?
- b. Is the command using the latest version of 3-M PQS?

14. Attribute 10 (*): Does the 3MC maintain an auditable record of PMS PQS for the command (e.g., copy of service record entries, signed copy of PQS cover letter, officer verified divisional training record, RADM)? Does the 3MC maintain an auditable record of 3-M PQS for the command (e.g., copy of service record entries, signed copy of PQS cover letter, officer verified divisional training record, RADM)?

- a. 3MC will maintain a list of all assigned 3M positions and PQS qualifications.
- b. Are all personnel qualified for their assigned 3-M positions?

15. Attribute 11: Have CSMP reconciliations been conducted per JFMM and TYCOM instructions?

- a. Does the SMMO conduct monthly ship to shore CSMP reconciliations?

16. Attribute 12: Is the 3MC triggering GLOBAL events and STATES? Does the 3MC have an updated Major Events Listing?

- a. Does 3MC trigger Global events and update states in SKED?
- b. Does 3MC maintain an ongoing Major Events Listing?

17. Attribute 13: Does the ship or activity conduct 3-M program training per directives?

- a. Is 3-M training included in PB4T (Planning Board for Training).
- b. Is 3-M training scheduled and published in the POW or POD?

18. Attribute 14: Is the 3-M Functional Area Supervisor (FAS) ensuring all 3-M databases are being routinely maintained? (Use the RAF computation sheet.)

- a. Insert RAF score.

19. Attribute 15: Equipment Validation Program.

20. Attribute 15a: Program Management. Does the 3MC ensure validations are conducted per TYCOM directive?

- a. Does 3MC ensure all required validations are completed?

21. Attribute 16: ER09 Score (Insert ER09 Score)

NOTE: ZERO POINTS WILL BE AWARDED IF SCORE IS BELOW 80 PERCENT.

- a. Insert ER09 Work Center score.

NOTE: COMMAND LEVEL EXECUTIVE EFFECTIVENESS REVIEW (CLER) WILL BE REDUCED BY 50% WHEN WORK CENTER, DIVISION OR DEPARTMENT STRUCTURE IS NOT PER JFMM DEPARTMENTAL WORK CENTER STRUCTURE.

APPENDIX A3 SECTION I-B1

CLER REMARKS

Provide the attribute number and amplifying information describing the deficiency that has caused a deduction of points.

[illegible]

APPENDIX A3 SECTION I-C
EQUIPMENT VALIDATION VERIFICATION (EVV)
CHECKSHEET

Dept or WC	Validated By	CDM RIN #	Validation Date	Assessed By	Date
Note: If items marked with an * are determined to be unsatisfactory, all subsequent attributes will be graded as "0". If validating an AEL (only applicable for safety of ship items), Maintenance Person must verify the quantity of equipment listed on the AEL is on-hand. A copy of the AEL, with inventory, must be attached to the Validation Aid that is turned into 3MC.					
				VALUE	GRADE
1. SIGHT VALIDATION AND VERIFICATION AID					
*	a.	Did the Maintenance Person conduct a sight validation of the equipment?		20	
*	b.	Did the Maintenance Person sign the validation aid?		3	
*	c.	Does the APL header data match the installed equipment?		5	
*	d.	Is the location block correct?		5	
	e.	Does the functional description match the installed equipment?		3	
*	f.	Was the serial number or positional reference ID verified?		10	
	g.	Is the validation aid dated?		3	
	h.	Is the correct Work Center assigned as a primary?		3	
*	i.	If incorrect Work Center is assigned, did the WCS of the correct Work Center sign the validation aid?		3	
*	j.	Is there a note stating the equipment is covered by PMS? (1) If yes, annotate "Verified in SKED" and list MIP Number and applicable MRCs. (2) If no, submit FBR and annotate, "FBR submitted requesting PMS". (3) If the ISEA determines that PMS is not applicable, then annotate, "No PMS Required".		10	
*	k.	Did the Maintenance Person annotate discrepancies on validation aid?		5	
2. MDS VERIFICATION					
	a.	Does the equipment have the correct serial number or positional reference ID?		10	
	b.	Does the equipment have the correct location?		10	
	c.	Does the Validation Source have Ship selected?		3	
	d.	Was proper validation action selected? Does the reason not validated (if required) match the validation action?		3	
	e.	Does the equipment validation date match the date on the validation aid?		3	
	f.	Is the correct primary Work Center selected as noted on Validation Aid?		3	
Totals (attributes evaluated as "N/A" are not calculated) Total Points (TP)				TP Available	TP Awarded
EVV Check Grade = (Points Awarded divided by Points Available) SAT = 85% or better				_____ %	
☐ Satisfactory ☐ Unsatisfactory					

Both the EVV Spot Check form and minimum validations per Work Center completed must be SAT for an overall grade of PASS. If the Work Center completed the validation required to all equipment assigned in OMMS-NG in the last 3 years, this requirement will be scored as “N/A”.

EQUIPMENT VALIDATION VERIFICATION (EVV)**GRADING ATTRIBUTES**

NOTE: IF ITEMS MARKED WITH AN (*) ARE DETERMINED TO BE UNSATISFACTORY, ALL SUBSEQUENT ATTRIBUTES WILL BE GRADED AS “0”.

- 1. Attribute 1:** Sight Validation and Verification Aid
- 2. Attribute 1.a (*):** Did the MP conduct a sight validation of the equipment?
 - a. MP locate the equipment using the validation aid, sight verify or sight validate the installed equipment.
- 3. Attribute 1.b (*):** Did the MP sign the validation aid?
 - a. Personnel who conducted the equipment validation print name and sign at the bottom of the validation aid. Completed validation aid will be turned in to WCS.
- 4. Attribute 1.c (*):** Does the APL header data match the installed equipment?
 - a. Compare the validation aid APL header data to the equipment. Annotate discrepancies on the validation aid with the correct information.
- 5. Attribute 1.d (*):** Is the location block correct?
 - a. Location of the equipment matches the location block of the validation aid.
- 6. Attribute 1.e:** Does the functional description match the installed equipment?
 - a. Verify the functional description on the validation aid describes the function performed by the equipment or component within the system. (Make no changes)
- 7. Attribute 1.f (*):** Was the serial number or positional reference ID verified?
 - a. If item has a manufacturer's label plate, is the manufacturer's serial number correct?
 - b. If no manufacturer label plate, is a Positional Reference ID (PRID) assigned? Verify PRID is assigned using applicable technical reference, i.e. Operating Sequencing System (OSS), Engineering Operating Sequencing System (EOSS), Combat System Operational Sequencing System (CSOSS), Aviation Fuels Operational Sequencing System (AFOSS) or Sea Operations (SEAOPS). For electrical item, use Ship's Information Book.
 - c. If a manufacturing serial number and PRID is not reflected in any technical reference, the Work Center will assign a local serial number using the following format: Work Center - four-digit number, i.e., CG04-0001. Like items should be numbered sequentially.
 - d. Serial Number and PRID fields for equipment records with a quantity of more than one will be left blank.
- 8. Attribute 1.g:** Is the validation aid dated?
 - a. Personnel who conducted the equipment validation annotated at the bottom of the validation aid the date.
- 9. Attribute 1.h:** Is the correct Work Center assigned as primary?

- a. Verify that the correct primary Work Center is listed on the validation aid for the equipment.

10. Attribute 1.i (*): If incorrect Work Center is assigned, did the WCS of the correct Work Center sign aid?

- a. The correct primary WCS will sign the validation aid if the wrong Work Center is listed on the validation aid.

11. Attribute 1.j (*): Is there a note stating the equipment is covered by PMS?

- a. If the equipment is present, ensure the equipment is linked to the associated PMS checks in the SKED system. This verification will be annotated at the bottom of the validation sheet to include MIP, MRC, Feedback number (if applicable), and date of validation, and print name with signature of the WCS. If PMS is missing, a PMS FBR will be submitted using the SKED system to request for PMS coverage. If the ISEA determines that PMS is not applicable, then annotate, “No PMS Required”.

12. Attribute 1.k (*): Did the Maintenance Person annotate discrepancies on validation aid?

- a. Verify all known discrepancies and corrections were entered in the validation aid.

13. Attributes 2: MDS Verification

14. Attribute 2.a: Does the equipment have the correct serial number or positional reference ID?

- a. OMMS NG: Is the correct serial number or Positional Reference ID (PRID) listed on the validation aid reflected in OMMS NG? If a PRID is used, ensure the PRID Type field correctly describes the PRID, i.e. Electrical (elect or elex) symbol no, valve mark, gage mark, launcher number, mount number, etc. Enter appropriate information in the PRID field, i.e., No.1 Fire Pump, Mount 52, SW-V-062).
- b. AWN: Is the correct serial number or Positional Reference ID (PRID) listed on the validation aid reflected on the electronic validation aid? If a PRID is used, ensure the PRID Type is annotated in the remarks.

15. Attribute 2.b: Does the equipment have the correct location?

- a. OMMS-NG: Is the correct location of the equipment listed on the validation aid and is reflected in OMMS NG.
- b. AWN: Is the correct location of the equipment listed on the validation aid, and reflected on the electronic validation aid?

16. Attribute 2.c: Does the validation source have ship selected?

- a. OMMS-NG: Does the configuration item record have “ship” selected in the validation source field?
- b. AWN: On the electronic validation aid, is the first character of the VS or AC “J”?

17. Attribute 2.d: Was proper validation action selected? And does the reason not validated (if required) match the validation action?

- a. OMMS-NG: If APL was verified (compare component characteristics on VALAID to nameplate data, Part Number, etc.), verify “site verification with RIC verification” was selected in validation action field on the configuration item record. If APL could not be verified, “site verification without RIC verification” should be selected, and “reason not validated” field should have either “insufficient nameplate data”, “inaccessible” or “lagged” selected as appropriate.
- b. AWN: On the electronic validation aid, is the second character of the VS or AC “S”? If the APL could not be verified, is there an entry in the remarks field stating so and providing the reason not validated (see **previous** acceptable entries)?

18. Attribute 2.e: Does the equipment validation date match the date on the validation aid?

- a. OMMS NG: On the configuration item record, does the equipment validation date match the date on the validation aid? (If record was last updated by a user, the date should match. If the record was last updated by an ASI, the date will be the last day of the month in which the validation was performed.)
- b. AWN: Functions tab - equipment validation - past results, locate the item being checked and verify that the “saved date” matches the date the validation aid was signed and dated.

19. Attribute 2.f: Is the correct primary Work Center selected as noted on Validation Aid?

- a. OMMS-NG: The correct primary Work Center selected in OMMS NG as noted on Validation Aid.
- b. AWN: If the Work Center on the electronic validation aid was incorrect, is the correct Work Center listed in the ‘suggested value’ column?

NOTE: ALLOWANCE EQUIPAGE LISTS (AELS) THAT SUPPORT THE “SAFETY OF THE SHIP AND THE CREW” (I.E., LIFE RAFTS, LIFE PRESERVERS, DAMAGE CONTROL ITEMS) WILL BE VALIDATED, ENSURING THE REQUIRED QUANTITIES ARE ONBOARD. A COPY OF THE AEL MUST BE ATTACHED TO THE VALIDATION AID THAT IS TURNED IN TO 3MC. A GRADE SCORE OF 85 PERCENT OR BETTER TO PASS.

Verify that the unit has a master listing that is up-to-date including all required validation spot checks. When the master listing is validated, up-to-date and the unit has a historical file of validation spot checks, select two completed equipment validations per Work Center.

Verify validation forms to the ship’s equipment record and to the installed equipment, verifying the data collected is accurate and complete and that the MDS record has been updated using the EVV Spot Check form.

Both the Equipment Validation Verification (EVV) spot check and minimum validation per Work Center completed must be SAT for an overall grade of PASS. If the Work Center completed the validation required to all equipment assigned in OMMS-NG in the last three years, this requirement will be scored as “N/A”.

APPENDIX A3
3-M SYSTEM INSPECTION PROCEDURES
SECTION II
SPOT CHECK ACCOMPLISHMENT RATING

APPENDIX A3 SECTION II-A1**SPOT CHECK ACCOMPLISHMENT RATING (SCAR)**

1. Using the basic definitions and guidelines described, determine the PMS Spot Check Accomplishment Rating (SCAR) for each Work Center. Enter the values determined on the SCAR Check Sheet, Section II-A of this Appendix.
 - a. The number of Spot Checks has been established at:
 - (1) Periodic=1%
 - (2) Situational= 0.5%for all completed maintenance (including Daily, Weekly and Bi-weekly) from the last 13 weeks. Every Work Center will receive at least one documented periodic and one situational spot check. The maximum spot checks accomplished during the inspection will be five total spot checks per Work Center. If a Work Center did not perform any maintenance in the last 13 weeks, the SCAR portion will be "N/A".
 - b. Complete an MRC Evaluation and SCAR Check Sheet, Section II-A of this Appendix, for each MRC selected. Based on the results, evaluate the overall effectiveness of the accomplishment of each MR selected. Enter a numeric evaluation of each assessment attribute and provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.
2. The SCAR Check Sheet is a series of inspection attributes to determine the accomplishment status of an MRC that has previously been reported as accomplished. Although, the sheet may be used as a reference for conducting a real time monitored MRC for the purposes of conducting a 3M Inspection, to determine SCAR, all spot checks will be conducted on accomplished (historic) MRCs.
3. Due to the nature of MRC completion, supporting programs such as Tag-Outs and Hazardous Material (HAZMAT) are encountered. Care should be taken to avoid expanding the SCAR to a review of the processes of those programs thereby preventing the assessor from determining the accomplishment status of the MRC under review.
4. The following is expanded guidance for completion of the assessment attributes of the SCAR Check Sheet. Best practices or other policies not supported by source documentation must not be included in evaluating compliance:
 - a. (block 1.a) Determine if the maintenance person is qualified to perform the maintenance task. PQS 301 is required for all MRCs but attention should also be paid to other qualifications required such as Quality Maintenance (see Volume 5, Part I, Chapter 3, paragraph 3.4 of this manual) or graduation from a required school such as gage calibration technician. PQS entry in service record or Relational Administration Data Management (RADM).
 - b. (block 1.b) Determine if the correct Tools, Parts, Material and Test Equipment (TPMTE) were used during the performance of the MRC. If the maintenance person did not have the required TPMTE, it is unlikely that they would have been able to complete all the procedural steps of the MRC as required. If an item of TPMTE was required to perform

a conditional step and that step was not required to be accomplished, it is not considered deficient. If the required test equipment required calibration, ensure that the calibration is within date and the equipment is of sufficient scale to accomplish the MRC. Verification can be performed at the equipment, through test equipment, special equipment check out records or Work Center accountability logs.

- c. (block 1.c) Determine if the maintenance person maintained the correct equipment.
- d. (block 1.d) Examine the MRC to determine that any locally applied changes are authorized by procedural notes, external correspondence or allowed by reference (a).
- e. (block 1.e) Determine applicability of the MRC to the component that the maintenance person signed for completion.

NOTE: IF A PROCEDURAL STEP WAS NOT COMPLETED, THE MRC SHOULD NOT HAVE BEEN REPORTED AS COMPLETE AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- f. (block 2.a) From a variety of potential techniques, determine if the maintenance person performed all the required steps of the MRC. This may be accomplished via re-enactment, a discussion regarding the steps or re-performance. The inspector should come away with a clear impression that all the steps of the MRC were either fully accomplished or not.

NOTE: IF A REQUIRED TAG-OUT WAS NOT CONDUCTED IN SUPPORT OF ACCOMPLISHING THE MRC, THE MRC SHOULD NOT HAVE BEEN CONDUCTED AND REPRESENTS A SERIOUS SAFETY VIOLATION. THEREFORE, THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- g. (block 2.b) If required by the MRC, verify that a tag-out was hung on the day the maintenance was performed. Ensure the isolation boundaries were appropriately identified and correctly positioned to ensure complete isolation of the maintained equipment. Were the TORS or LIR numbers documented on the accountability log or in the check note? If TORS or LIRS are not provided attribute 2.b and subsequent blocks will be graded as zero. If no Tag-Out was required, write “N/A” on the sheet.

NOTE: FAILURE TO ADHERE TO A SAFETY PRECAUTION PROVIDED ON THE MRC CONSTITUTES A SERIOUS SAFETY VIOLATION AND THE FAILURE TO PERFORM THE MRC AS WRITTEN. THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- h. (block 2.c) Determine compliance with all specific safety precautions listed on the MRC. If no safety requirements were invoked, write “N/A” on the sheet.
- i. (block 3.a) By physical examination of the maintained equipment, determine if maintenance of the nature required by the MRC had been performed. Take note of

fasteners that would have had to be disturbed, dirt in filters, fresh oil, etc., to make a judgment as to whether or not the maintenance has been performed. If unable to make this determination with absolute certainty, write "N/A" on the sheet.

NOTE: DUE TO THE POTENTIAL LIABILITY INCURRED BY IMPROPER USE AND DISPOSAL OF HAZMAT, SOME WORK CENTERS HAVE ASSIGNED SPECIALLY TRAINED PERSONNEL TO PROVIDE HAZMAT AND DISPOSAL SERVICES FOR SURPLUS MATERIAL INSTEAD OF THE MAINTENANCE PERSON. THIS IS ACCEPTABLE PROVIDED THE INSPECTOR CAN DETERMINE FULL COMPLIANCE.

- j. (block 3.b) Determine through questioning and record verification that HAZMAT was properly used and disposed of as a means of determining whether or not the MRC was accomplished. Once the inspector has determined that the HAZMAT was used and disposed of correctly, this attribute is considered fulfilled. If no HAZMAT was required to be utilized, write "N/A" on the sheet.
 - k. (block 3.c) Determine if the maintenance person could have performed the MRC from a standpoint of being trained and proficient in the tasks called out for by the procedure.
 - l. (block 4.a) Determine if the maintenance person filled out the 13-Week Accountability Log or annotated proper disposition of maintenance in SKED correctly for the accomplished MRC with the appropriate accomplishment date. If a tag-out isolation was used, ensure the tag serial number is recorded in the space allowed or as a check note in SKED. Ensure that the printed name and legal signature of the maintenance person who actually performed the maintenance is recorded or, in case of group performed PMS, the maintenance person in charge of the group.
 - m. (block 4.b) From reviewing the discussions and findings during the course of the spot check, determine if an FBR had been submitted if required. If no FBR was required, write "N/A" on the sheet.
 - n. (block 4.c) Determine if a material deficiency was noted during the PMS; if so, examine the CSMP to ensure the deficiency was documented. If no material deficiency was noted, write "N/A" on the sheet. If material discrepancies are properly documented in the CSMP attribute graded as a two (2). Material discrepancies which are not documented in the CSMP will be entered with an automatic grade of zero.
5. When a Spot Check is determined to be below standards, comments will be made in the "additional remarks" section of the sheet. Detailed descriptions will facilitate root cause analysis, the formulation of an effective corrective action plan and assist to clearly identify factors contributing to deficiencies that led to the conclusion that the MRC was not conducted as written or not conducted at all.

APPENDIX A3 SECTION II-A2
SPOT CHECK ACCOMPLISHMENT RATING (SCAR) CHECK SHEET

Planned Maintenance System (PMS) 3-M Spot Check Form						
SHIP	DEPARTMENT	EQUIPMENT	WORK CENTER	DATE PERFORMED	MIP EVALUATED	MRC EVALUATED
Maintenance Person:				Spot Check Date:		
NOTES: If an attribute marked with an “*” is evaluated as unsatisfactory, all subsequent attributes will be graded as “0”. Attribute marked with a pound sign “#” - Due to the potential liability incurred by improper use and disposal of HAZMAT, some Work Centers have assigned specially trained personnel to provide HAZMAT and disposal services for surplus material instead of the Maintenance Person. This is acceptable provided the inspector can determine full compliance.						
Inspection Attribute			Value	Grade	Notes	
Contact the maintenance person assigned responsibility for the accomplishment of the MRC, have the individual deliver MRC and determine the following by questions, personal observation, or both.						
1.	a.*	Is the maintenance person qualified (PQS) to perform the MR?	2			
	b.	Did the maintenance person present the correct tools, Personal Protective Equipment (PPE), parts (NSN), material (Military Specification (MIL-SPEC) and calibrated test equipment?	3			
	c.	Did the maintenance person properly identify the equipment (location, equipment validation)?	4			
	d.	Are there unauthorized changes or corrections to the MRC?	3			
	e.	Is the MRC correct for the equipment maintained?	3			
Demonstrated all steps of MR including all Notes, Warnings and Cautions according to the MRC.						
2.	a.*	Followed all steps of the MRC.	5			
	b.*	Correctly performed equipment Tag-Out.	5			
	c.*	Followed all safety precautions.	5			
Does the equipment condition reflect accomplishment of the MRC?						
3.	a.	Is it apparent that maintenance was performed recently?	10			
	b.#	Correctly demonstrated use and disposal of Hazardous Material.	3			
	c.	Was the MRC within the capability of the assigned individual?	5			
PMS Reporting						
4.	a.	Maintenance Person reported status of MR to the WCS if Completed or Not Fully Accomplished and made appropriate updates.	2			
	b.	Work Center generated FBR for any problem with MRC.	2			

	c.	Material deficiencies detected by the PMS action were recorded in MDS.	2		
Attributes Evaluated as "N/A" are not Calculated					
Total Points Available:			Total Points Awarded:		
Spot Check (SCAR) (Grade = Points Awarded divided by Points Available): SCAR =					
Above Standards (90% or greater)		At Standards (85-89.99%)		Below Standards (less than 85%)	
☐ Above Standards ☐ At Standards ☐ Below Standards					
Below Standard grade requires immediate accomplishment monitored by a Chief Petty Officer.					
Additional Remarks:					
Inspector Print:			Command:		
Inspector Signature:			Date:		

APPENDIX A3
SECTION III
MAINTENANCE ACCOMPLISHMENT RATE (MAR)

1. The Maintenance Performance formula has been redefined to more effectively capture maintenance that was not scheduled. The maintenance execution term is changed from PAR to MAR.
2. The PAR and SAR reports are automatically generated by SKED.
3. The MAR grade will be determined utilizing the formula reflected and a date range consisting of the previous 13 weeks of maintenance.

$$\text{MAR} = (\text{PAR}.5 + \text{SAR}.5)$$

$$\text{PAR} = \text{Comp} \text{ Divided by } (\text{Comp} + \text{Lost} + \text{Alerts} + \text{Omitted})$$

$$\text{SAR} = \text{Comp} \text{ Divided by } (\text{Comp} + \text{Lost} + \text{Omitted})$$

4. Omitted is defined as any maintenance action that should have been performed on a maintenance item and no matter the reason did not get scheduled, e.g. Situational or State Maintenance that didn't get scheduled when the situation dictated, improperly lined out periodic checks, non-accomplished IEM checks, non-accomplished maintenance added via ACN, FBR, Preliminary PMS, etc.

APPENDIX A3
SECTION IV
MAINTENANCE DATA SYSTEM (MDS)

APPENDIX A3 SECTION IV-A1
CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF)
CHECKLIST

CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF) CHECKLIST						
COMMAND:		DEPARTMENT:		DIVISION:		
DATE:						
				WORK CENTER		
CSMP Validity (Raw Data)					Value	
1.	Number of TA-1 Work Candidates *					
2.	Number of TA-2 Work Candidates *					
3.	Number of TA-3 Work Candidates *					
4.	Number of TA-4 Work Candidates *					
5.	Total Work Candidates (sum 1,2,3,4)					
6.	Number of TA-2 WC over 180 days old *(not updated)					
7.	Number of TA-4 WC over 180 days old *(not updated)					
8.	Aged Work Candidates : Sum of 6-7					
9.	Material Correction Rate: (#7/3)/#4					
10.	CSMP Validity review results from CVF Sheet. (Enter score from CVF Worksheet)					
11.	Ship's Force WC over 7 days old that require parts and the parts are not ordered. **					
12.	Total Work Candidate Deficiencies (WCD): #11/#4					
13.	Work Candidate Multiple Average: #10 minus (#9 plus #12)					

	CSMP Validity Score					
	Satisfactory		Y/N	Y/N	Y/N	Y/N

Satisfactory = 85% or better

*** Will be obtained from database pulls provided**

**** Will be obtained from RPPO log data pull**

CVF CHECKLIST GRADING ATTRIBUTES

NOTE: SEVERAL ATTRIBUTES CONTAINED ON THE CSMP VALIDITY CHECKLIST ARE NOT INCORPORATED INTO THE GRADE AND ARE DESIGNED TO CAPTURE CSMP DATA FOR FURTHER ANALYSIS.

NOTE: DATA FOR ATTRIBUTES 1-4 AND 6-7 WILL BE PULLED USING THE “JOB AGE” EXTRACTOR AVAILABLE ON CNSP OR CNSL 3M WEB SITE.

- 1. Attribute 1:** Number of Type Availability (T/A) 1 Work Candidates.
 - a. Defined as Depot level work candidates.
- 2. Attribute 2:** Number of Type Availability (T/A) 2 Work Candidates.
 - a. Defined as Intermediate Maintenance Activity (IMA) level work candidates.
- 3. Attribute 3:** Number of Type Availability (T/A) 3 Work Candidates.
 - a. Defined as Technical Support request work candidates in the CSMP.
- 4. Attribute 4:** Number of Type Availability (T/A) 4 Work Candidates.
 - a. Defined as Ships Force level work candidates.
- 5. Attribute 5:** Total Work Candidates (sum of attributes 1 thru 4).
 - a. Defined as All work candidates in the CSMP.
- 6. Attribute 6:** Number of TA-2 Work Candidates over 180 Days old.
- 7. Attribute 7:** Number of TA-4 Work Candidates over 180 Days old.
- 8. Attribute 8:** Aged Work Candidates (WCO) sum of 6 and 7.
- 9. Attribute 9:** Material Correction Rate WCO/3 (Aged TA-4) (#7/3)/#4.
 - a. Defined as total TA2 and TA4 work candidates in the CSMP over 180 days old, divided by 3. That total is divided by Attribute 4: Number of TA-4 Work Candidates. This numerically defines if command is managing CSMP and maintenance.
- 10. Attribute 10:** CSMP Validity review results from CVF Sheet Enter score from CVF Worksheet.
 - a. **CVF Work Candidate Worksheet** is used for this score.
- 11. Attribute 11:** Ship's Force WC over seven days old that require parts and the parts are not ordered.
 - a. RPPO log (submitted by the command one week prior to assessment) along with actual R-supply verification will be utilized to determine this attribute.
- 12. Attribute 12:** Total Work Candidate Deficiencies (WDC) Sum (#11/#4).
 - a. Place the result from Attribute 11: Ship's Force WC over seven days old that require parts and the parts are not ordered divided by Attribute 4: Number of TA-4 Work Candidates.
- 13. Attribute 13:** Work Candidate Multiple Average, #10 minus (#9 + #12) = CSMP Validity

APPENDIX A3 SECTION IV-A2
CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF)
WORK CANDIDATE WORKSHEET

CSMP VALIDITY FACTOR (CVF) WORK CANDIDATE WORKSHEET												
COMMAND:						DATE:						
DEPARTMENT:			DIVISION:				WORK CENTER:					
JCN	EQUIPMENT	1	2	3	4	5	6	7	8	9	10	CVF
CVF	Average of all cells	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	AVG

CSMP entry was reviewed with the following results:		Grade
1. Problem description adequate.		10
2. Recommended solution adequate.		10
3. Write-up reflects maintenance level assigned.		10
4. First (1 st) and Second (2 nd) contact person assigned.		10
5. Correct CSMP summary.		10
6. Type of Availability maintenance assignment and Equipment Status Codes match the problem description for work candidates.		10
7. Priority Code correct.		10
8. Write-up matches the Configuration Item and is written on the correct Configuration Item.		20
9. Were the correct special purpose or safety block selected with the correct values assigned? If selected, were the required Block 35 remarks present?		10
10. Does the work candidate reflect the current and correct status of the material deficiency? (physical verification, space walk-throughs, spot checks)		Yes or No

For attributes not required due to Class or Type differences, "N/A" attribute and recalculate total value of each field.
NOTE: If Item #10 Is "NO", The Work Candidate Will Be Zero.

NOTE: ENTER ONLY NUMERIC PORTION OF JSN AFTER ENSURING THAT DEPARTMENT AND WORK CENTER HEADER IS FILLED IN.

CVF WORK CANDIDATE WORKSHEET GRADING ATTRIBUTES

All priority one, two and three work candidates will be evaluated. For the CG, DDG, LSD, LPD, MCM, LCS, PC classes and shore activities (BMU, PHIBCB, and NBU) 20 percent of the priority four work candidates in every Work Center will be evaluated. For the LHA, LHD, LCC classes and Assault Craft Units (ACU), seven percent of priority four work candidates in every Work Center will be evaluated. Those Work Centers without an active CSMP the previous 180 days of CSMP in the previous 13 weeks: review SHORE file and compare to the previous 13 weeks. If Work Center has work candidates matching PMS completion, then "N/A" will be used for CVF score; if CSMP does not match SKED or no work candidates are in history, the CVF scored as zero. The CVF Work Candidate Work Sheet will be graded using this enclosure.

1. When the CSMP is provided, one week prior to the inspection, all reviews will be complete. 3MC will send the various reports required. 3MC will review, approve and up-line report all configurations and work candidates prior to submission of CSMP to ATG. A **score of zero** for all attributes will be assigned for any work candidates not approved by DH within 4 days or up-line reported by the 3MC within 7 days, or do not have the 180-day review and comments. These work candidates will be added to the Work Center CSMP scoring. The DH review will be verified for annotations in block 35 (recommended solution block for updates including the date reviewed).

- a. **Attribute 1:** Problem Description adequate?
 - (1) CSMP Block 35 description must adequately explain the problem.
- b. **Attribute 2:** Recommended Solution adequate?
 - (1) Does CSMP Block 35 description adequately explain the recommended solution?
(Complete description is required)
- c. **Attribute 3:** Write up reflects maintenance level assigned?
 - (1) Does type availability (TA) code match block 35 the comments? I.E., TA code is one (Depot) but comments reflect TA code four (S/F level).
- d. **Attribute 4:** First and second contact person assigned?
 - (1) Is MP who wrote the work candidate the first point of contact?
 - (2) Is the second person the LCPO (DLCPO when no LCPO) of the division?
- e. **Attribute 5:** Correct CSMP Summary?
 - (1) CSMP summary reflects the problem. For example; if pump mechanical seal is leaking, CSMP summary should state "Mechanical seal leaking" instead of "Overhaul (OVHL) pump".
- f. **Attribute 6:** Type of Availability maintenance assignment (1, 2 or 3) Work Candidates and Equipment Status Codes (1, 2 or 3) match the problem description?
 - (1) Equipment Status Code matches the problem description.
- g. **Attribute 7:** Priority Code correct?

- (1) Does Priority Code one, two and three have the required comments in the problem description and recommended solution and a CASREP at the matching level required in this enclosure?
- h. **Attribute 8:** Write up matches the Configuration Item and is written on the correct configuration item.
 - (1) Was the correct Configuration item chosen? For example, the job is for a motor but pump APL is listed.
 - (2) Was the correct component for the system chosen? For example: job was written on a Lube oil system to replace a valve when valve components are contained on a separate valve APL.
 - (3) Was the correct equipment nomenclature identified on the work candidate? For example: job written for Number (NR) One Gas Turbine Generator (GTG), but the work was being accomplished on NR Three GTG.
- i. **Attribute 9:** Were the correct special purpose or safety block selected with the correct values assigned? If selected, were the required problem description and recommended solution remarks present?
 - (1) Is the work candidate safety related?
 - (2) Is the appropriate safety code selected?
 - (3) Are comments in the problem description (block 35) detailing the safety problem?
 - (4) Are comments in the recommended solution (block 35) detailing how the safety problem will be corrected?
 - (5) Were Block 10 entries made for C, E, and Z where required? (C= Corrosion, E= Environmental, Z= Zone Inspection).
- j. **Attribute 10:** Work Candidate reflects the current and correct status of the material deficiency?
 - (1) Does the problem description and recommended solution describe without visual inspection, the material condition of the space or equipment? (Yes or No)

NOTE: IF ITEM #10 IS NO, THE WORK CANDIDATE SCORE WILL BE ZERO. MATERIAL DISCREPANCIES FOUND WHICH ARE NOT ENTERED IN THE CSMP WILL HAVE A JSN OF 0000 ENTERED AND A SCORE OF ZERO ASSIGNED FOR THE WORK CANDIDATE NOT ENTERED.

APPENDIX A3 SECTION IV-B
REPORTING ACCOMPLISHMENT FACTOR (RAF) WORKSHEET

SHIP:	DEPARTMENT:		
WORK CENTER:	LEVEL of ACCESS:		
ATTRIBUTES			
EQUIPMENT VALIDATION PROGRAM:	Points	Score	
1. Does the 3MC maintain a current week and previous 13 weeks of Configuration Item Record validations? Listing will be per Equipment File Validation Verification (EVV).	5		
SUSPENSE FILE SUMMARY STATISTICAL REPORT:			
2. Age of all configuration transactions was seven (7) days or less. (from CDMD-OA)	10		
MAINTAINENCE DATA SYSTEM REVIEW:			
3. Is the import correction queue empty?	4		
4. Has Archive and Inactive been run in the last 7 days?	4		
5. Does the Review and Approval queue have Work Candidates older than 7 days? (use report from OARS or OMMS-NG)	10*		
6. Does the FAS have a tracking system for up-line reporting?	4		
7. Does the FAS maintain a log tracking significant down time?	4		
8. Is there an effective process in place that deletes users as they transfer from the command? (Inactivate users in OMMS-NG and users in SKED)	4		
ASI PROCESSING:			
9. ASI processing within seven (7) days of creation. Points awarded based on backlog of ASI: Up-to-date in ASI processing = 10 points.	10		
10. Are ASI Input and Summary Reports (_mmm) worked until all processing errors noted have been completed? (asi_mmm report)	10		
11. After processing are ASI error reports (asi_cdm) sent to the CDM and other activities as directed by the TYCOM?	10		
12. Is Summary of Effective Allowance Parts List (SOEAPL) worked to determine APLs with no parts (\$), APLs awaiting logistic support (#), and APLs not loaded to COSAL (%)? Verify by looking at the bottom of each asi_cdm report that was sent to the CDM and electronic copy of a worked SOEAPL.	5		
Attributes Evaluated as "N/A" are not Calculated			
(Attributes evaluated as "N/A" are not calculated)	Total Points		
Available:			
	Total Points Awarded:		
RAF % = TP Awarded divided by TP Available	RAF**		
Inspector's Name and Rate:		Date:	

Inspector Notes:

- * Use the 13-week report pulled from OARS.
- ** SAT = 85% or better

RAF WORKSHEET GRADING ATTRIBUTES

Attribute 1: Does the 3MC maintain a current week and previous 13 weeks of Configuration Item Record validations?

- a. Does 3MC maintain a file of equipment validation aids completed over the previous 13 weeks?

Attribute 2: Age of all configuration transactions was seven days or less?

- a. OMMS-NG: In the configuration item review and approval queue, verify that there are no transactions awaiting approval more than seven days.
- b. AWN: On the Functions tab - Equipment Validations - Past Results - Ready To Be Sent Verify that saved date for all transactions ready to be sent is seven days or less.

Attribute 3: Is the import corrections queue empty?

- a. OMMS-NG: Verify the import corrections queue is empty.
- b. AWN: "N/A".

Attribute 4: Have Archive and Inactive been run in the last seven days:

- a. OMMS-NG: Go to reports - release, and verify that Archive and Inactive processes have been requested within the past seven days.
- b. AWN: "N/A".

Attribute 5: Does the Review and Approval queue have work candidates older than seven days?

- a. OMMS-NG: In the work candidate review and approval queue, verify that there are no transactions awaiting approval more than seven days.
- b. AWN: Go to the Home Page in AWN and group WNs by job status. Expand the 'Open' and 'Pre 2 Kilo' groups and sort by 'days old'. Verify there are no open or pre 2Kilo WNs older than 7 days.

Attribute 6: Does the FAS have a tracking system for up line reporting?

- a. OMMS-NG: Does the 3MC have a tracking system for 3M up-lines to ensure they are being performed a minimum of twice per week?
- b. AWN: Does the 3MC log into MRAS from the ATM at least twice per week, go to the Admin tab, open the log viewer, and ensure that there is current activity indicating that AWN is communicating properly?

Attribute 7: Does the FAS maintain a log tracking significant down time?

Attribute 8: Is there an effective process in place that deletes users as they transfer from the command? (Inactivate users in OMMS, AWN OR SKED)

Attribute 9: ASI processing within seven days of creation; Latest ASI file received has been processed?

- a. OMMS-NG: Retrieve ASI build date history from RadWeb. Compare ASI reports (ASI_RPT file) to build history to determine if ASIs were processed within seven days of creation.
- b. AWN: Retrieve ASI build date history from RadWeb. Go to the Admin tab in AWN, click on 'Read E52/ASI or POMMS'. Review the 'ASI files run locally' section and compare to build history to determine if ASIs were processed within seven days of creation.

Attribute 10: Are ASI Input and Summary reports (ASI_MMM) worked until all processing errors noted have been corrected?

- a. OMMS-NG: Spot check a couple of ASI_MMM reports and confirm that the errors have been corrected.
- b. AWN: "N/A".

Attribute 11: After processing, are ASI error reports sent to the CDM and to other activities as directed by TYCOM?

- a. OMMS-NG: Review RadWeb and ensure that all ASI_CDM files have been up-lined with product type ASI Error Report.
- b. AWN: "N/A".

Attribute 12: Is Summary of Effective APL (SOEAPL) generated after each ASI and worked per TYCOM guidance?

- a. OMMS-NG: Can the 3MC produce past SOEAPL reports, and have APLs with logistics support pending (#) for more than three months been added to the ASI_CDM report before up-lining?
- b. AWN: Can the 3MC produce past SOEAPL reports, and have APLs with logistics support pending (#) for more than three months been forwarded to the CDM via e-mail or some other means?

APPENDIX A3
SECTION V
PROFICIENCY

APPENDIX A3 SECTION V-A**SKED 3.1 PROFICIENCY FACTOR (SPF) WORKSHEET**

COMMAND			DEPARTMENT		DIVISION		WORK CENTER		DATE		
Individual Evaluated:							3M Billet Assigned:				
Proficiency Required						Proficiency Attribute			Yes or No		
WORK CENTER ACTIONS											
	WCS	LCPO	DO	DH	3MC			Y/N	Y/N	Y/N	
1	X	X	X	X	X	Able to log on.					
2	X	X	X	X	X	Able to open a Work Center.					
3	X	X	X	X	X	Able to view the Cycle, Quarter, Weekly and Schedule List View.					
4	X	X			X	Able to annotate Disposition of Maintenance.					
5	X	X			X	Able to save a Work Center.					
6	X	X			X	Able to back-up and restore a Work Center.					
7	X	X			X	Able to modify Work Center Options.					
8	X	X	X	X	X	Able to view Archive Quarter.					
9	X	X	X	X	X	Able to view Component Row Properties.					
10	X	X	X	X	X	Able to view Check Properties.					
11	X	X	X	X	X	Able to update Spot Check Results.					
12	X	X	X	X	X	Able to enter and view Flip Page Remarks.					
SCHEDULE ACTIONS											
13	X	X	X	X	X	Able to add, delete or modify MIPs and MRCs in Data Entry Mode.					
14				X	X	Able to finalize the Cycle Schedule.					
15		X			X	Able to adjust Quarter Start and End Dates.					
16				X	X	Able to finalize the Quarter Schedule.					
17	X	X	X		X	Able to generate the next Quarter Schedule.					
18		X			X	Able to regenerate a Quarter.					
19	X	X			X	Able to assign Maintenance Responsibilities.					
20	X	X	X		X	Able to modify Equipment Associations (Server Installations only).					
21		X			X	Able to restart the Cycle Schedule.					
22				X	X	Able to return the Quarter Schedule to Revise.					
EVENT LIST ACTIONS											
23	X	X			X	Able to create an Event List.					
24	X	X			X	Able to add checks to an Event List.					
25	X	X	X		X	Able to trigger a Local Event.					
26					X	Able to trigger a Global Event.					
FEEDBACK REPORT ACTIONS											
27	X	X	X	X	X	Able to generate an FBR.					

28		X	X	X	X	Able to Review and Approve an FBR.	
REVISION ACTIONS							
29		X			X	Able to place a Work Center in Revision.	
30				X	X	Able to finalize a Revision.	
31	X	X	X	X	X	Able to perform Data Integrity and Periodicity Range checks.	
REPORTS							
32	X	X	X	X	X	Able to generate or view PMS Reports.	
ADMINISTRATIVE ACTIONS							
33					X	Able to add Users.	
34	X	X	X	X	X	Able to edit Users.	
35	X	X			X	Able to inactivate Users.	
36			X	X	X	Able to view and modify the Chain of	
TOTALS							
	24	29	19	19	36	Divide Total Yes by Proficiency Required totals for the billet held by the individual.	Total Yes
SKED PROFICIENCY FACTOR							
WCS SPF % = SAT = 85% or better							
LCPO SPF % =							
DO SPF% =							
DH SPF% =							
3MC SPF % =							
SKED PROFICIENCY FACTOR (SPF) GUIDANCE (SKED 3.1 Users) Select a minimum of ten percent of the command's 3M 303 and higher PQS qualified for functional SKEDevaluation (SPF). This will include a minimum of two DHs, four DOs four CPO or LCPOs and six WCS. All SKED permission will be reviewed and assigned to command personnel will be commensurate to their respective level and position assigned in the command. The SKED access level and permissions are contained in SPF grading criteria per this guidance and for SKED 3.2. Personnel not having SKED access or the wrong level of access will be counted as an individual zero score on SPF. These personnel will be added into the final SPF score.							

APPENDIX A3 SECTION V-B
SKED 3.2/LCS PROFICIENCY FACTOR (SPF) WORKSHEET

COMMAND				DEPART		DIVISION		WC	DATE
Individual Evaluated:								3M Billet Assigned:	
Proficiency Required						Proficiency Attribute		Yes or No	
WORK CENTER ACTIONS									
	MP	WCS	LCPO	DO	DH	3MC		Y/N Y/N Y/N Y/N Y/N Y/N	
1	X	X	X	X	X	X	Able to log on.		
2	X	X	X	X	X	X	Able to open a Work Center.		
3	X	X	X	X	X	X	Able to view the Schedule, Review, Forecast, Situational, IEM, JOURNAL and PMS Document Display.		
4	X	X	X	X	X	X	Able to annotate Disposition of Maintenance.		
5	X	X	X	X	X	X	Able to view previous 13-weeks.		
6	X	X	X	X	X	X	Able to view Check Details.		
7		X	X	X	X	X	Able to update Spot Check Results.		
8	X	X	X	X	X	X	Able to enter and view Check Note Remarks.		
SCHEDULE ACTIONS									
9		X	X	X	X	X	Able to modify MRC lineout justifications.		
10		X	X	X	X	X	Able to add, delete or modify MIPs or MRCs in Revision Mode.		
11		X	X			X	Able to perform MRC lineouts.		
12			X	X	X	X	Able to approve MRC lineouts.		
13				X	X	X	Able to perform weekly closeouts.		
14				X	X	X	Able to acknowledge PMS Alerts.		
15			X			X	Able to regenerate Schedule.		
16	X	X	X			X	Able to assign Maintenance Responsibilities.		
17		X	X	X		X	Able to modify Equipment Associations.		
18						X	Able to archive 13 weeks.		
19		X	X			X	Able to generate an Open Work Candidate for parts.		
EVENT LIST ACTIONS									
20		X	X			X	Able to update Local State.		
21						X	Able to update Global State.		
22		X	X	X		X	Able to trigger a Local Event.		
23						X	Able to trigger a Global Event.		
FEEDBACK REPORT ACTIONS									
24		X	X	X	X	X	Able to generate an FBR.		
25		X	X	X	X	X	Able to Review and Approve an FBR.		
REVISION ACTIONS									
26			X			X	Able to start a Revision.		

27			X	X	X		Able to approve a Revision.	
28					X	X	Able to finalize a Revision.	
REPORTS								
29		X	X	X	X	X	Able to generate and View PMS Reports.	
ADMINISTRATIVE ACTIONS								
30						X	Able to add Users.	
31			X	X	X	X	Able to edit Users.	
32			X			X	Able to disable Users.	
33				X	X	X	Able to View and Modify the Chain of Command.	
TOTALS								
	8	19	25	21	20	32	Divide Total Yes by Proficiency Required totals for the billet held by the individual.	Total Yes
SKED PROFICIENCY FACTOR								
MP SPF % = SAT = 85% or better								
WCS SPF % =								
LCPO SPF % =								
DO SPF % =								
DH SPF % =								
3MC SPF % =								
SKED PROFICIENCY FACTOR (SPF) GUIDANCE (SKED 3.2 and SKED LCS Users)								
Select a minimum of ten percent of the command's 3M 303 and higher PQS qualified for functional SKEDevaluation (SPF). This will include a minimum of two DHs, four DOs four CPO or LCPOs and six WCS. All SKED permission reviewed and assigned to command personnel will be commensurate to their respective level and position assigned in the command. The SKED access level and permissions are contained in SPF grading criteria per this enclosure. Personnel not having SKED access or the wronglevel of access will be counted as an individual zero score on SPF. These personnel will be added into the final SPF score.								

APPENDIX A3 SECTION V-C

MAINTENANCE DATA SYSTEM PROFICIENCY FACTOR (MPF) WORKSHEET

COMMAND		DEPARTMENT			DIVISION		WORK CENTER	DATE
Individual Evaluated:								
Proficiency Required							3-M Billet Assigned:	
	MP	RPPO	WCS	LCP O	DO	DH	Proficiency Attribute	Yes or No Y/N Y/N Y/N Y/N Y/N Y/N
1	X	X	X	X	X	X	3-M PQS Qualification Completed	
2	X	X	X	X	X	X	Able to Log-on. (OMMS-NG)	
CSMP ACTIONS								
3	X	X	X	X	X		Add Maintenance Action (2-Kilo)	
4	X	X	X	X	X		Close Maintenance Action (2-Kilo)	
5	X	X	X	X	X		Change Maintenance Action (2-Kilo)	
6	X	X	X	X	X	X	Display Maintenance Action (2-Kilo)	
UPDATE SEF								
7	X	X	X	X	X	X	Review Online Equipment Records	
8			X	X			Add Equipment Records	
9			X	X			Modify Equipment Records	
10			X	X			Delete Equipment Records	
UPDATE LOGISTICS SUPPORT DATA (LSD) FILE								
11	X	X	X	X	X	X	Review Online LSD Records	
12			X	X			Add LSD Data Elements	
13			X	X	X		Change LSD Data Elements	
14			X	X	X		Delete LSD Data Elements	
SUPPLY REQUISITIONING								
15		X	X	X			Order Maintenance Parts	
16		X	X	X			Order Non-Maintenance Related Items	
PRINT REPORTS								
17		X	X	X	X	X	SEF summary reports	
18		X	X	X	X	X	CSMP reports	
PRE-TRANSMITTAL REVIEW								
19			X	X	X	X	Review CSMP transactions	
20			X	X	X	X	Review SEF transactions	
TOTALS								
	8	12	20	20	14	9	Divide Total Yes by Proficiency Required totals for the billet held by the individual.	Total Yes
							MPF (%)	

16 Oct 2019

Comments:

SAT = 85% or better**MDS PROFICIENCY FACTOR (MPF) GUIDANCE**

For this closed book assessment, select a minimum of ten percent of the command's 3M Personnel Qualification Standards (PQS) qualified personnel for functional MDS evaluation (MPF). The ten percent selected will include a minimum of two Department Heads (DHs), four Division Officers (DOs), six CPO or Leading Chief Petty Officers (LCPOs), six Work Center Supervisors (WCS), four RPPO and six maintenance personnel.

The MDS (Organizational Maintenance Management System - Next Generation (OMMS-NG), AWN etc.) permission assigned to command personnel will be commensurate to their respective level and position assigned in the command. The MDS access level and permissions are contained in MPF grading criteria per this enclosure. Personnel not having MDS access or the wrong level of access will be counted as an individual zero score on MPF. These personnel will be added into the final MPF score.

APPENDIX A3
SECTION VI
COMMAND TOTAL SCORE

APPENDIX A3 SECTION VI**3-M INSPECTION COMMAND TOTAL SCORE**

1. The Command Total Score (CTS) equals the sum of all Department Total Scores (DTS) multiplied by .80 (80%) plus 20% of the CLER.
 - a. $CTS = \text{Sum of all weighted DTS} \times 80\% + \text{CLER} \times 20\%$
 - $CTS = [(DTS \times \text{Weighted Factor}) + (DTS \times \text{Weighted Factor}) + (DTS \times \text{Weighted Factor}) \text{ etc.}] \times .80 + (\text{CLER} \times .20)$
 - b. $DTS = \text{Sum of all weighted Work Center Scores (WCS)}$
 - $DTS = (\text{WCS} \times \text{Weighted Factor}) + (\text{WCS} \times \text{Weighted Factor}) + (\text{WCS} \times \text{Weighted Factor}) \text{ etc.}$
 - c. $WCS = (\text{PPR} \times .50) + (\text{MDS} \times .50) \times \text{weighting factor}$
 - d. PMS Performance Rate (PPR) = MAR (combination of PAR and SAR) multiplied by total SCAR (spot check validation) divided by 100 and expressed as a RATE.
 - In other words, if a ship is properly scheduling only 90% of the checks assigned from NAVSEA, and then properly accomplishing those checks at a grade of 90%. Then PPR would be $90 \times 90 = 8100$ **divided by** 100 = 81 PMS Performance RATE. The PMS side counts as HALF of the overall grade.
 - e. MPR (MDS Performance Rate). The MDS portion gets an overall 50% weight of the overall 3M Inspection grade. This comes from the weight fleet commanders place on CSMP accuracy and validity. This leads to proper planning and budgeting for complex overhauls and extensive yard periods and getting surface combatants out on time and at the lowest cost.
 - f. CVF will be 85 percent or higher. If departmental CVF is less than 85 percent, those departments that failed to achieve 85 percent CVF will be remediated by ISIC.
 - g. CVF is graded in each Work Center and command CVF score is 10 points on the CLER scoring.
2. CVF and MDS for SURFOR consists of:
 - a. Grading of CSMP content.
 - b. Verifying CSMP to the equipment to validate job entries correctly written for the correct configuration item.
 - c. Space walk-through to ensure the CSMP reflect current material condition of the Unit.
3. CVF will be evaluated and validated as:
 - a. All priority one, two, and three work candidates will be evaluated. For the CG, DDG, LSD, MCM, LCS, PC classes and shore activities (BMU, PHIBCB and NBU), 20 percent of the priority four work candidates in every Work Center will be evaluated. For the LHA, LHD, LPD, LCC classes and ACU, seven percent of priority four work candidates in every Work Center will be evaluated.

- b. From the work candidates selected for evaluation, twenty percent will be physically validated with a minimum of one work candidate to a maximum of ten work candidates per Work Center. A Work Center that schedules or completes PMS or maintenance will have an active CSMP that is reflective of the actual material condition of the spaces and equipment.
4. When conducting CSMP physical validation, a space walk-through will be conducted in the space where the equipment is located. A material discrepancy that is properly documented in the CSMP will be entered and graded. Material discrepancies which are not documented in the CSMP will be entered with a JSN of “0000” which results in an automatic grade of zero. The space walk-through includes the following minimum spaces and equipment:
- a. Bridge
 - b. Galley
 - c. Radio Equipment Room
 - d. Radar, Sonar and Aegis Equipment Space
 - e. Three topside deck spaces (e.g., Bos'n locker weather decks, flight decks, or helo hanger)
 - f. One berthing compartment per department
 - g. One head per department
 - h. One fan room per department
 - i. Any other spaces or equipment as determined by the senior assessor
 - j. One Main Machinery Space
 - k. One Auxiliaries Machinery Space

APPENDIX A4
INSPECTION PROCEDURES FOR NAVY EXPEDITIONARY COMBAT COMMAND
FORCES

APPENDIX A4

SECTION I

WORK CENTER AND COMMAND LEVEL EFFECTIVENESS REVIEWS

APPENDIX A4 SECTION I-A1

NECC SCHEDULING AND EXECUTION EFFECTIVENESS REVIEW

Command		Department	Division	Work Center	Date	
General Attributes					Value	Points
1.		Do active and inactive MIPs reflect installed equipment? (Review SKED LOEP, FBR Managers, Local Guidance)			3	
2.		Are not applicable MRCs correctly lined out on MIPs? Annotated with reference for the change (FBR, Scheduling Aid, etc.) and justified citing authority?			5	
3.		Do MRCs in SKED accurately indicate Related Maintenance to match the MIP in SKED (calculate omitted)?			5	
4.		Does the Work Center PMS file contain:				
	a.	The current Service Brief?			1	
	b.	Current and applicable 3M messages and notices?			2	
5.		Is an effective system in use whereby supervisory personnel periodically and routinely monitor PMS performance per requirements of references (a) and (b), and this instruction? (Spot Check Program and Monitored Maint.)			5	
6.		Are Feedback Reports being reviewed and approved by the chain of command within seven days, "Action Taken" block update by WCS?			5	
Chain of Command SKED Administration						
7.		Are all administrative changes approved at the appropriate level?				
	a.	FR approved by Dept. Head?			2	
	b.	Weekly Closeouts performed on time, and at the appropriate level?			2	
	c.	All lineouts and MRC customization approved at the appropriate level?			2	
	d.	Is the Chain of Command in “Admin” tab commensurate with the assigned 3-M roles within the unit?			2	
SKED Equipment Structure and Association						
8.		Is the Equipment for each MIP properly divided into Maintenance Groups?			3	
9.		Does each Group contain an accurate list of Maintenance Items?			4	
10.		Does each Maintenance Item or Equipment contain a list of all applicable MRCs?			5	
11.		Are LGL tables on MRC properly filled out (e.g., equipment name, equipment location, equipment unique identifier, equipment attachments) per TYCOM requirement?			2	
12.		Are Maintenance Items in SKED associated or listed in the existing equipment configuration in OMMS-NG?			3	
PMS Execution						
13.		Are check note entries accurate, valid and complete?			3	
14.		Were PMS Alerts acknowledged by the LCPO, DIVO or DH?			5	
15.		Was situational PMS accomplished when required? (pre & post op, metered, triggered, state updates)			10	
13 Week Accountability Sheets						
16.		Were completed accountability sheets reviewed for accuracy by the WCS, LCPO, and DIVO per directives?			3	
17.		Was maintenance assigned only to qualified maintenance personnel?			10	
18.		Are 13-week accountability logs retained for the current week and 13 previous weeks?			2	

19.		Is the maintenance person listed in SKED the same person that signed the accountability sheet for completion of the maintenance action?	2			
20.		Does the maintenance on the accountability sheets match maintenance listed in SKED?	10			
21.		Was a tag-out serial number or "N/A" entered in the tag-out block?	2			
Inactive Equipment Maintenance (IEM)						
22.		Is the start of IEM correctly annotated (including having a valid reason)?	2			
23.		Are all IEM requirements properly documented? (LU, PM, SU, etc.)	5			
24.		Is the completion of the inactive period correctly annotated?	2			
Totals (Attributes evaluated as "N/A" are not calculated)		Total Points Available 107	Total Points Awarded _____			
☐ Above Standards ☐ At Standards ☐ Below Standards						
Above Standards (90% or greater) At Standards (80-89.99%) Below Standards (less than 80%)						
Inspector Name and Command (Print and Sign)						

Attribute Scoring:

Full credit, all points awarded requires 100% of a given attribute to be accomplished. For example, item 14, if all PMS Alerts were acknowledged by the LCPO, DIVO or DH, 5 points would be awarded.

Partial credit, a lesser number of points awarded if only 80% of a given attribute accomplished.

Value	Partial Credit	
1	0	either 1 point or 0
2	1	
3	2	
4	3	
5	3	
10	7	

No credit, no points awarded if less than 80% accomplished.

NECC SEER REMARKS

[illegible]

APPENDIX A4 SECTION I-B**NECC COMMAND LEVEL EFFECTIVENESS REVIEW (CLER)**

Command:			Date:	
General Attributes			Value	Points
1.		Does the 3M System Coordinator maintain:		
	a.	Current PMS DVD?	1	
	b.	Master LEOP (PMS-5)? (Including any WCS pen and ink changes)	3	
	c.	Change Service Accountability Log?	2	
	d.	Supplementary information (e.g., current and applicable 3-M messages, Notices, Instructions per TYCOM requirements to be found in SKED 3.2 under Help tab)?	1	
	e.	Current SKED Database back-up files on external media?	10	
	f.	Unit generate FBR response status in SKED and follow-up action tracked?	5	
2.		Does the 3-M Coordinator have an effective system for routing, explaining, and tracking of externally provided PMS documentation changes?	3	
3.		Is the 3-M Functional Area Supervisor (FAS) ensuring all 3-M databases are being routinely maintained? (Insert RAF _____ Percentage divided by 10=Score)	10	
4.		Does the activity conduct 3-M program training?	5	
5.		Is an effective system in use whereby supervisory personnel routinely spot-check and monitor PMS performance? (Spot Checks divided by Monitored Maintenance)	10	
6.		Does the 3MC maintain the status of command FBRs, responses and follow up actions taken in SKED?	5	
7.		Does the 3MC maintain a current auditable Advanced Skills Management report of 3-M PQS? Are 3-M qualifications commensurate to meet mission requirements?	3	
8.		Does the 3MC provide weekly status reports to the 3-M Manager per directives? (Retain for 1 year)	3	
9.		Have all feedback reports entered in SKED been properly reviewed by the chain of command and submitted off hull within 7 days? Is FBR response status and follow up actions tracked in SKED?	5	
10.		Does the 3MC have an approved master copy of 3-M PQS specifically tailored for the command?	5	
11.		Does the unit conduct internal audits of all Work Centers? (Retain latest copies of deficiencies, corrections and abatement for current & previous four quarters)	10	
12.		Did the unit conduct a mid-term 3-M self-assessment?	10	
13.		Does the 3MC maintain copies of 3-M System assessment reports (self, ISIC, TYCOM) for at least 24 months?	3	
14.		Does the 3MC ensure validations are conducted per TYCOM directive?	5	
Totals (Attributes evaluated as "N/A" are not calculated)				
Total Points Available: 99			Total Points Awarded:	
☐ Above Standards ☐ At Standards ☐ Below Standards				
Inspector Name and Command (Print and Sign)				

Attribute Scoring:**Sat = 80 percent or better**

All scoring will be done in a "yes" or "no" format. Example: If yes to the block, all points will be awarded. If no to the block, zero points will be awarded.

APPENDIX A4 SECTION I-B1
NECC CLER REMARKS

Provide the attribute number and amplifying information describing the deficiency that has caused a deduction of points.

[illegible]

APPENDIX A4

SECTION II

SPOT CHECK ACCOMPLISHMENT RATING (SCAR)

1. Using the basic definitions and guidelines described, determine the PMS Spot Check Accomplishment Rating (SCAR) for each Work Center. Enter the values determined on the Spot Check Monitor Form, Section II-A of this Appendix.
 - a. EVERY Work Center gets a FULL SEER review and at least one (1) spot check not to exceed 10 per Work Center. The NECC inspection team determines the number of spot checks to be conducted per Work Center based on PAR and SAR reports exported from the unit prior to inspection. Numbers reflect the Work Center accomplishment load.
 - b. Complete a MRC Evaluation SCAR Check Sheet, Section II-A of this Appendix or equivalent from SKED 3.2 or higher, for each MRC selected. Based on the results, evaluate the overall effectiveness of the accomplishment of each MR selected. Enter a numeric evaluation of each assessment attribute and provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.
2. The SCAR Check Sheet is a series of inspection attributes to determine the accomplishment status of an MRC that had previously been reported as accomplished. Although, the sheet may be used as a reference for conducting a real time monitored MRC as described by reference (a), paragraph 2-8.b., for the purposes of conducting a 3M Inspection, to determine SCAR, all spot checks will be conducted on accomplished (historic) MRCs.
3. Due to the nature of MRC completion, supporting programs such as Tag-Outs and Hazardous Material (HAZMAT) are encountered. Care should be taken to avoid expanding the SCAR to a review of the processes of those programs thereby preventing the assessor from determining the accomplishment status of the MRC under review.
4. The following is expanded guidance for completion of the assessment attributes of the Spot Check sheet. Best practices or other policies not supported by source documentation must not be included in evaluating compliance:
 - a. (block 1.a) Determine if the maintenance person is qualified to perform the maintenance task. PQS 301 is required for all MRCs but attention should also be paid to other qualifications required such as Safety Petty Officer, Damage Control Petty Officer or graduation from a required school such as NECC Armorer.
 - b. (block 1.b) Determine if the correct Tools, Parts, Material and Test Equipment (TPMTE) were used during the performance of the MRC. If the maintenance person did not have the required TPMTE, it is unlikely that they would have been able to complete all the procedural steps of the MRC as required. If an item of TPMTE was required to perform a conditional step and that step was not required to be accomplished, it is not considered deficient. If the required test equipment required calibration, ensure that the calibration is within date and the equipment is of sufficient scale to accomplish the MRC.
 - c. (block 1.c) Determine if the maintenance person maintained the correct equipment.
 - d. (block 1.d) Examine the MRC to determine that any locally applied changes are authorized by procedural notes, external correspondence or allowed by reference (a).

- e. (block 1.e) Determine applicability of the MRC to the component that the maintenance person signed for completion.

NOTE: IF A PROCEDURAL STEP WAS NOT COMPLETED, THE MRC SHOULD NOT HAVE BEEN REPORTED AS COMPLETE AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- f. (block 2.a) From a variety of potential techniques, determine if the maintenance person performed all the required steps of the MRC. This may be accomplished via re-enactment, a discussion regarding the steps or re-performance. The inspector should come away with a clear impression that all the steps of the MRC were either fully accomplished or not.

NOTE: IF A REQUIRED TAG-OUT WAS NOT CONDUCTED IN SUPPORT OF ACCOMPLISHING THE MRC, THE MRC SHOULD NOT HAVE BEEN CONDUCTED AND REPRESENTS A SERIOUS SAFETY VIOLATION AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- g. (block 2.b) If required by the MRC, verify that a tag-out was hung on the day the maintenance was performed. Ensure the isolation boundaries were appropriately identified and correctly positioned to ensure complete isolation of the maintained equipment. If no Tag-Out was required, write “N/A” on the sheet.

NOTE: FAILURE TO ADHERE TO A SAFETY PRECAUTION PROVIDED ON THE MRC CONSTITUTES A SERIOUS SAFETY VIOLATION AND THE FAILURE TO PERFORM THE MRC AS WRITTEN. THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- h. (block 2.c) Determine compliance with all specific safety precautions listed on the MRC. If no safety requirements were invoked, write “N/A” on the sheet.
- i. (block 3.a) By physical examination of the maintained equipment, determine if maintenance of the nature required by the MRC had been performed. Take note of fasteners that would have had to be disturbed, dirt in filters, fresh oil, etc., to make a judgment as to whether or not the maintenance has been performed. If unable to make this determination with absolute certainty, write “N/A” on the sheet.

NOTE: DUE TO THE POTENTIAL LIABILITY INCURRED BY IMPROPER USE AND DISPOSAL OF HAZMAT, SOME WORK CENTERS HAVE ASSIGNED SPECIALLY TRAINED PERSONNEL TO PROVIDE HAZMAT AND DISPOSAL SERVICES FOR SURPLUS MATERIAL INSTEAD OF THE MAINTENANCE PERSON. THIS IS ACCEPTABLE PROVIDED THE INSPECTOR CAN DETERMINE FULL COMPLIANCE.

- j. (block 3.b) Determine through questioning and record verification that HAZMAT was properly used and disposed of as a means of determining whether or not the MRC was accomplished. Once the inspector has determined that the HAZMAT was used and disposed of correctly, this attribute is considered fulfilled. If no HAZMAT was required to be utilized, write “N/A” on the sheet.
 - k. (block 3.c) Determine if the maintenance person could have performed the MRC from a standpoint of being trained and proficient in the tasks called out for by the procedure.
 - l. (block 4.a) Determine if the maintenance person filled out the 13-Week Accountability Log correctly or annotated proper disposition of maintenance in SKED for the accomplished MRC with the appropriate accomplishment date. If a tag-out isolation was used, ensure the tag serial number is recorded in the space allowed or as a check note in SKED. Ensure that the printed name and legal signature of the maintenance person who actually performed the maintenance is recorded or, in case of group performed PMS, the maintenance person in charge of the group.
 - m. (block 4.b) From reviewing the discussions and findings during the course of the spot check, determine if a FBR had been submitted if required. If no FBR was required, write “N/A” on the sheet.
 - n. (block 4.c) Determine if a material deficiency was noted during the PMS; if so, examine the CSMP to ensure the deficiency was documented. If no material deficiency was noted, write “N/A” on the sheet. If material discrepancies are properly documented in the CSMP attribute graded as a two (2). Material discrepancies which are not documented in the CSMP will receive an automatic grade of zero.
5. When a Spot Check is determined to be below standards, comments **must** be made in the “additional remarks” section of the sheet. Detailed descriptions will facilitate root cause analysis, the formulation of an effective corrective action plan and assist to clearly identify factors contributing to deficiencies that led to the conclusion that the MRC was not conducted as written or not conducted at all.

APPENDIX A4 SECTION II-A2

SPOT CHECK ACCOMPLISHMENT RATING (SCAR) CHECK SHEET

Planned Maintenance System (PMS) 3-M Spot Check Form						
SHIP	DEPARTMENT	EQUIPMENT	WORK CENTER	DATE PERFORMED	MIP EVALUATED	MRC EVALUATED
Maintenance Person:				Spot Check Date:		
NOTES: If an attribute marked with an “*” is evaluated as unsatisfactory, all subsequent attributes will be graded as “0”. Attribute marked with a pound sign “#” - Due to the potential liability incurred by improper use and disposal of HAZMAT, some Work Centers have assigned specially trained personnel to provide HAZMAT and disposal services for surplus material instead of the Maintenance Person. This is acceptable provided the inspector can determine full compliance.						
Inspection Attribute			Value	Grade	Notes	
Contact the maintenance person assigned responsibility for the accomplishment of the MRC, have the individual deliver MRC and determine the following by questions, personal observation, or both.						
1.	a.*	Is the maintenance person qualified (PQS) to perform the MR?	2			
	b.	Did the maintenance person present the correct tools, Personal Protective Equipment (PPE), parts (NSN), material (Military Specification (MIL-SPEC) and calibrated test equipment?	3			
	c.	Did the maintenance person properly identify the equipment (location, equipment validation)?	4			
	d.	Are there unauthorized changes or corrections to the MRC?	3			
	e.	Is the MRC correct for the equipment maintained?	3			
Demonstrated all steps of MR including all Notes, Warnings and Cautions according to the MRC.						
2.	a.*	Followed all steps of the MRC.	5			
	b.*	Correctly performed equipment Tag-Out.	5			
	c.*	Followed all safety precautions.	5			
Does the equipment condition reflect accomplishment of the MRC?						
3.	a.	Is it apparent that maintenance was performed recently?	10			
	b.#	Correctly demonstrated use and disposal of Hazardous Material.	3			
	c.	Was the MRC within the capability of the assigned individual?	5			
PMS Reporting						
4.	a.	Maintenance Person reported status of MR to the WCS if Completed or Not Fully Accomplished and made appropriate updates.	2			
	b.	Work Center generated FBR for any problem with MRC.	2			

c.	Material deficiencies detected by the PMS action were recorded in MDS.	2		
Attributes Evaluated as "N/A" are not Calculated				
Total Points Available:		Total Points Awarded:		
SCAR (Spot Check) (Grade = Points Awarded divided by Points Available): SCAR =				
Above Standards (90% or greater)		At Standards (85-89.99%)		Below Standards (less than 85%)
☐ Above Standards		☐ At Standards		☐ Below Standards
Below Standard grade requires immediate accomplishment monitored by a Chief Petty Officer.				
Additional Remarks:				
Inspector Print:			Command:	
Inspector Signature:			Date:	

APPENDIX A4

SECTION III

MAINTENANCE ACCOMPLISHMENT RATE (MAR)

1. The Maintenance Performance formula has been redefined to more effectively capture maintenance that was not scheduled. The maintenance execution term is changed from RAR or PAR to MAR.
2. The PAR and SAR reports are automatically generated by SKED.
3. The MAR grade will be determined utilizing the formula reflected and a date range consisting of the previous 13 weeks of maintenance.

$$\text{MAR} = (\text{PAR}.5 + \text{SAR}.5)$$

$$\text{PAR} = \text{Comp divided by (Comp + Lost + Alerts + Omitted)}$$

$$\text{SAR} = \text{Comp divided by (Comp + Lost + Omitted)}$$

4. Omitted is defined as any maintenance action that should have been performed on a maintenance item and no matter the reason did not get scheduled, e.g., Situational or State Maintenance that didn't get scheduled when the situation dictated, improperly lined out periodic checks, non-accomplished IEM checks, non-accomplished maintenance added via ACN, FBR, Preliminary PMS, etc.

APPENDIX A4
SECTION IV
MAINTENANCE DATA SYSTEM (MDS)

APPENDIX A4 SECTION IV-A1
CURRENT SHIP'S MAINTENANCE PROJECT
VALIDITY FACTOR (CVF) CHECKLIST

SHIP	DEPARTMENT	DIVISION	WORK CENTER	DATE
CSMP VALIDITY (RAW DATA)				
ASSESSMENT ATTRIBUTE				VALUE
1.	Number of TA-1 Work Candidates.			
2.	Number of TA-2 Work Candidates.			
3.	Number of TA-3 Work Candidates.			
4.	Number of TA-4 Work Candidates.			
5.	Total Number of Work Candidates (WC) Sum of 1 – 4.			
6.	Number of TA-2WC over 180 days old.			
7.	Number of TA-4WC over 180 days old.			
8.	Aged Work Candidates (WCO) Sum 6 and 7.			
9.	Material Correction Rate: WCO/3 (Aged TA-4). (#7/3)/#4			
10.	CSMP Validity review results from CVF Sheet. Enter score from CVF Worksheet.			
11.	Ship's Force WC over 7 days old that require parts and the parts are not ordered.			
12.	Open Ship's Force WC over 30 days old, not up-lined to the Master CSMP.			
13.	Total Work Candidate Deficiencies (WCD) Sum. (#11 - #12)/#4			
14.	Work Candidate Multiple Average #9, #10 and #13			
15.	Material deficiencies noted by MRC spot checks that were not documented in the CSMP.			
16.	Deductions #15/#5			
17.	CSMP Validity Average #14 and #16			
CSMP Validity ☐ Above Standards ☐ At Standards ☐ Below Standards Above Standards (90% or greater), At Standards (80-89%), Below Standards (less than 80%)				
Remarks:				

APPENDIX A4 SECTION IV-A2
CURRENT SHIP'S MAINTENANCE PROJECT VALIDITY FACTOR (CVF)
WORK CANDIDATE WORKSHEET

CSMP VALIDITY FACTOR (CVF) WORK CANDIDATE WORKSHEET																
COMMAND:											DATE:					
DEPARTMENT:			DIVISION:			WORK CENTER:										
JCN	EQUIP	Material not Ordered > 7 days			1	2	3	4	5	6	7	8	9	10	11	CVF
		Y	N	N/A												
		Y	N	N/A												
		Y	N	N/A												
		Y	N	N/A												
		Y	N	N/A												
		Y	N	N/A												
		Y	N	N/A												
		Y	N	N/A												
CVF	Average of all cells				A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	AVG
Number of Jobs Reviewed:										Material not Ordered:						
CSMP entry was reviewed with the following results:														Minus PTs		
1. The work candidate written against the correct configuration item?												#1 QTY	10			
2. Problem description was adequate.												#2 QTY	10			
3. Recommended solution was adequate.												#3 QTY	15			
4. Deferral reason was incorrect.												#4 QTY	5			
5. Current supply status not updated. Are there non-submitted or unapproved parts older than 4 days?												#5 QTY	10			
6. 1 st and 2 nd contact not assigned. (Cannot be the same person)												#6 QTY	10			
7. Write-up does not reflect maintenance level assigned. (Originating W/C, Intermediate Maintenance Activity, Depot Level Maintenance)												#7 QTY	10			
8. Incorrect CSMP summary. (Does not state the problem)												#8 QTY	10			
9. Priority code incorrect.												#9 QTY	5			
10. Does the Work Candidate Equipment Status Code match problem description? (Operational or Non-Operational)												#10 QTY	15			
11. Does the Work Candidate reflect the current and correct status of the material deficiency?												#11 QTY	Yes or No			
Enter only numeric portion of JSN after ensuring that Department and W/C header is filled in.																
NOTE: If item #11 is "NO", the work candidate will be zero.																
NOTE: If material not ordered greater than one week is Y, then Work Candidate score will be zero.																

CSMP Validity Factor (CVF). This is a targeted review of shipboard CSMP entries- 10 percent of EVERY Work Center's CSMP (minimum of 2, maximum of 15 JCNs) and accomplished ashore prior to a visit by MDS specialists. Targeted JCNs consist of TA 1, 2 and 3, Safety and Equipment Operational Codes of 2 and TA 4s. As per the items listed on the CVF form, NECC checks for accuracy to include problem description, recommended solution blocks, does the

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maintenance level requested match the write up, EOC and Safety codes match write up, etc.?

Finally, for each JCN selected, the ship is required to demonstrate knowledge of the deficiency and status. This is accomplished by asking a series of questions to all WCS and DIVO as listed on the CVF form. The answers to these questions (presented as an open book practical exam) are listed on the CSMP, MJB516 report, RPPO log or ships availability listing.

APPENDIX A4 SECTION IV-B

REPORTING AND ASI PROCESSING CONFIDENCE FACTOR (RAF) REVIEW

COMMAND:	DEPARTMENT:	
WORK CENTER:	LEVEL of ACCESS:	
OMMS-NG SYSTEM MAINTENANCE REVIEW	Points Available	Points Awarded
1. Is the Import Correction queue empty?	5	
2. Has Archive been run in the last 15 days?	5	
3. Has Inactive been run in the last 15 days?	5	
4. Have Work Candidates been removed from past availabilities C+30 Days?	5	
5. Is the REJ availability used to track jobs rejected or questioned by the TYCOM TRIAD empty?	5	
6. Have old availabilities been removed from OMMS-NG?	5	
7. Is a current, up to date, Ship Availability Listing readily available to the ship?	5	
8. Does FAS have a tracking system for up-line reporting? Is last 13 weeks of .uru and .pts on file?	5	
9. Does FAS have a tracking system for bulk loaded MM0001 files? Is last 13 weeks of bulk loads on file?	5	
10. Does FAS have a tracking system for customer feedback files? Is last 13 weeks of feedbacks on file?	5	
11. Does FAS maintain a log tracking significant OMMS-NG down time?	5	
12. Are current OMMS DAPs installed, and does the FAS know under what conditions they are utilized?	5	
13. Is the Reports Release queue being managed and cleared of obsolete reports? (Any reports over 14 days)	5	
14. Are values in the Site Parameter set per TYCOM directives?	5	
15. Is the Maintenance Assignment dropdown list populated per TYCOM directives?	5	
16. Is the Work Candidate Status dropdown list populated per TYCOM directives?	5	
17. Are Work Centers per the Joint Fleet Maintenance Manual, Vol VI Chapter 19?	5	
18. Is there an effective process in place that deletes users as they transfer from the command?	5	
19. Does the Review and Approval queue have Work Candidates older than 7 days below Ship Level Approval?	5	
20. Does the FAS have the current TYCOM directives and are they readily available to the ship?, i.e. Current; OMMS-NG User Guide.	5	
Attributes Evaluated as "N/A" are not Calculated		
Total Points Available:	100	
Total Points Awarded:		
RAF % = TP Awarded divided by TP Available	RAF**	
Inspector's Name and Rate:		Date:

Inspector Notes:

**** SAT = 80% or better**

APPENDIX A4
SECTION VI
COMMAND TOTAL SCORE

APPENDIX A4 SECTION VI**3-M INSPECTION COMMAND TOTAL SCORE**

1. The FINAL GRADE consists of two (2) parts and weighted as:
 - a. PPR (PMS Performance Rate). **PPR = (MAR x SCAR) divided by 100.**
 - b. This is overall MAR (combination of PAR and SAR) multiplied by total SCAR (spot check validation) divided by 100 and expressed as a RATE. For example, if a unit is properly scheduling only 90% of the checks assigned from NAVSEA, and then properly accomplishing those checks at a grade of 90%. Then PPR would be $90 \times 90 = 8100$ divided by 100 = 81 PMS Performance RATE. The PMS side counts as HALF of the overall grade.
2. MPR (MDS Performance Rate). The MDS portion gets an overall 50% weight of the overall 3M Inspection grade. This comes from the weight Commanders place on CSMP accuracy and validity. This leads to proper maintenance action planning at the lowest cost, drives manning, and budget requirements. The 5 sections detailed in section IV are weighted as:

$$\text{MPR} = (\text{MCF} \times .20) + (\text{CVF} \times .50) + (\text{RAF} \times .30).$$

3. OVERALL GRADE is computed as **(PPR + MPR) divided by 2**. A minimum grade point of 80 is required for a passing score.

APPENDIX A5
INSPECTION PROCEDURES FOR
COMMANDER NAVAL INFORMATION FORCES

APPENDIX A5

SECTION I

WORK CENTER AND COMMAND LEVEL EFFECTIVENESS REVIEWS

APPENDIX A5 SECTION I-A
SCHEDULING AND EXECUTION EFFECTIVENESS REVIEW (SEER)

Command		Department	Division	Work Center	Date		
General Attributes					Value	Points	
1.	Does the Work Center PMS file contain:						
	a. *	The current Service Brief?			1		
	b. *	Current and applicable 3-M messages, notices and supplementary information?			2		
2.		Do MIPs accurately reflect equipment configuration; are non-applicable MRCs correctly lined out and are applicable MRCs active?			10		
3.	*	Does the Work Center retain an auditable record of 3-M personnel qualification standards (PQS) and designation letters?			5		
Maintenance Requirement Card (MRC) Deck							
4.		Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current? (Per TYCOM direction)			2		
5.		Are classified MRCs complete and current?			3		
6.		Are blanks requiring installation data (including MRC location block) filled in prior to use? Specific location must reflect BLDG # with Room #.			3		
Chain of Command SKED Administration							
7.	Are all administrative changes approved at the appropriate level?						
	a.	FR approved by Dept. Head. (Verify using Journal tab.)			2		
	b.	Weekly Closeouts are performed by close of business on the first day of the week by the LCPO.			2		
	c.	All lineouts and MRC customization are approved by the LCPO.			2		
	d.	Check notes are reviewed and alerts approved by the Department Head.			2		
Location Guide Lists (LGL)							
8.	a.	Do LGLs contain required information (e.g., equipment name, equipment location, equipment serial number or unique identifier)?			3		
	b.	Are Maintenance Items in SKED associated to existing equipment configuration?			3		
Situational Requirements							
9.	*	Are all situational (triggered or metered) events being scheduled and executed in SKED?			8		
PMS Execution and Accountability							
10.		Are check note entries accurate, valid and complete?			3		
11.	*	Was maintenance assigned only to qualified maintenance personnel for MRCs requiring unique qualifications, NECs or billet?			4		

12.		Is a check note made for maintenance actions not completed or rescheduled during the week and retained in SKED?	2	
13.		Is a unique tag out serial number or “tag out not required” entered as a “check note” for maintenance actions requiring a lock out or tag out and marked as complete?	2	
14.		Have the minimum number of spot checks and monitored checks been accomplished?	3	
FBR File				
15.		Are Feedback Reports tracked in SKED, “Action Taken” block updated by WCS?	3	
Inactive Equipment Maintenance (IEM)				
16.	*	Is the start of an inactive period correctly annotated and approved by Dept Head?	2	
17.		Are all IEM requirements properly scheduled?	5	
18.		Is the completion of the inactive period correctly annotated?	2	
Totals (Attributes evaluated as NA are not calculated)		Total Points Available: _____	Total Points Awarded: _____	
SAT ☐ **SAT is 80% or better UNSAT ☐ (Score = Points Awarded Divided by Points Available)				

*** Electronic Versions Acceptable**

Attribute Scoring:

>85% = Satisfactory = Full Credit

< 85% = Unsatisfactory = No Credit

Example - Attribute 17 – If 85% or better of IEM requirements **were** properly scheduled, points awarded would be five (5). If less than 85% of IEM requirements were properly scheduled, points awarded would be zero (0).

Provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies **must** be reported via the final inspection report.

[illegible]

APPENDIX A5 SECTION I-A1**SKED 3.2 SEER CHECKLIST GRADING ATTRIBUTES**

NOTE: Numbers in parentheses indicates the attribute # on the SEER check sheet.

*** Indicates electronic versions acceptable.**

1. (1.) Does the Work Center PMS file contain:
 2. (1.a. *) Current Service Brief?
 - a. Is the latest FR PMS Service Brief available?
 3. (1.b. *) Current and applicable 3-M messages, notices and supplementary information?
 - a. Are all applicable messages and bulletins that provide additional guidance, information or areas of focus that pertaining to MIP/MRCs available?
4. (2) Do MIPs and MRCs accurately reflect equipment configuration; are non-applicable MRCs correctly lined out and are applicable MRCs active? (May be MIP standardization violations)
 - a. Does Work Center meet TYCOM MIP standardization requirements? Are any MRCs listed on MIP lined out that are applicable to installed equipment configuration and within the cognizance of the Work Center to perform maintenance? (Split MIP log will be verified against the LOEP and MIP.)
 - b. Are all applicable MRCs active on all applicable maintenance items?
 - c. Are non-applicable MRCs lined out? MRCs that are not applicable to the Work Center's installed equipment configuration.
 - d. Are line out justifications on MIPs accurate?
5. (3 *) Does the Work Center retain an auditable record of 3-M Personnel Qualification Standards (PQS) and designation letters?
 - e. Does the Work Center have record of the following: Dept. 3-M Assistant and WCS designation letters; 3-M (301) Maintenance Person, 3-M (303) WCS, and 3-M (304) Division Officer?

NOTE: FLTMPS REPORT, IF AVAILABLE, MUST BE USED. IF FLTMPS IS NOT AVAILABLE, PQS WATCH STATION COVER SHEETS SIGNED BY THE EXECUTIVE OFFICER MUST BE USED.

6. (4) Is the Work Center deck of MRCs, including classified MRC locator cards, complete and current? (Per TYCOM direction)
 - a. Does Work Center MRC deck contain all MRCs that are not lined out on MIP? The minimum of all quarterly checks and below, all R-checks, and all MRCs with fill in the blanks or pen and ink changes. Any MRC completed within the previous 13 weeks must be retained in the Work Center MRC deck. Verify SYSCOM MRC control number against MIPs per the 3-M Manual or TYCOM Guidance?

- b. Does MRC location block contain one of the following entries, as appropriate? (one) BLDG # with room #; "See LGL," "See Metbench Calibration Management System (MCMS)," "See Account Inventory Summary (AIS)," "LGL attached."
 - c. Is the MRC SYSCOM correct and matches the SYSCOM number on the MIP?
7. (5) Are classified MRCs complete and current?
- a. Does information on classified MRC locator cards match location of where classified MRCs are kept?
8. (6) Are blanks requiring installation data (including MRC location block) filled in prior to use? Specific location must reflect BLDG # with Room #.
- a. Are all Work Center MRCs with blank fields or tables within the MRC procedure block requiring data completed?
9. (7) Are all administrative changes approved at the appropriate level?
10. (7.a.) FR approved by Dept. Head. (Verify using Journal tab.)
- a. Has the final approval of revisions (FR, ACNs, FBR, Document Information Transmittals (DIT), and Admin changes) been completed by Dept. Head?
11. (7.b.) Weekly Closeouts are performed by COB on the first workday of the week by the LCPO?
- a. Has the weekly closeout been completed on the first workday of the week?
 - b. Has the weekly closeout been completed by LCPO?
12. (7.c.) All lineouts and MRC customization approved by the LCPO.
- a. Are all lineouts approved and initialed by LCPO?
13. (7.d.) Check notes reviewed and alerts approved by the Dept. Head?
- a. Are check notes and alert details approved by Dept. Head?
14. (8.a. *) Do LGLs contain required information (e.g., equipment name, equipment location, equipment serial number or unique identifier)?
- a. Work Centers with LGLs: Does the LGL have equipment nomenclature, serial number or unique identifier, and location (BLDG # and Room #) block completed for each line item?
 - b. If equipment manufacture serial number is available, it must be used.
15. (8.b.) Are Maintenance Items in SKED associated to existing equipment configuration?
- a. Are maintenance items in SKED correctly associated with equipment configuration?
16. (9*) Are all situational (triggers, metered) events being scheduled and executed in SKED?
- a. Are all local triggers and states executed as required?
 - b. Are all required (R) Checks listed on the Accountability Logs and scheduled in SKED?
 - c. Are metered readings entered and tracked in SKED (if applicable)?
17. (10) Are check note entries accurate, valid and complete?

- a. For all entries on the Work Center schedule that are not marked complete, is there a corresponding check note entry?
- b. Does the check note entry begin with either: rescheduled, out of periodicity, non-accomplished, not applicable (NA) for situational checks and with the date the check went out of periodicity, the reason why the MR was not accomplished or the reason check was not applicable?
- c. Cent (¢) sign Check Note entries will begin with “Performed by” and followed by the detailed information of the outside activity completing the maintenance, JSN, work order or applicable documentation used to complete the maintenance. Proof of the completion will be maintained in the Work Center PMS Manual until the next accomplishment of the maintenance action. Dept. Head will sign for accountability for all maintenance actions completed by outside activities.

18. (11) Was maintenance assigned only to qualified maintenance personnel for MRCs requiring unique qualifications, NECs or billet?

- a. For MRCs that indicate or require unique qualifications such as: Safety Petty Officer (SPO), Damage Control Petty Officer (DCPO), gauge calibration or NECs, does the assigned individual(s) hold that qualification or billet?

NOTE: UTILIZE SCHOOL COMPLETION CERTIFICATES, POSITION DESCRIPTIONS OR FLTMPs FOR VERIFICATION.

19. (12) Is a check note made for maintenance actions not completed or rescheduled during the week and retained in SKED?

- a. Do all check note entries match all entries in SKED?

20. (13) Is a unique tag out serial number or “tag out not required” entered as a “check note” for maintenance actions requiring a lock out or tag out and marked as complete?

- a. No entry is required for maintenance not completed.

21. (14) Have the minimum number of spot checks and monitored checks been accomplished?

- a. Are all required spot checks completed IAW COMNAVIFORINST 4790.1?

22. (15) Are Feedback Reports being tracked in SKED, “Action Taken” block updated by WCS?

- a. Does the Work Center retain copies of FBR responses requiring changes to PMS documents until reflected in the FR?
- b. Are FBRs being tracked in SKED?
- c. Are FBR responses entered in SKED when received and action taken updated within seven days?
- d. If no outstanding FBRs, mark as NA.

23. (16*) Is the start of an inactive period correctly annotated and approved by Dept. Head?

- a. Does Work Center Inactive Equipment Maintenance (IEM) tab annotate the proper IEM status?

- b. If Work Center has systems or equipment in IEM status II, are the following annotated: JSN or Work Documentation, Dept. Head authorization and outside activity or a repair Work Center?
- c. Did the Work Center obtain Dept. Head written authorization prior to placing equipment in IEM?
- d. If there is no equipment in IEM in the last 13 weeks, mark as NA.

24. (17) Are all IEM requirements properly scheduled?

- a. Does the Work Center annotate the proper scheduling of all applicable IEM maintenance (e.g., LU and PM)?
- b. If there is no equipment in IEM in the last 13 weeks, mark as NA.

25. (18) Is the completion of the inactive period correctly annotated?

- a. Does the Work Center schedule annotate the proper scheduling when removing equipment from IEM (e.g., SU and OT)?
- b. If there was no equipment removed from IEM in the last 13 weeks, mark as NA.

APPENDIX A5 SECTION I-B**COMMAND LEVEL EFFECTIVENESS REVIEW (CLER)**

Using the attributes and grading criteria described below, determine the Command Level Effectiveness Review (CLER). Provide amplifying information for deficiencies causing point reduction on the remarks page.

Command			Date	
General Attributes			Value	Points
1.	Does the 3MC maintain:			
a.		A Change Accountability Log?	2	
b.	*	A log tracking the assignment of MRCs from split MIPs to ensure all applicable MRCs are assigned?	3	
c.		A Master Classified MRC File?	2	
d.	*	A current PMS (and where applicable TFR) DVD or downloaded file?	3	
2.		Does the Command have a reliable system for backing up MDS and PMS data?	5	
3.	*	Does the 3-M Coordinator have an effective system in place to track, route and explain externally provided PMS changes?	3	
4.		Is there an effective system in use (Spot Check Program) whereby supervisory personnel periodically and routinely monitor PMS performance?	8	
5.		Have all FBRs entered in SKED been properly reviewed by the chain of command and submitted off station within seven (7) days?	3	
6.		Have CSMP reconciliations been conducted per JFMM and TYCOM instructions?	3	
7.	*	Does the activity conduct internal audits (Quarterly Self-Assessments) of all Work Centers? (Retain latest copies of deficiencies, corrections and abatement for a one-year period.)	15	
8.	*	Does the 3MC provide weekly status reports to the 3-M Manager IAW specific TYCOM directives?	3	
9.	*	Does the 3MC have an approved master copy of 3-M PQS specifically tailored for the command?	3	
10.	*	Does the 3MC maintain an auditable record of PMS PQS for the command (e.g., copy of service record entries, signed copy of PQS cover letter, officer verified divisional training record)?	3	
11.		Does the 3MC maintain the status of command FBRs, responses and follow up actions taken in SKED?	3	

12.		Does the activity conduct 3-M program training IAW directives?	8	
13.		Is the 3MC ensuring all 3-M databases are being routinely maintained? (Use the RAF computation sheet)	8	
14.		Does the activity conduct equipment validations via Automated Work Notification (AWN)?	3	
15.		Are changes annotated on validation and entered in AWN?	3	
16.		Does the 3MC retain 13 weeks' worth of validations?	2	
17.		Does the 3MC retain one years' worth of Quarterly reports?	2	
18.		Are the quarterly reports signed and dated by the Chain of Command?	2	
19.		Are the Check Note Reports included?	1	
Totals (Attributes evaluated as NA are not calculated)				
Total Points Available		88	Total Points Awarded	
☐ SAT		(Score = Points Awarded Divided by Points Available)	☐ UNSAT	
Inspector Name and Command (Print and Sign)				

*** Electronic Version Acceptable**

Sat = 80 percent or better

Attribute Scoring:

80% or above = Satisfactory = Full Credit

Less than 80% = Unsatisfactory = No Credit

Provide the attribute number and amplifying information describing the deficiency that has caused a deduction of points.

APPENDIX A5

APPENDIX A5
SECTION II
SPOT CHECK ACCOMPLISHMENT RATING (SCAR)

APPENDIX A5 SECTION II-A

SPOT CHECK ACCOMPLISHMENT RATING (SCAR) CHECK SHEET

Planned Maintenance System (PMS) 3-M Spot Check Form						
COMMAN D	DEPARTME NT	EQUIPMEN T	WORK CENTER	DATE PERFORME D	MIP EVALUATE D	MRC EVALUATE D
Maintenance Person:				Spot Check Date:		
NOTES: If an attribute marked with an “*” is evaluated as unsatisfactory, all subsequent attributes will be graded as “0”. Attribute marked with a pound sign “#” - Due to the potential liability incurred by improper use and disposal of HAZMAT, some Work Centers have assigned specially trained personnel to provide HAZMAT and disposal services for surplus material instead of the Maintenance Person. This is acceptable provided the inspector can determine full compliance.						
Inspection Attribute				Valu e	Grade	Notes
Contact the maintenance person assigned responsibility for the accomplishment of the MRC, have the individual deliver MRC and determine the following by questions or personal observation.						
1.	a.*	Is the maintenance person qualified (PQS) to perform the MR?	2			
	b.	Presented the correct tools, Personal Protective Equipment (PPE), parts (NSN), material (Military Specification (MILSPEC) and test equipment (Calibrated)?	3			
	c.	Properly identify the equipment (location, equipment validation)?	4			
	d.	Are there unauthorized changes or corrections to the MRC?	3			
	e.	Is this the correct MRC for the equipment maintained?	3			
Demonstrated all steps of MR including all Notes, Warnings and Cautions according to the MRC.						
2.	a.*	Followed all steps of the MRC.	5			
	b.*	Correctly performed equipment Tag Out.	5			

	c.*	Followed all safety precautions.	5		
Does the equipment condition reflect accomplishment of the MRC?					
3.	a.	Is it apparent that maintenance was performed recently?	10		
	b.#	Correctly demonstrated use and disposal of Hazardous Material.	3		
	c.	Was the MRC within the capability of the assigned individual to perform as written?	5		
PMS Reporting					
4.	a.	Maintenance Person reported status of MR to the WCS if Completed or Not Fully Accomplished and made appropriate updates.	2		
	b.	Work Center generated FBR for any problem with MRC.	2		
	c.	Were material deficiencies detected by the PMS action and recorded in MDS?	2		
Attributes Evaluated as NA are not Calculated					
Total Points Available:			Total Points Awarded:		
Spot Check (SCAR) (Grade = Points Awarded Divided by Points Available): SCAR =					
Above Standards (90% or greater)		At Standards (80-89.99%)		Below Standards (less than 80%)	
☐	Above Standards	☐	At Standards	☐	Below Standards
Below Standard grade requires immediate accomplishment monitored by a Chief Petty Officer.					

Additional Remarks:

Printed Name:

Signature

Command:

Date:

APPENDIX A5 SECTION II-A1**SPOT CHECK ACCOMPLISHMENT RATING (SCAR) DESCRIPTION AND GRADING ATTRIBUTES**

1. Using the basic definitions and guidelines described, determine the PMS Spot Check Accomplishment Rating (SCAR) for each Work Center. Enter the values determined on the Spot Check Monitor Form, Section II-A of this Appendix.

- a. The number of Spot Checks has been established:

- Periodic= 2%
- Situational= 0.5%

For all completed maintenance (including Daily, Weekly and Bi-weekly) from the last 13 weeks. Every Work Center will receive at least one periodic documented and one situational documented spot check. The maximum spot checks accomplished during the inspection will be five total spot checks per Work Center.

- b. Complete an MRC Evaluation, SCAR Check Sheet, Section II-A of this Appendix, for each MRC selected. Based on the results, evaluate the overall effectiveness of the accomplishment of each MR selected. Enter a numeric evaluation of each assessment attribute and provide amplifying information to describe the deficiencies driving point deductions. Significant deficiencies must be reported via the final inspection report.
2. The SCAR check sheet is a series of inspection attributes to determine the accomplishment status of an MRC that had previously been reported as accomplished. Although, the sheet may be used as a reference for conducting a real time monitored MRC for the purposes of conducting a 3-M Inspection, to determine SCAR, all spot checks will be conducted on accomplished (historic) MRCs.
3. Due to the nature of MRC completion, supporting programs such as Tag-Outs and Hazardous Material (HAZMAT) are encountered. Care should be taken to avoid expanding the SCAR to a review of the processes of those programs thereby preventing the assessor from determining the accomplishment status of the MRC under review.
4. The following is expanded guidance for completion of the assessment attributes of the SCAR check sheet. Best practices or other policies not supported by source documentation must not be included in evaluating compliance:
 - a. (1.a.) - Determine if the maintenance person is qualified to perform the maintenance task. PQS 301 is required for all MRCs but attention should also be paid to other qualifications required such as Quality Maintenance (see Volume 5, Part I, Chapter 3, paragraph 3.4 of this manual) or graduation from a required school such as gage calibration technician.
 - b. (1.b.) - Determine if the correct Tools, Parts, Material, and Test Equipment (TPMTE) were used during the performance of the MRC. If the maintenance person did not have the required TPMTE, it is unlikely that he or she would have been able to complete all the procedural steps of the MRC as required. If an item of TPMTE was required to perform a conditional step and that step was not required to be accomplished, it is not considered deficient. If the required test equipment required calibration, ensure that the calibration is within date and the equipment is of sufficient scale to accomplish the MRC.

- c. (1.c.) - Determine if the maintenance person maintained the correct equipment.
- d. (1.d.) - Examine the MRC to determine that any locally applied changes are authorized by procedural notes, external correspondence, or allowed by reference (a).
- e. (1.e.) - Determine if the MRC is applicable to the component that the maintenance person signed for as complete on the 13-Week Accountability Log.

NOTE: IF A PROCEDURAL STEP WAS NOT COMPLETED, THE MRC SHOULD NOT HAVE BEEN REPORTED AS COMPLETE AND THEREFORE THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- f. (2.a.) - From a variety of potential techniques, determine if the maintenance person performed all the required steps of the MRC. This may be accomplished via re-enactment, a discussion regarding the steps or re-performance. The inspector should come away with a clear impression that all the steps of the MRC were either fully accomplished or not.
- g. (2.b.) - If required by the MRC, verify that a tag out was hung on the day the maintenance was performed. Ensure the isolation boundaries were appropriately identified and correctly positioned to ensure complete isolation of the maintained equipment. If no Tag Out was required, write NA on the sheet.

NOTE: FAILURE TO ADHERE TO A SAFETY PRECAUTION PROVIDED ON THE MRC CONSTITUTES A SERIOUS SAFETY VIOLATION AND THE FAILURE TO PERFORM THE MRC AS WRITTEN. THE ATTRIBUTE GRADE SHOULD BE ZERO AND ALL SUBSEQUENT ATTRIBUTES SHOULD ALSO BE ZERO, THEREBY EFFECTIVELY “FAILING” THE SPOT CHECK.

- h. (2.c.) - Determine compliance with all specific safety precautions listed on the MRC.
- i. (3.a.) - By physical examination of the maintained equipment, determine if maintenance of the nature required by the MRC had been performed. Take note of fasteners that would have had to be disturbed, dirt in filters, fresh oil, etc. to make a judgment as to whether or not the maintenance has been performed. If unable to make this determination with absolute certainty, write NA on the sheet.

NOTE: DUE TO THE POTENTIAL LIABILITY INCURRED BY IMPROPER USE AND DISPOSAL OF HAZMAT, SOME WORK CENTERS HAVE ASSIGNED SPECIALLY TRAINED PERSONNEL TO PROVIDE HAZMAT AND DISPOSAL SERVICES FOR SURPLUS MATERIAL INSTEAD OF THE MAINTENANCE PERSON. THIS IS ACCEPTABLE PROVIDED THE INSPECTOR CAN DETERMINE FULL COMPLIANCE.

- j. (3.b.) - Determine through questioning and record verification that HAZMAT was properly used and disposed of as a means of determining whether or not the MRC was accomplished. Once the inspector has determined that the HAZMAT was used and disposed of correctly, this attribute is considered fulfilled. If no HAZMAT was required to be utilized, write NA on the sheet.

- k. (3.c.) - Determine if the maintenance person could have performed the MRC from a standpoint of being trained and proficient in the tasks called out for by the procedure.
 - l. (4.a.) - Determine if the maintenance person filled out the 13-Week Accountability Log or annotated proper disposition of maintenance in SKED correctly for the accomplished MRC with the appropriate accomplishment date. Ensure that if a tag out isolation was used, the tag serial number is recorded in the space allowed or as a check note in SKED. Ensure that the printed name and legal signature of the maintenance person who actually performed the maintenance is recorded or, in case of group performed PMS, the maintenance person in charge of the group.
 - m. (4.b.) - From reviewing the discussions and findings during the course of the spot check, determine if an FBR had been submitted if required. If no FBR was required, write NA on the sheet.
 - n. (4.c.) - Determine if a material deficiency was noted during the PMS; if so, examine the CSMP to ensure the deficiency was documented. If no material deficiency was noted, write NA on the sheet.
5. When a Spot Check is determined to be below standards, comments will be made in the “additional remarks” section of the sheet. Detailed descriptions will facilitate root cause analysis, the formulation of an effective corrective action plan and assist to clearly identify factors contributing to deficiencies that led to the conclusion that the MRC was not conducted as written or not conducted at all.

APPENDIX A5
SECTION III
MAINTENANCE ACCOMPLISHMENT RATE (MAR)

1. The Maintenance Performance formula has been redefined to more effectively capture maintenance that was not scheduled. The maintenance execution term is changed from RAR/PAR (Recorded Accomplishment Rate/Periodic Accomplishment Rate) to MAR (Maintenance Accomplishment Rate).
2. The PAR and SAR (Situational Accomplishment Rate) reports are automatically generated by SKED.
3. The MAR grade will be determined utilizing the formula reflected and a date range consisting of the previous 13 weeks of maintenance.

$$\text{MAR} = \text{PAR} (.5) + \text{SAR} (.5)$$

MAR = PAR (If Work Center holds no situational maintenance)

PAR = Completed Divided by (Completed + Lost + Alerts + Omitted)

SAR = Completed Divided by (Completed + Lost + Omitted)

4. Omitted is defined as any maintenance action that should have been performed on any and every maintenance item and no matter the reason did not get scheduled (e.g., Situational or State Maintenance that didn't get scheduled when the situation dictated, improperly lined out periodic checks, non-accomplished IEM checks, non-accomplished maintenance added via ACN, FBR, Preliminary PMS, etc.)

APPENDIX A5
SECTION IV
MAINTENANCE DATA SYSTEM (MDS)

APPENDIX A5 SECTION IV-A1

CURRENT MAINTENANCE PROJECT VALIDITY FACTOR (CVF) CHECKLIST

COMMAND	DEPARTMENT	DIVISION	WORK CENTER	DATE
General:				
Assessment Attributes				Value
CSMP Validity Raw Data				
1.	Number of TA-1 Work Candidates			
2.	Number of TA-2 Work Candidates			
3.	Number of TA-3 Work Candidates			
4.	Number of TA-4 Work Candidates			
5.	Total Work Candidates (WC) Sum of 1-4			
6.	Number of TA-2WC over 180 days old not reported to the ISIC			
7.	Number of TA-4WC over 180 days old not reported to the ISIC			
8.	Aged Work Candidates (WCO) Sum of 6-7			
9.	Material Correction Rate: WCO/3 (Aged TA-4) (#7/3)/#4 (percentage)			
10.	CSMP Validity review results from CVF Sheet Enter score from CVF Worksheet			
11.	Ship's Force WC over 7 days old that require parts and the parts are not approved.			
12.	Open Ship's Force WC over 30 days old, not up-lined to the Master CSMP.			
13.	Total Work Candidate Deficiencies (WCD) Sum (#11+#12)/#4 (percentage)			
14.	Work Candidate Multiple #10 -(#9 + #13)			
15.	Material deficiencies noted by MRC spot checks that were not documented in the CSMP			
16.	Deductions#15/#5 (percentage)			
17.	CSMP Validity Score #14 and #16			

CSMP Validity
☐ Above Standards ☐ At Standards ☐ Below Standards

Above Standards (90% or greater), At Standards (80-89%), Below Standards (less than 80%)

APPENDIX A5 SECTION IV-A2
CURRENT MAINTENANCE PROJECT VALIDITY FACTOR (CVF)
WORK CANDIDATE WORKSHEET

CSMP VALIDITY FACTOR (CVF) WORK CANDIDATE WORKSHEET												
COMMAND:						DATE:						
DEPARTMENT:		DIVISION:				WORK CENTER:						
JCN	EQUIPMENT	1	2	3	4	5	6	7	8	9	10	CVF
CVF	Average of all cells	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	A V G	AVG

CSMP entry was reviewed with the following results:		Score
1. Problem description adequate.		10
2. Recommended solution adequate.		10
3. Write-up reflects maintenance level assigned.		10
4. First (1 st) and Second (2 nd) contact person assigned.		10
5. Correct CSMP summary.		10
6. Correct Type of Availability (Maintenance Assignment) 1, 2, 3 or 4 Work Candidates.		10
7. Priority Code correct.		10

8. Write-up matches the Configuration Item and is written on the correct Configuration Item.	20
9. Were the correct special purpose or safety block selected with the correct values assigned? If selected, were the required Block 35 remarks present?	10
10. Does the work candidate reflect the current and correct status of the material deficiency? (physical verification, space walk-throughs, spot checks)	Yes or No
For attributes not required due to Class or Type differences, N/A attribute and recalculate total value of each field.	
Note: If item #10 is “NO”, the work candidate will be zero.	

NOTE: ENTER ONLY NUMERIC PORTION OF JSN AFTER ENSURING THAT DEPARTMENT AND WORK CENTER HEADER ARE FILLED IN.

APPENDIX A5
SECTION V
SKED 3.2 PROFICIENCY FACTOR (SPF)

APPENDIX A5 SECTION V-A

SKED 3.2 PROFICIENCY FACTOR (SPF) WORKSHEET

COMMAND		DEPARTMENT		DIVISION		WORK CENTER		DATE	
Individual Evaluated:						3M Billet Assigned:			
Proficiency Required						Proficiency Attribute		Yes or No	
WORK CENTER ACTIONS									
	MP	WC S	LCP O	DO	DH	3M C			
1	X	X	X	X	X	X	Able to log on.		
2	X	X	X	X	X	X	Able to open a Work Center.		
3	X	X	X	X	X	X	Able to view the Schedule, Review, Forecast, Situational, IEM, Journal and PMS Document displays.		
4	X	X	X	X	X	X	Able to annotate Disposition of Maintenance.		
5	X	X	X	X	X	X	Able to view Previous 13 weeks.		
6	X	X	X	X	X	X	Able to view Check Details.		
7	X	X	X	X	X	X	Able to view Component Row Properties.		
8		X	X	X	X	X	Able to update Spot Check results.		
9	X	X	X	X	X	X	Able to view and enter Check Note remarks.		
SCHEDULE ACTIONS									
10		X	X	X	X	X	Able to add, delete or modify MIPs/MRCs in Revision Mode.		
11		X	X			X	Able to perform MRC Lineout.		
12		X	X	X	X	X	Able to modify MRC line out justification.		
13			X	X		X	Able to approve MRC Lineout.		
14			X	X		X	Able to perform weekly closeout.		
15			X	X	X	X	Able to acknowledge PMS Alerts.		
16		X	X	X		X	Able to reschedule checks.		
17		X	X	X		X	Able to assign Maintenance Responsibilities.		
18		X	X			X	Able to modify Equipment Associations.		
19						X	Able to archive 13 weeks.		
EVENT LIST ACTIONS									
20		X	X			X	Able to create an Event List.		
21		X	X			X	Able to add checks to an Event List.		
22		X	X	X		X	Able to trigger a Local Event.		
23						X	Able to trigger a Global Event.		

FEEDBACK REPORT ACTIONS								
24		X				X	Able to generate a Feedback Report.	
25			X	X	X	X	Able to Review and Approve a Feedback Report.	
REVISION ACTIONS								
26			X	X		X	Able to Start a Revision.	
27			X	X	X		Able to Approve a Revision.	
28					X	X	Able to Finalize a Revision.	
REPORTS								
29		X	X	X	X	X	Able to generate or View PMS Reports.	
ADMINISTRATIVE ACTIONS								
30						X	Able to add Users.	
31			X	X	X	X	Able to edit Users.	
32			X	X		X	Able to disable Users.	
33			X	X	X	X	Able to View and Modify the Chain of Command.	
TOTALS								
	8	19	26	23	18	32	Divide Total Yes by Proficiency Required totals for the billet held by the individual.	Total Yes
SKED PROFICIENCY FACTOR								
	SAT = 85% or better						SPF (%):	
COMMENTS								

APPENDIX A5 SECTION V-AI**SKED 3.2 PROFICIENCY FACTOR (SPF) DESCRIPTION AND GRADING ATTRIBUTES****1. Able to log on.**

- a. Click on SKED 3.2 desktop icon.
- b. Enter user name and password.
- c. Click **“Enter”**.

2. Able to open a Work Center.

- a. On the view tab bar, click **“WORKCENTER”**. A box opens.
- b. Click to highlight the Work Center to **be** open.
- c. Click **“Open”** or double click the highlighted Work Center to open it.

3. Able to view the Schedule, Review, Forecast, Situational, IEM, Journal and PMS Document display.

- a. From the Work Center toolbar, click **“Schedule”**.
- b. From the Work Center toolbar, click **“Review”**.
- c. From the Work Center toolbar, click **“Forecast”**.
- d. From the Work Center toolbar, click **“Situational”**.
- e. From the Work Center toolbar, click **“IEM”**.
- f. From the Work Center toolbar, click **“Journal”**.
- g. From the Work Center toolbar, click **“PMS Documents”**.

4. Able to annotate Disposition of Maintenance. (Mark a check as complete etc.)

- a. From an open Work Center, in the grid, click to highlight the desired check.
- b. Right click the selected item and select the **“Complete (Green X) Check”** icon from the menu.
- c. The icon (Green X) will be displayed in the grid.
- d. To unmark the check, right click the same item and click the (Green X) again.

NOTE: WHEN THE PIN ACCOUNTABLIY FEATURE IS ENABLED, THE CREW MEMBER THAT WAS ASSIGNED THE MAINTANCE MUST BE PRESENT TO INPUT PIN WHEN WORK CENTER SUPERVISOR MARKS THE CHECK COMPLETE.

5. Able to Reschedule Checks. Checks that are manually added **or checks with a** periodicity **of weekly or greater.**

- a. From an open Work Center in the grid, right click a check, a menu will open.
- b. Scroll down to the **“Reschedule”** calendar icon and click it.

- c. A calendar opens with the originally scheduled date highlighted.
- d. Click the date for which the check **will be rescheduled**. **Only the white dates are available for the check to be rescheduled to.**
- e. Click **“Next”**. Click **“Finish”**.

NOTE: PER COMNAVIFOR 4790.1 A CHECK NOTE MUST BE ENTERED FOR RESCHEDULED, OUT OF PERIODICITY, NON-ACCOMPLISHED CHECKS.

6. Able to view previous 13 Weeks.

- a. From an open Work Center, in Schedule display view, on the Secondary tool bar, click on the **“Quarterly”** icon drop down arrow.
- b. Click one of the available quarters in the past to be reviewed.
- c. Once done reviewing, click on the **“Quarterly”** icon drop down arrow and select the current quarter.

7. Able to view Check Details.

- a. From an open Work Center, in Schedule display view, highlight a check in the grid and right click it.
- b. From the menu, select **“View Details”**.
- c. From the **“Check Details”** window, select the desired tab, such as General, SPMIG, MIP Document and MRC Document.
- d. Close when done.

8. Able to Update Spot Check Results.

- a. From an open Work Center, in Schedule display view, highlight a check that has been scheduled for a spot check. A circle with a yellow ✓ (check mark), is the spot check icon.
- b. Double click it.

NOTE: A SPOT CHECK MUST HAVE BEEN ALREADY ASSIGNED ON THE SCHEDULE.

- a. The check details box opens, select the **“Spot Checks”**, click on the **“Edit Spot Check”** icon and a spot check window displays.
- b. Fill in the scores of the spot check. **The task will be** in your task list.
- c. Double click the task to edit the spot check results.

9. Able to Schedule Spot Check.

- a. On the view bar tab, click **“SPOT CHECK”**.
- b. On the secondary tool bar, select **“Schedule Spot Check”**.
- c. The Spot Check Scheduling Wizard will appear. Click **“Next”**.
- d. Select **“Spot Check”**.

- e. Select the person that will be conducting the spot check, then click “Next”.
- f. Select the date the spot check will be conducted and the Work Center the spot check will be conducted in.
- g. Select the check, click “**Next**”.
- h. Review the information and click “**Finish**”.

10. Able to view and enter Check Note remarks.

- a. From an open Work Center, in Schedule display view; click to highlight the desired check.
- b. Right click the highlighted check.
- c. Select the “**Check Note**” icon from the menu.
- d. Enter your remarks (Lost, Not Applicable, Reschedule etc.).
- e. Click “**OK**”.

11. Able to add, delete or modify MIPs/MRCs in Revision Mode.

The Work Center must be put in revision mode, done by the LCPO (Step #25 LCPO or 3MC only). Procedures 12 through 16 are performed from the **Revision Editor**:

- a. Able to add a New MIP.
 - (1). On the Revision Editor Toolbar, click “**New MIP**” icon.
 - (2). The Add MIP dialog box opens.
 - (3). Select the MIP to be added to your Work Center.

NOTE: IF YOUR MIP IS NOT LISTED, ENTER THE MIP NUMBER IN THE BLANK PROVIDED IN THE LOWER PORTION OF THE SCREEN. THIS WILL ONLY BE AN ADMINISTRATIVE DOCUMENTATION, UNLESS THE NEW MIP IS IN THE FR DVD. CLICK OK. THE NEW MIP WILL BE GREEN

- b. Able to make a Maintenance Item active or inactive (Delete).
 - (1) Follow the MIP outline to the desired Maintenance Item and highlight it.
 - (2) On the toolbar, click the “**Make Active or Inactive**” icon. The Maintenance Item icon in the outline will become blue for active and gray for inactive. Clicking the button will toggle back and forth.

NOTE: MAKING A MAINTENANCE ITEM ACTIVE OR INACTIVE WILL AUTOMATICALLY MAKE ALL MRCS FOR THAT MAINTENANCE ITEM ACTIVE OR INACTIVE TO MATCH THE MAINTENANCE ITEM.

- c. Able to add MRCs (Same as add Cross MIP related MRCs). Follow the MIP outline to the desired Maintenance Item and highlight the item.
 - (1) On the toolbar, click the “**New MRC**” icon. The Add MRC wizard opens.
 - (2) Click “**Next**”.

- (3) Click the check box next to Check to select an MRC from the reference data. A check appears and the MIP Outline on the screen becomes active.
- (4) Follow the MIP Outline to the MREC to **be** add. Highlight the MRC and click “**Next**”.
- (5) Review the MRC details and make needed adjustments. Click “**Next**”.
- (6) Click “**Finish**” and the MRC is added to the Work Center’s MIP Outline.

NOTE: HE OR SHE CAN ALSO CHOOSE TO SKIP STEPS 4 AND 5. IN THIS CASE HE OR SHE NEEDS TO MANUALLY ENTER ALL DETAILS OF THE MRC IN STEP 6.

d. Able to modify the details of a Maintenance Item or MRCs.

- (1) Follow the MIP outline to the desired Maintenance Item or MRC and highlight the item.
- (2) Modify or add data in the white grids only on the right pane of the window. The Maintenance Item or MRC icon on the MIP Outline and the grid that **has** changed becomes yellow.

NOTE: “BOLD” TEXT INDICATES A STATUS CHANGE FOR THAT MRC. THE MRC SYSTEM COMMAND (SYSCOM) CONTROL NUMBERS (MRC CODE) MAY NOT BE EDITED. IF A REVISED DOCUMENT IS RECEIVED AS A RESULT OF AN FBR OR DIT REPLY, HE OR SHE MUST USE THE “ADD MRC” FUNCTION.

12. Able to perform MRC Lineout.

NOTE: DEPARTMENT HEADS MUST APPROVE LINEOUTS BEFORE THEY ARE PRINTED.

- a. From an open Work Center, click “**PMS Documents**”.
- b. Expand the appropriate MIP folder and follow the path to the MRC.
- c. On the secondary toolbar, click “**Customize MRC**”. The Customize MRC Document dialog box opens.
- d. Scroll through the MRC and double click and highlight the procedure lines that **are to be omitted**.
- e. To remove a lineout, double click the procedure line again.
- f. Type the notes to appear on the MRC in the Tools/Parts/Materials Custom Note field. Click “**OK**”.
- g. Your custom note is now part of the MRC and all of the icons in the organizational outline become red. **(not yet approved)**

13. Able to modify MRC line out justification.

- a. From an open Work Center, click the “**PMS Documents**” button on the top of the screen.
- b. Expand the MIP for the MRC that needs changes.

- c. Expand the tree for that MIP to get to the list of MRC(s) under that MIP.
- d. Highlight the MRC that needs modification.
- e. Click on the **“Pencil”** icon on the top left hand corner of the screen (this the “customize MRC” icon).
- f. A “Customize MRC Document” box will come up containing the MRC selected.
 - (1) Scroll through the MRC and click on the procedural steps that needs to be lined out. The affected procedural step will have a red line going through it. The red line indicates that the lineout has been performed but not yet approved. Lineouts approved by LCPO or higher turn the lineout from red to blue.
 - (2) In the Tools/Parts/Materials Custom Note on the bottom, refer to the specific procedural step lined out and provide detailed justification for lineout (e.g., Step 1.a.(2)(a) – Step omitted per FBR 2025-18).
 - (3) To reverse a lineout marked in red, click on the procedural step again. As long as the lineout is not yet approved, this will clear the lineout.

14. Able to approve MRC Lineout.

- a. “MY TASKS” displays MRCs that have custom review and omit lineouts which require lineout for a Work Center in your role in the chain of command. Since multiple users may belong to the same role in the chain of command, only one of the user’s needs to approve the lineout to remove it from everyone’s list. Lineouts appear in red, indicating they are not yet approved. When approving or disapproving lineouts, the requirement is to approve All or None of the lineouts. Partial lineouts are not allowed.
- b. Expand the Lineout approval list.
- c. Highlight the desired row.
- d. Double click the row; the Approve Customizations details screen displays for the selected item.
- e. On the “View Details” toolbar, click **“Approve and Close or Reject and Close”**. The task is removed from your “My Task” list.

15. Able to perform weekly closeout.

- a. From an open Work Center, on the “Toolbar”, click to open the Work Center menu.
- b. Scroll down to “Weekly Closeout” and click it. A window opens up, if there are no issues in the Work Center to resolve, the **“Close Out”** icon at the top of the window will be active.
- c. Select it and the week will be closed out.
- d. If there are issues, they must be resolved prior to the week being closed out.

16. Able to acknowledge PMS Alerts.

- a. “MY TASKS” displays PMS Alerts for MRCs that are out of periodicity. When PMS cannot be accomplished before going out of periodicity, the Work Center Supervisor must provide a reason, which should be specific and include well-defined details. The

chain of command, from the LCPO to the 3MC sees the alerts displayed in their “MY TASKS” list. Only one user needs to acknowledge the alert to remove it from everyone’s list.

- b. On the secondary toolbar at the top of the screen, click on “Tasks”.
- c. Expand the PMS Alert list.
- d. Highlight the desired row, double click it, or on the tool bar select “**VIEW DETAILS**” icon.
- e. Click “**OK**”.

NOTE: IF CANCEL IS SELECTED, THE PMS ALERT IS NOT ACKNOWLEDGED AND, THEREFORE NOT REMOVED FROM THE TASK LIST.

17. Able to Reschedule Checks. Checks that are manually added **or** reschedule checks when the periodicity is **weekly or greater**.

- a. From an open Work Center in the grid, right click a check, a menu will open.
- b. Scroll down to the “**Reschedule**” calendar icon and click it.
- c. A calendar opens with the originally scheduled date highlighted.
- d. Click the date the check **is to be rescheduled**. (**Only the white dates are available for the check to be rescheduled to.**)
- e. Click “**Next**”. Click “**Finish**”.

NOTE: PER COMNAVIFOR 4790.1 A CHECK NOTE MUST BE ENTERED FOR RESCHEDULED, OUT OF PERIODICITY, NON-ACCOMPLISHED CHECKS.

18. Able to perform Data Integrity and Periodicity Range checks.

- a. From the Review Display, view the PMS history for all Maintenance Items in a Work Center.
- b. Provide the next scheduled date in which maintenance should be performed again.
- c. Check the Review display to ensure maintenance is being performed as scheduled within the window of periodicity.
- d. View the maintenance tasks that are out of periodicity (i.e., maintenance not performed per the schedule).

19. Able to regenerate schedule.

- a. From an open Work Center, on the “Toolbar”, click to open the Work Center menu.
- b. Scroll down to “Regenerate Schedule” and click it. Answer the question about regenerating the schedule now.

20. Able to assign Maintenance Responsibilities.

- a. From an open Work Center, in Schedule display view.

- b. In the grid, click to highlight the desired check.
- c. On the “Toolbar”, click “**Assign Crew Member**” icon, or right click the desired check and select “Assign Crew” from the menu.
- d. Under the column heading for Crew Member, click the drop down arrow to view available crew members.
- e. Click the crewmember’s name.
- f. Click the small box to apply changes. A checkmark will appear in this box.
- g. Click “**OK**”.

21. Able to modify Equipment Associations.

- a. From an open Work Center, on the toolbar, click to open the Work Center menu.
- b. Select “Edit Equipment Details”.
- c. Follow the MIP outline to the desired Maintenance Item and highlight the item.
- d. Click the ellipses button in the SHIP RIN or CDM RIN row, which is found in the white grids. A dialog box will open. Use the drop down menus to locate criteria or enter search text. Click “**GO**”. Highlight the row of data needed. Click “**OK**”.
- e. Alternately, from the Revision Editor:
- f. Follow the MIP outline to the desired Maintenance Item and highlight the item.
- g. Click the ellipse button in the SHIP RIN or CDM RIN row, which is found in the white grids.
- h. A dialog box will open. Use the drop down menus to locate criteria or enter search i. text. Click “**GO**”. Highlight the row of data needed. Click “**OK**”.

22. Able to archive 13 weeks.

NOTE: THIS IS PERFORMED ONLY BY THE 3MC. ALL WORK CENTERS MUST BE UP TO DATE WITH THE LAST WEEK OF THE CURRENT QUARTER CLOSED OUT FOR THE QUARTER BEING ARCHIVED. WHEN THE 3MC ARCHIVES A QUARTER, A NEW QUARTER WILL BE CREATED.

- a. On the view tab bar, click “**ADMIN**”.
- b. From the “Admin” drop down on the top of screen, click “**Archive Quarter**”.
- c. If any Work Center has not closed out a week in the quarter being archived, a message will appear and the archive process will not be allowed to continue until close issues are resolved.

23. Able to view an Event List.

- a. Open the “EVENTS” tab at the bottom right of the SKED 3.2 program.
- b. A window opens up with a calendar.
- c. Click on “**Custom Events**” to view custom events.

24. Able to add checks to an Event List.

- a. Click “**Add Trigger**” on the toolbar. A dialog box opens.
- b. Select a trigger from the menu. Use the scroll bar to view all selections.
- c. Click the date the trigger **is** to occur. The trigger icon now displays on the EVENTS calendar.

25. Able to trigger a Local Event.

- a. From the Situational view, on the secondary toolbar, click Events.
- b. In the left pane, open the desired MIP outline.
- c. Click to highlight the Maintenance Item.
- d. Click the “**ADD TRIGGER**” icon to launch the Add Trigger Wizard.
- e. From the list, highlight a trigger. Then select the date for the trigger to occur.
- f. Click “**OK**”.

26. Able to trigger a Global Event.

NOTE: THIS IS PERFORMED ONLY BY THE 3MC.

27. Able to generate a Feedback Report.

NOTE: THERE ARE SEVERAL WAYS TO CREATE AN FBR IN SKED 3.2. THE FOLLOWING IS JUST ONE WAY OF DOING IT.

- a. From an open Work Center, highlight a check from the grid.
- b. On the Work Center toolbar menu, scroll down to “Submit Feedback Report” and click it.
- c. Select “**Technical MIP Changes** or **Technical MRC Changes**”.
- d. The Feedback Report Wizard opens.
- e. Several choices will be available for your selection. Choose one. Click “**Next**”.
- f. Enter any additional comments. Click “**Next**”.
- g. Your information will be displayed, if changes **are required**, click the back button or click “**Finish**”.

28. Able to Review **and Approve a Feedback Report.**

NOTE: THERE ARE SEVERAL WAYS TO CREATE AN FBR IN SKED 3.2. THE FOLLOWING IS JUST ONE WAY OF DOING IT.

- a. “My Tasks” displays Feedback Reports awaiting your review and approval.
- b. Expand the Feedback Report list.
- c. Highlight the desired row.
- d. Double-click the row, the Feedback Report Details block opens up.
- e. **The ability to** view, approve, modify, make urgent or reject the Feedback Report **is here**.

- f. The LCPO, DIVO, and DH must review and sign the FBR before it goes to the 3MC.

NOTE: THE 3MC CAN BYPASS THE COC IF REQUIRED TO GET THE FBR TRANSMITTED ASAP.

29. Able to Start a Revision.

NOTE: THE LCPO WILL PUT THE WC IN REVISION MODE FOR THE WCS.

- a. Open the Work Center, on the “Toolbar”, click to open the “Work Center” menu.
- b. Scroll down to “Start Revision” and click it. The Start Revision wizard opens.
- c. Click “**Next**”. The Start Revision dialog box opens.
- d. Select the Revision Type.
- e. Enter a valid Revision Name. Click “**Next**”.
- f. Provide a revision reason. A reason for starting a revision for anything other than an FR is required. Click “**OK**”, click “**Finish**”.
- g. The Revision editor will load and he or she should now be in **Revision Editor Mode**.

30. Able to Approve a Revision.

- a. “MY TASKS” displays revisions ready for approval.
- b. Expand the revision approval list. Highlight the desired row.
- c. Double click the row; The Revision Editor opens. Expand the path to the revision.
- d. On the toolbar, click “**Approve**” (Star icon)
- e. The Revision editor screen closes and is removed from your task list.

31. Able to Finalize a Revision.

- a. Same as paragraph 26, except that if performed by the DH or 3MC once they click on “**Approve**” (Star icon), is selected the revision is finalized.
- b. Revisions should be approved (signed) by the LCPO and DIVO before being approved by the DH. When the DH goes in to approve the revision, they will see a window indicating whether the revision was approved by the LCPO and DIVO. The DH can choose to approve the revision regardless.

32. Able to generate or View PMS Reports.

- a. Open the “REPORTS” tab at the bottom right of the SKED 3.2 program.
- b. A window opens up with two panes; the left-hand pane has all the reports available to view, the right-hand pane is blank, this is where your data will be displayed.
- c. Double click the report of your choice and follow the report wizard to display your requested data.

33 Able to add Users.

- a. Select the Admin tab (Last tab on the lower right).
- b. Select User Management from the top menu.

- c. Click “**Add User**” icon. The Edit User Details, New User dialog box opens.
- d. Enter pertinent information for the new user.
- e. Click the General, Feedback Reports, and Work Center tabs to check allowed permissions.

34. Able to edit Users.

- a. Select the Admin tab (Last tab on the lower right).
- b. Select User Management from the top menu.
- c. Highlight a crewmember from the display grid, and double click it.
- d. The User Details box opens.
- e. Update User information in the appropriate fields.
- f. Click “**OK**” to save changes.

35. Able to disable Users.

- a. Select the Admin tab (Last tab on the lower right).
- b. Select User Management from the top menu.
- c. Highlight a crewmember from the display grid, and double click it.
- d. The User Details box opens.
- e. Click the Status Field arrow. Select disabled.
- f. Click “**OK**” to save changes.

36. Able to View or Modify the Chain of Command.

- a. Select the Admin tab (Last tab on the lower right).
- b. Select Chain of Command from the top menu.
- c. A screen displays for the Activity and lists the User Name, Role, Rate, Last Name, First Name, and Signature.
- d. Click the plus sign at the far left to view by Department, Division, and Work Center.
- e. Select the “Edit Chain of Command” icon (top left corner, under File menu). An Edit Chain of Command display box opens up. Edit accordingly (add or delete) DH, DIVO, LCPO, or WCS.

APPENDIX A5 SECTION V-B

MAINTENANCE DATA SYSTEM PROFICIENCY FACTOR (MPF) WORKSHEET

COMMAND		DEPARTMENT				DIVISION	WORK CENTER	DATE
Individual Evaluated:						3-M Billet Assigned:		
Proficiency Required						Proficiency Attribute		Yes or No
	MP	RPPO	WCS	LCPO or DO	DH			
1	X	X	X	X	X	3-M PQS Qualification completed.		
2	X	X	X	X	X	Able to Log-on.		
CSMP ACTIONS								
3	X	X	X	X	X	Display Work Candidate or Maintenance Action.		
4	X	X	X	X		Add Work Candidate or Maintenance Action.		
5	X	X	X	X		Change Candidate or Maintenance Action.		
6	X	X	X	X		Close Work Candidate or Maintenance Action.		
CONFIGURATION MAINTENANCE ACTIONS								
7	X	X	X	X	X	Display Equipment File or Configuration Item.		
8			X	X		Report Installation of Equipment.		
9			X	X		Report Modification of Equipment File (to include Validation and WC Change)		
10			X	X		Report Removal of Equipment.		
SUPPLY REQUISITIONING								
11		X	X	X		Order Maintenance Parts from APL.		
12		X	X	X		Order Maintenance Parts not Listed.		
13		X	X	X		Order Non-Maintenance Related Items.		
14		X	X	X		Review Parts Ordered Status.		
15				X	X	Execute Parts Approval.		

PRINT REPORTS							
16			X	X		Validation Aid Report.	
17		X	X	X	X	CSMP Reports with Parts Status.	
REVIEW AND APPROVAL							
18			X	X	X	Review Work Candidate (Add, Mod, Complete).	
19			X	X	X	Review Configuration Item (Add, Mod, Delete).	
20			X	X	X	Review Work Related to Configuration Item.	
TOTALS							
	7	12	19	20	9	Divide Total Yes by Proficiency Required totals for the billet held by the individual.	Total Yes
						MPF (%)	

Comments:

SAT = 80% or better

APPENDIX A5
SECTION VI
COMMAND TOTAL SCORE (CTS)

APPENDIX A5 SECTION VI**3-M INSPECTION COMMAND TOTAL SCORE (CTS)**

1. The Command Total Score (CTS) is weighted 50% SCAR, 30% SEER, 10% MAR and 10% CLER.

$$\text{CTS} = (0.5 \times \text{SCAR}) + (0.3 \times \text{SEER}) + (0.1 \times \text{MAR}) + (0.1 \times \text{CLER})$$

2. Commands without an assigned 3MC (billeted or collateral) will determine their CTS as:

$$\text{CTS} = (0.5 \times \text{SCAR}) + (0.3 \times \text{SEER}) + (0.2 \times \text{MAR})$$

3. Evaluation criteria. The following criteria will be used:
 - a. Command's will be evaluated as "Above Standards" overall in 3-M if the unit's total score is 90% or higher.
 - b. Command's will be evaluated as "At Standards" overall in 3-M if the unit's total score is between 80% and 89.99%.
 - c. Command's will be evaluated as "Below Standards" overall in 3-M if the unit's total score is less than 80%.

16 Oct 2019

APPENDIX B
FORMAT FOR REPORTING 3-M INSPECTIONS

4790

Ser

Date

From: Accomplishing Activity
 To: Commanding Officer (Command Name and Hull Number (if applicable.)
 Subj: REPORT OF 3-M INSPECTION OF
 Ref: (a) NAVSEAINST 4790.8/OPNAVINST 4790.4; Ship's Maintenance and
 Material Management (3-M) Manual
 (b) COMUSFLTFORCOMINST 4790.3; Joint Fleet Maintenance Manual,
 Volume VI, Chapter 19
 Encl: (1) (as required)

1. **Per** references (a) and (b), a 3-M Inspection of (_____) was
 conducted during the period (Date) to (Date).

2. During this inspection, the following significant deficiencies were discovered:

a. (List)

Specific department and WC deficiencies are provided in enclosure(s) (1) through ().

3. The following overall ship or department numerical assessments are assigned:

a. 3-M Total Score _____

b. 3-M Inspection _____

(Above, At or Below Standards)

Copy to:

Immediate Superior In Command (with enclosures)

Type Commander (with enclosures)

APPENDIX C**LISTING OF STANDARD WORK CENTER CODES**

Appendix C _{1A}	Standard Work Center Codes for Naval Air Force Ships (CVN-68 Class)
Appendix C _{1B}	Standard Work Center Codes for Naval Air Force Ships (CVN-78 Class)
Appendix C ₂	Standard Work Center Codes for Naval Expeditionary Combat Command
Appendix C ₃	Standard Work Center Codes for Naval Submarine Force Ships
Appendix C ₄	Standard Work Center Codes for Naval Surface Force Ships and Shore Commands

APPENDIX C1A

STANDARD WORK CENTER CODES FOR NAVAL AIR FORCE SHIPS (CVN-68 CLASS)

WC CODE

1. Afloat Departmental Codes.

Safety	A
Command Religious Ministries	B
Combat Systems	C
Deck	D
Engineering	E
Security	F
Graphics Media	G
Aviation Intermediate Maintenance Department (AIMD)	I
Legal	L
Dental	MD
Medical	MH
Navigation	N
Operations	O
Reactor	R
INTEL (when assigned)	Q
Supply	S
Training	T
Air	V
Weapons	W
Administration	X
Airwing (when assigned)	Z

2. Afloat Professional WC Codes.

a. <u>Safety Department.</u>	AS01
b. <u>Command Religious Ministries Department.</u>	BC01
c. <u>Combat Systems Department Administration.</u>	CS00
Information Branch	
Telecommunications Division Administration	CS10
Message Processing/ADNS/NAVMACS	CS11
Tech Control/Antenna	CS12
Information Network Security Division Administration	CS20
Information Systems Security	CS21
Information Network Systems Division Administration	CS30
Unclassified Appts/Hardware/Lan/PC Repair	CS31
Classified Appts/Hardware/Lan/CVDS/VIDS	CS32
NTCSS/NIAPS/OOMA	CS33
INTEL Systems Maintenance (includes SCI, GCCS-M, TBMCS and DCGS-N)	CS34
Machinery Control System Maintenance	CS35

WC CODE

	Tactical Data Systems Division	CS50
	Administration	
	C2/Display Systems Maintenance (includes SSDS, CEC, BFTT, TMPC and OSCOT)	CS51
	Data Systems Maintenance (includes ADMACS and DCRS)	CS53
	2-M Repair/Fiber Optic Repair	CS54
	Tactical Data Links (includes CDLMS, ADSI, SGS, CDLS, LMMT, MIDS, VIG, URC-93, MOS and VCE)	CS55
	Radar Division Administration	CS60
	Air Traffic Control	CS61
	Surface Search/Air Search/IFF	CS62
	Navigation/Nav aids (includes AIS, PLGR, DAGR, NCDS)/Gyro	CS63
	Meteorology	CS64
	Test Equipment	CS65
	CS Department Tool, MOBI and Harness Issue	CS66
	Self Defense Weapons Division	CS70
	Administration	
	CIWS	CS71
	RAM	CS72
	NSSMS	CS73
	SPQ-9B	CS74
	IC Systems Division Administration	CS80
	SITE-TV/CVDS/VIDS	CS81
	Telephone	CS82
	Announcing Systems	CS83
	Alarm/Sensors/MCSS/IC Switchboards	CS84
	External Communications Repair Division	CS90
	Administration	
	HF/LOS/SATCOM Systems	CS91
	Peripherals/NAVMACS/Crypto	CS92
	Equip/SATCC	
	HYDRA/Portable Communication (includes PRCs)	CS93
d.	<u>Deck Department Administration.</u>	DX00
	1st Division	DA01
	2nd Division	DB02
	3rd Division	DC03
e.	<u>Engineering Department Administration.</u>	EX00
	Auxiliaries Division Administration	EA00
	Hydraulics	EA01

WC CODE

Steam Heat/Galley/Laundry	EA02
Air Conditioning & Refrigeration	EA03
Oxygen & Nitrogen	EA06
Boats	EA07
Outside Repair	EA08
Catapult Steam	EA10
Filter Shop	EA11
Waste Management	EA14
Damage Control Division Administration	ED00
Damage Control Training	ED01
Chemical/CBR-D	ED02
Damage Control Systems	ED03
SCBA/BARS/SAR-SCBA/EBACS/Gas Free	ED04
Damage Control Repair Stations	ED05
Electrical Division Administration	EE00
Lighting/Battery Shop	EE01
Rewind	EE02
Power (Non-nuclear)/General	EE03
Hotel Services	EE04
Electrical Safety	EE20
Repair Division Administration	ER00
General Work Shop	ER01
Carpenter	ER02
Pipe Shop/Marine Sanitation Device (MSD)	ER03
Machine Shop/Locksmith	ER04
Maintenance Division Administration	PM00
3-M	PM01
MSC	PM02
Quality Assurance (QA)	PM03
f. <u>Security Department Administration.</u>	FS00
Ship's Security Force	FS01
Force Protection	FS02
Brig	FS03
g. <u>Graphics Media Department Administration.</u>	GM00
PAO	GM11
Photo Shop	GM12
Print Shop	GM13
h. <u>AIMD Department Administration.</u>	IM00
PC/QA division (NALCOMIS reported equipment)	IM01
Mechanical Repairs	IM02
Avionics	IM03
Ground Support	IM04

WC CODE

	Field Calibration Activity	FCA1
i.	<u>Legal Department.</u>	LN01
j.	<u>Health Services.</u>	
	Dental Department	MD01
	Medical Department	MH01
k.	<u>Navigation Department.</u>	NN01
l.	<u>Operations Dept Administration.</u>	OX00
	Air Ops/CATCC	OC01
	Security Department Administration.	OF00
	Ship's Security Force	OF01
	Force Protection	OF02
	Brig	OF03
	CDC	OI01
	Undersea Warfare/Acoustics	OM01
m.	INTEL Department Administration (when assigned)	QZ00
	SSES	QC01
	Meteorological	QO01
	EW Maintenance	QW01
	PCMS	QW02
	Intelligence	QZ01
n.	<u>Reactor Department Administration.</u>	RX00
	Reactors Auxiliaries Division Administration	RA00
	Emergency Diesels	RA01
	Reactor Controls Division Administration	RC00
	#1 Reactor Plant	RC11
	#1 Reactor Plant (Non-Nuclear)	RC12
	#2 Reactor Plant	RC21
	#2 Reactor Plant (Non-Nuclear)	RC22
	Reactor Instrumentation and Maintenance	RC30
	Reactor Electrical Division Administration	RE00
	#1 Reactor Plant	RE11
	#1 Reactor Plant (Non-Nuclear)	RE12
	#2 Reactor Plant	RE21
	#2 Reactor Plant (Non-Nuclear)	RE22
	Tool Issue and Technical Support	RE30
	Reactor Laboratory Division Administration	RL00
	#1 Reactor Plant	RL11
	#1 Reactor Plant (Non-Nuclear)	RL12
	#2 Reactor Plant	RL21
	#2 Reactor Plant (Non-Nuclear)	RL22

WC CODE

	Dosimetry	RL30
	Reactor Mechanical Division Administration	RM00
	#1 Reactor Room	RM11
	#1 Reactor Room (Non-Nuclear)	RM12
	#2 Reactor Room	RM21
	#2 Reactor Room (Non-Nuclear)	RM22
	Technical Support	RM30
	Reactor Propulsion Division Administration	RP00
	#1 Main Machinery Room	RP01
	#2 Main Machinery Room	RP02
	Shaft Alley/Reboiler/Oily Waste	RP05
	Technical Support	RP30
	Reactor Training Division Administration	RT00
	o. <u>Supply Department Administration.</u>	SS00
	S-1 Stock Control	SS01
	S-2 Food Services	SS02
	S-3 Retail Operations	SS03
	S-4 Disbursing	SS04
	S-5 Hotel Services	SS05
	S-6 Aviation Support	SS06
	S-7 Morale, Welfare and Recreation	SS07
	S-8 Material	SS08
	S-8A Hazardous Material	SS09
	S-10 Supply Quality Assurance	SS10
	S-11 CPO Mess	SS11
	S-1A Customer Service (Post Office)	SS12
	S-13 Supply Department 3M/DC	SS13
	p. <u>Training Department.</u>	TX01
	q. <u>Air Department Administration.</u>	VV00
	V1 Division Administration	VA00
	Flight Deck	VA01
	Crash and Salvage	VA02
	V2 Division Administration	VB00
	#1 Catapult	VB01
	#2 Catapult	VB02
	#3 Catapult	VB03
	#4 Catapult	VB04
	#1 Arresting Gear	VB05
	#2 Arresting Gear	VB06
	#3 Arresting Gear	VB07
	#4 Arresting Gear (#3A CVN-76 Class)	VB08
	Barricade	VB09
	Improved Fresnel Lens Optical Landing System (IFLOLS)	VB10

WC CODE

Integrated Launch and Recovery Television System (ILARTS)	VB11
Flight Deck Lighting	VB12
Maintenance Control	VB20
QA	VB21
Maintenance Support	VB22

V3 Division Administration.	VC00
Hanger Deck	VC01

V4 Division Administration.	VF00
JP-5 Hanger Deck/Flight Maintenance	VF01
JP-5 Below Deck Equipment Maintenance	VF02
EM and IC Repair	VF03
JP-5 QA/Testing Lab	VF04

V5 Division Administration.	VX00
PRIFLY	VX01

r. <u>Weapons Department Administration.</u>	WG00

Weapons Handling G1 Division	WG01
Ship's Armory G2 Division	WG02
Weapons Magazine G3 Division	WG03
Weapons Elevator G4 Division	WG04
Weapons Control G5 Division	WG05
Weapons Electrical Tool Issue	WG20

s. <u>Administration Department.</u>	

CO's Admin	XX01
XO's Admin	XX02
Administration	XX03
Personnel	XX04
Special Assistants - ESO/CCC/CMC/DAPA/EOA	XX05

Flag/Embarked Staff	XF01

t. <u>Airwing (when assigned).</u>	

CAG	ZW00
Reserved for Assignment to Embarked Airwings	ZW01 thru ZW11

3. Afloat Damage Control WC Codes.

a. <u>Safety Department DC.</u>	AS40
b. <u>Command Religious Ministries Department DC.</u>	BC40
c. <u>Combat Systems Department DC (note 1).</u>	CS40

WC CODE

	Telecommunications Division DC	CS41
	Network Information Security DC	CS42
	ADP Division DC	CS43
	Data Systems Division DC	CS45
	Radar Division DC	CS46
	Self Defense Weapons Division DC	CS47
	IC Systems Division DC	CS48
	External Communications Repair Division DC	CS49
d.	<u>Deck Department DC</u> (note 1).	DX40
	1st Division DC	DA40
	2nd Division DC	DB40
	3rd Division DC	DC40
e.	<u>Engineering Department DC</u> (note 1).	EX40
	Auxiliaries Division DC	EA40
	Damage Control Division DC	ED40
	Electrical Division DC	EE40
	Repair Division DC	ER40
	Maintenance Department DC	PM40
f.	<u>Security Department DC.</u>	FS40
g.	<u>Graphics Media Department DC.</u>	GM40
h.	<u>AIMD Department DC</u> (note 1).	IM40
	IM1 Division DC	IM41
	IM2 Division DC	IM42
	IM3 Division DC	IM43
	IM4 Division DC	IM44
i.	<u>Legal Department DC.</u>	LN40
j.	<u>Health Services.</u>	
	Dental Department DC	MD40
	Medical Department DC	MH40
k.	<u>Navigation Department DC.</u>	NN40
l.	<u>Operations Department DC</u> (note 1).	OX40
	OC Division DC	OC40
	OF Division/Department DC	OF40
	OI Division DC	OI40
	OM Division DC	OM40
m.	Intelligence Department DC	QZ40
	Meteorological Division DC	QO40
	SSES Division DC	QC40

WC CODE

	Electronic Warfare Division DC	QW40
	n. <u>Reactor Department DC.</u>	RX40
	o. <u>Supply Department DC</u> (note 1).	SS40
	S-1 Stock Control	SS41
	S-2 Food Services	SS42
	S-3 Retail Operations	SS43
	S-4 Disbursing	SS44
	S-5 Hotel Services	SS45
	S-6 Aviation Support	SS46
	S-7 Morale, Welfare and Recreation	SS47
	S-8 Material	SS48
	S-8A Hazardous Material	SS49
	S-10 Supply Quality Assurance	SS50
	S-11 CPO Mess	SS51
	S-1A Customer Service (Post Office)	SS52
	p. <u>Training Department DC.</u>	TX40
	q. <u>Weapons Department DC</u> (note 1).	WG40
	G1 Division DC	WG41
	G2 Division DC	WG42
	G3 Division DC	WG43
	G4 Division DC	WG44
	G5 Division DC	WG45
	r. <u>Air Department DC</u> (note 1).	VV40
	V1 Division DC	VA40
	V2 Division DC	VB40
	V3 Division DC	VC40
	V4 Division DC	VF40
	V5 Division DC	VX40
	s. <u>Administration Department DC.</u>	XX40

NOTE 1: DAMAGE CONTROL (DC) WORK CENTERS ARE ASSIGNED AT THE DIVISION LEVEL, THEREFORE, THE DEPARTMENT WORK CENTER IS USUALLY NOT APPLICABLE. WHEN AUTHORIZED BY THE COMMANDING OFFICER TO COMBINE DIVISION DC WORK CENTERS AT THE DEPARTMENTAL LEVEL, THE DIVISION WORK CENTER IS NOT APPLICABLE.

4. Afloat Maintenance Availability WC Codes.

- a. Ship Alteration (N/A for Ship's Force, used by TYCOM for planning purposes).

Combat Systems SCD	CSSA
Deck Department SCD	DXSA
Engineering Department SCD	EXSA
Security Department SCD	FSSA

WC CODE

Graphics Media Department SCD	GMSA
AIMD SCD	IMSA
Health Services Department SCD	MXSA
Navigation Department SCD	NNSA
Operations Department SCD	OXSA
INTEL SCDs	QXSA
Nuclear Alteration Administration	RXFC
Reactor Department SCD	RXSA
Reactor Department TYCOM Alts	RXTY
Supply Department SCD	SSSA
Air Department SCD	VXSA
Weapons Department SCD	WGSA

b. Availability Maintenance Teams.

Work Control	PM10
Habitability	PM11
Paint	PM12
Deck	PM13
Valve Barge	PM14
Vent Cleaning	PM15
Tank and Void	PM16
Cable Way	PM17
Door Repair	PM18
GSE	PM19
Lagging	PM20
Joiner Door Repair	PM21
Ladder Repair	PM22
Electrical Repair	PM23
Fan Room Restoration	PM24
LIFAC	PM25
Plenum Repair	PM26
Matting	PM27
Interior Communications	PM28
Head Repair	PM29
Damage Control	PM30
Island Painting	PM31
JP-5	PM32

APPENDIX C1B

STANDARD WORK CENTER CODES FOR NAVAL AIR FORCE SHIPS (CVN-78 CLASS)

	<u>WC CODE</u>
1. Afloat Departmental Codes.	
Safety	A
Command Religious Ministries	B
Combat Systems	C
Deck	D
Engineering	E
Security	F
Graphics Media	G
Aviation Intermediate Maintenance Department (AIMD)	I
Legal	L
Dental	MD
Medical	MH
Navigation	N
Operations	O
Intel (when assigned)	Q
Reactor	R
Supply	S
Training	T
Air	V
Weapons	W
Administration	X
Airwing (when assigned)	Z
2. Afloat Professional WC Codes.	
a. <u>Safety Department.</u>	AS01
b. <u>Command Religious Ministries Department.</u>	BC01
c. <u>Combat Systems Department Administration.</u>	CS00
Telecommunications Division Administration	CS10
Message Processing	CS11
Tech Control	CS12
Information Sys Security/Assurance/EKMS	CS13
Information Resources Divisional ADMIN	CS20
Unclassified Appts/Hardware/LAN CANES	CS21
Classified Appts/Hardware/LAN CANES	CS22
SCI Networks(SESS)	CS23
Data Systems Division Administration	CS50
C2/Display Systems/SSDS/CEC/GCCS-M	CS51
Equipment	
Tactical USW Systems Maintenance (CV-TSC)	CS52
INTEL Systems Maintenance	CS53
2-M Repair/Fiber Optic Repair	CS54
Tactical Data Links	CS55

	<u>WC CODE</u>
Radar Division Administration	CS60
Air Traffic Control	CS61
Dual Band Radar/SPS-73 Surface Search Radar	CS62
IFF/TACAN/Electromagnetic Compatibility	CS63
Meteorology(NITES, MORIAH)	CS64
Test Equipment/Tool Issue	CS65
Self Defense Weapons Division Administration	CS70
CIWS	CS71
RAM	CS72
NSSMS	CS73
External Communications Repair Division Administration	CS90
HF/LOS/SATCOM Systems (NMT, Flight Deck Comms, CBSP, HF Antennas)	CS91
Peripherals/NAVMACS/Crypto Sys/HYDRA/TVS/Announcing Systems	CS92
SITE-TV/CCTV(All 27 TV Systems)	CS93
Telephones/Alarms	CS94
	CS95
d. <u>Deck Department Administration.</u>	DX00
1st Division	DA01
2nd Division	DB02
3rd Division	DC03
e. <u>Engineering Department Administration.</u>	EX00
Auxiliaries Division Administration	EA00
Hydraulics	EA01
Steam Heat/Galley/Laundry	EA02
Air Conditioning & Refrigeration	EA03
Oxygen & Nitrogen	EA06
Boats	EA07
Outside Repair	EA08
Waste Management	EA14
Damage Control Division Administration	ED00
Damage Control Training	ED01
Chemical/CBR-D	ED02
Damage Control Systems	ED03
SCBA/BARS/SAR-SCBA/EBACS/Gas Free	ED04
Damage Control Repair Stations	ED05
Electrical Division Administration	EE00
Lighting/Battery Shop	EE01
Rewind	EE02
Power (Non-nuclear)/General	EE03
Hotel Services	EE04
IC Repair	EE05
Electrical Safety	EE20

	<u>WC CODE</u>
Repair Division Administration	ER00
General Work Shop	ER01
Pipe Shop/VCHT	ER03
Machine Shop/Locksmith	ER04
Maintenance Division Administration	PM00
3-M	PM01
MSC	PM02
Quality Assurance (QA)	PM03
f. <u>Graphics Media Department Administration.</u>	GM00
PAO	GM11
Photo Shop	GM12
Print Shop	GM13
g. <u>Security Department Administration.</u>	FS00
Ship's Security Force	FS01
Force Protection	FS02
Brig	FS03
h. <u>AIMD Department Administration.</u>	IM00
PC/QA division (NALCOMIS reported equipment)	IM01
Mechanical Repairs	IM02
Avionics	IM03
Ground Support	IM04
Field Calibration Activity	FCA1
i. <u>Legal Department.</u>	LN01
j. <u>Dental Department.</u>	MD01
k. <u>Medical Department.</u>	MH01
l. <u>Navigation Department.</u>	NN01
m. <u>Operations Dept Administration.</u>	OX00
Meteorological	OA01
Air Ops/CATCC	OC01
CDC	OI01
Undersea Warfare/Acoustics	OM01
n. INTEL Department Administration (when assigned)	QZ00
SSES	QC01
Meteorological	QO01
EW Maintenance	QW01
PCMS	QW02

	<u>WC CODE</u>
Intelligence	QZ01
o. Reactor Department Administration.	RX00
Reactors Auxiliaries Division Administration	RA00
FWD Emergency Diesels	RA01
AFT Emergency Diesels	RA02
Shaft Alley & OWS(CVN-78)	RA05
Reactor Controls Division Administration	RC00
#1 Propulsion Plant	RC11
#2 Propulsion Plant	RC21
Reactor Instr. and Maint.	RC30
PPLAN/PPMC/TPL	RC31
Reactor Electrical Division Administration	RE00
#1 Propulsion Plant	RE11
#2 Propulsion Plant	RE21
Reactor Electrical Tool Issue	RE30
Reactor Laboratory Division Administration	RL00
#1 Propulsion Plant	RL11
#2 Propulsion Plant	RL21
Dosimetry	RL30
Reactor Mechanical Division Administration	RM00
#1 Propulsion Plant	RM11
#2 Propulsion Plant	RM21
Technical Support	RM30
Reactor Networking Division Administration	RN00
#1 Propulsion Plant	RN11
#2 Propulsion Plant	RN21
Reactor Training Division Administration	RT00
Student Training	RT01
p. Supply Department Administration.	SS00
S-1 Stock Control	SS01
S-2 Food Services	SS02
S-3 Retail Operations	SS03
S-4 Disbursing	SS04
S-5 Hotel Services	SS05
S-6 Aviation Support	SS06
S-7 Morale, Welfare and Recreation	SS07
S-8 Material	SS08
S-8A Hazardous Material	SS09
S-10 Supply Quality Assurance	SS10
S-11 CPO Mess	SS11
S-1A Customer Service (Post Office)	SS12
S-13 Supply Department 3M/DC	SS13

	<u>WC CODE</u>
q. <u>Training Department.</u>	TX01
r. <u>Air Department Administration.</u>	VV00
V1 Division Administration	VA00
Flight Deck	VA01
Crash and Salvage	VA02
V2 Division Administration	VB00
#1 Catapult	VB01
#2 Catapult	VB02
#3 Catapult	VB03
#4 Catapult	VB04
#1 Arresting Gear	VB05
#2 Arresting Gear	VB06
#3 Arresting Gear	VB07
#4 Arresting Gear	VB08
Barricade	VB09
Improved Fresnel Lens Optical Landing System (IFLOLS)	VB10
Integrated Launch and Recovery Television System (ILARTS)	VB11
Flight Deck Lighting	VB12
Maintenance Control	VB20
QA	VB21
Maintenance Support	VB22
V3 Division Administration.	VC00
Hanger Deck	VC01
V4 Division Administration.	VF00
JP-5 Hanger Deck/Flight Maintenance	VF01
JP-5 Below Deck Equipment Maintenance	VF02
EM and IC Repair	VF03
JP-5 QA/Testing Lab	VF04
V5 Division Administration.	VX00
PRIFLY	VX01
s. <u>Weapons Department Administration.</u>	WG00
Division Flight Deck/Hanger Deck/AWSEP	WG01
Division Armory/Sprinklers	WG02
Division Weapons Assembly	WG03
Division Elevators/Forklifts	WG04
Division Admin/AWMCS/QA/Safety	WG05
Weapons Electrical Tool Issue	WG20
t. <u>Administration Department.</u>	
CO's Admin	XX01
XO's Admin	XX02
Administration	XX03

	<u>WC CODE</u>
Personnel	XX04
Special Assistants -	XX05
ESO/CCC/CMC/DAPA/EOA	
Flag/Embarked Staff	XF01
u. <u>Airwing</u> (when assigned).	
CAG	ZW00
Reserved for Assignment to Embarked	ZW01 thru ZW11
Airwings	
3. Afloat Damage Control WC Codes.	
a. <u>Safety Department DC.</u>	AS40
b. <u>Command Religious Ministries Department DC.</u>	BC40
c. <u>Combat Systems Department DC</u> (note 1).	CS40
Telecommunications Division DC	CS41
Network Information Security DC	CS42
Data Systems Division DC	CS45
Radar Division DC	CS46
Self Defense Weapons Division DC	CS47
External Communications Repair Division DC	CS49
d. <u>Deck Department DC</u> (note 1).	DX40
1st Division DC	DA40
2nd Division DC	DB40
3rd Division DC	DC40
e. <u>Engineering Department DC</u> (note 1).	EX40
Auxiliaries Division DC	EA40
Damage Control Division DC	ED40
Electrical Division DC	EE40
Repair Division DC	ER40
Maintenance Division DC	PM40
f. <u>Security Department DC.</u>	FS40
g. <u>Graphics Media Department DC.</u>	GM40
h. <u>AIMD Department DC</u> (note 1).	IM40
IM1 Division DC	IM41
IM2 Division DC	IM42
IM3 Division DC	IM43
IM4 Division DC	IM44

	<u>WC CODE</u>
i. Legal Department DC.	LN40
j. <u>Dental Department DC.</u>	MD40
k. <u>Medical Department DC.</u>	MH40
l. <u>Navigation Department DC.</u>	NN40
m. <u>Operations Department DC</u> (note 1).	OX40
OA Division DC	OA40
OC Division DC	OC40
OI Division DC	OI40
OM Division DC	OM40
n. INTEL Department DC	QZ40
SSes Division DC	QC40
Meteorological Division DC	QO40
Electronic Warfare Division DC	QW40
o. <u>Reactor Department DC.</u>	RX40
p. <u>Supply Department DC</u> (note 1).	SS40
S-1 Stock Control	SS41
S-2 Food Services	SS42
S-3 Retail Operations	SS43
S-4 Disbursing	SS44
S-5 Hotel Services	SS45
S-6 Aviation Support	SS46
S-7 Morale, Welfare and Recreation	SS47
S-8 Material	SS48
S-8A Hazardous Material	SS49
S-10 Supply Quality Assurance	SS50
S-11 CPO Mess	SS51
S-1A Customer Service (Post Office)	SS52
q. <u>Training Department DC.</u>	TX40
r. <u>Weapons Department DC</u> (note 1).	WG40
G1 Division DC	WG41
G2 Division DC	WG42
G3 Division DC	WG43
G4 Division DC	WG44
G5 Division DC	WG45
s. <u>Air Department DC</u> (note 1).	VV40
V1 Division DC	VA40
V2 Division DC	VB40
V3 Division DC	VC40
V4 Division DC	VF40

	<u>WC CODE</u>
V5 Division DC	VX40
t. <u>Administration Department DC.</u>	XX40

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4. Afloat Maintenance Availability WC Codes.

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Deck Department SCD	DXSA
Engineering Department SCD	EXSA
Security Department SCD	FSSA
AIMD SCD	IMSA
Health Services Department SCD	MXSA
Navigation Department SCD	NNSA
Operations Department SCD	OXSA
INTEL SCDs	QXSA
Nuclear Alteration Administration	RXFC
Reactor Department SCD	RXSA
Reactor Department TYCOM Alts	RXTY
Supply Department SCD	SSSA
Air Department SCD	VXSA
Weapons Department SCD	WGSA
Graphics Media Department SCD	GMSA

- b. Availability Maintenance Teams.

Work Control	PM10
Habitability	PM11
Paint	PM12
Deck	PM13
Valve Barge	PM14
Vent Cleaning	PM15
Tank and Void	PM16
Cable Way	PM17
Door Repair	PM18
GSE	PM19
Lagging	PM20
Joiner Door Repair	PM21
Ladder Repair	PM22
Electrical Repair	PM23
Fan Room Restoration	PM24
LIFAC	PM25
Plenum Repair	PM26
Matting	PM27
Interior Communications	PM28

	<u>WC CODE</u>
Head Repair	PM29
Damage Control	PM30
Island Painting	PM31
JP-5	PM32

APPENDIX C₂**STANDARD WORK CENTER CODES FOR NAVAL EXPEDITIONARY COMBAT
COMMAND**

Appendix C ₂ A	Standard Work Center Codes for Explosive Ordinance Disposal Units
Appendix C ₂ B	Standard Work Center Codes for Mobile Diving and Salvage Units
Appendix C ₂ C	Standard Work Center Codes for EOD Training Evaluation Units
Appendix C ₂ D	Standard Work Center Codes for Mobile Security Squadrons/Navy Coastal Warfare Squadrons
Appendix C ₂ E	Standard Work Center Codes for RIVERINE Squadrons
Appendix C ₂ F	Standard Work Center Codes for Navy Mobile Construction Battalions
Appendix C ₂ G	Standard Work Center Codes for SEABEE Readiness Group
Appendix C ₂ H	Standard Work Center Codes for Construction Battalion Mobile Units
Appendix C ₂ I	Standard Work Center Codes for Underwater Construction Teams
Appendix C ₂ J	Standard Work Center Codes for Navy Mobile Construction Battalions Forward Headquarters
Appendix C ₂ K	Standard Work Center Codes for Naval Construction Force FWD Detachments
Appendix C ₂ L	Standard Work Center Codes for Navy Expeditionary Logistics Support Group
Appendix C ₂ M	Standard Work Center Codes for Navy Cargo Handling Battalion ONE

NOTES:

1. It is recommended all units under COMNECC develop a tool room or shop for maintenance and distribution of tools used for maintenance.
2. Some units are not large enough to incorporate three different Communication Work Centers. In such cases, all aspects of Information Technology will be incorporated into one Work Center (CS02).
3. All detachments that serve a specific purpose as listed in this instruction **must** use the first two letters as indicated in Appendices C₂A through C₂M and the first two numbers of the detachment provided it is not duplicated within the same Unit Identification Code.
4. Shore Detachments assigned outside the continental United States **must** use the two-letter country code in which they are located and the first two numbers of the detachment or unit number. Detachments within the United States **must** use appropriate designator identified within this Appendix.
5. Multiple boat and service craft Work Centers **must** use concurrent numbering to identify follow on Work Centers of the same type (e.g., CA01, CA02, etc.).

APPENDIX C₂A

STANDARD WORK CENTER CODES FOR EXPLOSIVE ORDNANCE DISPOSAL UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
<u>Supply Department</u>		SUPP	ALL
	Supply Division	SS01	ALL
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Weapons Department</u>		WG00	
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	
<u>Maintenance Department</u>		AA00	
	Maintenance Division	AA01	
	Builder Shop	MR01	ALL
	CESE/Vehicles	AL01	ALL
	Dispatch	AO01	ALL
	Boat Shop Division	DA01	ALL
	Utility Craft	CU01	NOTE 5
	Small Boats (Inflatable)	CR01	ALL
	Repair (Hull/Fabrication/ Welding)	ER01	ALL
	Electric Shop	EE01	ALL
	Engineering DC	ER02	ALL
	Equipment		
	Engine Shop	EA01	ALL
<u>Readiness and Training</u>		TT00	
	Training Division	TT01	ALL
	Dive Locker Division	DV01	ALL
	Dive Work Center	DC01	ALL
	Dive Chamber Systems Division	DS01	ALL
	Dive Systems Work Center	DS02	Fly Away
	Recompression Chamber	DC01	A/R

STANDARD WORK CENTER CODES FOR EXPLOSIVE ORDNANCE DISPOSAL UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
	Air Operations	VA01	A/R
<u>Communication Department</u>		CS00	ALL
	Communications Division	CS01	NOTE 2
	Radio Work Center	CS02	A/R
	ADP Center	CS03	A/R
	ET Shop	CS04	A/R
<u>Operations Department/ Detachments</u>			NOTE 3
	EOD DET	EX##	ALL
	EOD Equipment	EO##	A/R
	Dive Equipment	DV##	A/R
	FADL	DL01	ALL
	Magnetometer	DM01	ALL
	Shore DETS		NOTE 4
	Mine Counter Measures	MC##	A/R
	Combat Expeditionary Support	CE##	A/R
	Special Operation Force	SF##	A/R
	Underwater/IED	UD##	A/R
	Surface/IED	SD##	A/R
	Chemical NUC	CZ##	A/R
	Mobile Ashore Support Team	RS02	ALL

APPENDIX C₂B

STANDARD WORK CENTER CODES FOR MOBILE DIVING AND SALVAGE UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
<u>Supply Department</u>		SUPP	ALL
	Supply Division	SS01	ALL
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	A/R
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Weapons Department</u>		WG00	ALL
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	A/R
<u>Maintenance/Support Department</u>		AA00	ALL
	Maintenance Division	AA01	ALL
	CESE/Vehicles	AL01	ALL
	Dispatch	AO01	ALL
	Boat Shop (Deck)	DA01	ALL
	Small Boats (Inflatable)	DB01	ALL
	Repair (Hull/Fabrication/ Welding)	ER01	ALL
	Engineering DC	ER02	ALL
	Equipment	EA01	ALL
	Engine Shop	EA01	ALL
	Salvage Gear (Yellow Gear)	SG01	ALL
<u>Readiness and Training</u>			
	Chamber Systems	DS01	ALL
<u>Operations Department/ Detachments</u>			
	Detachment 2 (LANT)	SE02	
	Detachment 3 DV (PAC)	SE03	
	Detachment 3 SL (PAC)	SE33	
	Detachment 4 (LANT)	SE04	

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STANDARD WORK CENTER CODES FOR MOBILE DIVING AND SALVAGE UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
	Detachment 5 DV (PAC)	SE05	
	Detachment 5 SL (PAC)	SE55	
	Detachment 6 (LANT)	SE06	
	Detachment 7 DV (PAC)	SE07	
	Detachment 7 SL (PAC)	SE77	
	Detachment 8 (LANT)	SE08	
	Detachment 9 DV (PAC)	SE09	
	Detachment 9 SL (PAC)	SE99	
	Detachment 10 (LANT)	SE10	
	Detachment 11 DV (PAC)	SE01	
	Detachment 11 SL (PAC)	SE11	
	Detachment 12 (LANT)	SE12	
	Detachment 20 (LANT)	SE20	
	Detachment 13 DV (PAC)	SE13	
	Detachment 13 SL (PAC)	SE31	
	Detachment 30 (LANT)	SE30	
	Communications	CS01	

APPENDIX C₂C

STANDARD WORK CENTER CODES FOR EOD TRAINING EVALUATION UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
<u>Supply Department</u>		SUPP	ALL
	Supply Division	SS01	ALL
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	A/R
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Weapons Department</u>		WG00	ALL
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	A/R
<u>Maintenance Department</u>		AA00	ALL
	Maintenance Division	AA01	ALL
	CESE/Vehicles	AL01	ALL
	Dispatch	AO01	ALL
	Boat Shop Division	DA01	ALL
<u>Readiness and Training</u>		RD00	A/R
	Training Division	TT01	ALL
	Dive Lockers	DV01	ALL
	Air Operations	VA01	ALL
<u>Communication Department</u>		CS00	NOTE 2
	Communications Division	CS01	ALL
	ADP Center	CS02	A/R
	ET Shop	CS03	
<u>Operations Department/ Detachments</u>			
	Ordinance Clearing Diver	ED##	ALL
	Dive Chamber Systems	DS##	ALL
	Shore DETS		
	Underwater/IED	UD##	
	Surface/IED	SD##	

STANDARD WORK CENTER CODES FOR EOD TRAINING EVALUATION UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
	Chemical NUC	CZ##	
	Dive Locker	DV01	

APPENDIX C₂D

STANDARD WORK CENTER CODES FOR MOBILE SECURITY SQUADRON/NAVY COASTAL WARFARE SQUADRON

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
<u>Supply Department</u>		SUPP	
	Supply Division	SS01	ALL
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Weapons Department</u>		WG00	
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	
<u>Maintenance Department</u>		AA00	
	Maintenance Division	AA01	
	CESE/Vehicles	AL01	ALL
	Dispatch	AO01	ALL
	Boat Shop	DA01	ALL
	Repair (Hull/Fabrication/ Welding)	ER01	ALL
<u>Training</u>		TT00	ALL
<u>Operations Department</u>		CS00	
	Operations Division		
	Mobile Ashore Support Team	RS02	ALL
	Radar Sonar Surveillance Center (RSSC)	RS01	ALL
	Maritime Operations Center	OC01	ALL
	Communications	CS01	NOTE 2
	ADP Center	CS02	
	ET Shop	CS03	
<u>Boats and Service Craft</u>		DB00	NOTE 5
	Boat Division	DB01	

**STANDARD WORK CENTER CODES FOR MOBILE SECURITY SQUADRON/NAVY COASTAL
WARFARE SQUADRON**

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
	Patrol Craft	CP01	ALL
	Utility Craft	CU01	ALL

APPENDIX C₂E

STANDARD WORK CENTER CODES FOR RIVERINE SQUADRONS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
<u>Supply Department</u>		SUPP	
	Supply Division	SS01	ALL
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	Stock Control	STK	ALL
	HAZMAT	HZ01	ALL
<u>Weapons Department</u>		WG00	
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	ALL
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Boat Shop</u>		DA00	
	Boat Division	DA01	ALL
	Boat Work Center (Maint)	DA02	
	Boats (Individual)	CA01	A/R
<u>CESE Maintenance Department</u>		AA00	
	Maintenance Division	AA01	
	CESE Maintenance	AA02	ALL
	CESE/CEEI	AL01	ALL
	Dispatch	AO01	
<u>Communication Department</u>		CS00	ALL
	Communications Division	CS01	ALL
	Radar	CS02	ALL
	Radio	CS03	ALL

APPENDIX C₂F

STANDARD WORK CENTER CODES FOR NAVY MOBILE CONSTRUCTION BATTALIONS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
	Dental	MH03	ALL
<u>Supply Department</u>		SUPP	
	Supply Division	SS01	ALL
	Central Tool Room	SC01	ALL
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Alfa Company</u>		AA00	
	Alfa Division	AA01	ALL
	Cranes	AC13/AC15	ALL
	Heavy Shop (CESE)	AH03/AH05	ALL
	Light Shop (CESE)	AL03/AL05	ALL
	Mineral Products	AM05	ALL
	Machine Shop	AS01	ALL
	5000 Shop	AT03/AT05	ALL
	Dispatch	AO01	ALL
<u>Bravo Company</u>		BB00	ALL
	Bravo Co. Division	BB01	ALL
	BU/SW Shop	BU01	ALL
	UT/CE Shop	BE01	ALL
	CBR	BR01	ALL
<u>Training</u>		TT00	ALL
	Training Division	TT01	ALL
	Weapons (Small Arms)	WG01	ALL
	Weapons (Crew Served)	WG02	
<u>Communication Department</u>		CS00	ALL
	Communications Division	CS01	ALL
	Communications Work Center	CS02	ALL

APPENDIX C₂G

STANDARD WORK CENTER CODES FOR SEABEE READINESS GROUP

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Alfa Company</u>		AA00	
	Alfa Division	AA01	ALL
	Cranes	AC03/AC13	ALL
	Heavy Shop (CESE)	AH03/AH13	ALL
	Light Shop (CESE)	AL03/AL13	ALL
	Mineral Products	AM05	ALL
	Machine Shop	AS01	ALL
	5000 Shop	AT03/AT13	ALL
	Dispatch	AO01/AO11	ALL
<u>Bravo Company</u>		BB00	
	Bravo Division	BB01	
	Builder/SW Shop	BU01	
	CE/UT Shop	BE01	
	CEEI - TOA	BT01	
	CBR	BR01	ALL
<u>Training Department</u>		TT00	ALL
	Training Division	TT01	
	SRG Weapons (Small Arms)	WG01	
	SRG Weapons (Crew Served)	WG02	
	BATT Set #1 (Small Arms)	WG11	
	BATT Set #1 (Crew Served)	WG12	
	BATT Set #2 (Small Arms)	WG21	
	BATT Set #2 (Crew Served)	WG22	
	BATT Set #3 (Small Arms)	WG31	
	BATT Set #3 (Crew Served)	WG32	
<u>Communication Department</u>		CS00	ALL
	Communications Division	CS01	ALL
	SRG	CS02	ALL
	BATT Set #1	CS03	
	BATT Set #2	CS04	
	BATT Set #3	CS05	

APPENDIX C₂H

STANDARD WORK CENTER CODES FOR CONSTRUCTION BATTALION MOBILE UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
	Medical	MH01	ALL
<u>Supply Department</u>		SUPP	
	Supply Division	SS01	ALL
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	Material Liaison Office	SM01	
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Alfa Company</u>		AA00	ALL
	Alfa Division	AA01	ALL
	Heavy Shop (CESE)	AH03	ALL
	Light Shop (CESE)	AL03	ALL
	Dispatch	AO01	ALL
	Augment Equipment	AG05	
	5000 Shop	AT03	
<u>Bravo Company</u>		BB00	
	Bravo Division	BB01	
	Builder/SW Shop	BU01	
	CE/UT Shop	BE01	
	CEEI - TOA	BT01	
	CBR	BR01	ALL
<u>Communication</u>		CS00	
	Communications Division	CS01	ALL
	Tactical COMMS	CS02	ALL
<u>Training</u>		TT01	ALL
	Training Division	TT02	ALL
	Weapons Division (Small Arms)	WG01	ALL
	Weapons Division (Crew Served)	WG02	ALL
<u>Detachments DC</u>			
	Maintenance Division (CESE)	D103	
	Organic CESE	D104	
	Augment CESE	D105	

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STANDARD WORK CENTER CODES FOR CONSTRUCTION BATTALION MOBILE UNITS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
	Dispatch	D106	
	Maintenance Division (Non-CESE)	D108	
	Builder/SW Shop	D109	
	CE/UT Shop	D110	
	CEEI/CBR	D111	
	Weapons Division-TOA	D112	
	Safety/HAZMAT	D113	
	Central Tool Room	D114	

202 DET PREFIX CODES

DET DC - D1
 DET KB - D2
 DET JAX -D3
 DET KW - D4
 DET CL - D5

303 DET PREFIX CODES

DET Bangor - D1
 DET Fallen - D2
 DET Lemoore - D3
 DET Pearl Harbor - D4

APPENDIX C2I

STANDARD WORK CENTER CODES FOR UNDERWATER CONSTRUCTION TEAMS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	ALL
	Administration Division	XX01	ALL
	Administration	XX02	ALL
	Safety	XS01	ALL
	Engineering Aid	XE01	ALL
<u>Medical Department</u>		MH00	ALL
	Medical Division	MH01	ALL
	Medical	MH02	ALL
<u>Supply Department</u>		SUPP	
	Supply Division	SS01	ALL
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Training</u>		TT00	ALL
	Training Division	TT01	ALL
	Weapons (Small Arms)	WG01	ALL
	Weapons (Crew Served)	WG02	
<u>Communication</u>		CS00	
	Communications Division	CS01	ALL
	Communications	CS02	ALL
<u>Readiness Department</u>		RD00	ALL
	Readiness Division	RD01	ALL
	Boat Shop	DA01	ALL
	Maintenance (CESE)	AL01	ALL
	Dive Systems	DS00	ALL
	Fly Away Dive System	DC00	ALL
	SNDL Recompression Chamber	DC04	ALL
	Dive Equipment	DL01	ALL
	Central Tool Room	SC01	ALL
	Facilities	NF02	ALL
<u>Operations Department</u>		OD00	ALL
	Operations Division	OD01	ALL
	Air DET ALFA	AD01	
	BRAVO	AD02	ALL
	CHARLIE	AD03	
	Lightweight Dive System	DS11/DS12/DS13	ALL
	Trans. Recompression Chamber	DC11/DC12/DC13	ALL

STANDARD WORK CENTER CODES FOR UNDERWATER CONSTRUCTION TEAMS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
	TOA Equipment (Non-CESE)	TA11/TA12/TA13	ALL
	Weapons	WG11/WG12/WG13	ALL
	Communications	CS11/CS12/CS13	ALL
	Dive Boat	CU11/CU12/CU13	ALL

APPENDIX C₂J

STANDARD WORK CENTER CODES FOR NAVY MOBILE CONSTRUCTION BATTALIONS FORWARD HEADQUARTERS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX01	ALL
	PS/YN Division	XX02	ALL
	Medical	MH01	ALL
	3MC	XO01	ALL
<u>Communication Department</u>		CS01	
	Communications	CS02	
<u>Supply Department</u>		SS01	
	Supply DIV	SS02	
	Central Tool Room	SS03	
	Material Liaison Office	SS04	
	Control Store Room	SS05	
	DTO	SS01	
<u>Stock Department</u>		STCK	
	Stock Div	STOK	
	Stock	STK	

APPENDIX C₂K

STANDARD WORK CENTER CODES FOR **NAVAL CONSTRUCTION FORCE FWD** DETACHMENTS

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Detachment 3MA</u>		XO11	
<u>CESE Maint Div</u>		AA11	
	CESE/CEEI Maintenance	AL11	
	Dispatch	AO11	
<u>Non-CESE Maint Div</u>		BC11	
	Weapons Division	WG11	
	Safety/HAZMAT	SZ11	
	Communication	CS11	
<u>DET Supply</u>		SS11	
	Central Tool Room	SC11	

Detachment Codes

11 - Camp Moreell	12 - Falluja
13 - Balad	14 - TQ
15 - Al Asad	16 - Ramadi
17 - Bagram	

APPENDIX C₂L

STANDARD WORK CENTER CODES FOR NAVY EXPEDITIONARY LOGISTICS SUPPORT GROUP

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	
	Administration Division	XX01	
	Administration	XX02	
	Safety	XS01	
	Medical	MH01	
<u>Supply Department</u>		SUPP	
	Supply	SS01	
	Central Tool Room	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Operations Department</u>		OD00	
	Operations	OD01	
<u>Planning Department</u>		PA00	
	Plans	PA01	
<u>Training</u>		TT00	ALL
	Training Support	TT01	ALL
<u>Communication Department</u>		CS00	NOTE 2
	Communications	CS01	
	ADP Center	CS03	
<u>Engineering Department</u>		AA00	
	CESE/Vehicles	AL01	ALL
	Dispatch	AO01	ALL
	Engineering (DC Equip/ Facilities)	ER02	ALL
	Non-CESE (Hatch Boxes)	EH01	
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	

APPENDIX C₂M

STANDARD WORK CENTER CODES FOR NAVY CARGO HANDLING BATTALION ONE

<u>WORK CENTER NAME</u>	<u>DIVISION W/C</u>	<u>W/C CODES</u>	<u>UNIT(S)</u>
<u>Administration Department</u>		XX00	
	Administration Division	XX01	
	Administration	XX02	
	Safety	XS01	
	Medical	MH01	
<u>Supply Department</u>		SUPP	
	Supply Division	SS01	
	Central Tool Room (Hatch Boxes)	SC01	NOTE 1
	Central Store Room	ST01	ALL
	HAZMAT	HZ01	ALL
	DTO	SS01	
<u>Stock Department</u>		STCK	ALL
	Stock Division	STOK	ALL
	Stock	STK	ALL
<u>Operations Department</u>		OD00	NOTE 2
	Operations Division	OD01	
	Plans	PA01	
	Communications	CS01	
	ADP Center	CS03	
<u>Training</u>		TT00	ALL
	Training Support Division	TT01	ALL
	CISO	TT02	
	Schedules/Quotas	TQ01	
	Graphics	TG01	
	School House	TS01	
	Curriculum	TS01	
<u>Platforms</u>		PA00	
	Platforms Division	PA01	
	Land Ship	PL01	
	Cape Ship	PS01	
	Crane Site	PC01	
<u>Engineering Department</u>		AA00	
	CESE/Vehicles Division	AL01	ALL
	Dispatch	AO01	ALL
	Engineering (DC Equip/Facilities)	ER02	ALL
	Non-CESE (Hatch Boxes)	EH01	
	Weapons Division	WG01	ALL
	Weapons (Small Arms)	WG02	ALL
	Weapons (Crew Served)	WG03	

APPENDIX C₃

STANDARD WORK CENTER CODES FOR NAVAL SUBMARINE FORCE SHIPS

- Appendix C₃A Standard Work Center Codes for Submarines
- Appendix C₃B Standard Work Center Codes for Submarine Force Surface Ships
- Appendix C₃C Standard Work Center Codes for Small Boat and Service Craft Managers
 (Submarine Force Only)
- Appendix C₃D Standard Work Center Codes for Tugs and Retrievers (Submarine Force Only)

APPENDIX C₃A
STANDARD WORK CENTER CODES FOR SUBMARINES

Description	Used by Submarine Type	Code
<u>Executive</u>		
Executive/Administration (ADM - Functional Area Supervisor - SNAP)	All	XX00
Chief of the Boat	All	XX03
3-M Coordinator (SNAP OMMS Functional Area Supervisor)	All	XM01
Safety Petty Officer	All	SP01
<u>Engineering</u>		
Auxiliary	All	EA01
Damage Control Petty Officer (Note 1)	All	EDC1
Electrical (Main Power - SS)	All	EE01
Machinery	All	EM01
Engineering Administration	All	EX00
Engineering Log Room	All	EX02
Field Calibration	All	FCA1
Reactor Controls	All Nuclear	RC01
Engineering Laboratory	All	RL01
Nuclear Alteration Administration	All	RXFC
<u>Medical</u>		
Medical	All	MH01
<u>Navigation/Operations</u>		
Navigation/Electronics	All	NE01
Micro Miniature Repair (2M)	SSBN/SSGN	NE02
Radio/Communications	All	OC01
Afloat Information Systems/Automated Data Processing Coordinator (AIS/ADP)	All	OC02
Electronic Warfare	All	OC03
Navigation/Operations Administration	All	OX00
<u>Research and Development</u>		
Mission Auxiliary	SSN-23 Only	MA01
Mission Electronics	SSN-23 Only	ME01
Mission Navigation	SSN-23 Only	MN01
Mission Support	SSN-23 Only	MP01
Mission Auxiliary Support	SSN-23 Only	MV02
Mission Vehicles	SSN 23 Only	MV01

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Description	Used by Submarine Type	Code
<u>Supply</u>		
General Stores	All	SS01
Food Services	All	SS02
Supply Administration (SNAP Functional Area Supervisor)	All	SX00
<u>Weapons</u>		
Dry Deck Shelter #1 (Note 2)	SSGN and 774 Classes	DS01
Dry Deck Shelter #2 (Note 2)	SSGN and 774 Classes	DS02
Dry Deck Shelter #3 (Note 2)	SSGN and 774 Classes	DS03
Dry Deck Shelter #4 (Note 2)	SSGN and 774 Classes	DS04
Dry Deck Shelter #5 (Note 2)	SSGN and 774 Classes	DS05
Dry Deck Shelter #6 (Note 2)	SSGN and 774 Classes	DS06
Divers	All	DV01
Central Computer (Tactical/Strategic)	SSN-688/SSN-21/SSBN/SSGN	WC01
Fire Control	All	WF01
Missile Fire Control	SSBN/SSGN	WF02
First Lieutenant	All	WK01
Special Operations Forces Support (Note 3)	SSGN and 774 Classes	WK02
Sonar	All	WQ01
Torpedo	All	WI01
Missile Technicians	SSBN/SSGN	WM01
Missile Launcher	All	WS01
Weapons Administration	All	WX00

Note:

1. When Squadron must generate a CSMP deferral for the submarine, the Squadron will use the correct ship's work center and the Job Sequence Number (JSN) that is generated by Regional Maintenance Automated Information System (RMAIS). Example: EM01-Q123, Q denotes that the JSN was created by RMAIS.
2. Dry Deck Shelter Work Center Codes DS01 through DS06 are for SSGN and 774 Class hulls when the shelters are installed to maintain 3M continuity between the afloat units and LOGSU.
3. Special Operations Forces Support Work Center Code WK02 is for all SSGN's and 774 Class hulls that are designated to host the Dry Deck Shelter.

APPENDIX C₃B

STANDARD WORK CENTER CODES FOR SUBMARINE FORCE SURFACE SHIPS

Description	Used by Ship Type	Code
<u>Deck</u>		
1 st Division	ARDM	DA01
Boat Division	AS/ARDM	DB01
<u>Engineering</u>		
Auxiliary Division	ARDM	EA01
Crane Maintenance	ARDM	EC01
Lighting and Power	ARDM	EE01
Pipe/Metal Shop	ARDM	ER01
Carpenter/Docking	ARDM	ER02
Damage Control Petty Officer	All	EDC1
Engineering Administration	All	EX00
Engineering Log room	All	EX02
Calibration	ARDM	FCA1
<u>Medical</u>		
Medical	All	MH01
Dental	AS	MD01
<u>Navigation/Operations</u>		
Afloat Information Systems/Automated Data Processing Coordinator (AIS/ADP)	All	OC02
<u>Supply</u>		
Supply Administration	All	SX00
General Stores/Supply	All	SS01
Ship's Store	AS	SS03
Disbursing	AS	SS04
Inventory Control	AS	SS05
SUBSAT	AS	SS07
Post Office	AS	SS08
ROVSS	AS	SS09
<u>Weapons</u>		
Armory/Magazine	AS	WK02
Gunnery	AS/ARDM	WI05
Weapons Administration	All	WX00
Weapons Repair	AS	W10B
Fire Control Repair	AS	W67E
Weight Test	AS	W72D

Description	Used by Ship Type	Code
Weapons Alarms systems	AS	W91D
Torpedo/Missiles repair	AS	W91E
Weapons QA	AS	W91Q
<u>Executive</u>		
Executive Administration	AS	XX00
3-M Coordinator	All	XM01
Safety Petty Officer	All	SP01
Personnel Office	All	XX02
<u>Repair</u>		
Tool Room	AS	R06B
Repair Administration	AS	R10A
Planning P&E	AS	R10C
Tech Library	AS	R10E
Shipfitter/welding	AS	R11A
Sheet metal/Wood working	AS	R17A
Shore Services	AS	R25D
Welding	AS	R26A
Inside Machine shop	AS	R31A
Engraving shop	AS	R31B
Diesel shop	AS	R31C
Valve shop	AS	R31D
Engine and Governor shop	AS	R31E
Hydraulics shop	AS	R31F
Optical shop	AS	R35A
Print shop	AS	R37A
Outside Machine shop	AS	R38A
Nuc Repair	AS	R38N
Photo/Repair Admin/Print	AS	R39A
Elect Repair/Motor Rewind	AS	R51A
Outside Electrical shop	AS	R51B
IC Shop	AS	R51G
Pipe shop/Powder Coat shop	AS	R56A
AC&R shop	AS	R56B
Flex Hose shop	AS	R56C
Insulation Lagging/Canvas shop	AS	R57A
Rubber and Plastics	AS	R57B
Woodworking shop	AS	R64A
Key and lock shop	AS	R64E

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Description	Used by Ship Type	Code
General Electronics/Computer Repair	AS	R67A
Calibration	AS	R67B
Mast & Antenna shop	AS	R67H
2M Repair	AS	R67M
Rigging services	AS	R72A
Dive Locker	AS	R72B
Dive Locker (fly away team)	AS	R72F
Sail and Canvas	AS	R74A
Sound & analysis	AS	R92A
NDT/QA	AS	R93A
QA	AS	R93B
Radiological Controls	AS	R94A
MIRCS Lab	AS	R96A

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APPENDIX C₃C

**STANDARD WORK CENTER CODES FOR
SMALL BOAT AND SERVICE CRAFT MANAGERS
(Submarine Force Only)**

Name	Code	Name	Code
COMSUBRON ONE	PS	SUBASE PEARL HARBOR (IMF)	PK
COMSUBRON SIX	TQ	TRIDENT Refit Facility BANGOR	PM
COMSUBRON SEVEN	PW	TRIDENT Refit Facility KINGS BAY	TM
COMSUBRON EIGHT	TW		
COMSUBRON ELEVEN	PQ		
COMSUBRON SEVENTEEN	PV	USS <i>EMORY S. LAND</i> (AS-39)	TJ
COMSUBRON TWENTY	TX	USS <i>FRANK CABLE</i> (AS-40)	TA
COMSUBRON TWENTY-TWO	TS		
NAVSUBSUPPFAC NLON	TK		
SUBASE BANGOR	PY		
SUBASE KINGS BAY	TY		
SUBASE NLON	TC		

APPENDIX C₃D
STANDARD WORK CENTER CODES FOR
TUGS AND RETRIEVERS
(Submarine Force Only)

Description	Used by Ship Type	Code
Engineering	TWR/YTB/YTM	TE01
Other	TWR/YTB/YTM	TD01
Safety Petty Officer	TWR/YTB/YTM	SP01

APPENDIX C4**STANDARD WORK CENTER CODES FOR NAVAL SURFACE FORCE SHIPS AND SHORE COMMANDS**

Appendix C4A	Standard Work Center Codes for PC Class Ships
Appendix C4B	Standard Work Center Codes for MCM Class Ships
Appendix C4C	Standard Work Center Codes for LSD Class Ships
Appendix C4D	Standard Work Center Codes for LHA and LHD Class Ships
Appendix C4E	Standard Work Center Codes for CG, DDG and FFG Class Ships
Appendix C4F	Standard Work Center Codes for LCS Class Ships
Appendix C4G	Standard Work Center Codes for LCC-19 Class Ships
Appendix C4H	Standard Work Center Codes for LPD-17 Class Ships
Appendix C4I	Standard Work Center Codes for DDG-1000 Class Ships
Appendix C4J	Standard Work Center Codes for NBU-7 Command
Appendix C4K	Standard Work Center Codes for BMU Commands
Appendix C4L	Standard Work Center Codes For Amphibious Construction Battalion One
Appendix C4M	Standard Work Center Codes For Amphibious Construction Battalion Two
Appendix C4N	Standard Work Center Codes For Assault Craft Unit One (ACU-1) Command
Appendix C4O	Standard Work Center Codes For Assault Craft Unit Two (ACU-2) Command
Appendix C4P	Standard Work Center Codes For Assault Craft Unit Four (ACU-4) Command
Appendix C4Q	Standard Work Center Codes For Assault Craft Unit Five (ACU-5) Command
Appendix C4R	Standard Work Center Codes For ESB Class Ships
Appendix C4S	Standard Work Center Codes For LCC 20 Command

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APPENDIX C₄A
STANDARD WORK CENTER CODES FOR
PC CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>EXECUTIVE</u> <u>DEPARTMENT</u>	EX		
	OFF SHIP SERVICES	ES01	ALL
	MEDICAL	MH01	ALL
	3MC	XX03	
<u>ENGINEERING</u> <u>DEPARTMENT</u>	EN		
	ELECTRICAL SHOP	EE02	ALL
	MER FWD	EM01	ALL
	MER AFT	EM02	ALL
	DCPO	ER09	ALL
<u>OPERATIONS</u> <u>DEPARTMENT</u>	OP		
	RADIO	IS01	ALL
	ARMORY/FORCE		
	PROTECTION	CG03	ALL
	NAVIGATION	OI02	ALL
	DECK	OD01	ALL
	CIC	OI01	ALL

APPENDIX C4B
STANDARD WORK CENTER CODES FOR
MCM CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>ENGINEERING</u> <u>DEPARTMENT</u>	EE ELECTRICAL SHOP	EE02	ALL
	EM AUXILIARY	EA01	ALL
	MER	EM01	ALL
	AMR	EM02	ALL
	OIL LAB	EB14	ALL
	FLEET CAL ACTIVITY	FCA1	ALL
	ER HULL REPAIR	ER01	ALL
	DAMAGE CONTROL	ER04	ALL
	DCPO	ER09	ALL
<u>EXEC</u> <u>DEPARTMENT</u>	EX MEDICAL	EH01	ALL
	ADMIN	EX01	ALL
	3MC	EX03	ALL MDS ONLY
	OFF SHIP SERVICES	ES01	ALL Contains All X-Services XRICS MDS ONLY
<u>OPERATIONS</u> <u>DEPARTMENT</u>	OE INTERIOR COMMS	OE02	ALL
	RADIO	OC01	ALL
	ELECTRONICS	OE01	ALL
	OI CIC/MINE COUNT	OI01	ALL
	MEAS		
	NAVIGATION	OI02	ALL
	OD DECK	OD01	ALL
	ARMORY/FORCE	OD02	ALL
	PROTECTION		
<u>SUPPLY</u> <u>DEPARTMENT</u>	S1 GENERAL STORES	SS01	ALL
	FOOD SERVICE	SS02	ALL
	HAZ/ENV	HE01	ALL

APPENDIX C4C
STANDARD WORK CENTER CODES FOR
LSD CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>DECK DEPARTMENT</u>			
	DA		
	DECK BOATS	DA01	ALL
		DA02	AS REQUIRED
		DA03	AS REQUIRED
	DB		
		DB01	ALL
		DB02	AS REQUIRED
		DB03	AS REQUIRED
<u>ENGINEERING DEPARTMENT</u>			
	EA		
	ENGINE/BOAT SHOP	EA02	ALL
	HYDRAULICS	EA04	ALL
	AC&R	EA05	ALL
	EE		
	ELEC TOOL ISSUE/SAF	EE01	ALL
	ELECTRIC SHOP	EE02	ALL
	EM		
	MAIN MACHINERY RM 1	EM01	ALL
	MAIN MACHINERY RM 2	EM02	ALL
	AMR FWD	EM03	AS REQUIRED
	AMR AFT	EM04	AS REQUIRED
	OIL LAB	EB14	ALL
	GAGE CAL	FCA1	ALL
	ER		
	HULL REPAIR	ER01	ALL
	MACHINE SHOP	ER03	ALL
	DAMAGE CONTROL	ER04	ALL
	DCPO	ER09	ALL
<u>EXECUTIVE DEPARTMENT</u>			
	EX		
	ADMIN	EX01	ALL
	3MC	EX03	ALL MDS ONLY
	OFF SHIP SERVICES	ES01	Contains All X-Services
			XRICS MDS ONLY
	MAA	EX04	ALL MDS ONLY
<u>MEDICAL DEPARTMENT</u>			
	MH		

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	MEDICAL	MH01	ALL
<u>DENTAL DEPARTMENT</u>	DA DENTAL	DH01	ALL
<u>OPERATIONS DEPARTMENT</u>	OC RADIO LAN/ADP OE IC SHOP ELECTRONICS 2-M REPAIR/FIBER OPTIC REPAIR TEST EQUIPT ELEC CAL RADARS OI CIC ELECTRONIC WARFARE OW GWS FIRE CONTROL ARMORY/FORCE PROTECTION CIWS	OC01 OC02 OE06 OE01 OE03 OE04 OE05 OI01 OT01 OW02 OW03 OW04	ALL ALL ALL ALL ALL ALL ALL ALL ALL AS REQUIRED ALL ALL ALL
<u>NAVIGATION</u>	NN NAVIGATION	NN01	ALL
<u>PLANS AND TACTICS</u>	PT PLANS AND TACTICS	PT01	ALL MDS ONLY
<u>SUPPLY DEPARTMENT</u>	S1 STOCK CONTROL HAZ/ENV S2 FOOD SERVICE S3 SHIP SERVICES	SS01 HE01 SS02 SS03	ALL ALL ALL ALL

APPENDIX C4D
STANDARD WORK CENTER CODES FOR
LHA/LHD CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>AIMD DEPARTMENT</u>			
	IM		
	PRODUCTION/ QA/SUPPLY/TRAINING	IM01	ALL
	PWR PLANTS/AIRFRAMES	IM02	ALL
	AVIATION LIFE SUPPORT		
	ARMAMENT SUPPORT EQUIP/ CALIBRATION LAB	IM03	ALL
	AVIATION SUPPORT EQUIPMENT	IM04	ALL
<u>AIR DEPARTMENT</u>			
	V1		
	FLIGHT DECK	V101	ALL
	CRASH AND SALVAGE	V102	ALL
	V3		
	HANGER DECK	V301	ALL
	V4		
	FLIGHT DECK FUELS	V401	ALL
	BELOW DECK FUEL	V402	ALL
<u>CHAPLAIN DEPARTMENT</u>			
	CH		
	CHAP	CH01	Req'd If Chaplain Assigned
<u>COMBAT CARGO DEPARTMENT</u>			
	CD	CCD1	MDS ONLY
<u>COMMAND AND CONTROL, COMPUTERS, COMBAT SYSTEMS COMMUNICATIONS AND INFORMATION (C5I) DEPARTMENT</u>			
	CE		
	RADAR REPAIR	CE01	ALL
	COMMUNICATION REPAIR	CE02	ALL
	2-M REPAIR/FIBER OPTIC REPAIR	CSE3	ALL
	TEST EQUIP ELEC CAL	CE04	ALL
	IC SHOP	CE05	ALL
	INTERIOR COMM	CE06	ALL
	CCTV	CE07	ALL

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	CF		
	ACDS	CSF1	ALL
	RADARS	CSF2	ALL
	CIWS	CSF3	ALL
	MISSILES (RAM, TAS)	CSF4	ALL
	CC		
	RADIO	CC01	ALL
	LAN/ADP	CC02	ALL
	COMPUTER REPAIR	CC03	ALL
<u>DECK DEPARTMENT</u>			
	DA		
	FORWARD GEAR	DA01	ALL
	DB		
	AFT GEAR	DB01	ALL
<u>DENTAL DEPARTMENT</u>			
	MD		
	DENTAL	MD01	Req'd If Dentist Assigned
<u>ENGINEERING DEPARTMENT</u>			
	EA		
	AUX MACHINERY ROOM	EA01	As Required
	ENGINE SHOP	EA02	ALL
	STEAM SHOP (HOTEL SRV)	EA03	ALL
	AC&R	EA05	ALL
	AS		
	HYDRAULICS	AS01	ALL
	ASSAULT SHOP	AS02	ALL
	EE		
	ELEC TOOL ISSUE/SAFETY	EE01	ALL
	ELECTRIC SHOP	EE02	ALL
	POWER AND REWIND	EE03	ALL
	DISTRIBUTION	EE04	ALL
	EM		
	MAIN MACHINERY ROOM 1	EM01	ALL
	MAIN MACHINERY ROOM 2	EM02	ALL
	BOILER/ELECT CONTROL	EM03	ALL
	OIL LAB	EB14	ALL
	ER		
	HULL REPAIR	ER01	ALL
	MACHINE SHOP	ER03	ALL
	DAMAGE CONTROL REPR	ER04	ALL
	DCPO	ER09	ALL
<u>EXECUTIVE DEPARTMENT</u>			
	EX		
	ADMIN	EX01	ALL

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	3MC	EX03	ALL
	MAA	EX04	ALL
	TRAINING	ET01	MDS ONLY
	OFF SHIP SERVICES	ES01	X-SERVICE XRICS
			MDS ONLY
	VI	VI01	ALL
	MASS COMMUNICATION SPECIALIST		
<u>MEDICAL DEPARTMENT</u>			
	MH MEDICAL	MH01	ALL
<u>NAVIGATION DEPARTMENT</u>			
	NN NAVIGATION	NN01	ALL
<u>OPERATIONS DEPARTMENT</u>			
	OC AIR TRAFFIC CONTROL	OC01	ALL
	OI CIC	OI01	ALL
	OT ELECTRONIC WARFARE	OT01	ALL
	CRYPTOLOGIC WARFARE	OT02	As Required
	OZ JOINT INFORMATION CENTER	OZ01	ALL
<u>PLANS AND TACTICS</u>			
	PT PLANS AND TACTICS	PT01	All Req'd if PTO Assigned
<u>SAFETY DEPARTMENT</u>			
	SA SAFETY	SA01	ALL
<u>SUPPLY DEPARTMENT</u>			
	S1 STOCK CONTROL	SS01	ALL
	S2 FOOD SERVICE	SS02	ALL
	S3 SHIP SERVICES	SS03	ALL
	S5 WARD ROOM	SS05	ALL

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	S6		
	AVIATION STORES	SS06	ALL
	S8		
	GENERAL STORES	SS08	ALL
	HAZMAT/ENVIRONMENTAL	HE01	ALL
<u>WEAPONS</u>			
<u>DEPARTMENT</u>			
	G1		
	AVIATION ARMS	WG01	ALL
	G2		
	ARMORY/FORCE PROTECTION	WG02	ALL
	G3		
	CARGO HANDLING MAG	WG03	ALL
	G4		
	AMM0 ADMIN	WG04	ALL

APPENDIX C4E

STANDARD WORK CENTER CODES FOR CG/DDG CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>COMBAT SYSTEMS</u>			
	CC		
	RADIO	CC01	ALL
	LAN/ADP	CC02	ALL
	CF		
	SPY	CF01	ALL
	ACNT/DISPLAY	CF02	ALL
	FCS/ORTS	CF03	ALL
	CE		
	INTERIOR COMMS	CE01	ALL
	RADAR/NAV	CE03	ALL
	TEST EQUIPT ELEC CAL	CE04	ALL
	ELECTRONICS	CSE1	ALL
	2-M REPAIR/FIBER OPTIC REPAIR	CSE3	ALL
	CA		
	SPS-53/V-10/MAIN SONAR	CA01	ALL
	TOWED ARRAY	CA02	WHEN INSTALLED
	MINE COUNTERMEASURE	CA04	AS APPLICABLE
	CG		
	GUNS	CG01	ALL
	GWS	CG02	ALL
	ARMORY/TORPEDO/FORCE PROTECTION	CG03	ALL
	CIWS	CG04	AS APPLICABLE
	CM		
	TOMAHAWK	CM01	ALL
	VLS	CM02	ALL
	SPARROW/HARPOON/MISSILE	CM03	AS APPLICABLE
<u>ENGINEERING DEPARTMENT</u>			
	EA		
	AUXILIARY	EA01	ALL
	RAST	EA04	AS APPLICABLE
	EE		
	ELEC TOOL ISSUE/SAFETY	EE01	ALL
	ELECTRICAL SHOP	EE02	ALL
	EM		
	MER 1	EM01	ALL
	MER 2	EM02	ALL
	PROPULSION ELECTRICAL	EM04	ALL
	OIL LAB	EB14	ALL
	FLEET CAL ACTIVITY	FCA1	ALL
	ER		
	HULL REPAIR	ER01	ALL
	MACHINERY REPAIR	ER03	ALL
	DAMAGE CONTROL	ER04	ALL
	DCPO	ER09	ALL

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>EXECUTIVE DEPARTMENT</u>	EX ADMIN 3MC OFF SHIP SERVICES MAA	EX01 EX03 ES01 EX04	ALL ALL MDS ONLY ALL MDS ONLY ALL MDS ONLY
<u>HEALTH SERVICES DEPARTMENT</u>	HM MEDICAL	HM01	ALL
<u>OPERATIONS DEPARTMENT</u>	OD DECK OT ELECTRONIC WARFARE CRYPTOLOGIC WARFARE OI CIC	OD01 OT01 OT02 OI01	ALL ALL REQUIRED FOR PCMS ALL
<u>NAVIGATION DEPARTMENT</u>	NN NAVIGATION	NN01	ALL
<u>PLANS AND TACTICS</u>	PT PLANS AND TACTICS	PT01	ALL MDS ONLY
<u>SUPPLY DEPARTMENT</u>	S1 GENERAL STORES HAZMAT/ENVIRONMENT S2 FOOD SERVICE S3 SHIP SERVICES	SS01 HE01 SS02 SS03 STK	ALL ALL ALL ALL

APPENDIX C4F

STANDARD WORK CENTER CODES FOR LCS CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>COMBAT SYSTEMS DEPARTMENT</u>			
	CG GUNNERY/ARMORY GRP	CG03	ALL
	CS ELECT/COMMS/LAN GRP	CSE1	ALL
	ELECT/ELECT ISSUE	CE04	ALL
<u>ENGINEERING DEPARTMENT</u>			
	EA MECHANICAL GROUP	EA01	ALL
	EE ELECTRICAL GROUP	EE02	ALL
	ER REPAIR/DC/DCPO GROUP	ER09	ALL
<u>EXECUTIVE DEPARTMENT</u>			
	EX 3MC	XX03	ALL (NO PMS)
	OFF SHIP SERVICES	ES01	ALL (NO PMS)
<u>OPERATIONS DEPARTMENT</u>			
	OD DECK GROUP	OD01	ALL
<u>PLANS AND TACTICS</u>			
	PT PLANS AND TACTICS	PT01	Req'd if PTO Assigned (NO PMS)
<u>SUPPLY DEPARTMENT</u>			
	S1 SUPPLY GROUP	SS01	ALL
	MEDICAL	MH01	ALL
<u>LCS MISSION MODULES - 4 DEPARTMENTS</u>			
The work center assignments will be: (This will be based on the number and LCS hull number the module is assigned.)			
	SHORE DEPARTMENT	SH01 to SH99	

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>

Note 1: The shore department receives all of the material and tracks the maintenance of the gear while at the MPSF. All initial assignments of equipment and equipage will be work center SH01. The SH01 will be the secondary work center on all configuration records to allow for the ordering of parts while the module is deployed.

ASW DEPARTMENT AS01 to AS99

Note 2: For all ASW based Mission Modules

SUW DEPARTMENT SU01 to SU99

Note 3: For all SUW based Mission Modules

MCM DEPARTMENT MC01 to MC99

Note 4: For all MCM based Mission Modules

Each of the departmental structures will be broken down into work centers, using the first 2 letters of the department. There is one work center for each Mission Module. There can be a maximum of 99 work centers under each department.

To place the gear in a different department or work center, just change the work center assignment for the record. Up-line reporting informs CDMD-OA of the change, or communication with the CDM so they can do bulk changes.

Include the PMS team at **NAVSEALOGCEN** when making the changes to keep PMS data updated.

The MPSF will receive and serialize the equipage then assign to the correct mission module.

APPENDIX C4G

STANDARD WORK CENTER CODES FOR LCC 19 CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>INFORMATION SYSTEM DEPARTMENT</u>			
	CE		
	SATELLITE COMM	CE01	
	LINE OF SIGHT COMMS	CE02	
	RADAR	CE03	
	2-M REPAIR/FIBER OPTIC REPAIR	CSE3	
	TEST EQUIPT ELEC CAL	CE04	
	CSI		
	INTERIOR COMM	CSI1	
	CR		
	RADIO	CR01	
	CI		
	LAN AND LAN HARDWARE	CI01	
<u>DECK DEPARTMENT</u>			
	DA		
	ANCHOR/MOORING STA	DA01	
	SPONSON/BOATS	DA02	
	DB		
	MAIN DECK	DB01	
<u>ENGINEERING DEPARTMENT</u>			
	EA		
	AUXILIARY	EA01	
	ENGINE/BOAT SHOP	EA02	
	AC&R	EA05	
	EE		
	ELECTRICAL SHOP	EE01	
	ELEC TOOL ISSUE/SAF	EE02	
	EM		
	ENGINE ROOM	EM01	
	FIRE ROOM	EM02	
	EABC LAB	EM03	
	OIL LAB	EM04	
	GAGE CAL	EM05	
	ER		
	HULL REPAIR	ER01	
	MACHINE SHOP	ER03	
	DAMAGE CONTROL REP	ER04	
	DCPO	ER09	
<u>EXECUTIVE DEPARTMENT</u>			
	EX		
	ADMIN	EX01	
	3MC	EX03	
			MDS ONLY

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	OFF SHIP SERVICES	ES01	MDS ONLY
	MAA/LNS	EX04	
	VI		
	MCS	VI01	
<u>CHAPLAIN DEPARTMENT</u>	CH		
	CHAP	CHA1	IF CHAPLAIN ASSIGNED
<u>MEDICAL DEPARTMENT</u>	MH		
	MEDICAL	MH01	
<u>DENTAL DEPARTMENT</u>	MD		
	DENTAL	MD01	IF DENTIST IS ASSIGNED
<u>OPERATION DEPARTMENT</u>	OI		
	CIC	OI01	
	ON		
	NAVIGATION	ON01	
	OT		
	ELECTRONIC WARFARE	OT01	
	OW		
	GUNNERY MAINTENANCE	OW01	
	SHIPS ARMORY	OW03	
	CIWS	OW04	
<u>SUPPLY DEPARTMENT</u>	S1		
	STOCK CONTROL/POSTAL	SS01	
	HAZ/ENV	HE01	
	S2		
	FOOD SERVICE	SS02	
	S3		
	SHIPS SERVICE	SS03	
	S5		
	WARD ROOM	SS05	
	FLAG MES	FS05	
	STOK		
	STOCK	STK	

APPENDIX C₄H

STANDARD WORK CENTER CODES FOR LPD 17 CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>AIR DEPARTMENT</u>			
	V		
	FLIGHT DECK (ABH)	V101	ALL
	AVIATION FUELS	V401	ALL
	GROUND SUPPORT EQUIP	VM04	ALL
<u>CHAPLAIN DEPARTMENT</u>			
	CH		
	CHAP	CH01	ALL
<u>COMBAT CARGO DEPARTMENT</u>			
	CD		
	CCD	CCD1	MDS ONLY
<u>COMBAT SYSTEMS DEPARTMENT</u>			
	CC		
	RADIO	CC01	ALL
	LAN/ADP	CC02	ALL
	CE		
	TEST EQUIPT ELEC CAL	CE04	ALL
	RADAR REPAIR/NAV	CSE1	ALL
	COMMUNICATION REPAIR	CSE2	ALL
	2-M REPAIR/FIBER OPTIC REPAIR	CSE3	ALL
	COMPUTER REPAIR	CSE4	ALL
	IC SHOP	CSE5	ALL
	INTERIOR COMM	CSE6	AS REQUIRED
	CCTV	CSE7	ALL
	CM		
	ACDS/SSDS	CM01	ALL
	RADARS	CM02	ALL
	MISSILES (RAM, TAS)	CM04	ALL
	CG		
	GWS	CG02	ALL
	ARMORY/FORCE PROTECTION	CG03	ALL
	CARGO/AVIATION	CG04	ALL
	MAGZN		
<u>DECK DEPARTMENT</u>			
	DA		
	FIRST	DA01	ALL
	DB		
	SECOND	DB01	ALL

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>ENGINEERING DEPARTMENT</u>			
	EA		
	AUXILIARY	EA01	ALL
	ENGINE SHOP	EA02	AS REQUIRED
	HYDRAULICS	EA04	ALL
	AC&R	EA05	ALL
	EE		
	ELEC TOOL ISSUE/SAF	EE01	ALL
	ELECTRICAL SHOP	EE02	ALL
	POWER AND REWIND	EE03	AS REQUIRED
	ENGINEERING CONTROL SYSTEMS	EE07	AS MANNING RECEIVED CREATE WC
	EM		
	MAIN MACHINERY RM 1	EM01	ALL
	MAIN MACHINERY RM 2	EM02	ALL
	AUX MACHINERY RM 1	EM03	ALL
	AUX MACHINERY RM 2	EM04	ALL
	AUX MACHINERY RM 3	EM05	ALL
	OIL LAB	EB14	ALL
	GAGE CAL	FCA1	ALL
	ER		
	HULL REPAIR	ER01	ALL
	MACHINERY REPAIR	ER03	ALL
	DAMAGE CONTROL REP	ER04	ALL
	DCPO	ER09	ALL
<u>EXECUTIVE DEPARTMENT</u>			
	EX		
	ADMIN	EX01	ALL
	3MC	EX03	ALL MDS ONLY
	MAA	EX04	ALL MDS ONLY
	TRAINING	ET01	ALL MDS ONLY
	OFF SHIP SERVICES	ES01	All Contains All X- Services XRICS
<u>HEALTH SERVICES DEPARTMENT</u>			
	HM		
	MEDICAL	HM01	ALL
	HD		
	DENTAL	HD01	ALL
<u>OPERATIONS DEPARTMENT</u>			
	OI		
	CIC	OI01	ALL
	ON		

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	NAVIGATION	ON01	ALL
	OT		
	ELECTRONIC WARFARE	OT01	ALL
	CRYPTO WARFR (PCMS)	OT02	ALL
<u>PLANS AND TACTICS</u>	PT		
	PLANS AND TACTICS	PT01	ALL MDS ONLY
<u>SUPPLY DEPARTMENT</u>	S1		
	STOCK CONTROL	SS01	ALL
	HAZ/ENV	HE01	
	S2		
	FOOD SERVICE	SS02	ALL
	S3		
	SHIP SERVICES	SS03	ALL

APPENDIX C4I

STANDARD WORK CENTER CODES FOR DDG-1000 CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
<u>COMBAT SYSTEMS</u>			
	CF (STO)		
	SPY/FCS/ORTS/DISPLAY	CF01	
	CE (EMO)		
	RADAR/NAV	CE03	
	COM ELECTRONICS	CSE1	
	RADIO	CC01	
	LAN/ADP	CC02	
	CA (ASWO)		
	MAIN SONAR	CA01	
	CG (WEPS)		
	GUNS/GWS	CG01	
	ARMORY/TORPEDO/FORCE PR	CG03	
	TTWCS	CM01	
	VLS	CM02	
	2-M REPAIR/FIBER OPTIC	CSE3	
	REPAIR		
<u>ENGINEERING DEPT</u>			
	EA (AUXO)		
	HIGH VOLTAGE	EE03	
	EM (MPA)		
	POWER GEN AND FUEL (OIL LAB)	EM01	
	AUX SYS	EM02	
	MECHANICAL SHIP SUPPORT	EM03	
	FLEET CAL ACTIVITY	FCA1	
	ELEC TOOL ISSUE/SAF	EE01	
	ELECTRICAL SHOP	EE02	
	ER (DCA)		
	HULL REPAIR	ER01	
	DAMAGE CONTROL	ER04	
	DCAO	ER09	
<u>EXECUTIVE DEPT</u>			
	EXEC (XO)		
	ADMIN	EX01	
	OFF SHIP SERVICES	ES01	ALL MDS ONLY
	MAA	EX04	ALL MDS ONLY
	MEDICAL	HM01	
<u>OPERATIONS DEPT</u>			
	OD (1ST LT)		
	DECK	OD01	
	NAVIGATION	ON01	
	OT (IOW)		
	ELECTRONIC WARFARE	OT01	
	CRYPTO LOGIC WARFARE	OT02	REQUIRED FOR PCMS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>SHIP CODE</u>	<u>CLASS</u>
	OI (CICO) CIC	OI01	
<u>SUPPLY DEPT</u>	S-1 (LSC) GENERAL STORES	SS01	
	HAZ/ENV	HE01	
	S-2 (LSC) FOOD SERVICE	SS02	
	S-3 (LSC) SHIP SERVICES	SS03	

APPENDIX C4J

STANDARD WORK CENTER CODES FOR NBU-7 COMMAND

<u>DEPARTMENT</u>	<u>DIVISION</u>	<u>WORK CENTER</u>	<u>NOTES</u>
<u>EXECUTIVE (EX)</u>	ADMIN (AX)	EX03	3MC
		EX04	SECURITY FORCE SPECIALIST
		ES01	OFF UNIT SERVICES
		AX01	UNIT OFFICE
		AX02	OFFICER SUPPORT
		AX03	CAREER COUNSELOR
	HEALTH SERVICES (HS)	MH01	MEDICAL
	INFORMATION SYSTEMS (IS)	IS01	RADIO
		IS02	ADP
<u>QUALITY ASSURANCE/ MAINTENANCE MANAGEMENT (MA)</u>	QUALITY ASSURANCE (QA)	Q93B	QAO/UNIT MAINTENANCE MATERIAL OFFICER (UMMO)
		Q10S	SAFETY
		Q10C	PLANNING & ESTIMATING
		Q10E	TECH LIBRARY
		Q06B	TOOL ROOM
<u>MAINTENANCE (MD)</u>	FIELD CALIBRATION ACTIVITY POWER PLANT (PP)	FCA1	
		P31T	TURBINE SHOP
		P31F	HYDRAULIC SHOP
		P38A	PROP & LIFTFAN SHOP
		P31D	DIESEL SHOP
	STRUCTURAL (SS)	S26A	WELD SHOP
		S93A	NDT
		S64A	AIRFRAMES
		S31A	MACHINE SHOP
		S56B	A/C & R SHOP
		S71B	CORROSION CONTROL SHOP
		S09D	DAMAGE CONTROL SHOP
	ELECTRICAL/ ELECTRONICS (EE)	E67B	ELECTRONIC TOOL ISSUE/CAL
		E51B	GSE SHOP
		E67A	ELECTRONIC REPAIR SHOP
		E67M	2M/MTR
	ROLLING STOCK	RS01	LARC\LARC-V
		RS02	VEHICLES
<u>SUPPLY (SU)</u>	S1	SS01	SUPPLY SUPPORT
	HAZMAT (HZ)	HZ01	HAZMAT ISSUE/RECEIPT

<u>DEPARTMENT</u>	<u>DIVISION</u>	<u>WORK CENTER</u>	<u>NOTES</u>
	S2	SS02	FOOD SERVICES
	FUELS (FU)	FU01	FUEL SERVICES
<u>QUALITY ASSURANCE/ MAINTENANCE MANAGEMENT (MA)</u>	QUALITY ASSURANCE (QA)	Q93B	QAO/UNIT MAINTENANCE MATERIAL OFFICER (UMMO)
		Q10S Q10C	SAFETY PLANNING & ESTIMATING
<u>OPERATIONS</u>	WEAPONS (WE)	WG01	ARMORY
	CRAFT CONTROL (CC)	CC01	CRAFT CONTROL (OS RATING)
	LCU (CU)	CU33 CU34 CU51 CU46 CU66	LCU 1633 LCU 1634 LCU 1651 LCU 1646 LCU 1666
	LCAC (LC)	LC08 LC09 LC10 LC21 LC 29 LC30 LC47	LCAC 08 LCAC 09 LCAC 10 LCAC 21 LCAC 29 LCAC 30 LCAC 47
<u>STOCK REPLENISHMENT (SR)</u>	REGULAR STOCK		
	DLR STOCK REPLENISHMENT		

16 Oct 2019

APPENDIX C4K**STANDARD WORK CENTER CODES FOR BMU COMMANDS**

<u>DEPARTMENT</u>	<u>DIVISION</u>	<u>WORK CENTER</u>	<u>NOTES</u>
<u>BEACH PARTY (BP)</u>		BPT1 BPT1 BPT3 BPT4 BPT5 BPT6 BPT7	AS REQUIRED AS REQUIRED
<u>EXECUTIVE (EX)</u>		EX00	3MC (MDS ONLY)
<u>MAINTENANCE (MD)</u>	TRANSPORTATION	AL01 ER04	
	ELECTRICAL	EE02	
<u>MEDICAL (HM)</u>		HM01	
<u>OPERATIONS (OD)</u>	COMMS WEAPONS	OE01 WG01	
<u>SUPPLY (SU)</u>		SS01	(MDS ONLY)

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APPENDIX C4L
STANDARD WORK CENTER CODES FOR
AEGIS ASHORE ROMANIA AND POLAND COMMANDS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>COMBAT SYSTEMS</u>		BPT1	
<u>DEPARTMENT</u>			
	CF		
	SPY	CF01	ALL
	ACNT/DISPLAY	CF02	ALL
	FCS/ORTS	CF03	ALL
	CM		
	VLS	CM02	ALL
<u>OPERATIONS</u>			
<u>DEPARTMENT</u>			
	CC		
	RADIO	CC01	ALL
	CE		
	ELECTRONICS	CE01	ALL
	CO		
	JTT	HM01	
	HM		
	MEDICAL	HM01	ALL

APPENDIX C4L
STANDARD WORK CENTER CODES FOR
AMPHIBIOUS CONSTRUCTION BATTALION ONE

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>NOTES</u>
<u>ALFA COMPANY</u>			
	MAINTENANCE	A600	MDS ONLY
	COLLATERAL	A6TY	MDS ONLY
	LIGHT SHOP	AA01	ALL
	5000 SHOP	ACO1	ALL
	TOOL ROOM	ATR1	ALL
	HEAVY SHOP	AX01	ALL
	DISPATCH	AT01	ALL
<u>BRAVO COMPANY</u>			
	FIRST PLATOON		
	CAUSEWAY FERRY	CF16	ALL
	WARPING TUG	WT04	ALL
	SECOND PLATOON		
	CAUSEWAY FERRY	CF17	ALL
	WARPING TUG	WT03	ALL
	THIRD PLATOON		
	CAUSEWAY FERRY	CF02	ALL
	WARPING TUG	WT02	ALL
	DOCKING MOD	DBM1	ALL
	FOURTH PLATOON		
	MECHANICAL	EA04	ALL
	MECHANICAL	EA05	ALL
	FIFTH PLATOON		
	MARINE REPAIR	EA01	ALL
	ELECTRICIANS	EE01	ALL
	ELECTRICIANS	EE05	ALL
	CENTRAL TOOL RM	CT01	ALL
	BRAVO ADMIN	B600	MDS ONLY
	SANDBLAST SHOP	B6SB	MDS ONLY
	CRAFT SUPPORT	B6CS	MDS ONLY
<u>CHARLIE COMPANY</u>			
	CHARLIE ADMIN	C600	MDS ONLY
	CAMP SUPPORT	C6CS	MDS ONLY

APPENDIX C4L
STANDARD WORK CENTER CODES FOR
AMPHIBIOUS CONSTRUCTION BATTALION ONE

	CAMP SUPPORT		
	BUILDERS	BU01	ALL
	ELECTRICIANS	CE01	ALL
	STEELWORKERS	SW01	ALL
	UTILITIES	UT01	ALL
<u>EXECUTIVE DEPARTMENT</u>			
	COMMAND ADMIN	XX03	MDS ONLY
	EXECUTIVE OFFICER		
	CO FUND	CO00	MDS ONLY
	SAFETY	XS01	ALL
<u>3M</u>			
	MAINT COORD	MC00	MDS ONLY
<u>ADMIN</u>			
	ADMIN	S100	MDS ONLY
	PHOTO	OX00	MDS ONLY
<u>MEDICAL</u>			
	MEDICAL	MH01	ALL
<u>OPERATIONS</u>			
	FACILITIES	FACT	MDS ONLY
	OPS ADMIN	S300	MDS ONLY
	CONTAINERS	TA01	ALL
<u>INTEL</u>			
	ADP	SADP	MDS ONLY
<u>SUPPLY</u>			
	HAZMAT	HZ01	MDS ONLY
	SUPPLY ADMIN	S400	MDS ONLY
	CONT SERVICE	S4CS	MDS ONLY
	782 GEAR	S4EQ	MDS ONLY
	GREENS ISSUE	S4GR	MDS ONLY
	FUEL	S4N9	MDS ONLY
	CENTRAL TOOL	SCTR	MDS ONLY
	ROOM ISSUE		
	CBRN	BR01	ALL

APPENDIX C4L
STANDARD WORK CENTER CODES FOR
AMPHIBIOUS CONSTRUCTION BATTALION ONE

TRAINING

TRAINING ADMIN S7AO MDS ONLY

WEAPONS

ARMORY DX01 ALL

APPENDIX C4M
STANDARD WORK CENTER CODES FOR
AMPHIBIOUS CONSTRUCTION BATTALION TWO

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>3M OFFICE</u>	3MC	XM01	MDS ONLY
<u>HEADQUARTERS</u>	SUPPLY	ST01	ALL
	MEDICAL/DENTAL	MH01	ALL
	COMMS	OE01	ALL
	WEAPONS	WI01	ALL
<u>ALFA COMPANY</u>	CESE MAINTENANCE	AM01	ALL
	CRANE SHOP	AX02	ALL
<u>BRAVO COMPANY</u>	WATERFRONT		
	CAUSEWAY FERRY	CF00	ALL
	WARPING TUG	WT00	ALL
	ABLTS & RRDF	DG00	ALL
	ENGINEERING		
	ELECTRICIANS	EE01	ALL
	CAUSEWAY FERRY	EM01	ALL
	WARPING TUG	EM02	ALL
	HT & MR	ER04	ALL
<u>CHARLIE COMPANY</u>	CBRN	CR01	ALL
	ELCAS (M)	SW02	ALL

APPENDIX C4N
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT ONE (ACU-1) COMMAND

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>ENGINEERING DEPARTMENT</u>			
	EE		
	TOOL ISSUE	EE01	ALL
	ER		
	HT SHOP	ER01	ALL
	FC		
	FLEET CALIBRATION	FCA1	ALL
<u>EXECUTIVE DEPARTMENT</u>			
	EX		
	ADMIN	EX01	MDS ONLY
	3MC	EX03	MDS ONLY
<u>LANDING CRAFT DEPARTMENT</u>			
	CU		
	LANDING CRAFT XX **	CUXX **	ALL, AS REQUIRED
<u>MARITIME PREPOSITIONING FORCE DEPARTMENT</u>			
	LCM		
	LANDING CRAFT	SB46	ALL
	MECH		
	UB		
	UTILITY BOAT	UBXX **	ALL, AS REQUIRED
<u>OPERATIONS DEPARTMENT</u>			
	IS		
	COMMS	IS01	MDS ONLY
	RB		
	RIGID HULL BOATS	RBXX **	ALL, AS REQUIRED
	WG		
	WEAPONS	WG01	ALL

APPENDIX C4N
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT ONE (ACU-1) COMMAND

SUPPLY
DEPARTMENT

S1		
SUPPLY	SS01	MDS ONLY
HAZMAT	HE01	MDS ONLY

** THE DIVISIONAL STRUCTURE WILL BE BROKEN DOWN INTO WORK CENTERS, USING THE FIRST TWO LETTERS OF THE DIVISION. THERE IS ONE WORK CENTER FOR EACH LANDING CRAFT, UTILITY BOAT AND RIGID HULL INFLATABLE BOAT ASSIGNED, THE “XX” REPRESENTS THE CRAFT HULL NUMBER. INCLUDE THE PMS TEAM AT NSLC WHEN MAKING CHANGES FOR THESE WORKCENTERS TO KEEP PMS DATA UPDATED.

APPENDIX C4O
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT TWO (ACU-2) COMMAND

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>

EXECUTIVE
DEPARTMENT

EX			
ADMIN	EX01	MDS ONLY	
3MC	EX03	MDS ONLY	
HM			
MEDICAL	HM01	MDS ONLY	

MARITIME PREPOSITION
FORCE DEPARTMENT

LCM			
LANDING CRAFT	LCM2	ALL	
MECH			
SC			
RHIB/CRRC	SC02	ALL	
UB			
UTILITY BOAT	UB01	ALL	

REPAIR
DEPARTMENT

EA			
ENGINE SHOP	EA02	ALL	
MACHINE SHOP	EA09	ALL	
EE			
TOOL ISSUE	EE01	ALL	
ER			
HT SHOP	ER01	ALL	
FC			
FLEET CALIBRATION	FCA1	ALL	
MT			
TRANSPORTATION	MT01	ALL	
OE			
ELECTRONICS/COMMS	OE01	ALL	

LANDING CRAFT
DEPARTMENT

CU			
LANDING CRAFT XX **	CUXX **	ALL, AS REQUIRED	

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APPENDIX C4O
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT TWO (ACU-2) COMMAND

OPERATIONS
DEPARTMENT

WG			
ARMORY		WG01	ALL

SUPPLY
DEPARTMENT

S1			
SUPPLY	SS01		MDS ONLY
FOOD SERVICE OFFICE	S202		MDS ONLY

** THE DIVISIONAL STRUCTURE WILL BE BROKEN DOWN INTO WORK CENTERS, USING THE FIRST TWO LETTERS OF THE DIVISION. THERE IS ONE WORK CENTER FOR EACH LANDING CRAFT ASSIGNED. THE "XX" REPRESENTS THE CRAFT HULL NUMBER. INCLUDE THE PMS TEAM AT NSLC WHEN MAKING CHANGES FOR THESE WORKCENTERS TO KEEP PMS DATA UPDATED.

APPENDIX C4P
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT FOUR (ACU-4) COMMAND

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>EXECUTIVE</u> <u>DEPARTMENT</u>	EX		
	3MC	3MCA	MDS ONLY
	3MC	EX03	MDS ONLY
	OFF-SHIP SERVICES	ES01	MDS ONLY
	HM		
	MEDICAL	MH01	ALL
	IS		
	LAN/ADP	IT01	MDS ONLY
	VAULT/EKMS	IT02	MDS ONLY
<u>MAINTENANCE</u> <u>DEPARTMENT</u>			
	R0		
	QA SHOP	93BB	MDS ONLY
	NDT	93AA	ALL
	TECH LIBRARY	10EE	MDS ONLY
	R1		
	SHIPFITTER SHOP	11AA	ALL
	WELD SHOP	26AA	MDS ONLY
	CORROSION SHOP	71BB	MDS ONLY
	BAG SHOP	BG02	MDS ONLY
	R2		
	ENGINE SHOP	31TT	MDS ONLY
	A/C & R SHOP	56BB	MDS ONLY
	HYDRAULIC SHOP	31FF	MDS ONLY
	MACHINE SHOP	31AA	ALL
	PROP SHOP	38AA	MDS ONLY
	LIFT FAN SHOP	38BB	MDS ONLY
	R3		
	GSE / SISCAL SHOP	51BB	MDS ONLY
	R4		
	GAUGE CALIBRATION	FCA1	ALL
	TOOL ISSUE	06BB	ALL
	ELECTRONIC REPAIR	67AA	ALL
	ELECTRONIC CALIBRATION	67BB	ALL
	2M LAB	67MM	ALL
	GS		
	GROUND SUPPORT	06CC	ALL
	FUELS	68DD	ALL

APPENDIX C4P
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT FOUR (ACU-4) COMMAND

OPERATIONS
DEPARTMENT

LC			
LANDING CRAFT XX **	LCXX **	ALL, AS REQUIRED	
SC			
SHORE CONNECTOR XX **	SCXX **	ALL, AS REQUIRED	
LINE			
LINE SHACK	LS01	MDS ONLY	

SUPPLY
DEPARTMENT

S1			
SUPPLY SUPPORT	SS01	ALL	

TRAINING
DEPARTMENT

WE			
ARMORY	91QQ	ALL	
TNG			
TRAINING	TRA1	MDS ONLY	

** EACH OF THE DIVISIONAL STRUCTURES WILL BE BROKEN DOWN INTO WORK CENTERS, USING THE FIRST TWO LETTERS OF THE DIVISION. THERE IS ONE WORK CENTER FOR EACH LANDING CRAFT OR SHORE CONNECTOR ASSIGNED, THE "XX" REPRESENTS THE CRAFT HULL NUMBER. INCLUDE THE PMS TEAM AT NSLC WHEN MAKING CHANGES FOR THESE WORKCENTERS TO KEEP PMS DATA UPDATED.

APPENDIX C4Q
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT FIVE (ACU-5) COMMAND

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>EXECUTIVE</u>			
<u>DEPARTMENT</u>			
	EX		
	3MC	EX03	MDS ONLY
	OFF-SHIP SERVICES	ES01	MDS ONLY
<u>MAINTENANCE</u>			
<u>DEPARTMENT</u>			
	R1		
	WELD SHOP	26AX	ALL
	MACHINE SHOP	31AX	MDS ONLY
	R2		
	HYDRAULIC SHOP	31FX	ALL
	GAS TURBINE SHOP	31TX	MDS ONLY
	PROPELLER SHOP	38AX	MDS ONLY
	LIFT FAN SHOP	38BX	MDS ONLY
	A/C & R SHOP	56BX	MDS ONLY
	R3		
	TOOL ISSUE ROOM	06BX	ALL
	GSE SHOP	51BX	ALL
	MECH CALIBRATION SHOP	96AX	MDS ONLY
	SISCAL SHOP (GSE)	96BX	MDS ONLY
	R4		
	ELECTRONIC REPAIR SHOP (ET)	67AX	ALL
	ELECTRONIC CAL SHOP (ET)	67BX	MDS ONLY
	2M/MTR	67MX	MDS ONLY
	R5		
	AIRFRAME SHOP	64AX	ALL
	CORROSION CONTROL SHOP	71BX	MDS ONLY
	R6		
	SHIPSUP	10AX	MDS ONLY
	PLANNING AND ESTIMATING	10CX	MDS ONLY
	R7		
	NDT TESTING	93AX	MDS ONLY
	QUALITY ASSURANCE	93BX	MDS ONLY

APPENDIX C4Q
STANDARD WORK CENTER CODES FOR
ASSAULT CRAFT UNIT FIVE (ACU-5) COMMAND

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>OPERATIONS</u>			
<u>DEPARTMENT</u>			
	LC		
	LANDING CRAFT XX **	LCXX **	ALL, AS REQUIRED
	SC		
	SHORE CONNECTOR**	SCXX**	ALL, AS REQUIRED
	OPERATIONS		
	MAINTENANCE	OM01	MDS ONLY
	CRAFT CONTROL	OC01	ALL
<u>OPERATIONS ASHORE</u>			
<u>DEPARTMENT</u>			
	SUPPORT EQUIPMENT	72AX	ALL
	AIS SHOP	IT01	ALL
	GUNNERS MATE SHOP	OW01	ALL
<u>SUPPLY</u>			
<u>DEPARTMENT</u>			
	S1		
	STORES	SS01	MDS ONLY
	S2		
	GALLEY	SS02	MDS ONLY
	S4		
	HAZMAT	95A	ALL
	HAZMAT	HAZ1	MDS ONLY
	REP MATERIAL	RM64	MDS ONLY

** EACH OF THE DIVISIONAL STRUCTURES WILL BE BROKEN DOWN INTO WORK CENTERS, USING THE FIRST TWO LETTERS OF THE DIVISION. THERE IS ONE WORK CENTER FOR EACH LANDING CRAFT OR SHORE CONNECTOR ASSIGNED, THE "XX" REPRESENTS THE CRAFT HULL NUMBER. INCLUDE THE PMS TEAM AT NSLC WHEN MAKING CHANGES FOR THESE WORKCENTERS TO KEEP PMS DATA UPDATED.

APPENDIX C4R
STANDARD WORK CENTER CODES FOR
ESB CLASS SHIPS

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>EXECUTIVE DEPARTMENT</u>			
	EX		
	ADMIN	EX01	ALL MDS ONLY
	3MC	EX03	ALL MDS ONLY
	HM		
	MEDICAL	HM01	ALL
<u>AIR DEPARTMENT</u>			
	V1		
	FLIGHT DECK	V101	ALL
	SUPPORT EQUIP.	VM04	ALL
	V4		
	FUELS	V401	ALL
<u>COMBAT SYSTEMS DEPARTMENT</u>			
	CC		
	RADIO	CC01	ALL
	LAN/ADP	CC02	ALL
	CE		
	ELECTRONICS	CE01	ALL
	IC SHOP	CE05	ALL
	CG		
	ARMORY	CG03	ALL
<u>ENGINEERING DEPARTMENT</u>			
	EA		
	AUXILIARY	EA01	ALL
	EE		
	ELECTRICAL	EE02	ALL
	ER		
	DAMAGE CONTROL	ER04	ALL
<u>DECK DEPARTMENT</u>			
	OD		
	DECK	DA01	ALL

APPENDIX C4R
STANDARD WORK CENTER CODES FOR
ESB CLASS SHIPS

SUPPLY
DEPARTMENT

S1		
GENERAL STORES	SS01	ALL MDS ONLY
S2		
FOOD SERVICE	SS02	ALL
S3		
SHIP SERVICES	SS03	ALL

APPENDIX C4S
STANDARD WORK CENTER CODES FOR
LCC 20 COMMAND

<u>DEPARTMENT</u>	<u>DIVISION W/C</u>	<u>W/C CODE</u>	<u>CLASS</u>
<u>EXECUTIVE DEPARTMENT</u>	EX		
	ADMIN	EX04	ALL
	HM		
	MEDICAL	MH01	ALL
<u>COMBAT SYSTEMS DEPARTMENT</u>	CN		
	SATELLITE COMM	CE01	ALL
	2-M	CSE3	ALL
	INTERIOR COMMS	CE05	ALL
	CE		
	LINE OF SIGHT COMMS	CE02	ALL
	RADAR	CE03	ALL
	TEST EQUIPT ELEC CAL	CE04	ALL
<u>COMMUNICATIONS DEPARTMENT</u>	CIS		
	CIS	CI04	ALL
	CR		
	RADIO	CR01	ALL
	CI		
	LAN AND LAN HARDWARE	CI01	ALL
<u>OPERATIONS DEPARTMENT</u>	OI		
	CIC	OI01	ALL
	OX		
	ELECTRONIC WARFARE	OI03	ALL
	OW		
	GUNNERY MAINTENANCE	OW01	ALL
	CIWS	OW04	ALL
<u>SUPPLY DEPARTMENT</u>	S3		
	SHIPS SERVICES	SS03	ALL

APPENDIX D
LISTING OF STANDARD WORK CENTER CODES FOR
MASTER JOB CATALOG ITEMS CONTAINED IN SHIP'S CSMP
(Surface and Submarine Forces Only)

Submarine Forces:

Description	Code
Overhaul, SRA, Baseline routines	EXSY
NAVSEA Issued Ship Alterations	*XSA
NSWCPD Machinery Alteration	*XMA
NAVSEA Issued Field Changes	*XFC
NAVSEA Issued Engineering Changes	*XEC
NAVSEA Issued (TYCOM Managed) Temporary Alterations	**TA
TYCOM Issued Alterations	*XTY
DIRSSP Issued Strategic Systems Program Alterations (SSBN, SSGN)	**SP
TYCOM Directed and Funded Grooms and Certifications	**TY
Submarine Extended Operating Cycle PMRs	**JC
Test and Measurement System Repair Routines	**CR
MJC Service Routines	**MC

*=Department

**=Department or Division

Surface Forces:

Description	Code
Overhaul, SRA, Baseline routines	EXSY
NAVSEA and TYCOM Issued Alterations	EXSA
Engineering Cycle	**EC

First character identifies the requesting Department.

Second character identifies the Administrative Procedure ("X").

Third character indicates catalog routine ("C").

Last character denotes the maintenance source code as:

- A - Planned Maintenance Subsystem
- B - Unassigned
- C - Corrective
- D - Upkeep
- E - Miscellaneous

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APPENDIX E

JOB ORIGINATOR VALUES

JOB ORIGINATOR			OBS	BRKR	JOB ORIGINATOR TEXT	SHORT TEXT
SEQ	SORT	CODE	FG	FG		
25	1	A	0	0	ACCCIT (AIR)/DC (SURF) TSRA HM&E (SUBS)	LOCAL TYCOM
26	7	B	0	0	C5RA (AIR) CSAT/MAPAI (SUBS); CBR INSPECTION (SURF)	LOCAL TYCOM
27	2	C	0	0	LCS/DDG 1000 (SURF) TSRA COMBAT SYSTEMS (SUBS)	LOCAL TYCOM
28	8	D	0	0	CABLEWAY (AIR) I-LVL DEPARTURE (SUBS)	LOCAL TYCOM
42	42	E	0	0	ELEVATOR SUPPORT UNIT (AIR)	LOCAL TYCOM
46	46	F	0	0	INSURV (NATIONAL)	INSURV-N
29	9	G	0	0	ERAT, IRAT, TMIT (SURF)	LOCAL TYCOM
30	10	H	0	0	EQOL/FSL (AIR); 2K-FTA (SURF)	LOCAL TYCOM
43	43	I	0	0	NAVSEALOGCEN RESERVED	NAVSEALOGCEN
37	17	J	0	0	POET'S (AIR); ICAS (SURF)	LOCAL TYCOM
31	11	K	0	0	TSRA/CSC C5RA (SURF)	LOCAL TYCOM
40	40	L	0	0	PORT ENGINEER WRITTEN JSNs	NATIONAL
39	39	M	0	0	MicroPMR (MPMR)/MSWP (SUB)	LOCAL TYCOM
41	41	N	0	0	CORROSION CONTROL (SURF)	LOCAL TYCOM
32	12	P	0	0	PEPSI (AIR)/SECAP (SURF); PMT OSAR (SUBS)	LOCAL TYCOM
15	15	Q	0	1	CREATED BY RMAIS (NATIONAL)	RMAIS-N
16	16	R	0	0	INSURV (NATIONAL)	INSURV-N
33	13	S	0	0	CEMAT (AIR) SHIP SEMAT (SURF); SAIL DEFICIENCIES (SUBS)	LOCAL TYCOM
45	45	T	0	0	TYCOM (AIR, SURF, SUBS)	LOCAL TYCOM
38	18	U	0	0	TOOLSET FOR INSPECTIONS (BOILERS, DIESELS, ETC.)	OPNAVINST 9220.3
44	6	V	0	0	ALRE ICAV (AIR), UNSCHEDULED INSPECTION/ASSESSMENT TASKS (SURF)	LOCAL TYCOM
34	14	W	0	0	BAWP (AIR)/ICMP; IMF TSRA; ICAS; RMC TSRA (SURF)	LOCAL TYCOM
35	15	X	0	0	BAWP (AIR)	LOCAL TYCOM
36	16	Y	0	0	AIR/MST (SURF); BAWP (AIR)	LOCAL TYCOM
					MST/CLASS MAINTENANCE PLANS (SURF) CLASS MAINTENANCE PLANS	
23	5	Z	0	0	(NATIONAL) MST/M&SWP	LOCAL TYCOM
999,999	999,999	?	0	0	Invalid	Invalid

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APPENDIX F
SHIPYARD ALTERATION CERTIFICATION LETTER

4720

Ser/Org Code

Date:

From: (Originating Activity)

To: Commanding Officer, USS (Ship's Name and hull number)

Subj: CERTIFICATION OF ALTERATION INSTALLATION DURING AVAILABILITY
(include data range of availability)

Ref: (a) NAVSEAINST 4790.8(Series)

1. The following alterations are certified installed. The listed alterations meet the requirements of the issuing agency as instructed, and include all required Logistics Support documentation.

3-M WC/JSN	ALTERATION NO.	DESCRIPTION	A/T
(For example only):			
DXSA 0054	SADDG 0045 K	MISSILE LAUNCH INSTL	5B
EXSA 3994	SADDG 01003 K	SSTG INSTL	5B
EXSA 4007	SADDG 01675 K	HPAC RPLCMNT	5B

//Signature//

By direction

Copy to:
(Cognizant TYCOM)
NAVSEA (Cognizant Code)

Alteration Certification Letter

Appendix F Ship's Endorsement Examples

4720

Ser/Org Code

Date:

FIRST ENDORSEMENT on NSY ltr 4720 Ser/Org Code of (Date of ltr)

From: Commanding Officer, USS (Ship's Name and hull number)

To: (Supporting Activity, e.g., IUC, RSG, etc.)

Subj: CERTIFICATION OF ALTERATION INSTALLATION DURING AVAILABILITY
(include data range of availability)

Ref: (a) NAVSEAINST 4790.8(Series)

1. Request the alterations reported completed by basic correspondence be processed as completed deferrals in the Master CMSP.

//Signature//

By direction

Copy to:
(Cognizant TYCOM)
NAVSEA (Cognizant Code)

First Endorsement on Alt. Certification Letter

APPENDIX G**PREPARATION INSTRUCTIONS CONFIGURATION CHANGE FORM
(OPNAV 4790/CK)****1. CONFIGURATION CHANGE FORM (OPNAV 4790/CK)**

- a. The OPNAV 4790/CK Form is used to report completion (or partial completion) of alterations, maintenance actions that resulted in a configuration change and to correct discrepancies and errors in the configuration files.
- b. Three blocks at the top of the form are used to specify what type of action is being reported (a configuration file correction "CONFIG FILE CORR" a completed maintenance action that had no prior deferral "COMP M/A NO DEFL" and a completed deferred maintenance action "COMP DEFL"). The rest of the form is separated into four sections.
- c. The OPNAV 4790/CK is available to download in PDF format at:
https://navalforms.documentservices.dla.mil/formsDir/_OPNAV_4790_CK__540.pdf
- d. The OPNAV 4790/CK Continuation form is available to download in PDF format at:
https://navalforms.documentservices.dla.mil/formsDir/_OPNAV_4790_CK_C_3277.pdf

1.1. Section I - Job Identification: This section identifies the system or equipment involved in the configuration action. If a component or sub-unit is being reported, the Job Identification in this section must be that of the highest assembly. Components and sub-units are reported in Section III.

1.2. Section II - Job Description/Remarks: This section contains remarks relating to the accomplishment of the action. In some cases, an alteration directive will specify that certain information be documented.

1.3. Section III - Component Configuration Change Identification: This section contains information on the component(s) affected by the maintenance (configuration change) action. The Job Identification Level (section I) will be completed to the highest assembly directly affected by the change. The sub-units (components) are reported to the individual Allowance Parts List (APL) level in SECTION III. An OPNAV 4790/CK allows only one component (sub-unit) to be reported per form. When multiple sub-units need to be reported, "CONTINUATION SHEET(s)" OPNAV 4790/CK(C), that can report up to four components per Form can be attached. The same Job Control Number (JCN) as assigned to the higher-level assembly maintenance action recorded in SECTION I is to be continued on each component reported.

1.4. Section IV - Special Purpose: This section is filled in onboard, with the exception of Block 30 (is no longer applicable).

NOTE: EXAMPLES OF COMPLETED OPNAV 4790/CK FORMS FOR VARIOUS REPORTING SITUATIONS CAN BE FOUND AT THE END OF THIS APPENDIX AS FIGURES G1 THROUGH G8.

2. PROCEDURES FOR REPORTING CONFIGURATION CHANGE (OPNAV 4790/CK FORM) - Place an “X” in the appropriate block at top of form to indicate the type of action being reported, “COMP M/A NO DEFL” or “COMP DEFL”.

2.1. Section I - Job Identification.

2.1.1. Job Control Number (Blocks 1 - 3):

- a. Block 1 - UIC: Enter the Unit Identification Code (UIC) of the activity receiving the maintenance action.
- b. Block 2 - WORK CENTER: Enter the code of the Work Center responsible for the equipment. For Ships, a four-position Work Center code will be entered. For repair departments of SIMAs, RMCs and other IMAs, a three-digit code will be entered. The three-digit code is entered left-to-right leaving the right most position blank. Appendix C of this chapter provides a listing of authorized Work Center codes (Submarine Tenders have been converted to a four-position Work Center code).
- c. Block 3 - JOB SEQ. NO. (JSN): Enter the four character JSN assigned by the Work Center Supervisor. This is an entry assigned sequentially from the SFWL/JSN Log.

NOTE: (BLOCKS 1, 2, 3): IF THE CONFIGURATION CHANGE BEING REPORTED IS NOT AN ALTERATION AND CLOSES A JOB PREVIOUSLY DEFERRED AND ON THE CURRENT SHIP'S MAINTENANCE PROJECT (CSMP), ENTER THE JCN OF THE OPENING DEFERRAL. IF THE MAINTENANCE ACTION IS THE ACCOMPLISHMENT OF AN ALTERATION, ENTER THE JCN FROM THE ALTERATION RECORD (E.G., EXSA2134, OXTY1016, WXSP1124).

2.1.2. Alteration Identification.

- a. Block 4 - ALTERATIONS (Ship Alterations (SHIPALTs), Field Changes (FCs), Etc.): If applicable, enter the alteration number from the authorizing directive.
 - (1) For SHIPALTs, enter the alteration identification exactly as it appears on the SHIPALT Record. Record the alteration type “SA” in the first two positions, ship type starting in position three, and the alteration number starting in the 7th position of the block (e.g., SASSBNf342130). Enter the title code from the alteration record in the last right-hand position of the block.
 - (2) For all other alteration types, enter the alteration type character code in the first two positions of the block. Enter the alteration number starting in position four (e.g., OAf96999, FC 29, TY 0132). If an alteration identification number is not provided with the alteration record, leave blank. Table G-1 reflects the authorized alteration prefix codes:

SA	Ship Alteration
OA	Ordnance Alteration
BA	Boat Alteration
FC	Field Change
MA	Machinery Alteration

SI	SYSCOM Command Instruction
EC	Engineering Change
HI	Habitability
TY	TYCOM Direction
TD	Technical Directive
SP	STRATEGIC SYSTEMS PROJECT Office Alteration
SC	Service Change
TR	Trident Alteration
EP	Engineering Change Proposal
MO	Crypto Equipment Modification
AR	Alteration Request May be originated by a ship to request an alteration design. Enter and left justify the authorized prefix “AR” followed by a blank space, any number the ship assigns for its own control.

Table G-1

2.1.3. Block A - Enter Command’s Name.

2.1.4. Block B - Enter Ship’s Hull Number (if applicable).

2.1.5. Block 5 - EIC: Enter the Equipment Identity Code (EIC) for the equipment identified in the Equipment Noun Name field (Block 7). EICs are listed in the Ship Configuration Logistic Support Information System (SCLSIS) Index Report or Ship’s 3-M Reference CD/DVD.

NOTE: WHEN DOCUMENTING 3-M REQUESTS FOR FLEET AND DEPOT ASSISTANCE, A SPECIAL EIC OF “ZOOZ” FOR NAVSEA 08 AND “ZOYY” FOR DIRSSP **MUST BE USED AND THE REMAINING DATA MUST BE UNCLASSIFIED.**

2.1.6. Block 6 - ACT: Enter the appropriate Action Taken code from the lower section of the OPNAV 4790/CK form or from the list provided in Table G-2.

NOTE: THE LIST OF “ACTION TAKEN” CODES CHANGES OCCASIONALLY. VERIFY CURRENT “ACTION TAKEN” CODES AT THE FOLLOWING WEB SITE: [HTTPS://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML](https://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML)

Code	Descriptions
5A	Partially Completed Alteration. The IMA must describe in the Job Description/Remarks section what was done and the O-level that remains to be done.
5B	Fully Completed Alteration.
5C	Fully Completed Equivalent to Alteration.
5D	Alteration Directive Not Applicable.

Code	Descriptions
NOTE: USE OF A NUMBER 5 () CODE REQUIRES AN ENTRY IN BLOCK 4 “ALTERATION IDENTIFICATION”.	
1	Maintenance Action Completed; Parts Drawn from Supply.
2	Maintenance Action Completed; Required Parts Not Drawn from Supply (local manufacture, pre-expended bins, etc.).
3	Maintenance Action Completed; No Parts Required.
NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH THE ACTION TAKEN CODES 1, 2, OR 3 AS DIRECTED BY THE TYCOM:	
A	Maintenance Requirement Could Have Been Deferred.
B	Maintenance Requirement Was Necessary.
C	Maintenance Requirement Should Have Been Done Sooner.
M	High Cost Repairs.
T	The Equipment Being Reported Had a Time Meter.

Table G-2

2.1.7. Block 7 - EQUIPMENT NOUN NAME: If the maintenance action is as the result of the accomplishment of a SHIPALT, enter the equipment Noun Name from the SHIPALT record. Otherwise, enter the equipment nomenclature and description of the equipment or system on which the maintenance was performed. If the maintenance action affects several components, enter the name and designator of the highest assembly. For HM&E equipment, enter the noun name. For electronics equipment, enter the Army-Navy (AN) type designator or commercial model number. For ordnance equipment, enter the system/equipment nomenclature, followed by the Mark and Mod numbers, e.g., Launch System 36/1.

2.1.8. Block 8 - MHRS EXP: Enter the total number of man-hours expended by Ship's Force (and not previously reported) in completing and documenting the maintenance action.

Man-hours expended by others tasked to perform equipment maintenance are to be documented separately.

2.1.9. Block 9 - ACT: Actual Maintenance Time used for Selected Equipment List (SEL) equipment only. Enter the total number of clock hours expended to complete the maintenance.

2.1.10. Block 10 - COMP. DATE: Enter the Julian date the maintenance action was completed.

2.1.11. Block 11 - M/R (Meter Reading): Enter an “X” if the equipment or any of the equipment components or sub-units to be identified in Section III have time meters installed.

2.2. Section II - Job Description/Remarks Block 12: Enter any information and remarks relating to the accomplishment of the action. In some cases, an alteration directive will specify that

certain information be documented. If an “X” is entered in Block 11, identify in Block 12 each equipment followed by “M/R” and the time meter reading.

2.3. Section III - Component Configuration Change Identification.

2.3.1. Block 13 - COMPONENT NOUN NAME: Enter the noun name of the component removed, installed or modified. For HM&E equipment, enter the noun name. For electronics equipment, enter the “AN” type designator or commercial model number. For ordnance equipment, enter the system or equipment nomenclature, followed by the Mark and Mod numbers, e.g., Launch System 36/1.

2.3.2. Block 14 - QUANTITY: Enter the number of like components or sub-units identified in Block 13 that were, removed, installed or modified. The quantity must be “001” if a component identification number is entered in Block 16, or a serial number is entered in Block 17 (see 2.3.5.).

2.3.3. Block 15 - CA (Component Action): Enter the code identifying whether the equipment in Block 13 was, removed (R), installed (I) or modified (M). When reporting a configuration file action vice a maintenance action, enter (A) for an Add, (D) for a Delete or (C) for a Correction.

2.3.4. Block 16 - COMPONENT IDENTIFICATION: Enter the local identification number(s) such as station number or valve mark of the equipment identified in Block 13. This information must be consistent with the quantity entered in Block 14. For electronic (ELEX) equipment, enter the model number, and if available, enter the serial number in Block 17.

2.3.5. Block 17 - COMPONENT SERIAL NUMBER: Enter the manufacturer’s serial number of the equipment identified in Block 13. If the serial number is not available, enter “NONE”.

2.3.6. Block 18 - COMPONENT APL/AEL: Enter the Component Allowance Parts List or Allowance Equipage List (APL/AEL) of the component identified in Block 13. If not available, the unit’s supply department should assign a temporary APL.

2.3.7. Block 19 - LOCATION (DECK/FRAME/SIDE): Enter the location (compartment number, deck, frame or side notation), that best describes the location of the equipment identified in Block 13. If none of the mentioned location identifications are appropriate, enter a descriptive term of the onboard location (e.g., FANTAIL, FLIGHT DECK, etc.).

2.3.8. Block 20 - EIC: Enter the Equipment Identity Code (EIC) that best describes the component identified in Block 13.

2.3.9. Block 21 - NEXT HIGHER ASSEMBLY: Enter the nomenclature and serial number of the next higher assembly. No entry is required when the component identified in Block 13 is the highest assembly.

2.3.10. Block 22 - SAC: Enter the Service Application Code (SAC) of the component identified in Block 13. SAC codes can be obtained from the supply department.

2.3.11. Block 23 - WORK CENTER: Enter the code (Work Center Responsible for Equipment (WCRE)) of the Work Center having primary maintenance responsibility for the component identified in Block 13.

2.3.12. Block 24 - NAMEPLATE DATA: Enter the Contract Number or Procurement Document Number, Part Number or Model Number or Drawing Number, and if available, the

Commercial and Government Entity (CAGE) (formerly called Federal Supply Code for Manufacturers (FSCM)). Additional information, if available, such as physical characteristics and manufacturer's identification is useful. No entry is required for modifications and deletions if an APL is listed in Block 13.

2.3.13. Block 25 - MIP: Enter the Maintenance Index Page (MIP) covering the component identified in Block 13 for removals, modifications, changes and deletions. If not available, enter "N/A".

2.3.14. Block 26 - EOSS: (Engineering Operation Space Sequence) For HM&E equipment, enter the Engineering Operation Space Sequence (EOSS) Document Code and Control Number of the primary EOSS procedure affected. If more than a component level document is affected, enter only the EOSS component procedure.

NOTE: ENTRY NOT REQUIRED WHEN REPORTING ELECTRONIC OR ORDNANCE CONFIGURATION CHANGE ACTIONS.

2.3.15. Block 27 - TM: For removal and modifications, enter the Technical Manual (TM) covering the affected component. For like equipment installations, enter the TM covering the equipment. For new installations, enter the TM when available; if not available, enter N/A.

2.4. Section IV - Special Purpose.

2.4.1. Block 28 - RIN: Enter the Record Identification Number (RIN) as listed in Part I, Section C of the COSAL, for deletions, removals and modifications. For installations and additions, leave blank.

2.4.2. Block 29 - AILSIN: Enter the Automated Integrated Language System Identification Number (AILSIN) assigned by the Configuration Data Manager (CDM), Platform Manager or Item Manager. For Electronic equipment, no entry is required unless directed by TYCOM. (CNIC, CNSP, CNSL, CNIF, CSL and CSP have no requirement.)

2.4.3. Block 30 - SECAS OFFICE USE: Block is no longer used.

3. PROCEDURES FOR USING CK CONTINUATION PAGES: The JCN entry must be the same as on page 1. Up to four components can be reported on the same continuation form, with each separate component block considered a separate continuation page with its own page number. Assign page numbers consecutively. If applicable, check the block at the top of each component identification section to indicate that all data to be entered is the same as SECTION III, page 1, except for that data actually entered in the component identification section. An arrow pointing up (↑) * should be placed in the first block of each blank field to indicate that it is the same as page 1. For each component reported, the required entries on the continuation pages are the JCN, page number, equipment alteration number (if applicable) and those component identification data elements which differ from SECTION III, page 1 (original CK).

* On the electronic form, this is accomplished by holding down the "Alt" key and on the number keypad typing in 2 and then 4. This will produce an up arrow in the block selected.

4. PROCEDURES FOR REPORTING CONFIGURATION FILE CORRECTIONS, AND UPDATING THE COORDINATED SHIPBOARD ALLOWANCE LIST (COSAL).

4.1 Correct errors in a previous submission: Check the block "CONFIG FILE CORR" at the top right portion of the CK form. Enter the exact JCN (Blocks 1, 2, and 3) and page number of the

CK which was submitted in error. Enter action code “C”, which indicates “correction” in Block 15. If the entire configuration data submitted on the previous CK is in error, fill in ALL the blocks with the corrected data. Otherwise, fill in only the applicable blocks with the correct data.

4.2. Correct a Data Element Error in the Ship’s COSAL or COSAL Indexes, or Other Such Documents: Check the block (CONFIG FILE CORR) at the top right portion of the CK form. In SECTION I, enter a new JCN in Blocks 1, 2 and 3. In SECTION II, Block 12 for “JOB DESCRIPTION” insert the words “CORRECTION OF COSAL”, or a description of the type of correction. If the APL is to be corrected, enter the words “CHANGE APL FROM _____” and enter the incorrect APL number. In SECTION III, enter in Block 13 the component noun name from the SCLSIS Index report, COSAL, etc. Enter in Block 15 code “C” for “correction”. Enter the EIC of the component in Block 20. If the correction is for HM&E equipment, also enter the APL in Block 18. Enter the applicable RIN in Block 28. In addition to the corrected data these are the only required data elements that need to be reported.

5. REPORT AN EQUIPMENT RECORD ADDITION/DELETION: Complete the CK as described for “CORRECTING A DATA ELEMENT IN THE SHIP’S COSAL” in the **previous** paragraph, with the following exceptions: In SECTION II, Block 13 enter the words “ONBOARD - NOT COSAL SUPPORTED” or “NOT ONBOARD - COSAL SUPPORTED”, as appropriate. In SECTION III Block 15, enter action code “A” for equipment onboard but not COSAL supported, or action code “D” for equipment that is not onboard but is COSAL supported. For an equipment “ADD”, also provide as much additional information as possible (e.g., Serial Number, Next Higher Assembly, if applicable, Location, Work Center, EIC, Nameplate Data, MIP, TMs, etc.). For equipment DELETE, provide the RIN in Block 28 if applicable.

6. REPORT THE TURN-IN OR RECEIPT OF PORTABLE ELECTRICAL/ELECTRONIC TEST EQUIPMENT (PEETE): Check the CK Block for “CONFIG FILE CORR” and then follow standard procedures described for “CORRECTING A DATA ELEMENT IN THE SHIP’S COSAL” in the **previous** paragraph.

7. HANDLING PROCEDURES: The completed CK form is submitted to the Work Center Supervisor and then to the Division Officer, each of whom reviews the form for completeness and accuracy and initials in the appropriate blocks at the bottom of the form. The Division Officer then forwards the CK to the supply department. Supply department personnel verify or enter data such as APL/AEL, SAC and RIN and will resolve any discrepancies noted with the Work Center Supervisor prior to further routing. Supply department personnel will initial the appropriate block at the bottom of the form and ensure the sequence number first digit is the last digit of the current calendar year. The remaining four digits indicate the chronological sequence of CK forms being submitted by the ship or activity for the year. Supply department personnel will ensure the Work Center entered in Block 23 as the correct Work Center having primary maintenance responsibility for the equipment (not the supply department Work Center). The Supply Department should then forward the CK to the 3-M Coordinator. After reviewing for completeness, initialing and dating in the appropriate block, the 3-M Coordinator submits the CK to the 3-M ADP facility serving the activity. A copy is to be maintained in the Work Center as a suspense copy.

The following figures are provided:

Figure G - 1 Configuration Change Form for Component Removal Maintenance Action

Figure G - 2 Configuration Change Form for Component Install (continuation)

Figure G - 3 Configuration Change Form Resulting from an Alteration

Figure G - 4 Configuration Change Form for an Alteration Install (continuation)

Figure G - 5 Configuration Change Form for a Correction to a Previously Submitted Change

Figure G - 6 Configuration Change Form for Location Correction

Figure G - 7 Configuration Change Form for COSAL Add

Figure G - 8 Configuration Change Form for COSAL Delete

OPNAV 4790/CK (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM

☐ CONFIG FILE
CORR☐ COMP. M/A
NO DEFL☒ COMP DEFL

SECTION I JOB IDENTIFICATION

JOB CONTROL NUMBER			ALTERATION IDENTIFICATION		
1. UIC 23152	2. WORK CENTER OC01	3. JOB SEQ NO 0123	4. ALTERATIONS (SHIPALT, FLD. CHG., ETC.)		
A. COMMAND NAME USS KIDD		B. HULL NUMBER (IF APPLICABLE) DDG-100	5. EIC 0452E	6. ACT TKN 1	
7. EQUIPMENT NOUN NAME COMPUTER SYSTEM, DIGITAL		8. MHRS. EXP. 120	9. ACT.	10. COMP. DATE 7, 2, 1, 8	11. M/R ☐

SECTION II JOB DESCRIPTION/REMARKS

12. JOB DESCRIPTION/REMARKS COMPUTER RETROFITTED WITH UPDATED HARDWARE

SECTION III COMPONENT CONFIGURATION CHANGE IDENTIFICATION

13. COMPONENT NOUN NAME CONTROLLER, MEMORY		14. QUANTITY 001	15. CA R
16. COMPONENT IDENTIFICATION RACK 1A		17. COMPONENT SERIAL NUMBER 12345ABC	
18. COMPONENT APL/AEL 00002785CL	19. LOCATION (DECK/FRAME/SIDE) 04-102-0-Q		20. EIC QK4H200
21. NEXT HIGHER ASSEMBLY NONE		22. S.A.C.	23. WORK CENTER OC01
24. NAMEPLATE DATA HONEYWELL INFO SYS INC SERIAL: 12345ABC MOD: 1A			
25. MIP 4A00/003		26. EOSS	
27. TM NA47-00			

SECTION IV SPECIAL PURPOSE

28. RIN	29. AILSIN	30. SECAS OFFICE USE

--INSTRUCTIONS--

ITEM NUMBER	SECTION I & II DESCRIPTION	SECTION I & II PAGE 1			CONT. PAGE	LEGEND	
1-3	JOB CONTROL NUMBER	M			M	IA IF AVAILABLE	O OPTIONAL
4	ALTERATION IDENTIFICATION	IP			IP	IP IF APPLICABLE	NR NOT REQUIRED
5	EQUIPMENT IDENTIFICATION CODE	M			NR	M MANDATORY	
6	ACTION TAKEN	M			NR		
7	EQUIPMENT NOUN NAME	M			NR		
8	SHIP'S FORCE MANHOURS EXPENDED	M			NR		
9	ACTIVE MAINTENANCE TIME	M			NR		
10	COMPLETION DATE	M			NR		
11	METER READING	IP			NR		
12	JOB DESCRIPTION (REMARKS)	O			NR		
ITEM NUMBER	SECTION III DESCRIPTION	REMOVE (R/D)	INSTALL (I/A)	MODIFY (M/C)			
13	COMPONENT NOUN NAME	M	M	M			
14	QUANTITY	M	M	M			
15	COMPONENT ACTION	M	M	M			
16	COMPONENT IDENTIFICATION	IP	IP	IP			
17	COMPONENT SERIAL NUMBER	IA	IA	IA			
18	COMPONENT APL/AEL	M	IA	IA			
19	LOCATION	M	M	M			
20	EQUIPMENT IDENTIFICATION CODE	NR	IA	NR			
21	NEXT HIGHER ASSEMBLY	IP	IP	IP			
22	SERVICE APPLICATION CODE	IA	IA	IA			
23	WORK CENTER	NR	M	NR			
24	NAMEPLATE DATA	NR	M	NR			
25	MAINTENANCE INDEX PAGE	IA	IA	IA			
26	EOSS	IP	IP	IP			
27	TECH MANUAL NUMBER	IA	IA	IA			
WORK CENTER SUPERVISOR NUB		DIVISION OFF DUD	SUPPLY DEPT. CUG	3 M COORDINATOR MAC	SHIP SEQUENCE NUMBER 70345	PAGE 1 OF 2	

Figure G-1 Configuration Change Form for Component Removal Maintenance Action

16 Oct 2019

OPNAV 4790/CK(C) (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM CONTINUATION PAGE

1. COMMAND UIC 23152		2. WORK CENTER OC01		3. JOB. SEQ NO. 0123	4. ALTERATIONS (SHIPALT, ORDALT, Fid Chg. ect.)		SAME AS P1, SIII EXCEPT ☐	PAGE 2 OF 2	
13. COMPONENT NOUN NAME COMPUTER SYSTEM, DIGITAL							14. QUANTITY 001	15. CA R	
16. COMPONENT IDENTIFICATION INTERFACE, CURRENT LOOP					17. COMPONENT SERIAL NUMBER RAC1-2				
18. COMPONENT APL / AEL 00002803			19. LOCATION (Deck / Frame / Side) 040-102-0-Q			20. EIC QK4H200			
21. NEXT HIGHER ASSEMBLY COMPUTER, DIGITAL						22. S.A.C.		23. WORK CENTER OC01	
14. NAME PLATE DATA HONEYWELL INFO SYS INC									
25. MIP 4A02/003					26. EOSS				
26. TM NA47-00									
28. RIN		29. ALSIN			30. SECAS OFFICE USE				

1. COMMAND UIC		2. WORK CENTER		3. JOB. SEQ NO.	4. ALTERATIONS (SHIPALT, ORDALT, Fid Chg. ect.)		SAME AS P1, SIII EXCEPT ☐	PAGE _____ OF _____	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION					17. COMPONENT SERIAL NUMBER				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side)			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN		29. ALSIN			30. SECAS OFFICE USE				

1. COMMAND UIC		2. WORK CENTER		3. JOB. SEQ NO.	4. ALTERATIONS (SHIPALT, ORDALT, Fid Chg. ect.)		SAME AS P1, SIII EXCEPT ☐	PAGE _____ OF _____	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION					17. COMPONENT SERIAL NUMBER				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side)			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN		29. ALSIN			30. SECAS OFFICE USE				

1. COMMAND UIC		2. WORK CENTER		3. JOB. SEQ NO.	4. ALTERATIONS (SHIPALT, ORDALT, Fid Chg. ect.)		SAME AS P1, SIII EXCEPT ☐	PAGE _____ OF _____	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION					17. COMPONENT SERIAL NUMBER				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side)			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN		29. ALSIN			30. SECAS OFFICE USE				

Figure G-2 Configuration Change Form for Component Install (continuation)

16 Oct 2019

OPNAV 4790/CK (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM

☐ CONFIG FILE
CORR☒ COMP. M/A
NO DEFL☐ COMP DEFL

SECTION I JOB IDENTIFICATION

JOB CONTROL NUMBER			ALTERATION IDENTIFICATION		
1. UIC 23121	2. WORK CENTER EM03	3. JOB SEQ NO 0526	4. ALTERATIONS (SHIPALT, FLD. CHG., ETC.) SALSD 28758		
A. COMMAND NAME USS HARPERS FERRY		B. HULL NUMBER (IF APPLICABLE) LSD-49		5. EIC 0452E	6. ACT TKN 5B
7. EQUIPMENT NOUN NAME LP AIR COMPRESSOR		8. MHRS. EXP. 150	9. ACT. 010	10. COMP. DATE 6 1 9 2	11. M/R ☐

SECTION II JOB DESCRIPTION/REMARKS

12. JOB DESCRIPTION/REMARKS REMOVED LOW PRESSURE AIR COMPRESSORS (LPAC) NR 1 / NR 2, AS PER SHIPALT

SECTION III COMPONENT CONFIGURATION CHANGE IDENTIFICATION

13. COMPONENT NOUN NAME LP AIR COMPRESSOR		14. QUANTITY 001	15. CA R
16. COMPONENT IDENTIFICATION LPAC NR 1		17. COMPONENT SERIAL NUMBER DR-115880	
18. COMPONENT APL/AEL 061900511	19. LOCATION (DECK/FRAME/SIDE) 5-89-0-E		20. EIC TF03100
21. NEXT HIGHER ASSEMBLY COMPRESSED AIR SYSTEM		22. S.A.C. OBACB	23. WORK CENTER EM03
24. NAMEPLATE DATA DRESSER RAND INC MOD 1			
25. MIP 5515/072		26. EOSS LPAC/0001	
27. TM 9241-AB-MMO-010			

SECTION IV SPECIAL PURPOSE

28. RIN B0510	29. AILSIN 55153	30. SECAS OFFICE USE

--INSTRUCTIONS--

ITEM NUMBER	SECTION I & II DESCRIPTION	SECTION I & II PAGE 1	CONT. PAGE	LEGEND		
1-3	JOB CONTROL NUMBER	M	M	IA IF AVAILABLE	O OPTIONAL	
4	ALTERATION IDENTIFICATION	IP	IP	IP IF APPLICABLE	NR NOT REQUIRED	
5	EQUIPMENT IDENTIFICATION CODE	M	NR	M MANDATORY		
6	ACTION TAKEN	M	NR	SECTION I, BLOCK 6 ACTION TAKEN		
7	EQUIPMENT NOUN NAME	M	NR			
8	SHIP'S FORCE MANHOURS EXPENDED	M	NR	SECTION III, BLOCK 15 COMPONENT ACTION		
9	ACTIVE MAINTENANCE TIME	M	NR			
10	COMPLETION DATE	M	NR	5A PARTIALLY COMPLETED ALTERATION	MAINTENANCE ACTIONS	
11	METER READING	IP	NR	5B FULLY COMPLETED ALTERATION	R REMOVED EQUIPMENT	
12	JOB DESCRIPTION (REMARKS)	O	NR	5C FULLY COMPLETED EQUIVALENT TO ALTERATION	I INSTALLED EQUIPMENT	
13	COMPONENT NOUN NAME	REMOVE (R/D)	INSTALL (I/A)	5D ALTERATION DIRECTIVE NOT APPLICABLE	M MODIFIED EQUIPMENT	
14	QUANTITY	M	M	1 MAINTENANCE ACTION COMPLETED; PARTS DRAWN FROM SUPPLY	CONFIG FILE CORR NO MAINTENANCE ACTION	
15	COMPONENT ACTION	M	M		2 MAINTENANCE ACTION COMPLETED; REQUIRED PARTS NOT DRAWN FROM SUPPLY (LOCAL MANUFACTURE, PRE- EXPENDED BINS)	A ADDITION OF RECORD
16	COMPONENT IDENTIFICATION	IP	IP			B DELETION OF RECORD
17	COMPONENT SERIAL NUMBER	IA	IA	C CORRECT/CHANGE EXISTING RECORD		
18	COMPONENT APL/AEL	M	IA	3 MAINTENANCE ACTION COMPLETED; NO PARTS REQUIRED		
19	LOCATION	M	M			
20	EQUIPMENT IDENTIFICATION CODE	NR	IA			
21	NEXT HIGHER ASSEMBLY	IP	IP			
22	SERVICE APPLICATION CODE	IA	IA			
23	WORK CENTER	NR	M			
24	NAMEPLATE DATA	NR	M			
25	MAINTENANCE INDEX PAGE	IA	IA			
26	EOSS	IP	IP			
27	TECH MANUAL NUMBER	IA	IA			
WORK CENTER SUPERVISOR RET	DIVISION OFF FLT	SUPPLY DEPT. COG	3 M COORDINATOR RES	SHIP SEQUENCE NUMBER 60113		
				PAGE 1 OF 2		

Figure G-3 Configuration Change Form Resulting from an Alteration

OPNAV 4790/CK(C) (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM CONTINUATION PAGE

1. COMMAND UIC 23121		2. WORK CENTER EM03		3. JOB. SEQ NO. 0526	4. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.) SALSD 28758		SAME AS P1. SIII EXCEPT ☒	PAGE 2 OF 2	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION LPAC NR 2					17. COMPONENT SERIAL NUMBER DR-115892				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side) 05-89-4-E			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN B0511			29. AILSIN 55153			30. SECAS OFFICE USE			

1. COMMAND UIC		2. WORK CENTER		3. JOB. SEQ NO.	4. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)		SAME AS P1. SIII EXCEPT ☐	PAGE _____ OF _____	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION					17. COMPONENT SERIAL NUMBER				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side)			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN			29. AILSIN			30. SECAS OFFICE USE			

1. COMMAND UIC		2. WORK CENTER		3. JOB. SEQ NO.	4. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)		SAME AS P1. SIII EXCEPT ☐	PAGE _____ OF _____	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION					17. COMPONENT SERIAL NUMBER				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side)			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN			29. AILSIN			30. SECAS OFFICE USE			

1. COMMAND UIC		2. WORK CENTER		3. JOB. SEQ NO.	4. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)		SAME AS P1. SIII EXCEPT ☐	PAGE _____ OF _____	
13. COMPONENT NOUN NAME							14. QUANTITY	15. CA	
16. COMPONENT IDENTIFICATION					17. COMPONENT SERIAL NUMBER				
18. COMPONENT APL / AEL			19. LOCATION (Deck / Frame / Side)			20. EIC			
21. NEXT HIGHER ASSEMBLY						22. S.A.C.		23. WORK CENTER	
14. NAME PLATE DATA									
25. MIP					26. EOSS				
26. TM									
28. RIN			29. AILSIN			30. SECAS OFFICE USE			

Figure G-4 Configuration Change Form for an Alteration Install (Continuation)

16 Oct 2019

OPNAV 4790/CK (REV 4-17)

Clear Form**CONFIGURATION CHANGE FORM**☒ CONFIG FILE
CORR☐ COMP. M/A
NO DEFL☐ COMP DEFL**SECTION I JOB IDENTIFICATION**

JOB CONTROL NUMBER			ALTERATION IDENTIFICATION		
1. UIC 21447	2. WORK CENTER OE01	3. JOB SEQ NO 5412	4. ALTERATIONS (SHIPALT, FLD. CHG., ETC.)		
A. COMMAND NAME USS PRINCETON		B. HULL NUMBER (IF APPLICABLE) CG-59		5. EIC	6. ACT TKN
7. EQUIPMENT NOUN NAME		8. MHRS. EXP.	9. ACT.	10. COMP. DATE	11. M/R ☐

SECTION II JOB DESCRIPTION/REMARKS

12. JOB DESCRIPTION/REMARKS CHANGE APL FROM 09590072015 TO 09590072010

SECTION III COMPONENT CONFIGURATION CHANGE IDENTIFICATION

13. COMPONENT NOUN NAME MOTOR, AC		14. QUANTITY 001	15. CA C
16. COMPONENT IDENTIFICATION FAN MOTOR		17. COMPONENT SERIAL NUMBER	
18. COMPONENT APL/AEL 09590072010		19. LOCATION (DECK/FRAME/SIDE) 02-115-1-L	20. EIC T30B151
21. NEXT HIGHER ASSEMBLY		22. S.A.C.	23. WORK CENTER OE01
24. NAMEPLATE DATA			
25. MIP		26. EOSS	
27. TM			

SECTION IV SPECIAL PURPOSE

28. RIN	29. AILSIN	30. SECAS OFFICE USE

--INSTRUCTIONS--

ITEM NUMBER	SECTION I & II DESCRIPTION	SECTION I & II PAGE 1	CONT. PAGE	LEGEND	
1-3	JOB CONTROL NUMBER	M	M	IA IF AVAILABLE	O OPTIONAL
4	ALTERATION IDENTIFICATION	IP	IP	IP IF APPLICABLE	NR NOT REQUIRED
5	EQUIPMENT IDENTIFICATION CODE	M	NR	M MANDATORY	
6	ACTION TAKEN	M	NR		
7	EQUIPMENT NOUN NAME	M	NR		
8	SHIP'S FORCE MANHOURS EXPENDED	M	NR		
9	ACTIVE MAINTENANCE TIME	M	NR		
10	COMPLETION DATE	M	NR		
11	METER READING	IP	NR		
12	JOB DESCRIPTION (REMARKS)	O	NR		
ITEM NUMBER	SECTION III DESCRIPTION	REMOVE (R/D)	INSTALL (I/A)	MODIFY (M/C)	
13	COMPONENT NOUN NAME	M	M	M	
14	QUANTITY	M	M	M	
15	COMPONENT ACTION	M	M	M	
16	COMPONENT IDENTIFICATION	IP	IP	IP	
17	COMPONENT SERIAL NUMBER	IA	IA	IA	
18	COMPONENT APL/AEL	M	IA	IA	
19	LOCATION	M	M	M	
20	EQUIPMENT IDENTIFICATION CODE	NR	IA	NR	
21	NEXT HIGHER ASSEMBLY	IP	IP	IP	
22	SERVICE APPLICATION CODE	IA	IA	IA	
23	WORK CENTER	NR	M	NR	
24	NAMEPLATE DATA	NR	M	NR	
25	MAINTENANCE INDEX PAGE	IA	IA	IA	
26	EOSS	IP	IP	IP	
27	TECH MANUAL NUMBER	IA	IA	IA	
WORK CENTER SUPERVISOR NAM		DIVISION OFF SUL		SUPPLY DEPT. GUS	
3 M COORDINATOR CAM		SHIP SEQUENCE NUMBER 70021		PAGE 1 OF 1	

Figure G-5 Configuration Change Form for a Correction to a Previously Submitted Change

OPNAV 4790/CK (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM

CONFIG FILE
CORRCOMP. M/A
NO DEFL

COMP DEFL

SECTION I JOB IDENTIFICATION

JOB CONTROL NUMBER			ALTERATION IDENTIFICATION		
1. UIC 21447	2. WORK CENTER ER04	3. JOB SEQ NO 0265	4. ALTERATIONS (SHIPALT, FLD. CHG., ETC.)		
A. COMMAND NAME USS PRINCETON		B. HULL NUMBER (IF APPLICABLE) CG-59		5. EIC	6. ACT TKN
7. EQUIPMENT NOUN NAME		8. MHRS. EXP.	9. ACT.	10. COMP. DATE	11. M/R ☐

SECTION II JOB DESCRIPTION/REMARKS

12. JOB DESCRIPTION/REMARKS CHANGE LOCATION FROM 5-225-0-E TO 5-220-0-E

SECTION III COMPONENT CONFIGURATION CHANGE IDENTIFICATION

13. COMPONENT NOUN NAME MOTOR, AC		14. QUANTITY 001	15. CA C
16. COMPONENT IDENTIFICATION FIRE PUMP MOTOR		17. COMPONENT SERIAL NUMBER	
18. COMPONENT APL/AEL 09590072215		19. LOCATION (DECK/FRAME/SIDE) 5-220-0-E	20. EIC T801114
21. NEXT HIGHER ASSEMBLY		22. S.A.C.	23. WORK CENTER OE01
24. NAMEPLATE DATA			
25. MIP		26. EOSS	
27. TM			

SECTION IV SPECIAL PURPOSE

28. RIN	29. AILSIN	30. SECAS OFFICE USE

--INSTRUCTIONS--

ITEM NUMBER	SECTION I & II DESCRIPTION	SECTION I & II PAGE 1			CONT. PAGE	LEGEND	
1-3	JOB CONTROL NUMBER	M			M	IA IF AVAILABLE	O OPTIONAL
4	ALTERATION IDENTIFICATION	IP			IP	IP IF APPLICABLE	NR NOT REQUIRED
5	EQUIPMENT IDENTIFICATION CODE	M			NR	M MANDATORY	
6	ACTION TAKEN	M			NR		
7	EQUIPMENT NOUN NAME	M			NR		
8	SHIP'S FORCE MANHOURS EXPENDED	M			NR		
9	ACTIVE MAINTENANCE TIME	M			NR		
10	COMPLETION DATE	M			NR		
11	METER READING	IP			NR		
12	JOB DESCRIPTION (REMARKS)	O			NR		
ITEM NUMBER	SECTION III DESCRIPTION	REMOVE (R/D)	INSTALL (I/A)	MODIFY (M/C)			
13	COMPONENT NOUN NAME	M	M	M			
14	QUANTITY	M	M	M			
15	COMPONENT ACTION	M	M	M			
16	COMPONENT IDENTIFICATION	IP	IP	IP			
17	COMPONENT SERIAL NUMBER	IA	IA	IA			
18	COMPONENT APL/AEL	M	IA	IA			
19	LOCATION	M	M	M			
20	EQUIPMENT IDENTIFICATION CODE	NR	IA	NR			
21	NEXT HIGHER ASSEMBLY	IP	IP	IP			
22	SERVICE APPLICATION CODE	IA	IA	IA			
23	WORK CENTER	NR	M	NR			
24	NAMEPLATE DATA	NR	M	NR			
25	MAINTENANCE INDEX PAGE	IA	IA	IA			
26	EOSS	IP	IP	IP			
27	TECH MANUAL NUMBER	IA	IA	IA			
WORK CENTER SUPERVISOR PHL		DIVISION OFF BFB	SUPPLY DEPT. GUS	3 M COORDINATOR CAM	SHIP SEQUENCE NUMBER 70025	PAGE <u>1</u> OF <u>1</u>	

Figure G-6 Configuration Change Form for Location Correction

16 Oct 2019

OPNAV 4790/CK (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM

☒ CONFIG FILE CORR ☐ COMP. M/A NO DEFL ☐ COMP DEFL

SECTION I JOB IDENTIFICATION

1. UIC 22150		2. WORK CENTER EE02		3. JOB SEQ NO 4251		4. ALTERATIONS (SHIPALT, FLD. CHG., ETC.)	
A. COMMAND NAME USS KIDD		B. HULL NUMBER (IF APPLICABLE) DDG-100		5. EIC		6. ACT TKN	
7. EQUIPMENT NOUN NAME SWITCH		8. MHRS. EXP.		9. ACT.		10. COMP. DATE	
						11. MR ☐	

SECTION II JOB DESCRIPTION/REMARKS

12. JOB DESCRIPTION/REMARKS ON BOARD, NOT COSAL SUPPORTED

SECTION III COMPONENT CONFIGURATION CHANGE IDENTIFICATION

13. COMPONENT NOUN NAME SWITCH, ELEMENT		14. QUANTITY 001		15. CA A	
16. COMPONENT IDENTIFICATION		17. COMPONENT SERIAL NUMBER NONE			
18. COMPONENT APL/AEL		19. LOCATION (DECK/FRAME/SIDE) 2-25-0-L		20. EIC	
21. NEXT HIGHER ASSEMBLY FAN, AXIAL		22. S.A.C.		23. WORK CENTER EE02	
24. NAMEPLATE DATA SWITCH, ELEMENT CUTLER HAMMER 654975P VENTILATION SYSTEM					
25. MIP 6641/005		26. EOSS			
27. TM 0963-LP-026-010					

SECTION IV SPECIAL PURPOSE

28. RIN	29. AILSIN	30. SECAS OFFICE USE

--INSTRUCTIONS--

ITEM NUMBER	SECTION I & II DESCRIPTION	SECTION I & II PAGE 1	CONT. PAGE	LEGEND	
1-3	JOB CONTROL NUMBER	M	M	IA IF AVAILABLE	O OPTIONAL
4	ALTERATION IDENTIFICATION	IP	IP	IP IF APPLICABLE	NR NOT REQUIRED
5	EQUIPMENT IDENTIFICATION CODE	M	NR	M MANDATORY	
6	ACTION TAKEN	M	NR		
7	EQUIPMENT NOUN NAME	M	NR		
8	SHIP'S FORCE MANHOURS EXPENDED	M	NR		
9	ACTIVE MAINTENANCE TIME	M	NR		
10	COMPLETION DATE	M	NR		
11	METER READING	IP	NR		
12	JOB DESCRIPTION (REMARKS)	O	NR		
ITEM NUMBER	SECTION III DESCRIPTION	REMOVE (R/D)	INSTALL (I/A)	MODIFY (M/C)	
13	COMPONENT NOUN NAME	M	M	M	
14	QUANTITY	M	M	M	
15	COMPONENT ACTION	M	M	M	
16	COMPONENT IDENTIFICATION	IP	IP	IP	
17	COMPONENT SERIAL NUMBER	IA	IA	IA	
18	COMPONENT APL/AEL	M	IA	IA	
19	LOCATION	M	M	M	
20	EQUIPMENT IDENTIFICATION CODE	NR	IA	NR	
21	NEXT HIGHER ASSEMBLY	IP	IP	IP	
22	SERVICE APPLICATION CODE	IA	IA	IA	
23	WORK CENTER	NR	M	NR	
24	NAMEPLATE DATA	NR	M	NR	
25	MAINTENANCE INDEX PAGE	IA	IA	IA	
26	EOSS	IP	IP	IP	
27	TECH MANUAL NUMBER	IA	IA	IA	
5A PARTIALLY COMPLETED ALTERATION				SECTION III, BLOCK 15 COMPONENT ACTION	
5B FULLY COMPLETED ALTERATION				MAINTENANCE ACTIONS	
5C FULLY COMPLETED EQUIVALENT TO ALTERATION				R REMOVED EQUIPMENT	
5D ALTERATION DIRECTIVE NOT APPLICABLE				I INSTALLED EQUIPMENT	
1 MAINTENANCE ACTION COMPLETED; PARTS DRAWN FROM SUPPLY				M MODIFIED EQUIPMENT	
2 MAINTENANCE ACTION COMPLETED; REQUIRED PARTS NOT DRAWN FROM SUPPLY (LOCAL MANUFACTURE, PRE-EXPENDED BINS)				CONFIG FILE CORR NO MAINTENANCE ACTION	
3 MAINTENANCE ACTION COMPLETED; NO PARTS REQUIRED				A ADDITION OF RECORD	
				B DELETION OF RECORD	
				C CORRECT/CHANGE EXISTING RECORD	
WORK CENTER SUPERVISOR DER	DIVISION OFF SED	SUPPLY DEPT. CUG	3 M COORDINATOR MAC	SHIP SEQUENCE NUMBER 70420	PAGE <u>1</u> OF <u>1</u>

Figure G-7 Configuration Change Form for COSAL Add

OPNAV 4790/CK (REV 4-17)

Clear Form

CONFIGURATION CHANGE FORM

☒ CONFIG FILE
CORR☐ COMP. M/A
NO DEFL☐ COMP DEFL

SECTION I JOB IDENTIFICATION

JOB CONTROL NUMBER			ALTERATION IDENTIFICATION		
1. UIC 23161	2. WORK CENTER EE02	3. JOB SEQ NO 5151	4. ALTERATIONS (SHIPALT, FLD. CHG., ETC.)		
A. COMMAND NAME USS SAMPSON		B. HULL NUMBER (IF APPLICABLE) DDG-102		5. EIC	6. ACT TKN
7. EQUIPMENT NOUN NAME SWITCH		8. MHRS. EXP.	9. ACT.	10. COMP. DATE	11. M/R ☐

SECTION II JOB DESCRIPTION/REMARKS

12. JOB DESCRIPTION/REMARKS NOT ON BOARD, COSAL SUPPORTED

SECTION III COMPONENT CONFIGURATION CHANGE IDENTIFICATION

13. COMPONENT NOUN NAME SWITCH, ELEMENT		14. QUANTITY 001	15. CA D
16. COMPONENT IDENTIFICATION		17. COMPONENT SERIAL NUMBER NONE	
18. COMPONENT APL/AEL	19. LOCATION (DECK/FRAME/SIDE) 2-25-0-L		20. EIC
21. NEXT HIGHER ASSEMBLY FAN, AXIAL		22. S.A.C.	23. WORK CENTER EE02
24. NAMEPLATE DATA SWITCH, ELEMENT CUTLER HAMMER 654975P VENTILATION SYSTEM			
25. MIP 6641/005		26. EOSS	
27. TM 0963-LP-026-010			

SECTION IV SPECIAL PURPOSE

28. RIN	29. AILSIN	30. SECAS OFFICE USE

--INSTRUCTIONS--

ITEM NUMBER	SECTION I & II DESCRIPTION	SECTION I & II PAGE 1	CONT. PAGE	LEGEND	
1-3	JOB CONTROL NUMBER	M	M	IA IF AVAILABLE	O OPTIONAL
4	ALTERATION IDENTIFICATION	IP	IP	IP IF APPLICABLE	NR NOT REQUIRED
5	EQUIPMENT IDENTIFICATION CODE	M	NR	M MANDATORY	
6	ACTION TAKEN	M	NR	SECTION I, BLOCK 6 ACTION TAKEN	
7	EQUIPMENT NOUN NAME	M	NR		
8	SHIP'S FORCE MANHOURS EXPENDED	M	NR	SECTION III, BLOCK 15 COMPONENT ACTION	
9	ACTIVE MAINTENANCE TIME	M	NR		
10	COMPLETION DATE	M	NR	5A PARTIALLY COMPLETED ALTERATION	
11	METER READING	IP	NR		
12	JOB DESCRIPTION (REMARKS)	O	NR	5B FULLY COMPLETED ALTERATION	
13	COMPONENT NOUN NAME	M	M		
14	QUANTITY	M	M	5C FULLY COMPLETED EQUIVALENT TO ALTERATION	
15	COMPONENT ACTION	M	M		
16	COMPONENT IDENTIFICATION	IP	IP	5D ALTERATION DIRECTIVE NOT APPLICABLE	
17	COMPONENT SERIAL NUMBER	IA	IA		
18	COMPONENT APL/AEL	M	IA	1 MAINTENANCE ACTION COMPLETED; PARTS DRAWN FROM SUPPLY	
19	LOCATION	M	M		
20	EQUIPMENT IDENTIFICATION CODE	NR	IA	2 MAINTENANCE ACTION COMPLETED; REQUIRED PARTS NOT DRAWN FROM SUPPLY (LOCAL MANUFACTURE, PRE- EXPENDED BINS)	
21	NEXT HIGHER ASSEMBLY	IP	IP		
22	SERVICE APPLICATION CODE	IA	IA	3 MAINTENANCE ACTION COMPLETED; NO PARTS REQUIRED	
23	WORK CENTER	NR	M		
24	NAMEPLATE DATA	NR	M	A ADDITION OF RECORD B DELETION OF RECORD C CORRECT/CHANGE EXISTING RECORD	
25	MAINTENANCE INDEX PAGE	IA	IA		
26	EOSS	IP	IP	PAGE <u>1</u> OF <u>1</u>	
27	TECH MANUAL NUMBER	IA	IA		
WORK CENTER SUPERVISOR CUW		DIVISION OFF DAR	SUPPLY DEPT. FAL	3 M COORDINATOR POH	SHIP SEQUENCE NUMBER 70025

Figure G-8 Configuration Change Form for COSAL Delete

APPENDIX H
PREPARATION INSTRUCTIONS MAINTENANCE ACTION FORM
(OPNAV 4790/2K)

1. MAINTENANCE ACTION FORM (OPNAV 4790/2K). The OPNAV 4790/2K Form is used for reporting deferred maintenance actions, and the completion of maintenance actions that do not result in a configuration change. Two blocks at the top of the form are used to specify what type of maintenance action is being reported, a deferral “DEFL” or a completion “COMP”. The rest of the form is separated into six sections. A partially completed maintenance action which results in a configuration change or a complete or partially accomplished alteration should be reported using the OPNAV 4790/CK Form. Refer to the instructions for using the OPNAV 4790/CK Form, Appendix G.

1.1 Section I - IDENTIFICATION: This section is used to identify the equipment or system on which maintenance actions are being reported.

1.2 Section II - DEFERRAL ACTION: This section, filled in when reporting a deferral of a maintenance action, indicates man-hours expended up to the time of deferral, the date of deferral, man-hours remaining and required completion date (if necessary).

1.3 Section III - COMPLETED ACTION: This section is filled in when reporting the completion of a maintenance action and contains blocks used when reporting maintenance actions on selected equipment.

1.4 Section IV - REMARKS/DESCRIPTION: This section is filled in when reporting the deferral of a maintenance action. The type of information recorded includes remarks that describe what is wrong, what caused the failure or malfunction, maintenance to be performed, the names of personnel involved in the maintenance action, a priority and availability assignment and signatures by management personnel who screened the maintenance action.

1.5 Section V - SUPPLEMENTARY INFORMATION: This section completed by the reporting activity provides information pertaining to required maintenance actions or onboard reference material (e.g., technical manuals, blueprints, etc.). This section is also used by the repair activity in planning, scheduling and controlling the repair activity work.

1.6 Section VI - REPAIR ACTIVITY PLANNING/ACTION: This section is used by the repair activity for planning, estimating and scheduling purposes and can be used to report work accomplished by an internal department Work Center or by an external activity not under an ADP system.

NOTE: EXAMPLES OF COMPLETED OPNAV 4790/2K FORMS FOR VARIOUS REPORTING SITUATIONS CAN BE FOUND AT THE END OF THIS APPENDIX:

Figure H-1 Maintenance Action Form for a Deferred Maintenance Action

Figure H-2 Maintenance Action Form for a Completed Maintenance Action without Prior Deferral

Figure H-3 Maintenance Action Form for Changes to a Previously Submitted Deferred Maintenance Action

Figure H-4 Maintenance Action Form for Add-on Remarks to a Previously Submitted Deferred Maintenance Action

2. PROCEDURES FOR DOCUMENTING A DEFERRED MAINTENANCE ACTION - PLACE AN "X" IN THE BLOCK TITLED "DEFL" AT TOP OF FORM.

2.1 Section I - IDENTIFICATION

- a. **JOB CONTROL NUMBER (Blocks 1 - 3):**
 - (1) **Block 1 - UIC:** Enter the UIC of the activity initiating the maintenance action.
 - (2) **Block 2 - WORK CENTER:** Enter the Work Center code of the Work Center initiating the maintenance action. For Ships, a four-position Work Center code will be entered. For repair departments of, SIMAs, RMCs and other IMAs, a three-digit code will be entered. The three-digit code is entered left-to-right leaving the right most position blank. Appendix C of this chapter provides a listing of authorized Work Center codes. (Submarine Tender Repair Work Centers have been converted to 4-position work center codes)
 - (3) **Block 3 - JOB SEQ. NO.:** Enter the job sequence number assigned by the Work Center Supervisor. This is an entry assigned sequentially from the SFWL/JSN Log.
- b. **Block 4 - APL/AEL (Allowance Parts List/Allowance Equipment List):** Enter the APL/AEL of the equipment being reported. These numbers are found in the COSAL or SCLISIS Index Report. An example of an APL would be "882170236" and an AEL would be "2-260034096."
- c. **Block A - Enter COMMAND'S NAME**
- d. **Block 5 - EQUIPMENT NOUN NAME:** Enter the equipment nomenclature and description on which maintenance is being reported. The equipment nomenclature and description should be the same as that identified by the EIC and is limited to 16 positions. Standard abbreviations can be used if clarity is retained. For electronic equipment having an Army-Navy (AN) designation, it will be substituted for the equipment nomenclature.
- e. **Block B - Enter SHIP'S HULL NUMBER (if applicable).**
- f. **Block 6 - WHEN DISCOVERED (WND):** Enter the code (Table H-1) that best identifies when the need for maintenance was discovered.

When Discovered Codes

Code	Description
1	Lighting Off or Starting
2	Normal Operation
3	During Operability Test

Code	Description
4	During Inspection
5	Shifting Operational Modes
6	During PMS
7	Securing
8	During AEC (Assessment of Equipment) Program
9	No Failure, PMS Accomplishment Only
0	Not Applicable (use when reporting printing services, etc.)

Table H-1

- g. Block 7 - STATUS (STA): Enter the code (Table H-2) that most accurately describes the effect of the failure or malfunction on the operational performance capability of the equipment when the need for maintenance was first discovered.

Status Codes

Code	Description
1	Operational
2	Non-Operational
3	Reduced Capability
0	Not Applicable (use if reporting printing services, etc.)

Table H-2

- (1) OPERATIONAL **must** be selected when the system or equipment is operational with only minor discrepancies that do not impact performance. (Similar to EOC 0.8 – 1.0: See Chapter 5, Appendix A of this volume)
- (2) NON-OPERATIONAL **must** be selected when the system or equipment is totally inoperative, or is severely degraded with major operation restrictions and may be a threat to personnel safety. (Similar to EOC 0.0 - 0.4: See Chapter 5, Appendix A, of this volume)
- (3) REDUCED CAPABILITY **must** be selected when the system or equipment is operational with discrepancies that could potentially impact performance or has minor operational restrictions that are not a threat to personnel safety. (Similar to EOC 0.5 - 0.7: See Chapter 5, Appendix A, of this volume)

- (4) NOT APPLICABLE (Equivalent to EOC 1.0: See Chapter 5, Appendix A, of this volume) **must** be selected:
- (a) When ordering parts for PMS.
 - (b) When updating a 4790/2K and the object has been repaired but the JCN cannot be closed due to awaiting parts.
 - (c) When requesting services such as printing, plaques, special support equipment, test equipment, etc.
 - (d) For data reporting.
 - (e) For SHIPALTs/Ship Change Documents.
 - (f) For system or equipment configuration changes (4790/CK).
 - (g) When requesting support services in a maintenance availability.
 - (h) For future time directed CMP and PMS maintenance tasks.
- h. Block 8 - CAUSE (CAS): Enter the code (Table H-3) that best describes the cause of the failure or malfunction when the need for maintenance was first discovered. (Refer to reference (a), Appendix A, Table A-6 data element "CAUSE" for an expanded definition of the allowable codes/values).

Cause Codes

Code	Description
1	Abnormal Environment
2	Manufacturer or Installation Defects
3	Lack of Knowledge or Skill
4	Communication Problem
5	Inadequate Instruction or Procedure
6	Inadequate Design
7	Normal Wear and Tear
0	Other or No Malfunction

Table H-3

- i. Block 9 - DEFERRAL REASON (DFR): Enter the deferral reason code (Table H-4) which best describes the reason the maintenance cannot be done at the time of deferral. (Refer to reference (a), Appendix A, Table A-7 data element "DEFERRAL REASON" for an expanded definition of the allowable codes/values).

Code	Deferral Reason
1	Due to Ship's Force, Unit's Work Backlog or Operational Priority
2	Lack of Material
3	No Formal Training on this Equipment
4	Formal Training Inadequate for this Equipment
5	Inadequate School Practical Training
6	Lack of Facilities or Capabilities
7	Not Authorized for Ship's Force or Unit Accomplishment
8	For Ship's Force or Unit Overhaul of Availability Work List
9	Lack of Technical Documentation
0	Other - or Not Applicable (explain in block 35)

Table H-4

- j. Block 10 - This Block is reserved for TYCOM directed applications. Refer to TYCOM instruction for use.
- k. Block 11 - This Block is reserved for TYCOM directed applications. Refer to TYCOM instruction for use.
- l. Block 12 - This Block is reserved for TYCOM directed applications. Refer to TYCOM instruction for use.
- m. Block 13 - IDENT/EQUIPMENT SERIAL NUMBER: Enter the identification or serial number of the equipment or system on which maintenance is being deferred. For Hull, Mechanical & Electrical (HM&E) equipment, enter the Valve Mark/Electric Symbol Number (ESN) or Primary Identification Number. For electronic equipment, enter the manufacturer's serial number of the equipment or system on which maintenance is being deferred.
- n. Block 14 - EIC: Enter the Equipment Identification Code of the component, equipment, subsystem or system for which the maintenance is being reported.
- o. Block 15 - SAFETY HAZARD: Enter an "X" or applicable safety code (Table H-5) if the maintenance action describes a problem or condition which has caused, or has the potential to cause serious injury to personnel or material. A brief explanation must be included in the Remarks/Description field (Block 35).

For example: "REINSPECTION OF SEPARATOR FOR PRESENCE OF OIL AFTER RINSE. MRC A-27 EVIDENTLY NOT DONE. PRESENCE OF OIL

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RESULTED IN FIRE IN HP AIR SYSTEM WHEN COMPRESSOR OPERATED UNDER LOAD. FIRE BADLY BURNED VALVE AHP-287, REQUIRING REPLACEMENT.”

NOTE: THE SHIP’S OR UNIT’S 3-M COORDINATOR WILL FORWARD A COPY OF ALL OPNAV 4790/2K DOCUMENTATION HAVING AN ENTRY IN THIS FIELD TO THE SAFETY OFFICER FOR REVIEW. (REFER TO REFERENCE (A), APPENDIX A, TABLE A-14, DATA ELEMENT “SAFETY HAZARD” FOR AN EXPANDED DEFINITION OF THE ALLOWABLE CODES/VALUES).

Safety Hazard Codes

Code	Description
1	Critical Safety or Health Deficiency-Correct Immediately
2	Serious Safety or Health Deficiency-Suspension of Equipment, System or Space Use is required
3	Moderate Safety or Health Deficiency-Waiver of Equipment, System or Space Use is granted Pending Correction of the Item
4	Minor Safety or Health Deficiency
5	Negligible Safety or Health Deficiency
0	Maintenance Action is Not Safety Related
NOTE: CODES “6” THROUGH “9” MAY BE LOCALLY ASSIGNED BY TYCOMS IF ADDITIONAL SAFETY CODES ARE REQUIRED.	

Table H-5

- p. Block 16 - LOCATION: Enter the location (compartment number, deck, frame or side notation), that best describes the location of the equipment requiring maintenance as identified in Block 13. If none of the mentioned location identifications are appropriate, enter description of the location (e.g., FANTAIL, FLIGHT DECK, etc.).
- q. Block 17 - WHEN DISCOVERED DATE: Enter the Julian date when the equipment or system failure or malfunction was discovered.
- r. Block 18 - ALTERATIONS (SHIPALT, ORDALT, Fld. Chg., etc.): If reporting the deferral of an alteration:
 - (1) SHIPALT - Enter the alteration identification exactly as it appears on the SHIPALT Record. Record the alteration type “SA” in the first two positions, ship type starting in position three, and the alteration number starting in the 7th position of the block (i.e., SASSBNf342130). Enter the title code from the

alteration record in the last right-hand position of the block.

- (2) OTHER Alteration Types - Enter the alteration type character code (Table H-6) in the first two positions of the block. Leave the third position blank and enter the alteration number starting in position four (i.e., OA f96999, FC 29, TY 0132). If an alteration identification number is not provided with the alteration record, leave blank.

Alteration Type Codes

SA	Ship Alteration
OA	Ordnance Alteration
BA	Boat Alteration
FC	Field Change
MA	Machinery Alteration
SI	SYSCOM Command Instruction
EC	Engineering Change
HI	Habitability
TY	TYCOM Direction
TD	Technical Directive
SP	Strategic Systems Project Office Alteration
SC	Service Change
TR	Trident Alteration
EP	Engineering Change Proposal
MO	Crypto Equipment Modification
AR	Alteration Request May be originated by a ship to request an alteration design. Enter and left-justify the authorized prefix "AR" followed by a blank space any number the ship assigns for its own control.

Table H-6

- s. Blocks 19 through 24 - FOR INSURV USE - no entries required. See Section 2 of NAVSEAINST 4790.8C for specifications.

2.2. Section II - DEFERRAL ACTION.

- a. Block 25 - MAN-HOURS EXPENDED (MHRS. EXP.): Enter the total man-hours (to the nearest whole hour) expended by personnel of all Work Centers involved in the maintenance action up to the time of deferral (include documentation time which should not exceed 1 hour).
- b. Block 26 - DEFER. DATE: Enter the Julian date when the maintenance action was deferred. An example of a deferral on 11 January 1994 would be "4011".
- c. Block 27 - MAN-HOURS REMAINING (MHRS. REM.): Enter the estimated number of man-hours remaining to complete the maintenance action. Round off to the nearest whole hour. If the TYCOM allows an automated close out of the deferral by the IMA, the letters "AUTO" will be entered. This is a request to the IMA to complete the maintenance action with no further documentation from the shop after the job has been accepted by the originator (authorized signature). If the originating command does not receive CSMP support from the IMA doing the work, do not use the "AUTO" close out feature.
- d. Block 28 - DEADLINE DATE:
 - (1) Depot (shipyard or ship repair facility) (T/A-1) the Deadline Date is required. The date entered is the end of the scheduled maintenance availability.
 - (2) Intermediate Maintenance Activity (tender, repair ship, etc.) (T/A-2) the Deadline Date is required. The date entered is the end of the scheduled maintenance availability.
 - (3) TYCOM Support Unit (floating dry dock, etc. or technical assistance from Systems Command, organic technical agents or contractor representative) (T/A-3) is required. Date entered is the entry date plus a realistic estimated time to repair. Update to the Deadline Date is required if the estimate changes.
 - (4) Ship's Force or Unit (T/A-4) is required. Date entered is the entry date plus a realistic estimated time to repair. Updates to Deadline Date are required if the estimate changes.

2.3 Section III - COMPLETED ACTION.

- a. Blocks 29 through 33 - USED FOR REPORTING THE COMPLETION OF A MAINTENANCE ACTION.
- b. Block 34 - METER READING: If the equipment has a time meter and is on the Selected Equipment List (SEL), the reading (to the nearest whole hour) at the time of failure is entered in this block. If the equipment has more than one meter, designate the meter being recorded in Block 35 "REMARKS" using the letters "METRED" followed by the meter designator. An asterisk (*) must precede and follow the meter designation. Example: *METRED-1A2M1*.

2.4 Section IV - REMARKS/DESCRIPTION.

- a. Block 35 - REMARKS/DESCRIPTION: Enter remarks relating to the maintenance action. These remarks should be brief, but complete and meaningful. Remarks should

state what is wrong, what caused the failure (if known) and what must be done to correct the problem. Separate the two statements with “XXX”. For example, “HIGH PITCHED SQUEAL OF PUMP SHAFT, GAUGE READING ABOVE RED LINE ON #2 PUMP, SSG CASING IS EXTREMELY HOT. XXX INVESTIGATE AND REPAIR AS NECESSARY.” If more space is needed, check Block 36 “CONT. SHEET” and continue the remarks on a second form using the same JCN. Include the statement “2L USED” if Supplemental Form OPNAV 4790/2L is used for drawings or other supplemental information. The remarks should not include statements explaining what has been coded in another place of the form; i.e., “DEFERRAL REASON 2 = LACK OF MATERIAL”. Classified or Navy Nuclear Power Information is prohibited from being entered into the Work Candidate. If a full description of the material deficiency requires the use of classified information, a separate message should be generated with the required data and the message referred to in Block 35 by message Date Time Group. The following are minimum requirements for Block 35:

- (1) Depot (shipyard or ship repair facility) (T/A-1):
 - (a) Concisely describe the failure or malfunction and what caused it. Include how and when the casualty was discovered. Provide description of the casualty to include information on operating configuration symptoms and indications.
 - (b) Concisely describe the actions taken by Ship’s Force or Unit personnel and outside activities to troubleshoot and correct the failure or malfunction. Include initial follow-up and troubleshooting, Ship’s Force or Unit repair efforts or technical assistance received.
 - (c) Include any test results from troubleshooting.
 - (d) Include the reason for deferral to an off ship maintenance activity.
- (2) Intermediate Maintenance Activity (tender, repair ship, etc.) (T/A-2):
 - (a) Concisely describe the failure or malfunction and what caused it. Include how and when the casualty was discovered. Provide description of the casualty to include information on operating configuration symptoms and indications.
 - (b) Concisely describe the actions taken by the command and outside activities to troubleshoot and correct the failure or malfunction. Include initial follow-up and troubleshooting, command repair efforts or technical assistance received.
 - (c) Include any test results from troubleshooting.
 - (d) Include the reason for deferral to an off ship maintenance activity.
- (3) Technical Assistance in troubleshooting (T/A-3):
 - (a) Concisely describe the failure or malfunction and what caused it. Include how and when the casualty was discovered. Provide

- description of the casualty to include information on operating configuration symptoms and indications.
- (b) Concisely describe the actions taken by command personnel to troubleshoot and correct the failure or malfunction. Include initial follow-up and troubleshooting, command's repair efforts or previous technical assistance.
 - (c) Include any test results from troubleshooting.
 - (d) Clearly specify the type of outside assistance and the time frame desired by the activity.
- (4) Technical Assistance in obtaining special support or test equipment (T/A-3):
- (a) Describe the special support or test equipment required by the activity.
 - (b) Describe the maintenance action for which the equipment will be used.
 - (c) Include any assistance the activity may need from the requesting activity (e.g., training, assistance in operating the equipment, etc.).
 - (d) Clearly specify the dates the equipment is needed and estimated time the equipment will be returned.
- (5) Technical Assistance documenting the results of an inspection or assessment (T/A-3):
- (a) The inspection or assessment activity **must** provide the activity with a maintenance ready 4790/2K.
 - (b) Documentation of assessment results by the equipment Subject Matter Expert will include all the technical data needed to complete a 4790/2K as specified in Chapter 42 of this volume.
- (6) Technical Assistance in obtaining support services during a maintenance availability (T/A-3):
- (a) Describe the support service required by the activity.
 - (b) Describe the maintenance action for which the support services will be used.
 - (c) Include any assistance the activity may need from the requesting activity (e.g., training, assistance in operating the equipment, etc.).
 - (d) Clearly specify the dates the support services are needed and estimated time the support services will no longer be required.
- (7) Ship's Force and Unit maintenance action (T/A-4):
- (a) Concisely describe the failure or malfunction and what caused it. Include how and when the deficiency was discovered. Provide description of the deficiency to include information on operating configuration symptoms and indications.

- (b) Concisely describe the actions taken by command personnel to correct the failure or malfunction. Include initial follow-up and troubleshooting, command personnel repair efforts or previous technical assistance.
 - (c) Include any test results from either troubleshooting or post repair testing.
- b. Block 36 - CONT. SHEET: Enter an "X" in this block if the "REMARKS" are continued on additional 2K forms. No more than three additional OPNAV 4790/2K forms can be used.

NOTE: WHEN USING OPNAV 4790/2K CONTINUATION PAGES FOR THE CONTINUATION OF "REMARKS", ENTER THE JCN OF THE FIRST FORM AND CONTINUE WITH THE REMARKS IN SECTION IV. IN THE TOP MARGIN OF EACH CONTINUATION PAGE, INSERT THE WORDS "PAGE 2", "PAGE 3", ETC.

- c. Block 37 - CSMP SUMMARY: Enter a condensed description of the problem. The Work Center Supervisor is to ensure the summary succinctly captures the meaning of the Block 35 REMARKS/DESCRIPTION narrative. The CSMP summary conveys to management the significance of the JCN (maintenance action). The CSMP summary is displayed on management reports, as opposed to the entire narrative of the REMARKS block.
- d. Block 38 - FIRST CONTACT/MAINT. MAN: Printed name of the senior person knowledgeable in the specifics of the JCN (maintenance action).
- e. Block 39 - RATE: Enter the rate of the first contact or maintenance person. Examples are:

Rank or Rate Code	Entry
Officers	OFF
ET1	ET1
Civilian	CIV
GMG2	GMG2
FTGSN	FTGN
FN	FN

Table H-7

- f. Block 40 - SECOND CONTACT/SUPERVISOR: Printed name of the supervisor of the first contact or maintenance person after screening the maintenance action for completeness and accuracy.
- g. Block 41 - PRI: Enter the appropriate priority code (Table H-8). Refer to reference (a) Appendix A, Table A-12 for an expanded definition of the allowable codes/values.

Code	Description
1	Mandatory
2	Essential
3	Highly Desirable
4	Desirable

Table H-8

- h. Block 42 - TA: Enter the Type Availability (T/A) code (Table H-9) for the type availability recommended for performance of the deferral.

Type Availability Codes

Code	Description
1	Depot (shipyard or ship repair facility)
2	Intermediate Maintenance Activity (tender, repair ship, etc.)
3	Fleet Technical Support. TYCOM Support Unit (floating dry dock, etc., or technical assistance from NAVSEA or Regional Maintenance Centers or contractor representative)
4	Ship's Force or Unit (Originating Work Center, Organizational Level)
0	Not Applicable
U	(Mission Degrading) (entered on 2K) Used by INSURV. Field identifies certain deficiencies which are considered as preventing the activity from carrying out some part of its mission.

Table H-9

NOTE: TABLE H-10 PROVIDES GUIDANCE ON USING AVAILABILITY CODES.

Scenario/Issue	Use T/A Code
When requesting technical assistance from off-hull activities.	3
When requesting repair (industrial) from outside activities.	1 or 2
When requesting calibration from outside activities.	1 or 2

Scenario/Issue	Use T/A Code
When ordering parts or materials for Ship's Force or Unit use.	4
For data reporting.	3
When requesting special support or test equipment (hydrostatic pumps, rigging equipment, etc.).	3
Completed without prior deferral.	4
When submitting a CASREP.	1, 2, 3 or 4
When submitting a temporary DFS.	1, 2 or 4
For any change in system or equipment configuration.	3
For documenting the results of an inspection or assessment.	3
For installation of a SHIPALT or Ship Change Document.	1, 2 or 4
For support services during a maintenance availability.	3
For a CMP maintenance action.	1 , 2, 3 or 4

Table H-10

- i. Block 43 - INTEGRATED PRIORITY: If the maintenance is to be done by an outside activity, the Command's Engineer may rank departmental deferrals by integrated priority. A sequential number may be placed in this block to indicate its priority relative to other deferred work for a given availability.
- (1) Block C - DIV. INIT: Initialed by the Division Officer after screening the document.
 - (2) Block D - DEPT. INIT: Initialed by the Department Head after screening the document.
 - (3) Block E - COMMANDING OFFICER'S SIGNATURE: Required on all deferrals for outside assistance, the Commanding Officer or authorized representative must sign the deferral.
 - (4) Block F - TYCOM AUTHORIZATION: This block is reserved for the signature of the TYCOM representative screening the deferral. This is usually applicable when direct routing from command to TYCOM for Depot emergent work is employed.

- j. Blocks 44 through 46 are not completed at the time of deferral. Entries are made by the next level of management after leaving the command (IUC and TYCOM during the screening process).

2.5 Section V - SUPPLEMENTARY INFORMATION. Block 47 - BLUEPRINTS, TECH. MANUALS, PLANS, ETC.: Enter any TMs, blueprints, etc., which might be of use to a repair activity providing assistance. Indicate with an “X” in the “AVAILABLE ON BOARD” – “YES/NO” block if the TM is onboard or not.

3. PROCEDURES FOR DOCUMENTING INTERNAL WORK REQUESTS - When it is necessary to obtain assistance from other departments within the organizational level, the OPNAV 4790/2K Form can be used as an internal work request. If more than a single assisting Work Center is required, multiple copies will be prepared using the same JCN on each request. The requesting Work Center prepares the number of copies required for internal control. The words “INTERNAL WORK REQUEST” is written at the top of each copy to be sent to the assisting Work Center(s). The following blocks are used:

3.1. Section I - IDENTIFICATION: Document all of this section. See “Procedures for Documenting a Deferred Maintenance Action” paragraph 4.1.

3.2. Section IV - REMARKS/DESCRIPTION. Block 35 - REMARKS/DESCRIPTION: Describe the tasks required of the Assisting Work Center (AWC).

3.3. Section VI - REPAIR ACTIVITY PLANNING/ACTION.

- a. Block 49 - REPAIR WORK CENTER (W/C): Enter the AWC’s code.
- b. Block 55 - REPAIR ACTIVITY UIC: Enter the organization unit’s UIC. This will be the same as Block 1 except when the ship is being assisted by a non-reporting outside activity, in this case, the outside activity’s UIC will be entered.
- c. Block 56 - WORK REQ. ROUTINE: Enter the appropriate Expanded Ship Work Breakdown Structure (ESWBS), Ship Work Authorization Boundary (SWAB), Ship Work Line Item Number (SWLIN), etc., as directed by the TYCOM.

4. PROCEDURES FOR DOCUMENTING SCREENING INFORMATION ON DEFERRED MAINTENANCE ACTIONS - Used by other activities, such as IUCs, TYCOM representatives and IMAs for screening, planning and scheduling.

4.1. Section IV - REMARKS/DESCRIPTION.

- a. Block F - TYCOM AUTHORIZATION: This block is reserved for the signature of the TYCOM representative screening the deferral.
- b. Block 44 - IUC: The IUC or designated representative screening the deferral enters the recommendation as to the action to be taken. See the allowable codes (Table H-11).

Action to be Taken Codes

Code	Description
1	Depot (shipyard or ship repair facility) Accomplish

Code	Description
1A	Depot Assisted by Ship's Force or Unit Personnel
1S	Ship to Shop
1M	Accomplish with Modification
2	Intermediate Maintenance Activity (IMA) (tender or repair ship, etc.) Accomplish
2A	IMA Assisted by Ship's Force or Unit Personnel
2S	Ship to Shop
2M	Accomplish with Modification
3	Fleet Technical Support. TYCOM Support Unit (TSU) (floating dry dock, etc.) accomplished or Technical Assistance from NAVSEA, Regional Maintenance Center or Contractor Representative.
3A	TSU Assisted by Ship's Force or Unit Personnel
3S	Ship to Shop
3M	Accomplish with Modification
4	Ship's Force or Unit Personnel Accomplish
5	Deferred
5A	Insufficient Time in the Availability to Complete the Task
5B	Lack of Shipyard Capability
5C	Lack of Material
5D	Lack of Funds
5E	Not Required During this Availability
5F	General
6	Not Authorized
6A	Not Technically Justified

Code	Description
6B	Covered by an Existing Ship Alteration
6C	Duplicate of Another Job Control Number (JCN)
6D	Not Cost Effective
6E	General
8*	Disapproved. * This screening code disapproves the accomplishment of a work item by an outside activity. It does not prevent entry of the deferral into the CSMP, which is the decision of the Commanding Officer
9**	Remove from Current Ship's or Unit Maintenance Project (CSMP). Pass to history (to be assigned by TYCOM only). ** This screening code is restricted to the removal of INSURV items from the CSMP for which, in the opinion of the Ship's or Unit's IUC and TYCOM, the ship has no responsibility for accomplishment.
NOTE: THE FIRST CHARACTER OF THE UIC OR TYCOM SCREENING CODE SHOULD BE ENTERED IN THE APPROPRIATE FIELD. THE SECOND CHARACTER, WHEN USED, SHOULD BE ENTERED IN THE SPACE JUST BELOW IT.	

Table H-11

- c. Block 45 - TYCOM: The TYCOM or designated representative screening the deferral will enter the action to be taken. See the allowable codes (Table H-11).
- d. Block 46 (A-L) - SPECIAL PURPOSE: Use of these codes are optional and indicates that quality control and quality assurance standards may be required. Special purpose blocks 46A through 46H and 46K will be used when directed by TYCOM.
 - (1) Block 46A - The Department Head may enter the KEY EVENT code from the ISIC provided Key Event Schedule.
 - (2) Block 46B – Optional, if used Submarines will enter code “SS” if the job requires work within SUBSAFE boundaries or involves SUBSAFE materials. Surface Ships may enter S1 for “PARTS ON HAND/PARTS NOT REQD,” S2 for “PARTS ON ORDER-DEF DEL DT,” S3 for “CONT PROCURE PARTS,” S4 for “WORK COMPL PREVIOUSLY.”
 - (3) Block 46C – Optional, if used, enter the code “L1” if the job requires work within Level I boundaries or involves Level I material.

- (4) Block 46D – Optional, if used, enter the code “08” if the job is associated with nuclear equipment. Refer to NAVSEAINST 9210.4A (NOTAL).
- (5) Block 46E - Optional, if used, enter the code “RC” if the job requires radiological controls (RADCON). (Refer to NAVSEA Technical Publication S9213- 33-MMA-000/(V).
- (6) Block 46F - Optional, if used, enter the code “DD” if the job requires Dry Docking to accomplish.
- (7) Block 46G - Optional, if used, enter the code “NC” for critical noise deficiencies or “NP” for potential radiated noise deficiencies.
- (8) Block 46H - The following codes are used in MFOM VSB for work screening: GC (Contract), IC (Indefinite Delivery, Indefinite Quantity), CC (Commercial Industrial Services), RC (Regional Maintenance Center Contracting Officer), TC (Type Commander Contracting), BC (Blanket Purchase Agreement/Basic Ordering Agreement), TV (Tanks & Voids), CS (Crane Services), NS (NAVSEA), DV (Diver Services) or AC (AVCERT).
- (9) Block 46I - Reserved for future use.
- (10) Block 46J - Reserved for future use.
- (11) Block 46K - Optional, if used, enter the appropriate code: FB for Fly-By-Wire Certification Boundary (FBW Certification Blue Boundary), SF for Submarine Flight Critical Component (SFCC Red Boundary) or DS for Deep Submergence System-Scope of Certification (DSS-SOC).
- (12) Block 46L - Enter the code assigned to the visiting activity. This will identify the visiting activity as the originator of the deferral.

4.2. Section V - SUPPLEMENTARY INFORMATION.

- a. Block 47 - BLUEPRINTS, TECHNICAL MANUALS, PLANS, ETC: The repair activity can use this block during the work request planning in much the same manner as the originator. Information that might be of use in the accomplishment of the maintenance can be entered (e.g., TMs, blueprints, etc.).
- b. Block 48 - PREARRIVAL/ARRIVAL CONFERENCE ACTION/REMARKS: The repair activity may enter any remarks considered necessary to facilitate repairs.

4.3. Section VI - REPAIR ACTIVITY PLANNING/ACTION.

- a. Block 49 - REPAIR W/C: Enter the character code of the lead Work Center assigned to the job. Refer to reference (a) Appendix A, Table A-10 data element “IMA REPAIR WORK CENTER” for a listing of IMA Work Center codes.
- b. Block 50 - EST. MHRS.: Enter the total number of estimated man-hours required by the lead Work Center to complete the job.
- c. Block 51 - ASST. REPAIR W/C: Enter the three or four character code of the first Work Center assigned to assist the lead Work Center on the job being planned. If more than one assist Work Center is required, check Block 36 to indicate a

continuation page is being used. On the continuation page (new 2K form), fill in Blocks 1, 2, 3 with the same JCN of the original 2K. In Block 51, enter the second assist repair Work Center's code. No more than two assist Work Centers (two supplemental 2K forms) can be submitted.

- d. Block 52 - ASST. EST. MHRS: Enter the total number of estimated man-hours required by the assist Work Center to complete its portion of the job.
- e. Block 53 - SCHED. START DATE: Enter the Julian date that work on the job is to begin.
- f. Block 54 - SCHED. COMP. DATE: Enter the Julian date that all work on the job is scheduled to be completed by the repair activity.
- g. Block 55 - REPAIR ACTIVITY UIC: Enter the UIC of the repair activity performing the work for the originating command.
- h. Block 56 - WORK REQ. ROUTINE: Enter the appropriate Expanded Ship Work Breakdown Structure (ESWBS), Ship Work Authorization Boundary (SWAB), Ship Work Line Item Number (SWLIN), etc., as directed by the TYCOM.
- i. Blocks 57 through 63: - Used to identify Depot estimates on individual CSMP items from the Master Job Catalog. These blocks may also be used as directed by TYCOM instruction.
 - (1) Block 57 - EST. MAN-DAYS: Enter an estimate of the total number of man-days required to complete the job. If the estimate is less than one, enter 1.
 - (2) Block 58 - EST. MAN-DAY COSTS: Enter an estimate of the total man-day costs required to complete the job.
 - (3) Block 59 - EST. MATERIAL COSTS: Enter an estimate of the total material costs required to complete the job.
 - (4) Block 60 - EST. TOTAL COST: Enter an estimate of the total cost required to complete the job (Add Blocks 58 and 59).
 - (5) Block 61 - JOB ORDER NUMBER: Enter Job Order Number assigned by the activity performing the work.
 - (6) Block 62 - LEAD P&E CODE: Enter the code assigned to the lead planning and scheduling organization.
 - (7) Block 63 - DATE OF EST: Enter the date that the repair activity's planning action was completed.

5. PROCEDURES FOR DOCUMENTING A COMPLETED MAINTENANCE ACTION

PREVIOUSLY DEFERRED: Blocks A, B and applicable Blocks 1 through 47 have previously been filled. The maintenance person **must** report completion of a previously deferred maintenance action by using the copy of the OPNAV 4790/2K retained onboard when the maintenance action was deferred. If there is no record (paper) copy of the original 2K and the maintenance action is on the CSMP, enter the JCN on a blank 2K form, and without providing all the deferred maintenance information, enter the completion data in Section III. If the word

“AUTO” has been entered in Block 27 as directed by the TYCOM, submission of a completed maintenance action by the originating ship may not be necessary.

5.1. Section III - COMPLETED ACTION. Block 29 - ACT. TKN: Enter the code (Table H-12) that best describes the action taken to complete the maintenance.

NOTE: THE LIST OF “ACTION TAKEN” CODES CHANGES OCCASIONALLY. VERIFY CURRENT “ACTION TAKEN” CODES AT THE FOLLOWING WEB SITE:

[HTTPS://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML](https://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML)

Action Taken Codes

Code	Description
1	Maintenance Action Completed; Parts Drawn from Supply
2	Maintenance Action Completed; Required Parts Not Drawn from Supply (local manufacture, pre-expended bins, etc.)
3	Maintenance Action Completed; No Parts Required

NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH THE ACTION TAKEN CODES 1, 2, OR 3 AS DIRECTED BY THE TYCOM:

A	Maintenance Requirement Could Have Been Deferred
B	Maintenance Requirement Was Necessary
C	Maintenance Requirement Should Have Been Done Sooner
M	High Cost Repairs
T	The Equipment Being Reported Had a Time Meter
4	Canceled (When this code is used, the deferral will be removed from the CSMP). This code is not to be used with INSURV, Safety, or Priority 1 or 2 deferrals screened for accomplishment by the TYCOM or IUC.
7	Maintenance Action Completed; 2-M (Miniature/Micro-Miniature Electronic Modules) Capability Utilized.

NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH ACTION TAKEN CODE 7 TO BETTER DESCRIBE THE ACTION TAKEN:

A	Parts Drawn from Supply Utilized

Code	Description
	B Parts Not Drawn from Supply Utilized
	C Automatic Test Equipment (ATE) Utilized
	D ATE and Parts Drawn from Supply Utilized
	E ATE and Parts Not Drawn from Supply Utilized
8	Periodic Time Meter/Cycle Counter reporting. (This code is not applicable to the "FINAL ACTION" code reported by the repair activity.)
9	Maintenance Action Completed; 3-M Fiber Optic Repair

NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH ACTION TAKEN CODE 9 TO BETTER DESCRIBE THE ACTION TAKEN:

A	FOTE, multimode ST MQJs utilized
B	FOTE, multimode heavy duty MQJs utilized
C	FOTE, multimode rotary mechanical splice MQJs utilized
D	FOTE, single mode ST MQJs utilized
E	FOTE, single mode heavy duty MQJs utilized
F	FOTE, multimode specialty MQJs utilized
G	FOTE, single mode specialty MQJs utilized
H	FOTE, not available
I	Standard MQJs not available
J	Specialty MQJs not available
0	None of the Above

Table H-12

- b. Block 30 - MHRS: Enter the total man-hours (to the nearest whole hour) that was expended doing the maintenance after submitting the deferral. This includes man-hours expended for reinstallation, witnessing of tests, etc. (include documentation time which should not exceed 1 hour).

- c. Block 31 - COMPLETION DATE: Enter the Julian date the maintenance action was completed.
- d. Block 32 - ACT. MAINT. TIME: Enter the total clock hours (to the nearest whole hour) during which maintenance was actually performed. This should include time for troubleshooting, but not delays.
- e. Block 33 - TI: Enter a single numeral (1 through 9) to indicate, to the nearest 10%, the percentage of active maintenance expended in troubleshooting. For example, if no troubleshooting is involved, enter “1”, “2” for 20%, “3” for 30%, “7” for 70%, etc.
- f. Block 34 - METER READING: There is no entry required on the completed deferral action. (Refer to Block 34 instructions for DOCUMENTING A DEFERRED MAINTENANCE ACTION).
- g. Block 35 - REMARKS/DESCRIPTION: When the “what must be done” statement on the original deferral accurately describes the work which was done, no further entries are required. If remarks in addition to the original remarks entered are needed to describe the work done, refer to paragraph 7 of this appendix for “Documenting Changes, Additions and Deletions to Previously Submitted Maintenance Actions.” Describe what was done and any additional information considered significant. If additional space is needed for the completed action description, use up to three continuation pages.

5.2. Section IV - REMARKS/DESCRIPTION - (Used by the Repair Activity when Reporting a Completed Maintenance Action): This type of completed work request is to be provided to the ship for 3-M processing.

Block 64 - FINAL ACT.: Enter the code that best describes the final action taken to complete the maintenance. (Refer to Block 29 for “ACTION TAKEN” allowable codes/values). In addition, the following codes (Table H-13) can be used:

**NOTE: THE LIST OF “ACTION TAKEN” CODES CHANGES OCCASIONALLY. VERIFY CURRENT “ACTION TAKEN” CODES AT THE FOLLOWING WEB SITE:
[HTTPS://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML](https://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML)**

Action Taken Codes

Code	Description
5A	Partially Completed Alteration
5B	Fully Completed Alteration
5C	Fully Completed Equivalent to Alteration
5D	Alteration Directive Not Applicable
6	Rejected Work Request

Code	Description

NOTE: ADD THE FOLLOWING SECOND CHARACTER CODE WITH ACTION TAKEN CODE 6 TO BETTER DESCRIBE THE ACTION TAKEN:

A	Ship's Force or Unit Standard Stock Item
B	Excessive Ship Workload or Insufficient Availability
C	Lack of Skills
D	Lack of Facilities
E	Lack of Test or Calibration Equipment
F	Lack of Parts or Material
G	Lack of Documentation
H	Lack of Funds
I	Other (record the explanation in "Remarks")

Table H-13

- b. Block 65 - MHRS. EXPENDED: Enter the man-hours expended on the last day the Repair Work Center is involved in the Work Request (NOT the total man-hours of the work request).
- c. Block 66 - DATE COMPLETED: Enter the Julian date the work request is completed and signed off by the requesting command.
 - (1) Block G - COMPLETED BY: The signature, rank and rate of the individual authorized by the repair activity to verify the acceptability of work performed is entered in this block.
 - (2) Block H - ACCEPTED BY: The signature, rank and rate of the individual authorized by the command to verify the acceptability of work performed. Completion of this block is mandatory when a 2K is used to report completion of a previously deferred maintenance action.

6. PROCEDURES FOR DOCUMENTING A COMPLETED MAINTENANCE ACTION WITHOUT PRIOR DEFERRAL: Place an "X" in the block titled "COMP" at top of form.

6.1. Section I – IDENTIFICATION.

- a. JOB CONTROL NUMBER (Blocks 1 - 3):
 - (1) Block 1 - UIC: Enter the Unit Identification Code (UIC) of the activity initiating the maintenance action.

- (2) Block 2 - WORK CENTER: Enter the code of the Work Center initiating the maintenance action. For Ships, a four-position Work Center code will be entered. For repair departments of SIMAs, RMCs and other IMAs, a three-digit code will be entered. The three-digit code is entered left-to-right leaving the right most position blank. Appendix C of this chapter provides a listing of authorized Work Center codes (Submarine Tenders have been converted to a four-position Work Center code).
- (3) Block 3 - JOB SEQ. NO. (JSN): Enter the four character JSN assigned by the Work Center Supervisor. This is an entry assigned sequentially from the SFWL/JSN Log.
- b. Block 4 - APL/AEL (Allowance Parts List/Allowance Equipment List): Enter the APL/AEL of the equipment being reported. These numbers are found in the COSAL or SCLISIS Index Report. An example of an APL would be "882170236" and an AEL would be "2-260034096."
- c. Block A - Enter COMMAND'S NAME.
- d. Block 5 - EQUIPMENT NOUN NAME: Enter the equipment nomenclature and description on which maintenance is being reported. The equipment nomenclature and description should be the same as that identified by the EIC and is limited to 16 positions. Standard abbreviations can be used if clarity is retained. For electronic equipment having an Army-Navy (AN) designation, it will be substituted for the equipment nomenclature.
- e. Block B: - Enter SHIP'S HULL NUMBER (if applicable).
- f. Block 6 - WHEN DISCOVERED (WND): Enter the code (Table H-14) that best identifies when the need for maintenance was discovered.

When Discovered Codes

Code	Description
1	Lighting Off or Starting
2	Normal Operation
3	During Operability Test
4	During Inspection
5	Shifting Operational Modes
6	During PMS
7	Securing
8	During AEC (Assessment of Equipment) Program

Code	Description
9	No Failure, PMS Accomplishment Only
0	Not Applicable (use when reporting printing services, etc.)

Table H-14

- g. Block 7 - STATUS (STA): Enter the code (Table H-15) that most accurately describes the effect of the failure or malfunction on the operational performance capability of the equipment when the need for maintenance was first discovered.

Status Codes

Code	Description
1	Operational
2	Non-Operational
3	Reduced Capability
0	Not Applicable (use if reporting printing services, etc.)

Table H-15

- h. Block 8 - CAUSE (CAS): Enter the code (Table H-16) that best describes the cause of the failure or malfunction when the need for maintenance was first discovered. (Refer to reference (a), Appendix A, Table A-6 data element "CAUSE" for an expanded definition of the allowable codes/values).

Cause Codes

Code	Description
1	Abnormal Environment
2	Manufacturer or Installation Defects
3	Lack of Knowledge or Skill
4	Communication Problem
5	Inadequate Instruction or Procedure
6	Inadequate Design
7	Normal Wear and Tear
0	Other or No Malfunction

Table H-16

- i. Block 9 - DEFERRAL REASON (DFR): Leave blank.
- j. Block 10: - Block is reserved for TYCOM directed applications. Refer to TYCOM instruction for use.
- k. Block 11: - Block is reserved for TYCOM directed applications. Refer to TYCOM instruction for use.
- l. Block 12: - Block is reserved for TYCOM directed applications. Refer to TYCOM instruction for use.
- m. Block 13 - IDENT./EQUIPMENT SERIAL NUMBER: Enter the identification or serial number of the equipment or system on which maintenance is being deferred. For Hull, Mechanical & Electrical (HM&E) equipment, enter the Valve Mark/Electric Symbol Number (ESN) or Primary Identification Number. For electronic equipment, enter the manufacturer's serial number of the equipment or system on which maintenance is being deferred.
- n. Block 14 - EIC: Enter the Equipment Identification Code of the component, equipment, subsystem or system for which the maintenance is being reported.
- o. Block 15 - SAFETY HAZARD: Enter an "X" or applicable safety code (Table H-17) if the maintenance action describes a problem or condition which has caused, or has the potential to cause, serious injury to personnel or material. A brief explanation must be included in the REMARKS/DESCRIPTION field (Block 35). For example:
 "Reinspection of separator for presence of oil after rinse. MRC A-27 evidently not done. Presence of oil resulted in fire in HP air system when compressor operated under load. Fire badly burned valve AHP-287, requiring replacement."

NOTE: THE SHIP'S OR UNIT'S 3-M COORDINATOR WILL FORWARD A COPY OF ALL OPNAV 4790/2K DOCUMENTATION HAVING AN ENTRY IN THIS FIELD TO THE SAFETY OFFICER FOR REVIEW. (REFER TO REFERENCE (A), APPENDIX A, TABLE A-14, DATA ELEMENT "SAFETY HAZARD" FOR AN EXPANDED DEFINITION OF THE ALLOWABLE CODES/VALUES).

Safety Hazard Codes

Code	Description
1	Critical Safety or Health Deficiency-Correct Immediately
2	Serious Safety or Health Deficiency-Suspension of Equipment, System or Space Use is required
3	Moderate Safety or Health Deficiency-Waiver of Equipment, System or Space Use is granted Pending Correction of the Item
4	Minor Safety or Health Deficiency

Code	Description
5	Negligible Safety or Health Deficiency
0	Maintenance Action is Not Safety Related

NOTE: CODES “6” THROUGH “9” MAY BE LOCALLY ASSIGNED BY TYCOMS IF ADDITIONAL SAFETY CODES ARE REQUIRED.

Table H-17

- p. Block 16 - LOCATION: Enter the location (compartment number, deck, frame or side notation), that best describes the location of the equipment requiring maintenance as identified in Block 13. If none of the mentioned location identifications are appropriate, enter description of the location (e.g., FANTAIL, FLIGHT DECK, etc.).
- q. Block 17 - WHEN DISCOVERED DATE: Enter the Julian date when the equipment or system failure or malfunction was discovered.
- r. Block 18 - ALTERATIONS: Leave blank. If the completed maintenance action resulted in a configuration change or alteration, refer to the instructions for submitting an OPNAV 4790/CK form Appendix G.
- s. Blocks 19 through 24 - FOR INSURV USE: No entries required. See Section 2 for details.

6.2. Section II - DEFERRAL ACTION (Block 25 - 28): Leave blank.

6.3. Section III - COMPLETED ACTION.

- a. Block 29 - ACT. TKN: Enter the code (Table H-18) that best describes the action taken to complete the maintenance.

NOTE: THE LIST OF “ACTION TAKEN” CODES CHANGES OCCASIONALLY. VERIFY CURRENT “ACTION TAKEN” CODES AT THE FOLLOWING WEB SITE:

[HTTPS://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML](https://OARS.NSLC.NAVY.MIL/OARS/DOCS/REF/INDEX.HTML)

Action Taken Codes

Code	Description
1	Maintenance Action Completed; Parts Drawn from Supply
2	Maintenance Action Completed; Required Parts Not Drawn from Supply (local manufacture, pre-expended bins, etc.)
3	Maintenance Action Completed; No Parts Required

NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH THE ACTION TAKEN CODES 1, 2, OR 3 AS DIRECTED BY THE TYCOM:

	A	Maintenance Requirement Could Have Been Deferred
	B	Maintenance Requirement Was Necessary
	C	Maintenance Requirement Should Have Been Done Sooner
	M	High Cost Repairs
	T	The Equipment Being Reported Had a Time Meter
4	Canceled (When this code is used, the deferral will be removed from the CSMP). This code is not to be used with INSURV, safety, or priority 1 or 2 deferrals screened for accomplishment by the TYCOM or IUC.	
7	Maintenance Action Completed; 2-M (Miniature/Micro-Miniature Electronic Modules) Capability Utilized.	

NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH ACTION TAKEN CODE 7 TO BETTER DESCRIBE THE ACTION TAKEN:

	A	Parts Drawn from Supply Utilized
	B	Parts Not Drawn from Supply Utilized
	C	Automatic Test Equipment (ATE) Utilized
	D	ATE and Parts Drawn from Supply Utilized
	E	ATE and Parts Not Drawn from Supply Utilized
8	Periodic Time Meter/Cycle Counter reporting. (This code is not applicable to the "FINAL ACTION" code reported by the repair activity.)	
9	Maintenance Action Completed; 3-M Fiber Optic Repair	

NOTE: THE FOLLOWING SECOND CHARACTER CODES CAN BE USED WITH ACTION TAKEN CODE 9 TO BETTER DESCRIBE THE ACTION TAKEN:

	A	FOTE, multimode ST MQJs utilized
	B	FOTE, multimode heavy duty MQJs utilized
	C	FOTE, multimode rotary mechanical splice MQJs utilized
	D	FOTE, single mode ST MQJs utilized

E	FOTE, single mode heavy duty MQJs utilized
F	FOTE, multimode specialty MQJs utilized
G	FOTE, single mode specialty MQJs utilized
H	FOTE, not available
I	Standard MQJs not available
J	Specialty MQJs not available
0	None of the Above

Table H-18

- b. Block 30 - MHRS: Enter the total man-hours (to the nearest whole hour) that were expended completing the maintenance. This includes man-hours expended for reinstallation, witnessing of tests, etc. (include documentation time, which should not exceed 1 hour).

NOTE: BLOCKS 32, 33, AND 34 ARE ONLY TO BE REPORTED, IF THE EQUIPMENT HAS BEEN SEL DESIGNATED.

- c. Block 31 - COMPLETION DATE: Enter the Julian date the maintenance action was completed.
- d. Block 32 - ACT. MAINT. TIME: Enter the total clock hours (to the nearest whole hour) during which maintenance was actually performed. This should include time for troubleshooting, but not delays.
- e. Block 33 - TI: Enter a single numeral (1 through 9) to indicate, to the nearest 10 percent, the percentage of active maintenance expended in troubleshooting. For example, if no troubleshooting is involved, enter "f", "2" for 20%, "3" for 30%, "7" for 70%, etc.
- f. Block 34 - METER READING: Enter the time meter reading (to the nearest whole hour) at the time of failure. If the equipment has more than one meter, designate the meter being recorded in Block 35 "REMARKS" using the letters "METRED" followed by the meter designator. An asterisk (*) must precede and follow the meter designation. Example: *METRED-1A2M1*.
- g. Block 35 - REMARKS/DESCRIPTION: Enter remarks relating to the maintenance action. These remarks should be brief, but complete and meaningful. Remarks should state what was wrong, what caused the failure (if known) and what was done to correct the problem. If "SAFETY HAZARD" (Block 15) is checked, a description of the condition creating the hazard should be inserted in "REMARKS". If more space is needed, check Block 36 "CONT. SHEET" and continue the remarks on a second form using the same JCN.

7. PROCEDURES FOR DOCUMENTING CHANGES, ADDITIONS, AND DELETIONS TO PREVIOUSLY SUBMITTED MAINTENANCE ACTIONS: Place an “X” in the block titled “CORRECTION” at the top of the form. Enter the exact JCN (Blocks 1, 2, and 3) of the original 2K previously processed. Enter only the information to be added, deleted, or changed in the applicable blocks. If the selected data elements are to be deleted, without deleting the entire document, enter dashes (one dash per tic mark) within the data block to be deleted. When changing Block 35, REMARKS/DESCRIPTION, the entire narrative must be entered so that the correct information is included. It is not possible to change just a word or two.

8. PROCEDURES TO ADD-ON REMARKS TO THE CSMP: To add to the remarks as originally submitted, place an “X” in the block titled “ADD-ON REMARKS” at the top of a new 2K Form. Place an “X” in the “DEFL” block at the top of the form and enter in Blocks 1, 2 and 3 the JCN of the original 2K. In Block 35 “REMARKS/DESCRIPTION”, enter the initials of the activity adding on to the remarks followed by a dash (-). For example, CINCPACFLT would be entered as “CPF-”. Following the dash (-) enter the additional information. If it is necessary to rewrite, or change the narrative as originally submitted, use the procedures for “DOCUMENTING CHANGES, ADDITIONS, and DELETIONS” in paragraph 7.

9. HANDLING PROCEDURES: The 2K is required for documenting a maintenance action that did not result in a configuration change. The 2K **must** be forwarded to the automated data processing facility serving the command. A copy is submitted when reporting the completion of that maintenance action. A second copy is retained until completion of the maintenance action results in its removal from the CSMP; then it may be destroyed.

Maintenance Action Form for a Deferred Maintenance Action

OPNAV 4790/2K (REV 5-17)

Clear Form

MAINTENANCE ACTION FORM (2-KILO) ☐ COMP ☒ DEFL ☐ CORRECTION ☐ ADD-ON REMARKS

SECTION I. IDENTIFICATION		JOB CONTROL NUMBER																																	
1. UIC 21455		2. WORK CENTER OI01		3. JOB. SEQ NO. 0589		4. APL/AEL 882170236																													
A. COMMAND NAME USS SCOUT				5. EQUIPMENT NOUN NAME VALVE, GLOBE				6. WND		7. STA		8. CAS		9. DFR		10.		11.		12.															
B. HULL NUMBER (IF APPLICABLE) MCM8				13. INDENT / EQUIPMENT SERIAL NUMBER FM-3-20-0				14. EIC 5E451				6		1		7		1																	
15. SAFETY HAZARD ☐		16. LOCATION (Compartment / Deck / Frame / Side) 3-20-0-E						17. WHEN DISCOVERED DATE YR DAY 6 2 1 4																											
18. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)						19. **		20. INSURV NUMBER				21. SUFFIX		22. U		23. S		24. R/M																	
CONFIGURATION CHANGE						FOR INSURV USE																													
SECTION II. DEFERRAL ACTION																						25. MHRS. EXP. 4		26. DEFER DATE YR DAY 6 2 1 4		27. MHRS. REM. 6		28. DEADLINE DATE YR DAY 6 2 2 5							
SECTION III. COMPLETED ACTION																						29. ACT. TKN.		30. MHRS.		31. COMPLETION DATE YR DAY		32. ACT. MAINT. TIME		33. TI		34. METER READING			
SECTION IV. REMARKS / DESCRIPTION																																			
35. REMARKS / DESCRIPTIONS WHILE PERFORMING PMS, MAINTENANCE PERSON NOTED EXCESSIVE LEAKING FROM VALVE STEM PACKING GLAND ON FIREMAIN SUPPLY VALVE. XXX SHIPS FORCE WILL ORDER PACKING MATERIAL FROM SUPPLY AND REPAIR AT SOONEST OPPORTUNITY UPON RECEIPT OF PARTS.																																			
36. CONT. SHEET ☐																																			
37. CSMP SUMMARY VALVE FM-3-20-0 STEM PACKING GLAND LEAKS EXTERNALLY																																			
38. FIRST CONTACT / MAINT. MAN (Print) GRUBE				39. RATE ENFN		40. SECOND CONTACT / SUPERVISOR (Print) GROFF, ENC				41. PRI 4		42. T/A 4		43. INTEGRATE PRIORITY				SCREENING																	
C. DIV. INT. TFO		D. DEPT. INIT. DER		E. COMMANDING OFFICER'S SIGNATURE								F. TYCOM AUTHORIZATION								44. IUC		45. TYCOM													
46. SPECIAL PURPOSE		A.		B.		C.		D.		E.		F.		G.		H.		I.		J.		K.		L.											
SECTION V. SUPPLEMENTARY INFORMATION																																			
47. BLUEPRINTS, TECH. MANUALS, PLANS, ECT. 0947-214-9010										AVAILABLE ON BOARD YFS NO ☒ ☐		48. PREARRIVAL / ARRIVAL CONFERENC ACTION / REMARKS																							
										☐																									
										☐																									
										☐																									
SECTION VI. REPAIR ACTIVITY PLANNING / ACTION																																			
49. REPAIR W/C		50. EST. MHRS.		51. ASST. REPAIR W/C		52. ASST. EST. MHRS		53. SCHED. START DATE YR DAY		54. SCHED. COMP. DATE YR DAY																									
55. REPAIR ACTIVITY UIC				56. WORK REQ. ROUTINE				57. EST. MANDAYS				58. EST. MANDAY COST \$				59. EST. MATERIAL COST \$																			
60. EST. TOTAL COST \$				61. JOB ORDER NUMBER				62. LEAD P&E CODE				63. DATE OF EST. YR DAY																							
64. FINAL ACT.		65. MHRS EXPENDED		66. DATE COMPLETED YR DAY		G. COMPLETED BY (Signature - Rate)				H. ACCEPTED BY (Signature - Rate/Rank)				PAGE 1 OF 1																					

Figure H-1 Maintenance Action Form for a Completed Maintenance Action without Prior Deferral

16 Oct 2019

OPNAV 4790/2K (REV 5-17)

Clear Form

MAINTENANCE ACTION FORM (2-KILO) ☒ COMP ☐ DEFL ☐ CORRECTION ☐ ADD-ON REMARKS

SECTION I. IDENTIFICATION		JOB CONTROL NUMBER																							
1. UIC 21455		2. WORK CENTER OI01		3. JOB. SEQ NO. 0593		4. APL/AEL 882170236																			
A. COMMAND NAME USS SCOUT				5. EQUIPMENT NOUN NAME VALVE, GLOBE				6. WND	7. STA	8. CAS	9. DFR	10.	11.	12.											
B. HULL NUMBER (IF APPLICABLE) MCM8				13. INDENT / EQUIPMENT SERIAL NUMBER FM-2-21-0				14. EIC 5E451				6		1		7		0							
15. SAFETY HAZARD ☐		16. LOCATION (Compartment / Deck / Frame / Side) 2-20-0-E						17. WHEN DISCOVERED DATE YR DAY 6 2 1 5																	
18. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)						19. **						20. INSURV NUMBER						21. SUFFIX		22. U		23. S		24. R/M	
CONFIGURATION CHANGE						FOR INSURV USE																			
SECTION II. DEFERRAL ACTION		25. MHRS. EXP				26. DEFER DATE YR DAY				27. MHRS. REM.				28. DEADLINE DATE YR DAY											
SECTION III. COMPLETED ACTION		29. ACT. TKN 3		30. MHRS. 2		31. COMPLETION DATE YR DAY 6 2 1 5				32. ACT. MAINT. TIME 2				33. TI				34. METER READING							
SECTION IV. REMARKS / DESCRIPTION		35. REMARKS / DESCRIPTIONS WHILE PERFORMING PMS, MAINTENANCE PERSON NOTED EXCESSIVE LEAKING FROM VALVE STEM PACKING GLAND ON FIREMAIN CUT-OUT VALVE. XXX SHIPS FORCE TIGHTENED PACKING GLAND NUT IAW TECHNICAL MANUAL AND MONITORED VALVE FOR PROPER OPERATION. LEAK FROM VALVE STEM PACKING GLAND HAS BEEN REPAIRED.																							
37. CSMP SUMMARY VALVE FM-2-21-0 STEM PACKING GLAND LEAKS EXTERNALLY		36. CONT. SHEET ☐																							
38. FIRST CONTACT / MAINT. MAN (Print) GRUBE				39. RATE ENFN		40. SECOND CONTACT / SUPERVISOR (Print) GROFF, ENC				41. PRI 4		42. T/A 4		43. INTEGRATE PRIORITY				SCREENING							
C. DIV. INT. TFO		D. DEPT. INIT. DER		E. COMMANDING OFFICER'S SIGNATURE						F. TYCOM AUTHORIZATION						44. IUC		45. TYCOM							
46. SPECIAL PURPOSE		A.		B.		C.		D.		E.		F.		G.		H.		I.		J.		K.		L.	
SECTION V. SUPPLEMENTARY INFORMATION		47. BLUEPRINTS, TECH. MANUALS, PLANS, ECT. 0947-215-9010																							
48. PREARRIVAL / ARRIVAL CONFERENC ACTION / REMARKS														AVAILABLE ON BOARD YES ☒ NO ☐											
														☐											
														☐											
														☐											
SECTION VI. REPAIR ACTIVITY PLANNING / ACTION		49. REPAIR W/C																							
50. EST. MHRS.		51. ASST. REPAIR W/C		52. ASST. EST. MHRS		53. SCHED. START DATE YR DAY		54. SCHED. COMP. DATE YR DAY																	
55. REPAIR ACTIVITY UIC		56. WORK REQ. ROUTINE		57. EST. MANDAYS		58. EST. MANDAY COST \$		59. EST. MATERIAL COST \$																	
60. EST. TOTAL COST \$		61. JOB ORDER NUMBER		62. LEAD P&E CODE		63. DATE OF EST. YR DAY																			
64. FINAL ACT.		65. MHRS EXPENDED		66. DATE COMPLETED YR DAY		G. COMPLETED BY (Signature - Rate)		H. ACCEPTED BY (Signature - Rate/Rank)																	
PAGE 1 OF 1																									

Figure H-2 Maintenance Action Form for a Change to a Previously Submitted Deferred Maintenance Action

OPNAV 4790/2K (REV 5-17)

Clear Form

MAINTENANCE ACTION FORM (2-KILO) ☐ COMP ☐ DEFL ☒ CORRECTION ☐ ADD-ON REMARKS

SECTION I. IDENTIFICATION		JOB CONTROL NUMBER													
1. UIC 21455		2. WORK CENTER OI01		3. JOB. SEQ NO. 0589		4. APL/AEL									
A. COMMAND NAME				5. EQUIPMENT NOUN NAME				6. WND	7. STA	8. CAS	9. DFR	10.	11.	12.	
B. HULL NUMBER (IF APPLICABLE)				13. INCIDENT / EQUIPMENT SERIAL NUMBER				14. EIC				2			
15. SAFETY HAZARD ☐		16. LOCATION (Compartment / Deck / Frame / Side)						17. WHEN DISCOVERED DATE YR DAY							
18. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)						19. */*		20. INSURV NUMBER		21. SUFFIX	22. U	23. S	24. R/M		
CONFIGURATION CHANGE						FOR INSURV USE									
SECTION II. DEFERRAL ACTION						25. MHRS. EXP.		26. DEFER DATE YR DAY		27. MHRS. REM.		28. DEADLINE DATE YR DAY			
SECTION III. COMPLETED ACTION						29. ACT. TKN		30. MHRS.		31. COMPLETION DATE YR DAY		32. ACT. MAINT. TIME		33. TI	34. METER READING
SECTION IV. REMARKS / DESCRIPTION															
35. REMARKS / DESCRIPTIONS WHILE PERFORMING PMS, MAINTENANCE PERSON NOTED EXCESSIVE LEAKING FROM VALVE STEM PACKING GLAND ON FIREMAIN SUPPLY VALVE. DUE TO DESIGN, VALVE STEM PACKING GLAND IS NOT ADJUSTABLE / REPAIRABLE. XXX SHIPS FORCE WILL ORDER REPLACEMENT VALVE FROM SUPPLY AND REPLACE AT SOONEST OPPORTUNITY UPON RECEIPT OF NEW VALVE.															
														36. CONT SHEET ☐	
37. CSMP SUMMARY															
38. FIRST CONTACT / MAINT. MAN (Print)			39. RATE		40. SECOND CONTACT / SUPERVISOR (Print)			41. PRI	42. T/A	43. INTEGRATE PRIORITY					
C. DIV. INT.			D. DEPT. INIT.		E. COMMANDING OFFICER'S SIGNATURE				F. TYCOM AUTHORIZATION				SCREENING 44. IUC 45. TYCOM		
46. SPECIAL PURPOSE		A.	B.	C.	D.	E.	F.	G.	H.	I.	J.	K.	L.		
SECTION V. SUPPLEMENTARY INFORMATION															
47. BLUEPRINTS, TECH. MANUALS, PLANS, ECT.								AVAILABLE ON BOARD YES ☐ NO ☐		48. PREARRIVAL / ARRIVAL CONFERENC ACTION / REMARKS					
								☐							
								☐							
								☐							
SECTION VI. REPAIR ACTIVITY PLANNING / ACTION															
49. REPAIR W/C		50. EST. MHRS.		51. ASST. REPAIR W/C		52. ASST. EST. MHRS		53. SCHED. START DATE YR DAY		54. SCHED. COMP. DATE YR DAY					
55. REPAIR ACTIVITY UIC		56. WORK REQ. ROUTINE				57. EST. MANDAYS				58. EST. MANDAY COST \$				59. EST. MATERIAL COST \$	
60. EST. TOTAL COST \$		61. JOB ORDER NUMBER				62. LEAD P&E CODE				63. DATE OF EST. YR DAY					
64. FINAL ACT.		65. MHRS EXPENDED		66. DATE COMPLETED YR DAY		G. COMPLETED BY (Signature - Rate)				H. ACCEPTED BY (Signature - Rate/Rank)				PAGE 1 OF 1	

Figure H-3 Maintenance Action Form for Add-on Remarks to a Previously Submitted Deferred Maintenance Action

16 Oct 2019

OPNAV 4790/2K (REV 5-17)

Clear Form

MAINTENANCE ACTION FORM (2-KILO) ☐ COMP ☒ DEFL ☐ CORRECTION ☒ ADD-ON REMARKS

SECTION I. IDENTIFICATION		JOB CONTROL NUMBER															
1. UIC 21455		2. WORK CENTER OI01		3. JOB. SEQ. NO. 0589		4. APL/AEL											
A. COMMAND NAME				5. EQUIPMENT NOUN NAME				6. WND	7. STA	8. CAS	9. DFR	10.	11.	12.			
B. HULL NUMBER (IF APPLICABLE)				13. INCIDENT / EQUIPMENT SERIAL NUMBER				14. EIC									
15. SAFETY HAZARD ☐		16. LOCATION (Compartment / Deck / Frame / Side)						17. WHEN DISCOVERED DATE YR DAY									
CONFIGURATION CHANGE						FOR INSURV USE											
18. ALTERATIONS (SHIPALT, ORDALT, Fld Chg. ect.)						19. *"		20. INSURV NUMBER		21. SUFFIX		22. U	23. S	24. R/M			
SECTION II. DEFERRAL ACTION				25. MHRS. EXP.		26. DEFER DATE YR DAY		27. MHRS. REM.		28. DEADLINE DATE YR DAY							
SECTION III. COMPLETED ACTION				29. ACT. TKN.		30. MHRS.		31. COMPLETION DATE YR DAY		FOR SELECTED EQUIPMENT ONLY							
										32. ACT. MAINT. TIME		33. TI		34. METER READING			
SECTION IV. REMARKS / DESCRIPTION																	
35. REMARKS / DESCRIPTIONS CSP - THIS IS THE FIFTH (5) FAILURE OF THIS TYPE OF VALVE ON THE MCM CLASS IN 60 DAYS. THIS APL / ESWBS WILL BE FLAGGED AS A "TROUBLED SYSTEM" FOR MATERIEL TRACKING PURPOSES.																	
36. CONT. SHEET ☐																	
37. CSMP SUMMARY																	
38. FIRST CONTACT / MAINT. MAN (Print)				39. RATE		40. SECOND CONTACT / SUPERVISOR (Print)				41. PRI	42. T/A	43. INTEGRATE PRIORITY					
C. DIV. INT.				D. DEPT. INIT.		E. COMMANDING OFFICER'S SIGNATURE				F. TYCOM AUTHORIZATION				44. IUC		45. TYCOM	
46. SPECIAL PURPOSE		A.	B.	C.	D.	E.	F.	G.	H.	I.	J.	K.	L.				
SECTION V. SUPPLEMENTARY INFORMATION																	
47. BLUEPRINTS, TECH. MANUALS, PLANS, ECT.								AVAILABLE ON BOARD YES ☐ NO ☐		48. PREARRIVAL / ARRIVAL CONFERENC ACTION / REMARKS							
								☐									
								☐									
								☐									
SECTION VI. REPAIR ACTIVITY PLANNING / ACTION																	
49. REPAIR W/C		50. EST. MHRS.		51. ASST. REPAIR W/C		52. ASST. EST. MHRS		53. SCHED. START DATE YR DAY		54. SCHED. COMP. DATE YR DAY							
55. REPAIR ACTIVITY UIC		56. WORK REQ. ROUTINE				57. EST. MANDAYS				58. EST. MANDAY COST \$				59. EST. MATERIAL COST \$			
60. EST. TOTAL COST \$		61. JOB ORDER NUMBER				62. LEAD P&E CODE				63. DATE OF EST. YR DAY							
64. FINAL ACT.		65. MHRS EXPENDED		66. DATE COMPLETED YR DAY		G. COMPLETED BY (Signature - Rate)				H. ACCEPTED BY (Signature - Rate/Rank)				PAGE 1 OF 1			

Figure H-4

VI-19H-33

APPENDIX H

APPENDIX I
PREPARATION INSTRUCTIONS SUPPLEMENTAL FORM
(OPNAV 4790/2L)

1. SUPPLEMENTAL FORM (OPNAV 4790/2L).

- a. This form is used to provide amplifying information (such as drawings and listings) related to a maintenance action, reported on an OPNAV 4790/2K Form. The 2L may be used to list multiple item serial numbers and locations for which identical maintenance requirements exist from an outside activity; or to provide a list of drawings and sketches that would be helpful in the accomplishment of the maintenance.
- b. The 2L form is retained with the suspense copy of the corresponding 2K form that deferred the maintenance action. The 2L is never submitted to the ADP facility servicing the activity, as the data on the 2L will never be entered into the computer. However, the 2L can be attached to the original 2K or computer produced (simulated) 2K when submitted to an assisting activity.

2. SPECIAL APPLICATION.

- a. If a Master Job Catalog (MJC) routine has been added to the CSMP for service routines or for IMA manufacturing of sheet metal enclosures/structures or flex hoses, multiple OPNAV 4790/2Ls may be used for the same JCN. Each 2L would result in an additional task being added to the JCN, thus accounting for man-hour expenditure for each task. Similarly, the 2L could be used to request critical hose manufacturing by referencing the MJC number and using the activity's own JCN, thus precluding the necessity to submit multiple complete OPNAV 4790/2Ks.
- b. The form is separated into three sections:
 - (1) SECTION I "IDENTIFICATION"
 - (2) SECTION II "REMARKS/SKETCHES"
 - (3) SECTION III "AUTHENTICATION"

NOTE: WHEN USING THE 2L, ALL SECTIONS OF THE FORM ARE TO BE FILLED OUT. ON THE OPNAV 4790/2K FORM, BE SURE TO ENTER THE NOTATION "2L USED" IN THE "REMARKS/DESCRIPTION" SECTION, BLOCK 35.

NOTE: FIGURE I-1 AND I-2 PROVIDE AN EXAMPLE OF COMPLETED OPNAV 4790/2L FORMS.

Figure I-1 SUPPLEMENTAL FORM Containing an Equipment Listing.

Figure I-2 SUPPLEMENTAL FORM Containing a Sketch or Drawing.

3. PROCEDURES FOR PROVIDING ADDITIONAL INFORMATION USING THE 2L.

3.1. Section I – Identification.

- a. Block A: - Enter the Command's Name.
- b. Block B: - Enter the Ship's Hull Number (if applicable).
- c. JOB CONTROL NUMBER: - Enter the same JCN (Command's UIC, Work Center, and Job Sequence Number) assigned to the original maintenance action (OPNAV 4790/2K or equivalent) in Blocks C, D and E.
- d. Block F - CONTINUATION FOR: Enter an "X" in one of the blocks to indicate that this 2L is a continuation of either an OPNAV 4790/2K, 4790/2L or a 4790/2P Form.

3.2. Section II - Remarks/Sketches. Block G: - Enter the information **that is desired to be provided** such as a list of serial numbers and locations for which identical maintenance requirements exist or sketches or drawings that may be useful in the accomplishment of the maintenance action.

3.3. Section III – Authentication.

- a. Block H - FIRST CONTACT/MAINTENANCE MAN: The maintenance person preparing the form prints his or her name in this block.
- b. Block I - DATE (YR/DAY): Enter the Julian date the document is prepared.
- c. Block J - SECOND CONTACT/SUPERVISOR: The Work Center Supervisor prints his name following his review of the document in the block.
- d. Block K - DATE: The Work Center Supervisor enters the Julian date the document was reviewed.

SUPPLEMENTAL FORM Containing an Equipment Listing

OPNAV 4790/2L (REV 4-17) S/N 0107-LF-770-3060

Clear Form

SUPPLEMENTAL FORM (2-LIMA)

SECTION I. IDENTIFICATION

SECTION I. IDENTIFICATION		JOB CONTROL NUMBER		
A. COMMAND NAME USS JASON DUNHAM	B. HULL NUMBER DDG 109	C. UIC 55685	D. WORK CENTER OI02	E. JOB SEQ NO. 0173
F. CONTINUATION FOR			☒ 2K	☐ 2L ☐ 2P

SECTION II. REMARKS SECTION

G. REMARKS / DESCRIPTIONS
**THE FOLLOWING BINOCULARS NEED TO BE COLLIMATED;
SERIAL 17865, 17866, 17870, 20188, 20189, 21220, 21223**

ADD IMAGE TO REMARKS / DESCRIPTIONS (BELOW)

CLEAR IMAGE

SECTION III. AUTHENTICATION

H. FIRST CONTACT/ MAINTENANCE MAN (Print) JONES ET3	I. DATE YR DAY 6 2 3 6	J. SECOND CONTACT/SUPERVISOR (Print) HOGGE ETC	K. DATE YR DAY 6 2 3 8

*U.S.GPO:1991-0-505-750

Figure I-1 SUPPLEMENTAL FORM Containing a Sketch or Drawing

APPENDIX J
WORK CANDIDATE AND JSN LOG EXAMPLE

DEFICIENCY IDENTIFICATION		TYP AVAIL	P R I	DEFICIENCY	REVIEW		REPAIR STATUS	SUPPLY	3M ACTION		COMPLETION
DATE:	SYS/CMPNT:	1	1		LPO	DIV OFF		REQN#	DEFER	COMPLETE	DATE:
		2	2						Y/N	Y/NA	
		3	3								
JSN:	ENTERED BY:	4	4	2 LIMA Y N TAG-OUT Y N					INT:	INT:	CLEARED BY:(Sign)
DATE:	SYS/CMPNT:	1	1		LPO	DIV OFF		REQN#	DEFER	COMPLETE	DATE:
		2	2						Y/N	Y/NA	
		3	3								
JSN:	ENTERED BY:	4	4	2 LIMA Y N TAG-OUT Y N					INT:	INT:	CLEARED BY:(Sign)
DATE:	SYS/CMPNT:	1	1		LPO	DIV OFF		REQN#	DEFER	COMPLETE	DATE:
		2	2						Y/N	Y/NA	
		3	3								
JSN:	ENTERED BY:	4	4	2 LIMA Y N TAG-OUT Y N					INT:	INT:	CLEARED BY:(Sign)
DATE:	SYS/CMPNT:	1	1		LPO	DIV OFF		REQN#	DEFER	COMPLETE	DATE:
		2	2						Y/N	Y/NA	
		3	3								

Figure J-1

VOLUME VI**CHAPTER 20****WEIGHT AND MOMENT CONTROL FOR SUBMARINES**REFERENCES.

- (a) NAVSEA S9086-C6-STM-010 - NSTM Chapter 096 (Weights and Stability)
- (b) NAVSEAINST C9096.2 - Weight and Stability Requirements for Active Submarines
- (c) NAVSEA S9SSN-W4-SSM-PA0/C688CLV7 - SSN688 Class Ship Systems Manual, Vol 7, Chapter 2, Section 2.3

LISTING OF APPENDICES.

- A Sample Ship Message to ISIC Concerning Removal or Reinstallation of DDS Lead
- B Sample Ship Message to ISIC Concerning Audit of DDS Lead Loading
- C Sample Ship Message to ISIC Concerning Audit of Cargo Lead Documentation

20.1 PURPOSE. This chapter provides basic information and guidance concerning submarine ballast changes, including mandatory authorization and reporting requirements.

- a. The use of solid ballast is important for submarine stability and the ability to maintain submerged equilibrium for all design conditions. Ballast lead typically, is installed in submarines for the following purposes:
 - (1) To maintain adequate stability.
 - (2) To correct for inherent transverse moments that would otherwise create list.
 - (3) To permit submarines to submerge with neutral buoyancy and zero trim for all design equilibrium conditions.
 - (4) To compensate for future installed alterations.
- b. An inclining experiment and all-stop trim dive are performed **per** the requirements of reference (a). These experiments provide the basic data concerning weight and center of gravity for use in all considerations of stability, reserve buoyancy, equilibrium and in determining compliance with the requirements of the weight control program. An inclining experiment is the only satisfactory method of accurately determining the location of the vertical center of gravity of the submarine. The trim dive is the only satisfactory method of determining the load to submerge and the final ballasting solution. Inclining experiments are conducted on each submarine in new construction, after the Post Shakedown Availability and when authorized by Naval Sea Systems Command (NAVSEA) for some overhaul availabilities. Trim dives are performed during delivery sea trials, prior to and after Post Shakedown Availability, prior to and after major availabilities and under specific circumstances to address ballasting issues reported by Ship's Force. Trim dives are also performed periodically prior to smaller availabilities to identify weight growth.
- c. Initial ship design provides for adequate stability and equilibrium for all expected loading conditions. Service life margin, in the form of permanent lead ballast in

excess of that needed to maintain stability and equilibrium, allows for growth, but historically the margin is quickly consumed for several reasons:

- (1) The on-going process of modernization over the life of the ship.
- (2) Unknown weight growth due to the accumulation of personal gear and equipment, undocumented alterations, spare parts and stores.
- (3) Weight removal or margin recovery measures being accorded a low priority.

20.2 BALLAST CHANGES. NAVSEA maintains a record of the solid ballast installed in each submarine. These records are required for evaluating and tracking the ship's stability and equilibrium. Any permanent alteration to a submarine that changes weight, moment or displacement may require compensation by the removal or installation of lead ballast.

20.2.1 Naval Sea Systems Command Notification. Any activity performing this alteration is required by reference (b) to submit a reballasting proposal to NAVSEA for approval. NAVSEA approval is required for all permanent ballast changes. Copies of the reballasting proposal **must** be sent to the Type Commander (TYCOM), Immediate Superior In Command (ISIC) and the Commanding Officer.

20.2.2 Ballast Types. Submarines of the active fleet **must** be maintained within stability and buoyancy limits for a state of war readiness. Deviations from this principle are generally unauthorized. Some ships are authorized to carry other types of lead ballast:

- a. Dry-Deck Shelter (DDS) Capable SSN: Some of these SSN ships have special lead called DDS lead that can be removed when the shelter is installed and re-loaded after the shelter is removed.
 - (1) After each Depot Maintenance Period, a Weight and Stability Data Report is developed by the Shipyard performing the availability. This document provides the amount, location and moment calculations for the removable DDS lead. The document provides the amount of DDS lead to be removed for DDS on-load and operations based on a specific set of loading parameters. The latest copy of this data package is to be maintained by Ship's Force.
 - (2) The amount of DDS lead either removed or reinstalled will be reported using the message format shown in Appendix A following an on-load or off-load of the DDS shelter prior to at sea operations.
 - (3) Each ship is responsible to determine the amount of DDS lead to remove (if any) based on their expected mission loading to maintain conditions within the equilibrium polygon. It is the responsibility of the ISIC to ensure Ship's Force is trained on the handling of DDS lead. Details on the DDS lead, including handling procedures, can be found in reference (c).
 - (4) In the event the DDS is on-loaded in a port other than the homeport, the ISIC is responsible for ensuring the DDS lead is transported to the port where the DDS will be removed so that the lead is available for Ship's Force loading concurrent with the DDS off-load.

- (5) When the DDS capable ship is operating without the DDS, all DDS lead is considered part of the ship's permanent lead ballast and **must** be installed in the designated locations as specified in the Weight and Stability Data Report.
 - (6) Actual DDS lead loading **must** be audited by Ship's Force prior to each Dry-Docking Selected Restricted Availability (DSRA), Depot Modernization Period (DMP), Engineered Overhaul, or Pre-Inactivation Restricted Availability (PIRA) to ensure the DDS lead is properly installed. The ISIC is responsible for ensuring that Ship's Force is using the latest shipyard Weight and Stability Data Report for validating the DDS lead loading. A report of the audit findings will be made using the message format shown in Appendix B. If a particular tank is scheduled for re-preservation and the work is listed in the Availability Work Package, the audit of the DDS lead in that specific tank may be delayed until the lead is reinstalled following preservation. Any audit conducted during the availability must be completed and reported prior to Dock Trials.
- b. Cargo Lead: Ships have cargo lead loaded at various times to compensate for loads or loading configurations. This cargo lead can become undocumented weight over time due to crew turnover and loss of corporate knowledge. To that end, the following is required for loading and off-loading of cargo lead:
- (1) Cargo ballast, unless part of the original design, is approved by NAVSEA on a ship-by-ship basis. Requests for cargo ballast, and requests for increased amount of cargo ballast, must be submitted by the ship, in writing, to NAVSEA for approval. All such requests **must** have TYCOM endorsement.
 - (2) Changes to cargo lead which includes adding, removing or relocating **must** normally be accomplished only by a nuclear qualified shipyard. Approval by the ISIC and TYCOM is required in the event a situation requires an organization other than a nuclear qualified shipyard to add, remove or relocate cargo lead.
 - (a) All requests for cargo lead changes will include the specific weight amount, location, and method for securing the lead.
 - (b) Cargo lead documentation **must** be audited by Ship's Force during each Maintenance and Modernization Program, DSRA, DMP, Engineered Overhaul, or PIRA to ensure the cargo lead is being properly tracked. The ISIC is responsible for ensuring that Ship's Force is using the latest shipyard documentation for the cargo lead. A report of the audit findings will be made using the format of Appendix C.
 - (3) Any cargo lead load that results in a calculated mission equilibrium point outside the equilibrium polygon requires a NAVSEA approved Departure From Specifications (DFS). Additional guidance and procedures concerning the installation or removal of cargo ballast is available in reference (b).
- c. Permanent Ballast: Changes in permanent ballast, which includes adding, removing or relocating, **must** not be accomplished by Ship's Force, Fleet Maintenance Activities or

any industrial activity without prior TYCOM concurrence and NAVSEA written approval.

- d. Sea Trial Lead. Temporary ballast may be added as necessary to assure that the ship is capable of diving and trimming out when lightly loaded during sea trials following a Chief of Naval Operations availability (DMP, DSRA, PIRA, etc.). NAVSEA **must** review and approve temporary ballast used for trials. The TYCOM **must** approve the use of any temporary lead retained or added after sea trials for transit to homeport. All temporary lead ballast must be removed prior to load-out and deployment. A temporary DFS **must** be opened upon installation of temporary sea trial ballast and closed upon removal of that ballast. The forwarding letter for the post-availability stability report **must** reference the DFS and provide the current status of the temporary lead ballast.

20.3 UNUSUAL CONDITIONS. NAVSEA requires reports to be submitted of any unusual conditions which are considered dangerous or seriously affect the operation of the ship. Ship's Force will report the following situations to NAVSEA, via the ISIC and TYCOM, **per** the requirements of reference (a).

- a. Excessive rolling.
- b. Heeling due to rudder action.
- c. Excessive pounding.
- d. Inadequate propeller immersion.

16 Oct 2019

APPENDIX A**SAMPLE SHIP MESSAGE TO ISIC CONCERNING REMOVAL OR
REINSTALLATION OF DDS LEAD**

FM USS <SHIP NAME>//
TO COMSUB<RON/GRU NO.>//
COMSUBRON <NO. HOME SQUADRON IF DEPLOYED>
INFO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//
BT
UNCLAS //N9096//
MSGID/GENADMIN//USS <SHIP'S NAME>//
SUBJ/(SUBS) USS <SHIP NAME/HULL NO.>REMOVAL <REINSTALLATION> OF DDS
LEAD//
REF/A/DOC/COMUSFLTFORCOM/<DATE>//
REF/ REF A IS COMUSFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE
MANUAL,
VOLUME VI, CHAPTER 20.//
RMKS/1. DDS SHELTER <NUMBER> IS BEING ON-LOADED <OFF-LOADED>
2. PER REF A THE SPECIFIC DDS LEAD THAT HAS BEEN REMOVED
<REINSTALLED> IS PROVIDED:

<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>

BT

**NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT
AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS
UTILIZED.**

16 Oct 2019

APPENDIX B**SAMPLE SHIP MESSAGE TO ISIC CONCERNING AUDIT OF DDS LEAD LOADING**

FM USS <SHIP NAME>//
TO COMSUB<RON/GRU NO.>//
COMSUBRON <NO. HOME SQUADRON IF DEPLOYED>
INFO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//
BT
UNCLAS //N9096//
MSGID/GENADMIN//USS <SHIP'S NAME>//
SUBJ/(SUBS) USS <SHIP NAME/HULL NO.>AUDIT OF DDS LEAD LOADING//
REF/A/DOC/COMUSFLTFORCOM/<DATE>//
REF/B/DOC/<SHIPYARD>/<DATE>
REF/ REF A IS COMUSFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE
MANUAL,
VOLUME VI, CHAPTER 20. REF B IS THE WEIGHT AND STABILITY DATA REPORT
FROM <SHIPYARD> DATED <DATE>.
RMKS/1. PER REF A THE CURRENT DDS LEAD LOADING AS REQUIRED BY REF B IS
AS FOLLOWS:

<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>
<NUMBER> DDS PIGS - <NUMBER> APPROXIMATE WEIGHT - LOCATION <TANK
AND LEAD BIN LOCATION>

BT

**NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT
AND CURRENT PLAD IS UTILIZED.**

16 Oct 2019

APPENDIX C**SAMPLE SHIP MESSAGE TO ISIC CONCERNING AUDIT OF CARGO LEAD
DOCUMENTATION**

FM USS <SHIP NAME>//
TO COMSUB<RON/GRU NO.>//
INFO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//
<SUPERVISING ACTIVITY/CODE NO>
COMNAVSEASYCOM WASHINGTON DC //
BT
UNCLAS //N9096//
MSGID/GENADMIN//USS <SHIP'S NAME>//
SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> AUDIT OF INSTALLED CARGO LEAD
REF/A/DOC/COMUSFLTFORCOM/<DATE>//
REF/B/DOC/<ACTIVITY>/<DATE>//
REF/ REF A IS COMUSFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE
MANUAL,
VOLUME VI, CHAPTER 20. REF B IS THE DATA PACKAGE BY THE <NAME> NAVAL
SHIPYARD FOR THE INSTALLATION OF CARGO LEAD.//
RMKS/1. THE SHIP IS UNDERGOING <AVAILABILITY TYPE>. PER REF A AN AUDIT
OF CARGO LEAD DOCUMENTATION HAS BEEN CONDUCTED. SHIP'S FORCE HAS
REF B THAT DOCUMENTS THE CURRENT AMOUNT AND LOCATION OF CARGO
LEAD.
BT

**NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT
AND CURRENT PLAD IS UTILIZED.**

VOLUME VI
CHAPTER 21
SUBMARINE STORAGE BATTERIES

REFERENCES.

- (a) NAVSEA S9223-AF-MMO-010 - Submarine Main Storage Battery Technical Manual
- (b) NAVSEA S9086-G1-STM-010 - NSTM Chapter 223, V1 (Submarine Storage Batteries - Lead Acid Batteries)

LISTING OF APPENDICES.

- A Temperature Versus TVG Table
- B Temperature Versus MCV Table
- C TCV Calculation Table
- D Capacity Test Discharge Data Sheet
- E Main Storage Battery Inspection Check-Off
- F Instructions for Completing Submarine Battery Quarterly Reports - NAVSEA 9320/3
- G Instructions for Maintaining the Submarine Battery Record Book - NAVSEA 9320/1 (3-92)

21.1 PURPOSE. To emphasize the necessity for proper operation and maintenance of flooded submarine main storage batteries and to provide instructions for:

- a. Operation of submarine main storage batteries.
- b. Completing Submarine Quarterly Battery Reports (QBR).
- c. Maintaining the Submarine Battery Record Book – Naval Sea Systems Command (NAVSEA) 9320/1 (3-92).

21.1.1 Background. Records of prior submarine batteries indicate that with proper operation and maintenance, the batteries will provide relatively trouble free service throughout their expected life. The primary factors in obtaining reliable performance are:

- a. Strict compliance with maintenance and charging instructions.
- b. Accomplishment of periodic meter checks ensuring the accurate indication of parameters monitored.
- c. Proper operation and maintenance of electrolyte agitation systems.
- d. Proper operation of battery ventilation systems.
- e. Strict adherence to the trickle discharge routine.

21.1.2 Discussion. This chapter does not apply to Valve Regulated Lead-Acid batteries. Although there are a wide variety of problems that can develop in batteries, previous experience has shown that there are specific causes of problems that can be eliminated.

- a. Improper electrolyte agitation is the most frequent cause of problems with flooded submarine batteries. Airlift pump failure can cause stratification, sulfation, internal shorts, low gravities and low Individual Cell Voltages (ICV). The end result is failed

cells and decreased capacity. Improper maintenance of the agitation system can cause problems to exist for up to six months before becoming evident as capacity reductions below 90% during a test discharge.

- b. Improper maintenance of the battery will shorten its service life and result in an unscheduled battery replacement or inability of the ship to perform its mission until the battery is replaced. For example, inaccurate voltmeters and ammeters can cause the battery to be overcharged or undercharged. Allowing this condition to go uncorrected can result in permanent damage to the cell plates with a subsequent decrease in service life.
- c. Operating the main storage battery and support systems **following** established procedures is essential. The consequences of improper operation can range from a reduction in battery life with subsequent rescheduling of ship operations to a major ship's casualty.

21.2 ACTION.

- a. All submarines with flooded lead acid cells installed **must** comply with the procedures in this chapter for the operation, maintenance and inspection of main storage batteries.
- b. Since the main storage battery can be operated safely and efficiently by using references (a) and (b) directly, individual ship main storage battery operating procedures, which may require changes because of changes to source documents, are not required except as specified in this chapter. Where conflicts exist, reference (a) takes precedence over reference (b).
- c. Naval Surface Warfare Center Crane, through the battery manufacturer and with Type Commander (TYCOM) approval, will conduct on-site battery inspections between 9 and 15 months since the last submarine inspection and in situations warranting closer scrutiny. An inspection report will be prepared by the manufacturer and forwarded to the parent Immediate Superior In Command (ISIC) by Naval Surface Warfare Center Crane, copy to the ship. The ISIC will endorse the report and forward to the ship for retention and completion of any recommended corrective actions. Ships will report to TYCOM N4 via ISIC the root causes for and the satisfactory completion of all corrective actions for deficiencies noted in the inspection report within 30 days of receipt of the report.
- d. ISIC **must** ensure that attached units operate and maintain installed main storage batteries **following** established procedures. When deemed appropriate, **issue** lessons learned concerning battery operation and maintenance among units and provide feedback to the TYCOM.
- e. Submarine Commanding Officers **must** implement the provisions of this instruction as **indicated**:
 - (1) Maintain a hard copy of references (a) and (b) in the Maneuvering Area (or normal controlling station for battery charges).
 - (2) SSN 688, SSN 21, SSBN **and** SSGN 726, SSN 774 and later Class submarines **must** operate the main storage battery and support system **following** the Ship's

Systems Manual. These submarines may insert copies of Appendices A through C of this chapter in the Battery Technical Manual if desired.

- (3) Require Battery Charging Electrician (BCE) and Battery Charging Electrician Forward (BCEF) qualifications to include familiarity with this chapter.
- (4) Incorporate familiarity with reference (a), reference (b) and this chapter as part of the formal qualification procedures for Officer of the Deck, Duty Officer, Chief of the Watch, Inport Duty Chief, Engineering Officer of the Watch, Engineering Duty Officer, Engineering Watch Supervisor and Engineering Duty Petty Officer.
- (5) Perform battery planned maintenance as specified by Planned Maintenance System (PMS) and reference (a). Where conflicts exist, PMS takes precedence over reference (a).
- (6) Conduct battery charges at the frequency and in the manner specified in reference (a).
- (7) Operate and maintain battery ventilation including minimum airflow requirements, as specified in reference (b).
- (8) Maintain battery test discharge data using Appendix D of this chapter. A copy of Appendix D must be included with the Submarine QBR when a test discharge is conducted during a reporting quarter.
- (9) Maintain battery records per reference (a) and reference (b). The Battery Record Book (BRB) for SSBN and SSGNs is to be updated and certified by the Engineer Officer during each crew turnover.
- (10) Submit a Submarine QBR as specified in reference (b).
- (11) Pursue a battery well maintenance and cleaning program. With proper care and maintenance, a battery resistance to ground with the battery isolated (i.e., battery circuit breakers open) can easily be maintained greater than 500,000 ohms. DC bus grounds must be above 100,000 ohms to conduct a battery charge except in an emergency (see reference (b)).
- (12) Ensure that electric plant logs show a minimum specification of 50,000 ohms for AC and DC bus grounds and battery charging logs show a minimum specification of 100,000 ohms for DC bus grounds.
- (13) Upon battery replacement, prior to Fast Cruise at completion of a Depot Modernization Period, Engineered Refueling Overhaul or Engineered Overhaul and annually, use Appendix E of this chapter to evaluate the material condition of the battery and determine accuracy and completeness of battery records. Material deficiencies will be recorded in the Equipment Status Log for correction and the Job Sequence Number recorded in the margin of the inspection checklist next to the appropriate article. Record the completion date of the most recent Appendix E inspection and correction of deficiencies in the remarks section of the QBR. Only the most recent complete copy of Appendix E of this chapter need be retained with battery records.

- (14) Request technical assistance from higher authority via ISIC or TYCOM for correction of abnormal conditions not within Ship's Force capability.

21.3 CASUALTY REPORTING.

21.3.1 Purpose. To provide guidance for Casualty Reporting (CASREP) requirements for the submarine main storage battery. CASREPs are in addition to, and do not replace the reporting requirements of other documents (e.g., Naval Reactors Technical Bulletins, Operational Orders, Mishap Reports, etc.).

21.3.2 Background. The significance of a submarine's emergency and backup power supplies cannot be overstated. CASREP requirements of Out of Commission power generating or storage equipment require additional clarification.

21.3.3 SSN and SSGN Class Submarine Main Storage Battery. Battery CASREPs **must** be submitted as:

- a. C-2 when battery capacity falls below 80 percent of rated capacity for SSN 688, SSN 21 and SSGN 726 Class. For SSN 774 Class, C-2 when battery capacity falls below 92%.
- b. C-3 when battery capacity falls below 65 percent of rated capacity for SSN 688, SSN 21 and SSGN 726 Class. For SSN 774 Class, C-3 when battery capacity falls below 87%.
- c. C-4 when battery capacity falls below 50 percent of rated capacity for SSN 688, SSN 21 and SSGN 726 Class. For SSN 774 Class, C-4 when battery capacity falls below 70%.

21.3.4 SSBN Class Submarine Main Storage Battery. Report low battery capacity casualties by message as allowed by operational constraints.

APPENDIX A

TEMPERATURE VERSUS TVG TABLE

N = Number of cells in battery circuit (not jumpered out).
 T_c = Average pilot cell temperature (°F) or average cell temperature (for batteries with an operating Automatic Battery Monitoring System) at the beginning of the charge operation.
 TVG = $(2.62 - (0.003 \times T_c))N$

T_c (°F)	N								
	126	125	124	123	122	121	120	119	118
50	311	309	306	304	301	299	296	294	291
51	311	308	306	303	301	299	296	294	291
52	310	308	306	303	301	298	296	293	291
53	310	308	305	303	300	298	295	293	290
54	310	307	305	302	300	297	295	293	290
55	309	307	304	302	300	297	295	292	290
56	309	307	304	302	299	297	294	292	289
57	309	306	304	301	299	296	294	291	289
58	308	306	303	301	298	296	294	291	289
59	308	305	303	300	298	296	293	291	288
60	307	305	303	300	298	295	293	290	288
61	307	305	302	300	297	295	292	290	288
62	307	304	302	299	297	295	292	290	287
63	306	304	301	299	297	294	292	289	287
64	306	304	301	299	296	294	291	289	287
65	306	303	301	298	296	293	291	289	286
66	305	303	300	298	295	293	291	288	286
67	305	302	300	298	295	293	290	288	285
68	304	302	300	297	295	292	290	288	285
69	304	302	299	297	294	292	290	287	285
70	304	301	299	296	294	292	289	287	284
71	303	301	298	296	294	291	289	286	284

T _c (°F)	N								
	126	125	124	123	122	121	120	119	118
72	303	301	298	296	293	291	288	286	284
73	303	300	298	295	293	291	288	286	283
74	302	300	297	295	293	290	288	285	283
75	302	299	297	295	292	290	287	285	283
76	301	299	297	294	292	289	287	285	282
77	301	299	296	294	291	289	287	284	282
78	301	298	296	293	291	289	286	284	282
79	300	298	295	293	291	288	286	284	281
80	300	298	295	293	290	288	286	283	281
81	300	297	295	292	290	288	285	283	280
82	299	297	294	292	290	287	285	283	280
83	299	296	294	292	289	287	285	282	280
84	298	296	294	291	289	287	284	282	279
85	298	296	293	291	289	286	284	281	279
86	298	295	293	291	288	286	283	281	279
87	297	295	293	290	288	285	283	281	278
88	297	295	292	290	287	285	283	280	278
89	296	294	292	289	287	285	282	280	278
90	296	294	291	289	287	284	282	280	277
91	296	293	291	289	286	284	282	279	277
92	295	293	291	288	286	284	281	279	277
93	295	293	290	288	286	283	281	279	276
94	295	292	290	288	285	283	281	278	276
95	294	292	290	287	285	283	280	278	276
96	294	292	289	287	285	282	280	278	275
97	293	291	289	286	284	282	279	277	275
98	293	291	288	286	284	281	279	277	274
99	293	290	288	286	283	281	279	276	274
100	292	290	288	285	283	281	278	276	274

APPENDIX B

TEMPERATURE VERSUS MCV TABLE

N = Number of cells in battery circuit (not jumpered out).
 T_c = Average pilot cell temperature (°F) or average cell temperature (for batteries with an operating Automatic Battery Monitoring System) at the beginning of the charge operation.
 $MCV = (2.86 - (0.003 \times T_c))N$

$T_c(^{\circ}F)$	N								
	126	125	124	123	122	121	120	119	118
50	341	339	336	333	331	328	325	322	320
51	341	338	336	333	330	328	325	322	319
52	341	338	335	333	330	327	324	322	319
53	340	338	335	332	330	327	324	321	319
54	340	337	335	332	329	326	324	321	318
55	340	337	334	331	329	326	323	321	318
56	339	337	334	331	328	326	323	320	318
57	339	336	333	331	328	325	323	320	317
58	338	336	333	330	328	325	322	320	317
59	338	335	333	330	327	325	322	319	317
60	338	335	332	330	327	324	322	319	316
61	337	335	332	329	327	324	321	319	316
62	337	334	332	329	326	324	321	318	316
63	337	334	331	329	326	323	321	318	315
64	336	334	331	328	325	323	320	317	315
65	336	333	330	328	325	322	320	317	314
66	335	333	330	327	325	322	319	317	314
67	335	332	330	327	324	322	319	316	314
68	335	332	329	327	324	321	319	316	313
69	334	332	329	326	324	321	318	316	313
70	334	331	329	326	323	321	318	315	313
71	334	331	328	326	323	320	318	315	312

T _c (°F)	N								
	126	125	124	123	122	121	120	119	118
72	333	331	328	325	323	320	317	315	312
73	333	330	327	325	322	320	317	314	312
74	332	330	327	324	322	319	317	314	311
75	332	329	327	324	321	319	316	314	311
76	332	329	326	324	321	318	316	313	311
77	331	329	326	323	321	318	315	313	310
78	331	328	326	323	320	318	315	312	310
79	330	328	325	323	320	317	315	312	310
80	330	328	325	322	320	317	314	312	309
81	330	327	325	322	319	317	314	311	309
82	329	327	324	322	319	316	314	311	308
83	329	326	324	321	319	316	313	311	308
84	329	326	323	321	318	316	313	310	308
85	328	326	323	320	318	315	313	310	307
86	328	325	323	320	317	315	312	310	307
87	327	325	322	320	317	314	312	309	307
88	327	325	322	319	317	314	312	309	306
89	327	324	322	319	316	314	311	309	306
90	326	324	321	319	316	313	311	308	306
91	326	323	321	318	316	313	310	308	305
92	326	323	320	318	315	313	310	307	305
93	325	323	320	317	315	312	310	307	305
94	325	322	320	317	315	312	309	307	304
95	324	322	319	317	314	312	309	306	304
96	324	322	319	316	314	311	309	306	303
97	324	321	319	316	313	311	308	306	303
98	323	321	318	316	313	310	308	305	303
99	323	320	318	315	313	310	308	305	302
100	323	320	317	315	312	310	307	305	302

APPENDIX C

TCV CALCULATION TABLE

- N = Number of cells in battery circuit (not jumpered out).
 T_c = Average pilot cell temperature (°F) or average cell temperature (for batteries with an operating Automatic Battery Monitoring System) at the end of the charge.
V = Switchboard voltage just prior to end of charge.
TCV = $(0.003(N)) \times (T_c - 80) + (V)$ (Add or subtract as indicated to switchboard voltage)

$T_c(^{\circ}\text{F})$	N								
	126	125	124	123	122	121	120	119	118
60	-7.6	-7.5	-7.4	-7.4	-7.3	-7.3	-7.2	-7.2	-7.1
61	-7.2	-7.1	-7.1	-7.0	-7.0	-6.9	-6.8	-6.8	-6.7
62	-6.8	-6.8	-6.7	-6.6	-6.6	-6.5	-6.5	-6.4	-6.4
63	-6.4	-6.4	-6.3	-6.3	-6.2	-6.2	-6.1	-6.1	-6.0
64	-6.0	-6.0	-6.0	-5.9	-5.9	-5.8	-5.8	-5.7	-5.7
65	-5.7	-5.6	-5.5	-5.5	-5.5	-5.4	-5.4	-5.4	-5.3
66	-5.3	-5.3	-5.2	-5.2	-5.1	-5.1	-5.0	-5.0	-5.0
67	-4.9	-4.9	-4.8	-4.8	-4.8	-4.7	-4.7	-4.6	-4.6
68	-4.5	-4.5	-4.5	-4.4	-4.4	-4.4	-4.3	-4.3	-4.2
69	-4.2	-4.1	-4.1	-4.1	-4.0	-4.0	-4.0	-3.9	-3.9
70	-3.8	-3.8	-3.7	-3.7	-3.7	-3.6	-3.6	-3.6	-3.5
71	-3.4	-3.4	-3.3	-3.3	-3.3	-3.3	-3.2	-3.2	-3.2
72	-3.0	-3.0	-3.0	-3.0	-2.9	-2.9	-2.9	-2.9	-2.8
73	-2.6	-2.6	-2.6	-2.6	-2.6	-2.5	-2.5	-2.5	-2.5
74	-2.3	-2.3	-2.2	-2.2	-2.2	-2.2	-2.2	-2.1	-2.1
75	-1.9	-1.9	-1.9	-1.8	-1.8	-1.8	-1.8	-1.8	-1.8
76	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.4	-1.4	-1.4
77	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1
78	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
79	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
82	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7

T _c (°F)	N								
	126	125	124	123	122	121	120	119	118
83	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
84	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4
85	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8
86	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.1	2.1
87	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5
88	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9
89	3.4	3.4	3.3	3.3	3.3	3.3	3.2	3.2	3.2
90	3.8	3.8	3.7	3.7	3.7	3.6	3.6	3.6	3.5
91	4.2	4.1	4.1	4.1	4.0	4.0	4.0	3.9	3.9
92	4.5	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.2
93	4.9	4.9	4.8	4.8	4.8	4.7	4.7	4.6	4.6
94	5.3	5.3	5.2	5.2	5.1	5.1	5.0	5.0	5.0
95	5.7	5.6	5.6	5.5	5.5	5.4	5.4	5.4	5.3
96	6.0	6.0	6.0	5.9	5.9	5.8	5.8	5.7	5.7
97	6.4	6.4	6.3	6.3	6.2	6.2	6.1	6.1	6.0
98	6.8	6.8	6.7	6.6	6.6	6.5	6.5	6.4	6.4
99	7.2	7.1	7.1	7.0	7.0	6.9	6.8	6.8	6.7
100	7.6	7.5	7.4	7.4	7.3	7.3	7.2	7.1	7.1
101	7.9	7.9	7.8	7.7	7.7	7.6	7.6	7.5	7.4
102	8.3	8.3	8.2	8.1	8.1	8.0	7.9	7.9	7.8
103	8.7	8.6	8.6	8.5	8.4	8.3	8.3	8.2	8.1

APPENDIX D

CAPACITY TEST DISCHARGE DATA SHEET

USS _____ DATE: _____

	TEMP		SPECIFIC GRAVITY	
	BEFORE	and AFTER	BEFORE,	AFTER and PT DROP
PILOT CELL # _____	_____	/ _____	_____	/ _____ / _____
PILOT CELL # _____	_____	/ _____	_____	/ _____ / _____
AVERAGE _____	_____	/ _____	AVG PT DROP _____	

TIME (ACTUAL)	TIME DIFFERENCE (MINUTES)	BATTERY DISCHARGE RATE	CALCULATED AMP-HOURS DISCHARGED	TOTAL BATTERY VOLTAGE	AMPERE-HOUR METER READING
START					
FINISH					

NOTE (1) $\frac{\text{TIME DIFFERENCE (MINUTES)}}{\text{REQUIRED TIME (MINUTES CORRECTED)}} = () \times 100 = \text{ } = \text{ } \% \text{ CAPACITY}$

$\frac{\text{NOTE (2)}}{\text{(AMP-HRS/PT)}} = \text{ } \text{ THEORETICAL AMP-HRS}$

- (1) OBTAINED FROM DISCHARGE CHARACTERISTICS AND TEMPERATURE CORRECTION TABLE.
- (2) BASED ON ACTUAL LABORATORY TESTS USING 3 HOUR DISCHARGE RATE.

BATTERY TYPE	DISCHARGE RATE	AMP-HR/PT
MOD E (ASB-49)	2400	49
SEAWOLF (LLL-69)	2600	54
TRIDENT (PDX-57)	3450	91

NOTE: COMPARISON OF TOTAL AMP-HR VALUES (METER, CALCULATED AND THEORETICAL) WILL GIVE INDICATION OF CALCULATION ERRORS OR INACCURACIES/NEED FOR CALIBRATION OF BATTERY AMP-METER. (>10% BETWEEN METER AND CALCULATED OR >20% BETWEEN METER OR CALCULATED AND THEORETICAL INDICATES INACCURACIES OR ERRORS.) USE THE LOWEST VALUE (METER, CALCULATED OR THEORETICAL) TO DETERMINE THE 10% AND 20% VALUES.

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NOTE: PILOT CELL AVG TEMPERATURES AND ACTUAL AND REQUIRED TIMES SHOULD BE ROUNDED TO THE NEAREST WHOLE NUMBER AND THE ROUNDED VALUES USED FOR ALL CALCULATIONS.

APPENDIX E**MAIN STORAGE BATTERY INSPECTION CHECK-OFF**

Battery Inspection of USS _____ Date _____

NOTE: UPON BATTERY REPLACEMENT, PRIOR TO FAST CRUISE AT COMPLETION OF A DEPOT MODERNIZATION PERIOD, ENGINEERED REFUELING OVERHAUL OR ENGINEERED OVERHAUL AND ANNUALLY, USE THE MAIN STORAGE BATTERY INSPECTION CHECK-OFF TO EVALUATE THE MATERIAL CONDITION OF THE BATTERY AND DETERMINE ACCURACY AND COMPLETENESS OF BATTERY RECORDS. MATERIAL DEFICIENCIES WILL BE RECORDED IN THE EQUIPMENT STATUS LOG FOR CORRECTION AND THE JOB SEQUENCE NUMBER RECORDED IN THE MARGIN OF THE INSPECTION CHECKLIST NEXT TO THE APPROPRIATE ARTICLE. RECORD THE COMPLETION DATE OF THE MOST RECENT APPENDIX E INSPECTION AND CORRECTION OF DEFICIENCIES IN THE REMARKS SECTION OF THE QUARTERLY BATTERY REPORT. ONLY THE MOST RECENT COMPLETE COPY OF THE INSPECTION NEED BE RETAINED WITH BATTERY RECORDS.

NOTE: IF ANY CONFLICT EXISTS BETWEEN THIS CHECK-OFF AND THE REFERENCE DOCUMENTS, THE REFERENCE DOCUMENTS TAKE PRECEDENCE.

1. Battery Records and Documentation:

a. Cycles	_____
b. Age in months	_____
c. Date battery installed	_____
d. Date of last capacity test discharge	_____
e. Capacity of battery at last test discharge	_____
f. List cell which reached minimum final cell voltage during test discharge	_____
g. Next four lowest cells at the end of test discharge Cell/Voltage	Cell Voltage

h. Battery ground reading, (battery circuit breakers open)	_____
i. Total battery voltage at the end of test discharge	_____
j. Pilot cells are numbers _____ and _____.	
k. List cells jumpered out _____, _____, _____, _____, _____, _____.	

	Yes	No
2. Does the ship use standard submarine battery log (NAVSEA 9320/6 (4-90), National Stock Number 0116-LF-010-4100)?	_____	_____
3. Does a review of the completed battery logs indicate the following:		
a. Does the first set of battery charge log readings indicate that the initial charging rate (amps) did not exceed the total number of ampere-hours discharged prior to the charge? _____		
b. Subsequent log readings indicate:		
(1) When maximum charging rate was obtained? _____	_____	_____
(2) When TVG was reached? _____	_____	_____
NOTE: BOTH SECTIONS (1) AND (2) OF THIS APPENDIX MAY BE WRITTEN AS ONE LOG READING IF TVG IS REACHED FIRST.		
c. Charge and discharge data completed correctly?	_____	_____
d. Specific Gravity (SG) data completed correctly?	_____	_____
e. Is data recorded per reference (b)?	_____	_____
f. Did the Engineering Officer of the Watch or Engineering Duty Officer review and initial the battery charging log approximately hourly during the battery charge?	_____	_____
g. Is there an effective system utilized to ensure that logs are reviewed and data entered in the BRB promptly?	_____	_____
4. Does the BCE comply with reference (a) and reference (b)? (e.g., take ground readings at fifteen minute intervals during charge)	_____	_____
5. Does a review of completed Individual Cell Record Sheets indicate the following:		
a. ICV and SG section completed correctly?	_____	_____
b. SG averages computed?	_____	_____
c. Log reviewed and signed?	_____	_____
6. At the completion of equalizing charges and prior to SG readings, does the ship check the hydrometers in use against reference hydrometers and record these readings to ensure accurate hydrometer readings? (N/A for digital thermometers)	_____	_____
7. Does the ship use and forward QBR NAVSEA 9320/3?	_____	_____
a. Is the QBR being maintained per Appendix F of this chapter?	_____	_____
b. Is Appendix D of this chapter being sent with QBR as appropriate?	_____	_____
c. Are the battery manufacturer's inspection recommendations reported as complete and status of non-completed recommendations addressed?	_____	_____
d. Is the date of completion for the last Appendix E inspection being reported on each QBR?	_____	_____

	Yes	No
8. Does the ship have an effective system to ensure that different cells are checked for agitation before each battery charge?	_____	_____
9. Does the ship have a set of calibration curves for the venturi airflow meter showing pressure (inches of water) versus airflow (Cubic Feet per Minute)?	_____	_____
10. Capacity Test Discharges:		
a. Was a two-ohm resistance check completed? (If applicable) (Applicable to SSGN 726, 727, 728 and SSBN 730 only until TZ-0253 Rev 0 Battery Digital Voltmeter EN DE44753 Rev D is complete.)	_____	_____
b. Are ICVs being plotted at 30-minute intervals?	_____	_____
c. When any cell drops to 1.75 volts are the ICVs being taken and plotted continuously?	_____	_____
11. Are the ship's charging instructions available in Maneuvering to the BCE?	_____	_____
a. Are they per reference (b)?	_____	_____
12. Are BRB entries following the instructions contained in Appendix G of this chapter?	_____	_____
a. Are BRB entries neat, legible and correct?	_____	_____
b. Does the Engineer Officer review and sign the BRB at monthly intervals and at each crew turnover for SSBN and SSGNs?	_____	_____
c. Are there monthly and grand totals at the end of each month's charges?	_____	_____
d. Are battery electrolyte sample results being recorded?	_____	_____
e. Is discharge data being recorded properly?	_____	_____
13. Has corrective action been taken in any case where the battery capacity has dropped 10% or below 90%?	_____	_____
14. PMS:		
a. Could a BCEF or BCE demonstrate the ability to properly check battery air agitation?	_____	_____
b. Could a BCEF or BCE properly inspect the air agitation system?	_____	_____
c. Does the ship complete the proper agitation filter Maintenance Requirement Cards?	_____	_____
d. Is the two-ohm resistance check done within 24 hours prior to each equalizer? (If applicable) (Applicable to SSGN 726, 727, 728 and SSBN 730 only until TZ-0253 Rev 0 Battery Digital Voltmeter EN DE44753 Rev D is complete.)	_____	_____
e. Are all cells with ICV readings of 0.10 volts below battery average checked for loose, dirty or corroded connections and completion recorded on ICV Sheet?	_____	_____
f. Have the following been calibrated:		

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	Yes	No
(1) Ammeters:		
(a) Emergency propulsion motor ammeters?	_____	_____
(b) Main storage battery ammeters?	_____	_____
(c) Main storage battery ampere-hour meter?	_____	_____
(d) Ship's Service Motor Generator DC ammeters?	_____	_____
(2) Voltmeters:		
(a) Emergency propulsion motor voltmeters?	_____	_____
(b) Main storage battery voltmeters?	_____	_____
(c) Main storage battery individual cell voltmeter?	_____	_____
g. Have the following had calibration checks performed:		
(1) Hydrometers?	_____	_____
(2) Thermometers?	_____	_____
(3) Battery Airflow Meter?	_____	_____
(4) Hydrogen detector?	_____	_____
(a) Is the proper equipment onboard for completion of this calibration?	_____	_____
(b) Do both meters read within 1/2% H ₂ of each other?	_____	_____
NOTE: METER ACCURACY IS +1/4%. IF INDIVIDUAL METERS INDICATE BELOW A READING OF -1/4%, H₂ CIRCUIT INACCURACY SHOULD BE SUSPECTED.		
h. Are the flash arrestors cleaned and checked following PMS?	_____	_____
i. Were failed flash arrestors replaced or treated for water repellency by Ship's Force or Fleet Maintenance Activity?	_____	_____
j. Is the battery cleaned and inspected at specified periodicity?	_____	_____
k. When the isolated battery ground decreases to 50,000 ohms, does the ship pursue the cleaning and correction of battery grounds?	_____	_____
l. Was inspection of individual cell voltmeter and intercell connection completed?	_____	_____
m. Was torquing of intercell connectors completed?	_____	_____
15. Battery Well and Material Items:		
a. During the last two equalizing charges, did all of the cells have a SG within 0.010 points of the average SG?	_____	_____
(1) If no, list cells and gravities.		

Date	Chg #	Cell	SG	Cell	SG	Date		Chg #	Cell	SG	Cell	SG

		Yes	No
(2)	Were these cells inspected for proper agitation, SG verified and the results recorded on back of the individual cell record sheet per reference (a)?	_____	_____
b.	Does the location of the pilot cells meet the criteria defined in reference (b)?	_____	_____
c.	Does the ship have a "Charge in Progress" sign to install over the battery hatch during battery charges?	_____	_____
d.	During inspection of the battery well was it free of any loose or unauthorized gear?	_____	_____
(1)	Is the battery well hatch free, latch works and gasket not deteriorated?	_____	_____
(2)	Are the cell tops cleaned?	_____	_____
(3)	Are the flash arrestors free of electrolyte?	_____	_____
(4)	Are jumpered cells properly jumpered out?	_____	_____
(5)	Is agitation being maintained for isolated cells?	_____	_____
(6)	Is electrolyte level being maintained for isolated cells? (N/A for cells due to grounds)	_____	_____
(7)	Are jumpered cell terminals painted red?	_____	_____
(8)	Spot-check several cells throughout the battery well. Is electrolyte height and air agitation proper?	_____	_____
(9)	Are the battery deck flats properly secured? (Note missing or damaged fastener hardware)	_____	_____
(10)	Is the battery well deck and area between cells clean, dry and free of foreign material?	_____	_____
(11)	Are meter leads on the shunt tight?	_____	_____
e.	Are the air hoses and fittings in the air agitation system free of deterioration and cracks?	_____	_____
f.	Is the lighting sufficient?	_____	_____
g.	Are the support bracket nuts either self-locking, lockwired or lock cabled? (Trolley, disconnect links, etc.)	_____	_____

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		Yes	No
h.	Are the ICV leads properly bundled and securely fastened in standoffs to prevent sagging or rubbing?	_____	_____
i.	Do ICV conductors have the proper clearance from bussing?	_____	_____
j.	Are ICV fuses of the proper type and are ICV connections tight?	_____	_____
k.	Are the plastisol covers on connections and bussing free of cuts and in good condition?	_____	_____
l.	Are ventilation ducts and filters clean:		
	(1) Battery Inlet Filter?	_____	_____
	(2) Battery Inlet Plenum?	_____	_____
	(3) Battery Outlet Plenum?	_____	_____
m.	Does the ship have rubber matting available for working in the battery well?	_____	_____
n.	Are battery water hose ends and battery water guns capped or covered when not in use to prevent entry of foreign matter?	_____	_____
o.	Is the battery watering hose tagged for "Battery Watering Only"?	_____	_____
p.	How many hydrometers are onboard? (See reference (b) table 223-3 for allowance requirements)		
	Number Range		
	(1) Low Range _____ (_____ SG to _____ SG)		
	(2) Mid-Range _____ (_____ SG to _____ SG)		
	(3) High Range _____ (_____ SG to _____ SG)		
	(4) Digital _____		
q.	Are the reference hydrometers labeled as such and segregated from the remaining hydrometers?	_____	_____
r.	Are the in use hydrometers cleaned after use?	_____	_____
s.	Does the ship have a current copy of Allowance Equipage List - 1-911393001?	_____	_____
t.	Does the ship have the required operating space items per Allowance Parts List 090660045 (ASB-49), T090660036 (PDX-57), or 090660046 (LLL-69)?	_____	_____
u.	Does the ship have the required number of jumper cable assemblies available for use onboard?		
	(1) 60-inch cables (four) [72-inch cables on SSBN and SSGN-726 Class]	_____	_____
	(2) 30-inch cables (eight) [36-inch cables on SSBN and SSGN-726 Class]	_____	_____
	(3) 36-inch cable assemblies (six) on SSN-21 Class	_____	_____

		Yes	No
	(4) 72-inch cable assemblies (three) on SSN-21 Class	_____	_____
	(5) Eighteen LLX terminal plates on SSN-21 Class ships	_____	_____
	(6) LLX hardware jumper assemblies on SSN-21 Class ships	_____	_____
	(7) Are these assemblies complete?	_____	_____
	(8) Are these assemblies stowed in a dry place?	_____	_____
	(9) Are these assemblies cleaned following applicable PMS?	_____	_____
v.	Are the leads for cell and battery testing in the ICV panel tight?	_____	_____
w.	Do they fit properly into the female connectors?	_____	_____
x.	Are eyewash facilities, with a minimum 2-quart capacity, available near the battery well hatch?	_____	_____
y.	Does the ship have the torque wrenches (two) required for intercell torquing?	_____	_____
	(1) Are they calibrated?	_____	_____
	(2) Are the sockets six point?	_____	_____
z.	Are the battery well heaters:		
	(1) Turned on when injection temperature is less than 55°F?	_____	_____
	(2) Turned off whenever the battery well hatch is open?	_____	_____

Results and Recommendations:

Submitted: _____
Inspector Officer

Title_____

Noted: _____
Commanding Officer

Date_____

APPENDIX F**INSTRUCTIONS FOR COMPLETING SUBMARINE BATTERY
QUARTERLY REPORTS - NAVSEA 9320/3**

1. General. Accurate battery reports are an absolute requirement. These reports enable reviewing activities to recognize a specific problem or to change the scheduled battery replacement date based on the history and performance of a particular battery installation. These reports provide vital information for assessing submarine readiness, predicting future funding requirements and scheduling battery renewals. The NAVSEA form 9320/3 is designed to facilitate the automatic data processing of specific information reported. Therefore, all blocks must be completed correctly.
2. Frequency. This section is applicable to all submarines with installed storage batteries, including those in pre-commissioning status.

- a. Submarine QBRs **must** be submitted each calendar quarter that a battery is installed in the ship. The report **must** be submitted within five working days of the quarter just ending, operations permitting.
- b. When a battery is being replaced, submit a “final” report on the date the battery is removed. Submit a “first” report on the date a new battery is installed. If no battery is installed on the end of a reporting quarter (such as during overhaul) no report is required. First reports **must** contain the date of initial filling, the date of installation and data on the installing activity acceptance test discharge. Ampere-hours and cycles of charge from the initial charge and developing cycle **must** not be included as part of the total ampere-hours and cycles.
- c. A “special” report **must** be submitted whenever the battery capacity falls below 90%, whenever battery capacity decreases more than 10 percentage points from the previous capacity test discharge or anytime unusual or unexplained changes occur.

3. Distribution.

- a. Original to Naval Surface Warfare Center Crane (Code 6095).
- b. One copy to the applicable TYCOM. (Commander Submarine Force Atlantic Code N43213 **or** Commander Submarine Force Pacific Code 43213.)
- c. One copy to the ISIC.
- d. One copy to the GNB Industrial Power.
- e. One copy for ship’s file.

4. Instructions. (See Sample Report.)

- a. Submarine QBRs will be submitted on form NAVSEA 9320/3 (provided by TYCOM) as a word document.
- b. Title Section. Insert ship’s name and hull number on FROM line. Fill in the date of submission (must be 1 January, 1 April, 1 July, or 1 October, except Special Reports), and the date of installation (the battery completely bussed and fully ready for service).

Place an “X” in the appropriate box to indicate individual meters and detectors are currently in calibration.

Block #(s)	Required Format	Remarks
1-5	Five digits, no blanks.	Unit Identification Code (UIC).
6-11	Letters and numbers. Do not use hyphens. Block 11 may be blank.	Battery type (ASB-49, PDX-57, LLL-69).
12-13	Two digits, no blanks.	Battery age in months to the nearest whole month computed from the date of initial filling (02, 05, 32, 55, etc.).
14	One digit.	Fiscal Quarter (either 1, 2, 3, or 4) (Note: Oct, Nov, Dec is Fiscal Quarter 1).
15-16	Two digits.	Fiscal Year (01, 02, etc.).
17	Either X or blank.	Mark with an X if this is the first report after a new battery installation. Otherwise, leave blank.
18	Either X or blank.	Mark with an X if battery has been removed or inactivated. Otherwise, leave blank.
19-20	Two digits, no blanks.	Months (to nearest whole month) on open circuit since initial filling. Months on open circuit is defined as any calendar month in which an onboard charge is not conducted and the battery is only used intermittently for supplemental power or not used at all.

- c. Battery Upkeep (Section A). Fill in data as indicated for battery charges, cycles and watering. Amount of water **must** be to the nearest gallon. Ampere-hours **must** be to the nearest ampere-hour. Under “Amp-Hours Charged (A-H Meter)” and “Amp-Hours Discharged (A-H Meter)” columns, “Last Report” and “Total” entries are not required (see Sample Report).

Block #(s)	Required Format	Remarks
21-24	Four digit, no blanks	Total cycles to the nearest tenth of a cycle since initial charge (127.8, 002.1, etc.). Freshening charges are included but ampere-hours charged during the initial charge and developing cycle are not to be included in computing cycles. Amp-Hrs Charged <u>(Calculated)</u> = # of cycles X (see note)

NOTE: FOR ASB-49 X=6500; LLL-69 X=7000; PDX-57 X=10,000.

25-27	Three digits, no blanks.	Total number of normal charges completed (000, 016, 238, etc.).
28-30	Three digits, no blanks.	Total number of equalizing charges completed (000, 083, 192, etc.).
31-33	Three digits, no blanks.	Total number of partial charges (000, 008, etc.).

- d. Data at End of Equalizing Charge (Section B). Enter data for equalizing charges only. Battery volts and ICVs are to be corrected to 80°F. To obtain corrected average SG, correct each cell for its temperature and compute the average of corrected specific gravities.

Block #(s)	Required Format	Remarks
34-37	Four digits or leave blank.	Total corrected battery voltage to the nearest tenth of a volt (339.0, 344.2, etc.). ICV readings are rounded off to two significant digits (2.72, 2.51 etc.).
42-45		
50-53		
58-61		

- e. Battery Capacity Tests (Section C). If no test discharge was conducted during the reporting quarter, enter data from previous test discharge. A completed copy of Appendix D of this chapter will be included with this report when a test discharge was conducted during the reporting quarter.

Block #(s)	Required Format	Remarks
66-71	Six digits or the letters "INYARD"	Month, day and year of the capacity test discharge (02/25/01, 11/03/02, etc.). For ships that are in CNO Maintenance Availabilities for more than six months, put the words "INYARD" in Blocks 66-71 and report the date and information of the last capacity test discharge on the line below Blocks 66-71.
72-75	Four digits, no blanks.	Percent capacity to the nearest tenth (088.5, 101.2, etc.).

- f. Other Data and Signature Lines (Section D). Use this section to include remarks such as (attach additional sheets if required to keep the information legible):
- (1) Date of the most recent Appendix E Main Storage Battery Inspection Check-Off.
 - (2) Cells noted during PMS, inspection or battery charging lineups that had insufficient air agitation.
 - (3) Cell or cells jumpered this quarter and reason.

- (4) Any other information that would affect the service life or performance of the battery.
- (5) Report completion of manufacturer's battery inspection recommendations and plan for completion of any recommendations not yet accomplished.
- (6) Meter calibration problems, battery open circuited and other pertinent information.
- (7) Results of electrolyte analysis performed as a result of battery manufacturer's recommendation.

16 Oct 2019

SAMPLE REPORT

SUBMARINE BATTERY QUARTERLY REPORT																		NAVSEA PRT 9320-1																											
NAVSEA 9320/3 (REV 1-78) 0116-LF-093-2016																																													
From:										DATE OF SUBMISSION				QUARTERLY CHECK (Check One)				YES		NO																									
Commanding Officer, USS (Ship's Name and Hull No.)										05 Oct 95				PROP. MTR. & GEN. AMMETERS				☒		☐																									
To: Commander, Code 6095 Bldg. 3287 NAVSURFWARCENDIV 300 Highway 361 Crane, IN 47522-5001										DATE OF INITIAL FILING				BATTERY AMMETERS				☒		☐																									
										09 Dec 93				BATTERY A-H METERS				☒		☐																									
										DATE OF INSTALLATION				PROP. MTR. & GEN. VOLTMETERS				☒		☐																									
Requiring Document: Naval Ships Technical Manual Chapter 223, Vol. 1										12 Feb 94				BATTERY VOLTMETERS				☒		☐																									
										DATE OF ELECTROLYTE ANALYSIS (SEMI-ANNUAL)				BATTERY AIRFLOW METERS				☒		☐																									
										15 Apr 95				HYDROMETERS				☒		☐																									
								HYDROGEN DETECTORS				☒		☐																															
0		5		5		5		T		L		X		3		9		8		2		2		4		9		5		17		18		19		0		4							
1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20							
UIC				BATTERY TYPE										AGE (MONTHS)		FY RPT QTR		FISCAL YEAR		FIRST RPT		FINAL RPT		MONTHS ON OPEN CIRCUIT																					
A- BATTERY UPKEEP																																													
		WATER USED (GALLONS)		AMP HOURS CHARGED (CALCULATED)		CYCLES (1)		NUMBER OF CHARGES														AMP HOURS CHARGED (A-H METER)		AMP HOURS DISCHARGED (A-H METER)																					
								NORMAL				EQUALIZING				PARTIAL																													
LAST REPORT		265		141989		028.4		080				018				005				NA		NA																							
FIRST MONTH		70		8773		001.8		005				001				000				8882		8067																							
SECOND MONTH		62		13959		002.8		007				001				001				14121		14690																							
THIRD MONTH		53		17808		003.6		010				001				000				16		17317																							
TOTAL		450		182529		0 3 6 6 1 21 22 23 24 25 26 27 28 29 30 31 32 33														NA		NA																							
(2) B-DATA AT END OF EQUALIZING CHARGE																																													
DATE			BATTERY VOLTS CORRECTED TO 80°F (3)			CORRECTED SP. GR. (AVERAGE) (4)			CELLS 10 POINTS BELOW OR ABOVE AVERAGE SP. GR (CONTINUE IN REMARKS SECTION)														FOUR LOWEST CORRECTED INDIVIDUAL CELL VOLTAGE (5)																						
MO. DA. YR.									CELL				NONE				NONE				CELL				81				74				77				75								
07 23 95			34 35 36 37			1.274			SP. GR.												VOLTS				2.72				2.72				2.72				2.73								
08 25 95			3 4 3 3 42 43 44 45			1.280			CELL				104				NONE				NONE				CELL				81				104				47				101				
09 28 95			3 4 2 1 50 51 52 53			1.280			SP. GR.				1.270								VOLTS				2.69				2.71				2.72				2.72								
			3 4 2 1 50 51 52 53						CELL				NONE				NONE				CELL				81				41				104				58								
			58 59 60 61						SP. GR.												VOLTS				2.69				2.70				2.71				2.71								
DATE			BATTERY DISCHARGE RATE (6) (AMPERES)			ACTUAL TIME (MIN) (7)			AGE IN CYCLES (6)			AVG. PILOT CELL TEMP AT START AND END			RATED TIME (MIN) (9)			ACTUAL CAPACITY (PERCENT) (10)			NO. OF CELLS JUMPERED			FINAL VOLTS																					
MO. DA. YR.												CELL NO.															TOTAL			THREE LOWEST CELLS															
0 6 1 2 9 5												START			END															CELL			91				102				47				
8 6 8 6 7 7												78			96			179			72 73 74 75			0			212			VOLTS				1.51				1.53				1.63			
8 7 8 9 0 1																														CELL															
																														VOLTS															
D-OTHER DATA AND SIGNATURE LINES																																													
REMARKS: (11)																																													
COPY TO:																		ENGINEERING OFFICER																											
FORCE COMMANDER (Self-Explanatory)																																													
COMSUBRON (Self-Explanatory)																																													
BATTERY MFGR (As appropriate)																		APPROVED BY																											
FILE																		COMMANDING OFFICER																											
(Numerals in parentheses refer to instructions on reverse side)																																													

APPENDIX G**INSTRUCTIONS FOR MAINTAINING THE SUBMARINE
BATTERY RECORD BOOK
NAVSEA 9320/1 (3-92)**

1. GENERAL. Accurate battery records are an absolute requirement. These records enable reviewing activities to identify problem areas or to change the scheduled battery replacement based on the performance of a particular battery installation. These records provide the data necessary to complete NAVSEA form 9320/3, Submarine Battery Quarterly Report. Therefore, proper maintenance of the BRB is essential.

2. INSTRUCTIONS.

- a. Remarks Section: This section should include information of a general nature. Information such as the following should be included: Date and manner of installation; lifting of a cell for examination and results thereof, electrolyte “spiking” to include reason for action, quantities involved, authority granted, etc.; initial pilot cells selected, as well as any change of pilot cells; any change, transfer or removal of cells; pertinent data concerning the isolation of cells; completion of battery manufacturers recommendations from battery inspection reports; other abnormal or unusual information that is pertinent to the battery. The following should not be included in the remarks section: waterings; two ohm load checks; PMS checks; water purity test results performed by Ship’s Force; battery well inspections or other information of a repetitive nature unless different or unusual conditions exist.
- b. Electrolyte Analysis Section:
 - (1) Laboratory - enter the name of the laboratory where the analysis was performed.
 - (2) Serial or file number of report - enter the number assigned to the report by the laboratory.
 - (3) Date - the date on which the sample was taken from the cell (vice the date the analysis was performed by the laboratory).
 - (4) Cells analyzed - enter the battery cell number from which the sample was drawn.
 - (5) Remarks - enter either satisfactory or unsatisfactory based on the analysis record. If unsatisfactory, enter the reference covering the action taken.

NOTE: THE “DATE” AND “CELLS ANALYZED” INFORMATION SHOULD BE ENTERED IMMEDIATELY AFTER THE SAMPLE IS DRAWN. ALL OTHER INFORMATION SHOULD BE ENTERED UPON RECEIPT OF THE LABORATORY REPORT.

- c. Equalizing Charge Data Section:
 - (1) Date - enter the date on which the equalizing charge was commenced. (This should match the date on the Submarine Battery Log (NAVSEA 9320/6)).

- (2) Charge number - enter the charge number for the equalizing charge being logged.
 - (3) Average SG - for all nuclear submarines, the average SG of the battery (all battery cells in the circuit) following the equalizing charge is recorded in Block 1. (This should never be the pilot cell averages, but an average of the entire battery.) Block 2 will only be used on diesel submarines.
 - (4) Cells - list all cells with a SG greater than or equal to ten points (0.010 SG) above or below the battery average SG. List the following: cell number, corrected SG of the cell, corrected ICV. If no cells are beyond the ten-point parameter, write "None".
- d. Summary of Test Discharges and Trial Runs:
- (1) Date - enter the date in which the test discharge was performed.
 - (2) Battery rate including average auxiliary load - capacity test discharges are conducted at the three-hour rate for all submarine battery types. The discharge rates for each battery type are:

Guppy 1, Mod E (ASB-49)	2400 amps (three hr rate)
TRIDENT (PDX-57)	3450 amps (three hr rate)
SEAWOLF (LLL-69)	2600 amps (three hr rate)
 - (3) Limiting voltage allowed - enter the total battery voltage limit and the ICV limit allowed for the discharge rate maintained (as noted in the Battery Rate block). These values are noted in reference (a) for each battery type and discharge rates.
 - (4) Temperature - enter the average pilot cell temperature at the start and at the finish of the test discharge cycle in the appropriate block. (Round to whole number).
 - (5) Required length of discharge corrected for temperature - enter the rated length of time (in minutes) to attain 100% capacity. This value must be corrected for temperature. Temperature corrections are accomplished utilizing the applicable Curve and Data table contained in reference (a). The average temperature of the pilot cells is used in the temperature correction. For example: If pilot cell temperatures are 83°F and 86°F, average temperature equals 84.5°F. This number is rounded to 85°F. Required length of discharge for the 3-hour rate would be 182.5 minutes. This number is rounded to 183 minutes.
 - (6) Discharge maintained - enter the actual time (in whole minutes). This will be the duration of the discharge to the limiting voltage (either total battery voltage, ICV or average ICV). Limiting voltages are listed on the appropriate Curve and Data table in reference (a).
 - (7) Total volts at end of discharge - enter the actual switchboard voltage (recorded at the EPCP) immediately prior to securing the test discharge.

- (8) Actual capacity - enter the actual capacity in percent. Capacity is always logged to the nearest tenth (i.e., 100.5%). Capacity is computed as:

$$\text{Percent capacity} = \frac{\text{Actual time (min)}}{\text{Rated time (min)}} \times 100$$
- (9) Ten lowest voltage cells at end of discharge - list ten individual cells with the lowest end of discharge voltage. Cells should be listed in ascending (lowest to highest) voltage order for trending purposes.
- (10) Remarks - enter any pertinent data, event or condition with regards to the test discharge. If comments are too extensive to fit in the space provided, write "See Remarks Section" and enter the data in the "Remarks" section of the BRB.

e. Condensed Summary of all Charges and Waterings:

NOTE: LIST PILOT CELLS IN AN ASCENDING ORDER, WITH THE LOWEST NUMBERED PILOT CELL LISTED FIRST.

NOTE: DATA SHOULD BE ENTERED INTO THE BATTERY RECORD BOOK AS SOON AS POSSIBLE UPON COMPLETION OF THE CHARGE OR DISCHARGE IN ORDER TO PREVENT THE LOSS OF DATA SHOULD THE BATTERY CHARGE OR DISCHARGE LOG BE LOST DURING THE REVIEW PROCESS. THIS INITIAL DATA ENTRY MAY BE DONE IN PENCIL TO PREVENT UNNECESSARY LINE OUTS UNTIL THE CHARGE REVIEW PROCESS IS COMPLETE.

- (1) Pilot Cell Numbers - enter, in the space provided at the top of each page, the current pilot cell numbers. If the pilot cell(s) are changed, draw a single line through the old pilot cell number(s) and write in the new pilot cell number(s). The change need only be made on the page in which the pilot cell(s) are changed.
- (2) Date - enter the date entered on the Submarine Battery Log (NAVSEA 9320/6). This should reflect the date in which the charge was begun.
- (3) Type of charge - enter the code that reflects the type of charge conducted. These codes apply:
 N = Normal charge
 E = Equalizing charge
 P = Partial charge
 EE = Extended or non-tapering charge
- (4) Charge number - enter the charge numbers in sequential order. Charge numbering begins with the first on board charge.
- (5) SG and temperature-pilot cells - the data to be entered in this section should match the data entered in the "Specific Gravity Data" block in the lower right hand corner of the Submarine Battery Log (NAVSEA 9320/6). As noted at the top of each page of this section, all SG entries must be the temperature corrected values (height corrections are not used for the current batteries).

Before change **and** after change number - enter the pilot cell number for the data to be entered in that column. As previously noted, enter the pilot cells in an ascending order, with the lowest numbered pilot cell listed first.

- (6) End of charge voltage - entries in this section are required to be temperature corrected. The data to be entered can be retrieved from the Submarine Battery Log (NAVSEA 9320/6).
 - (a) Pilot cells - enter the end of charge corrected ICV for both pilot cells. To facilitate entering both pilot cells, evenly split the column using a black pen. Extend the line into the "Pilot cells" header. Enter the pilot cell numbers above each newly created column (enter the numbers in the header area, beneath the words "Pilot cells"). (Pilot cell numbers should be entered in ascending order.) Individual cell temperature corrections can be accomplished by using the TCV formula. Enter a value of "1" for the "N" (number of cells) value.
 - (b) Total voltage corrected to 80°F - enter the TCV value. TCV is calculated using the formula in reference (a). (The last on charge battery voltage reading entered on the Submarine Battery Log (NAVSEA 9320/6) must be used in this calculation). This value need only be entered for equalizing and non-tapering equalizing charges. This value is contained in Block 4 of the Submarine Battery Log (NAVSEA 9320/6).
- (7) Minutes on charge after reaching TVG at finishing rate - enter the total time (in whole minutes) from the point at which the finishing rate is reached at TVG until the charge is completed. This value need only be entered for equalizing and non-tapering equalizing charges. This data is contained in Block 5 of the Submarine Battery Log (NAVSEA 9320/6).
- (8) Hours of charge to nearest tenth (this charge) - enter the total number of hours (to the nearest tenth) to complete the charge (time from the first on charge log readings, until the last on charge log reading). This data is contained in Block 6 of the Submarine Battery Log (NAVSEA 9320/6).
- (9) Amp-hours of charge per battery (this charge) - enter the calculated ampere hours of charge. (Calculate as indicated in reference (a)). This number should be rounded to the nearest whole number. This data is contained in Block 8 of the Submarine Battery Log (NAVSEA 9320/6).
- (10) Total cycles of charge to nearest 0.1 - enter the value for total cycles to the nearest tenth. This data is contained in Block 9 of the Submarine Battery Log (NAVSEA 9320/6). Use the following formula to derive these values:

$$\text{Cycles} = \frac{\text{Ampere-hours (calculated)}}{\text{Service cycle}}$$

A service cycle is defined as:

Guppy 1, Mod E (ASB-49) 6,500 ampere hours

16 Oct 2019

TRIDENT (PDX-57)	10,000 ampere hours
SEAWOLF (LLL-69)	7,000 ampere hours

- (11) Number of gallons of water used - enter the amount of water (in gallons) actually added to the cells. The amount used to flush out the watering hose and piping prior to sampling the filling water is not included in this figure. The value should be rounded to the nearest whole number. This data is contained in Block 13 of the Submarine Battery Log (NAVSEA 9320/6).
- (12) Percent charge back - enter the percentage of ampere hours charged back. The data is contained in Block 12 of the Submarine Battery Log (NAVSEA 9320/6). This value is calculated using the following formula:
- $$\text{Percent charge back} = \frac{\text{Ampere hour meter charged}}{\text{Ampere hour meter discharged}} \times 100$$
- (13) Ampere hours by meter - enter the values as read directly from the ampere hour meter. Discharged values are the ampere hours as read immediately prior to the start of charge. Charged values are the ampere hours from the beginning (following resetting (zeroing) the ampere hour meter) of the charge to the charge completion. The mode selector switch must be placed in the appropriate position (depending on ampere hour meter type used). The values for discharge and charge ampere hours are contained in Blocks 10 and 11 respectively of the Submarine Battery Log (NAVSEA 9320/6).
- (14) Totals - both monthly and grand totals must be calculated at the end of the calendar month. Quarterly totals need not be maintained, but may be calculated if desired. If quarterly totals are maintained, entries should coincide with the submission date of the QBR. The following values must be computed for monthly and grand totals (and quarterly, if maintained).
- Hours of charge to nearest tenth (this charge) - computed by adding the hours of charge values for each individual charge.
 - Ampere hours of charge per battery (this charge) - computed by adding the ampere hours of charge values per battery for each individual charge.
 - Total cycles for charge to nearest 0.1 - computed by dividing the appropriate (monthly, grand totals or quarterly) ampere hours of charge by the appropriate service cycle as listed [here](#):

$$\text{Cycles} = \frac{\text{Ampere-hours (calculated)}}{\text{Service cycle}}$$

A service cycle is defined as:

Guppy 1, Mod E (ASB-49)	6,500 ampere hours
TRIDENT (PDX-57)	10,000 ampere hours
SEAWOLF (LLL-69)	7,000 ampere hours

- (d) Number of gallons of water used - computed by adding the water addition values for each individual charge.
- (e) Ampere hours by meter - computed by adding the ampere hours of discharge **or** charge for each individual charge.

NOTE: ONLY MONTHLY TOTALS ARE REQUIRED FOR AMPERE HOURS BY METER. GRAND TOTALS NEED NOT BE MAINTAINED.

- (15) BRB audits **and** records reviews - between 9 and 15 months since last inspection, through a NAVSEA contract, a battery manufacturer's representative will conduct an on-site battery inspection. The BRB will be signed and dated following the representative's review. Where possible, the dated signature will be placed after the last month of the inspection period in the "Condensed Summary of All Charges and Waterings" section. Battery records should be made available for overnight off-ship review by the battery manufacturer's representative.
- f. Certification by Engineer Officer:
 - (1) This section certifies that the Engineer Officer has reviewed the battery records (including the BRB) for accuracy and legibility. The Engineer should review and sign the BRB on a monthly basis and at each crew turnover for SSBN **or** SSGNs.
 - (2) Period - from date - to date - enter the period **or** time frame of the records being reviewed.
 - (3) Signature - signature of the reviewing officer (Engineer Officer).
 - (4) Rank - rank of the reviewing officer (Engineer Officer).

VOLUME VI**CHAPTER 22****TRIDENT SYSTEM AND EQUIPMENT MAINTENANCE PLANS**REFERENCES.

- (a) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (b) SUBMEPP 9086-008-814 - TRIPER Information Notebook

LISTING OF APPENDICES.**A TRIPER Information Sheet**

22.1 PURPOSE. To provide information and guidance concerning TRIDENT submarine system and equipment maintenance plans and associated programs.

22.2 TRIDENT SYSTEM AND EQUIPMENT MAINTENANCE PLANS. Maintenance plans have been prepared for all maintenance worthy configuration items onboard SSBN and SSGN 726 Class Submarines. These maintenance plans are written to the system, equipment or component and list all of the planned maintenance required by a configuration item during its life cycle. These Maintenance Requirements are derived through the conduct of a maintenance engineering and a logistics support analysis process. Maintenance plans list the job description, periodicity, maintenance level (organization, intermediate, or industrial) and the applicable maintenance procedures. Unrestricted Operation (URO), TRIDENT Planned Equipment Replacement (TRIPER), Major Shore Spares (MSS), Submarine Maintenance Standards (SMS) and Performance Monitoring applications are included in maintenance plans as appropriate. Technical management of these plans is assigned to the Submarine Maintenance Engineering, Planning and Procurement Activity. A SSBN or SSGN 726 Class Submarine Maintenance Plan comprising all individual maintenance plans is issued periodically by NAVSEA. Per reference (a), the Type Commander will identify and prioritize corrective maintenance actions for SSBN and SSGN Class Submarine emergent repairs. Programs and requirements supporting the SSBN or SSGN 726 Class operating cycle are discussed in the following paragraphs.

22.2.1 TRIDENT Planned Equipment Replacement. The purpose of the TRIPER program is to accomplish an incremental overhaul of a submarine over several refit periods in the case of SSBNs and during Major Maintenance Periods (MMP) in the case of SSGNs.

- a. Shipboard equipment which requires significant maintenance during the planned operating cycle between overhauls, which is beyond the capability of Ship's Force, and which cannot be accomplished during the refit period or MMP (without unacceptable impact on other refit or MMP requirements), will be supported by this program. TRIPER equipment will be removed from the ship for refurbishment ashore, replaced with pre-tested, ready for issue units and the affected system restored to full operational condition prior to completion of the refit period or MMP. Replacement will be accomplished on a planned basis at intervals designed to preclude the failure of the equipment or significant degradation of its associated system. Deviations of greater or less than one refit or MMP from established TRIPER change-out periodicities **must** require Type Commander concurrence. A planned change to shelf

stock TRIPER equipment will be accomplished only when sufficient change kits are available to effect the change in all units of a given model of the equipment held in shelf stock. Shelf stock TRIPER equipment is represented in configuration status accounting databases maintained by Submarine Maintenance Engineering, Planning and Procurement Activity Hull, Mechanical, Electrical, Ordnance and Electronic and Naval Underwater Warfare Center Division Newport and transitions to the configuration database of the receiving ship upon installation.

- b. The Type Commander **must** manage emergent repairs requiring use of TRIPER assets. **Per** reference (a), the Type Commander will identify and prioritize corrective maintenance actions for SSBN **and** SSGN Class Submarine emergent repairs. Support of the Strategic Platform (SSBN) generally has the highest priority.

22.2.2 Deployed SSGN Unplanned TRIPER Change Out. An unplanned change out is not to be used as a substitute for accomplishing repairs. An unplanned change out is only to be accomplished if the deficient condition cannot be repaired or if the repair time required is unacceptable.

22.2.2.1 TRIPER Asset Segregation. TRIPER assets are segregated from normal supply process instructions and additional controls are in effect to manage these assets. Additional actions beyond normal supply procedures are required to obtain a TRIPER asset for corrective maintenance. Stakeholders in the maintenance process for SSGNs must understand the TRIPER process and how to quickly identify a TRIPER asset from normal stock numbered items to ensure timely release of material from the TRIPER Program. The supply system will cancel requisitions that have not been pre-alerted to the TRIPER Program Management.

22.2.2.2 TRIPER Information Notebook. Reference (b), available as a CD-ROM from SUBMEPP, provides identification, location, Comp ID, technical data, boundary drawings and configuration change records for all components in the TRIPER Program. All TRIPER assets have a TRIPER Tag with a unique TRIPER Serial Number (TSN) engraved on it. Location of the TRIPER Tag is shown on the component boundary drawing. TRIPER assets have a “4Y” COG national stock number. When requesting a “4Y” COG asset, Appendix A must be submitted by the Fleet Maintenance Activity (FMA) to the homeport SSGN Project Team. The homeport SSGN Project Team will interact with TRIPER Program Management to ship the requested asset to the needed location.

22.2.2.3 Responsibilities.

- a. SSGN: Identify the deficient component TSN via the Casualty Report message reporting system and submit work request to their Immediate Superior In Command.
- b. Immediate Superior In Command: Assign job to an FMA.
- c. FMA:
 - (1) Fill out Appendix A and forward to the homeport SSGN Project Team.
 - (2) Upon confirmation of receipt of delivery of Appendix A, the FMA will order the TRIPER asset via normal supply means.
 - (3) Receive shipped TRIPER asset, carefully uncrate and save the shipping container for use as a shipping container for the off-loaded asset carcass.

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- (4) Ship back the TRIPER carcass to an address provided by the SSGN Project Team in the same shipping container the received asset was shipped in.
- d. Naval Submarine Support Center: Induct a separate job from the actual maintenance action Job Sequence Number for the homeport SSGN Project Team to ship the TRIPER asset to and from job location. This will allow for closing of the maintenance action Job Control Number (JCN) for work certification and maintain a separate JCN for disposition of the shipped asset to and from the deployed maintenance site.
- e. SSGN Project Team:
 - (1) Use Appendix A, fill out the appropriate forms and deliver to the TRIPER Manager. Forms are: "REQUEST FOR UNSCHEDULED REPLACEMENT OF TRIPER ASSET" and "REQUEST FOR CANNIBALIZATION OF TRIPER PROGRAM ASSET". Appropriate forms can be found on the internet under Navy Forms on Line.
 - (2) Act as liaison between the FMA and the TRIPER Manager.
 - (3) Ship the TRIPER asset to desired location when released by the TRIPER Manager.
 - (4) Coordinate the return shipment of the TRIPER carcass to the TRIPER Manager.
 - (5) Close out Naval Submarine Support Center inducted job once the TRIPER Manager has received the carcass.
- f. TRIPER Manager:
 - (1) Evaluate request priorities of the requested asset from a total TRIPER Program support position. Approve the release of the requested asset.
 - (2) Ensure appropriate Pre-Installation Testing and material condition assessments are conducted prior to the release of the asset to the SSGN Project Team.
 - (3) Release asset to the SSGN Project Team for subsequent shipping to desired location.

22.2.3 Major Shore Spares. The purpose of the TRIDENT MSS Program is to maintain a supply of designated major equipment candidates in a certified, tested, ready-for-issue condition to effect replacement of equipment experiencing catastrophic failure, without jeopardizing refit completion. The employment of MSS assets **must** require Type Commander authorization. Typically, MSS equipment includes ship's propeller, Ship's Service Turbine Generators, towed arrays, towed buoys, Integrated Radio Room cabinets, etc. Like TRIPER, MSS equipment is managed by NAVSEA (PMS 392). Configuration tracking is under the cognizance of the applicable Participating Manager and is identified in the TRIDENT MSS Catalog published by NAVSEA (PMS 392). Equipment under the cognizance of the Strategic System Project Office and Naval Sea Systems Command Nuclear Propulsion Directorate (NAVSEA 08) is not included in the TRIPER or MSS programs.

22.2.4 Fleet Logistics Agent. The function of the fleet logistics agent for SSBN **and** SSGN 726 Class Submarines has been assigned to the TRIDENT Refit Facility (TRIREFAC) in the case of

Kings Bay and Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS-IMF) for the Pacific Northwest. TRIREFFAC and PSNS-IMF provides refit, MMP and configuration management support. These functions involve:

- a. Staging and delivering updated Logistics Technical Data (LTD) applicable to the ship's current configuration.
- b. Providing available interim technical documentation and logistic support elements for emergent changes installed during refit or MMP.
- c. Assessing the logistic impact and reporting of, configuration changes effected by all sources in SSBN and SSGN 726 Class Submarines.

22.2.5 Updating of Submarine Logistics Technical Data. TRIREFFAC and PSNS-IMF will stage and deliver LTD Advance Change Notices and revisions to SSBN and SSGN 726 Class Submarines during refit or MMP and must assist Ship's Force in the removal and disposal of LTD that is no longer applicable to the ship's current configuration. Upon request, TRIREFFAC and PSNS-IMF will also provide training to Ship's Force in the proper techniques for identification, procurement and maintenance of TRIDENT LTD.

22.2.6 Planned Refit Work Lists. Planned Refit Work Lists (PRWL) define all the planned work required for each SSBN and SSGN 726 Class ship for a one-year period or four refits. The PRWL includes scheduled TRIPER replacements, URO and Performance Monitoring requirements. In addition, alterations approved for accomplishment will be incorporated into the PRWL. The PRWL will be issued periodically, each for a one-year period. Subsequent PRWLs will include rescheduling of requirements identified on previous work lists which were not reported complete. Each PRWL will allocate specific work items to a proposed refit based on the Class Maintenance Plan scheduled requirements and projected manpower requirements.

APPENDIX A
TRIPER INFORMATION SHEET

FMA will fill out this form and forward to SSGN Project Team

1. Requesting Activity: _____
2. Requesting Activity Point of Contact: _____
3. Phone number(s): _____
4. E-mail: _____
5. Date: _____
6. Ship: USS _____ SSGN (_____)
7. CASREP Serial Number, Date Time Group of message, or both:

8. JCN: _____
9. NSN: _____
10. COG: 4Y
11. Nomenclature: _____
12. TRIPER Serial No. (TSN) of failed item TSN _____
(TSN is located on the assets TRIPER Tag)
13. FGC (S): _____
14. Requisition Number: _____
15. Description of failure: _____
16. Remarks: _____

Printed name of FMA Repair Officer or PMA

Signature: _____ Date: _____

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CHAPTER 23
SUBMARINE NOISE REDUCTION

REFERENCES.

- (a) NAVSEA S9073-AW-SNC-010 - Ship Acoustical Surveys for Submarines
- (b) NAVSEA S9073-A4-SNC-010 - USS LOS ANGELES (SSN 688) Class Acoustic Stealth Manual
- (c) NSWCCD-71-TR-2001/020 - February 2001 USS SEAWOLF (SSN 21) Class Acoustic Stealth Manual
- (d) NAVSEAINST C9073.2 - Acoustical Survey of Submarines
- (e) COMSUBFORINST C9460.3 - Coordinated Submarine Radiated Noise Analysis
- (f) NAVSEA S9073-AF-SNC-010(C) - Ship Noise Control
- (g) NAVSEA S0600-AA-PRO-230 - Underwater Ship Husbandry Manual, Chapter 23: Submarine Predeployment Noise Inspections
- (h) NAVSEA S0600-AA-PRO-010 - Underwater Ship Husbandry Manual
- (i) NAVEDTRA 10500 - Catalog of Navy Training Courses
- (j) COMNAVSUBFORINST 5400.25 - Standard Submarine Supply Department Organization and Regulations Manual
- (k) COMNAVSUBFORINST 5400.29 - Standard Submarine Navigation/Operations Department Organization and Regulations Manual
- (l) COMNAVSUBFORINST 5400.40 - Standard Submarine Combat Systems Department Organization and Regulations Manual (SSN)
- (m) COMNAVSUBFORINST 5400.41 - Standard Submarine SSBN 726 Class Weapons Department Organization and Regulations Manual
- (n) COMNAVSUBFORINST 5400.47 - Standard Submarine Combat Systems Department Organization and Regulations Manual (SSGN)

LISTING OF APPENDICES.

- A Supplemental Noise Measurements
- B Beartrap Acoustic Radiated Trials (BART)
- C Shipboard Noise Reduction Instruction
- D Predeployment Noise Inspection
- E Submarine Silencing Publications
- F Sample Propeller Changeout Message

23.1 PURPOSE. This chapter provides the requirements for an effective onboard noise reduction program during the ship's operating cycle. It identifies the acoustic surveys required to assess the radiated noise signature of a ship and summarizes the responsibilities and requirements for the onboard surveys necessary to be performed on a regular basis to maintain the submarine in its most quiet configuration.

23.1.1 Scope. Reference (a) discusses the various acoustic surveys to be conducted on ships in order to establish their baseline noise signatures and to monitor those signatures throughout the

operating cycle. Surveys discussed in reference (a) are briefly summarized, as well as several additional survey techniques available and essential to an effective noise reduction program. In addition, a discussion of the model shipboard noise reduction program and available training programs are presented. References (b) and (c) provide class specific and comprehensive documentation on submarine noise reductions, including discussion of acoustic surveys, shipboard noise reduction program, acquisition systems, and procedures, data analysis and trending, and detailed write-ups with photographs and audio clips of typical noise sources. In addition, the manual contains an extensive library of documents and training aids.

23.1.2 Background. Reduction of the radiated noise signature of a submarine platform is a key element to the tactical employment of the ship. As a ship begins its operating cycle, a series of acoustic surveys are conducted to characterize the baseline noise signature. Then, throughout the remainder of its operating cycle, the ship requires the tools and procedures necessary to monitor its signature against the baseline. As deficiencies are identified, Ship's Force needs to have an understanding of the extent to which an identified deficiency can affect the ship's radiated noise signature and the procedures required to effect corrective action. It should be kept in mind that although the implications of a degraded noise signature are fundamentally tactical in nature, the primary method of preserving a ship's acoustic advantage is through an aggressive and effective planned and corrective noise reduction maintenance program. Because of an increased emphasis in recent years, a number of new initiatives are being pursued within the technical community to develop new and improved measurement procedures and equipment that will assist Ship's Force in more effectively assessing the effects of noise deficiencies on their radiated noise signature. These efforts should lead to improved survey procedures and will be incorporated into future changes to this chapter.

23.2 NOISE REDUCTION PROGRAM ELEMENTS.

23.2.1 Radiated Noise Surveys.

23.2.1.1 Naval Sea Systems Command Acoustic Trials. These trials are conducted at the beginning of and at various times throughout each ship's operating cycle **per** reference (d) and provide a broad range of baseline measurements for the ship. In particular, the radiated noise signature of the ship is measured under various operating conditions. A determination is made of the controlling radiated noise offenders including those which are speed and depth dependent. While the principal objective of these trials is to assess the radiated noise signature of the submarine, platform, machinery and hull vibration, measurements are also made to provide baseline and supporting data in these areas for continued ship monitoring.

23.2.1.2 Coordinated Submarine Radiated Noise Analysis Exercise. This test **must** be conducted **per** reference (e), for Commander Submarine Force Atlantic (COMSUBLANT) units and Commander Submarine Force Pacific (COMSUBPAC) units. The primary objective of these submarine-versus-submarine exercises is to collect and analyze data to assess current acoustic vulnerabilities. These tests can be used during Pre-Overseas Movement (POM) **or** Deployment Preparation Period (DPP) work-ups to indicate that the deploying unit's acoustic signature is free of any unusual or highly detectable noise characteristics.

23.2.1.3 Coordinated Submarine Exercises (KILOEX, JTFEX, INT-2, TRACKEX, GUNSLINGER). While acoustic trials and surveys are the principal means to evaluate a submarine's acoustic profile, coordinated exercises provide another opportunity for the

submarine force to monitor itself for noise deficiencies. Although the primary purpose of these exercises is generally tactically oriented, the noise signature obtained can and should also serve to monitor submarine radiated noise. It is incumbent upon exercise participants to note and record any unusual or excessive radiated noise being emitted by submarine exercise participants. Discrepancies noted should be reported to the cognizant Immediate Superior In Command (ISIC) for evaluation and corrective action. Initial message reports should be followed by supporting documentation including tape recordings, annotated LOFARgrams, and annotated frequency spectrum plots. The message report should contain the following information:

- a. Description of noise signature problem.
- b. Date and time of detection.
- c. Range at detection.
- d. Sensor or processor used for detection.
- e. Own ship depth and speed.
- f. Acoustic sea state.
- g. Water depth.
- h. Water temperature.
- i. Layer depth.

23.2.1.4 Beartrap Acoustic Radiated Trials. The primary objective of these trials is to provide a cost effective means to detect and identify radiated noise sources that have caused signature degradations. Coordinated trial events are conducted with Marine Patrol Aircraft. Detected narrowband tones in the radiated noise signature are provided by naval message. Parent ISICs are responsible for requesting these trials. Specific information, including message requests and scheduling requirements, as well as Ship's Force and Type Commander (TYCOM) responsibility is provided in Appendix B of this chapter.

23.2.2 Onboard Noise Surveys. The noise surveys discussed in this section do not provide conclusive information on the actual radiated noise signature of the ship. However, when these surveys are analyzed for developing trends, they can be effective tools for monitoring overall ship effectiveness in noise reduction.

23.2.2.1 Platform Noise Survey. This survey is conducted to define own ship's noise environment and is the best means available to Ship's Force to assess the radiated noise signature of the ship using only onboard equipment. Surveys are conducted by taking periodic measurements under various ship's operating conditions using the applicable Planned Maintenance System (PMS) Maintenance Requirement Cards (MRC). In addition, at-sea watch-to-watch aural monitoring is also conducted. Analysis of this data determines the platform noise signature and also identifies the noise offenders which affect this signature. When changes in the ship's signature occur, the diagnostic procedures of the class specific platform noise manual are used to isolate the noise source. Platform Noise Surveys should be conducted per enclosure (2a) of Appendix C of this chapter. Propeller cavitation surveys, a separate survey from the Platform Noise Survey but considered an important part of platform noise monitoring analysis, should be conducted per enclosure (2b) of Appendix C of this chapter.

23.2.2.2 Topside and Housekeeping Survey. The most common and preventable sources of submarine noise are rattles emanating from improperly secured topside equipment, discontinuities in the hull, and machinery noise sound shorted to the hull due to improper stowage.

23.2.2.2.1 Topside Survey. The topside survey consists of a thorough inspection to identify and eliminate potential noise sources external to the pressure hull. Particular attention should be given to ensure that rattles are not installed, built in, or created by repairs, alterations, or stowage. Topside Surveys should be conducted **per** enclosure (2c) of Appendix C of this chapter.

23.2.2.2.2 Housekeeping Survey. The housekeeping survey consists of a thorough visual inspection to identify and eliminate these potential noise sources internal to the pressure hull. Particular attention should be given to ensure that sound shorts are not installed, built in, or created by repairs, alterations, or stowage. Housekeeping Surveys should be conducted **per** enclosure (2d) of Appendix C of this chapter.

23.2.2.2.3 Machinery Vibration Survey. A vibration survey conducted quarterly for both machinery health assessment and noise reduction purposes. Performance of this survey alone does not provide reliable information on radiated noise. Machinery Vibration Surveys should be conducted **per** enclosure (2e) of Appendix C of this chapter.

23.2.2.2.4 Hull Vibration Survey. A shipboard hull vibration survey is conducted quarterly or as required for the purpose of noise diagnostics by Ship's Force. The purpose is to assess acoustic deficiencies related to noise sources and transmission paths, and to estimate certain slow-speed, low frequency radiated noise levels. Hull Vibration Surveys should be conducted **per** enclosure (2e) of Appendix C of this chapter.

23.2.2.2.5 Isolation System Survey. This survey consists of a visual inspection of sound isolation components throughout the ship per applicable road maps and reference (f). These components include resilient mounts, pipe hangers, ground straps, and flexible piping. This visual inspection ensures that these devices are properly installed, undamaged and not sound shorted. Improper installation or failure of any of these devices will contribute to increasing the radiated noise signature of the ship. Isolation System Surveys should be conducted **per** enclosure (2f) of Appendix C of this chapter.

23.2.2.2.6 Damping Material Survey. This is a visual inspection of sound damping material installed in the vicinity of sonar arrays, sail, free flood spaces, and on machinery foundations. Like the isolation system survey, this inspection is designed to detect deficiencies in materials installed to limit the radiated noise signature of the ship. Damping Material Surveys should be conducted **per** enclosure (2g) of Appendix C of this chapter.

23.2.2.2.7 Predeployment Noise Inspections. Requirements and forms are contained in references (g) and (h) and Appendix D of this chapter.

23.2.2.2.8 Technical Onboard Monitoring Assist. This survey consists of at sea analysis by acoustic technical experts to evaluate the acoustic signature of the ship. The survey consists of a towed array, platform noise hydrophones and machinery and hull vibration measurements taken simultaneously to identify and localize major acoustic degradation. Emphasis is placed on training the submarine's crew on own ship noise data acquisition and analysis using their

available sensors. Technical Onboard Monitoring Assists should be conducted **per** Appendix A of this chapter.

23.2.2.9 Sound Absorption Material Survey. This is a thorough visual inspection of interior sound absorption material and sound transmission loss material conducted in all spaces. These materials are installed to assist in habitability of the ship by absorbing vibration. Sound Absorption Material Surveys should be conducted **per** enclosure (2h) of Appendix C of this chapter.

23.2.2.10 Airborne Noise Survey. The airborne noise survey exists to identify shipboard areas whose airborne noise levels have increased or are possibly high enough to cause hearing damage. Airborne Noise Surveys should be conducted **per** paragraph 5.c.(6) of Appendix C of this chapter.

23.2.3 Shipboard Noise Reduction Program. The key to a successful shipboard noise reduction program will be the ability of the ship to identify potential noise deficiencies and to initiate prompt corrective action. References listed in Appendix E of this chapter should be a part of the ship's onboard library of submarine silencing publications. Several elements of the noise reduction program are discussed in the following paragraphs.

23.2.3.1 Noise Reduction Officer. To ensure a coordinated and aggressive approach to noise reduction, each ship will assign one of its senior Department Heads, as designated by the Commanding Officer, to serve as Noise Reduction Officer. The Noise Reduction Officer will coordinate the activities of all personnel assigned to support the ship's Noise Reduction Program. This officer will ensure that all required surveys are conducted, that identified deficiencies are documented, and that corrective action is initiated. A Noise Reduction Board, chaired by the Noise Reduction Officer, will convene at regular intervals to review the status of the Noise Reduction Program. Following each meeting, formal written reports will be made to the Commanding Officer.

23.2.3.2 Noise Deficiency Log. The ship's Equipment Status Log (ESL) will be used to record and track all noise deficiencies. Deficiencies will be entered in the section for the Work Center (WC) responsible for the equipment concerned. The Critical Noise Deficiencies (NC) **or** Potential Noise Deficiencies (NP) code (per paragraph 23.2.3.3) in the deficiency description block will tag the entry as a noise deficiency. The Noise Reduction Officer will ensure the ESL is properly maintained and accurately reflects the latest status of all noise deficiencies. Items to be entered in the ESL include noise deficiencies reported during radiated noise acoustic trials as well as those discovered during onboard surveys. Ship's logs **must** be maintained in a manner where all diagnostics, repairs or other evaluations performed are documented. The logs need to be maintained until noise issues are verified to be repaired by associated acoustic or vibration measurements.

23.2.3.3 Noise Related Maintenance Records. The OPNAV 4790/2K will be used to document all deferred and completed noise related maintenance actions. Block 46-G will be used to further classify noise deficiencies in one of two categories; NC and NP.

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NOTE: INFORMATION CONTAINED IN WORK CANDIDATES MUST BE UNCLASSIFIED. IF CLASSIFIED DATA IS REQUIRED TO FULLY DESCRIBE THE NATURE OF THE PROBLEM BEING REPORTED, REFER TO TYCOM REPORTING REQUIREMENTS TO FULLY DESCRIBE THE NATURE OF THE PROBLEM.

- a. The NC code will be used to identify deficiencies of a critical nature identified during one of the following:
 - (1) Naval Sea Systems Command (NAVSEA) Acoustic Trials.
 - (2) Supplemental Radiated Noise Measurements.
 - (3) Technical Onboard Monitoring Assist.
 - (4) Platform Noise Monitoring Surveys.
- b. The NP code will be used to identify deficiencies that could potentially be radiated noise problems identified during one of the following:
 - (1) Topside and Housekeeping Surveys.
 - (2) Machinery and Hull Vibration Surveys.
 - (3) Isolation System Surveys.
 - (4) Damping Material Surveys.
 - (5) Airborne Sound Absorption Material Surveys.
 - (6) Routine Ship Operations.

23.2.4 Training. Formal training course prerequisites and descriptions are listed in reference (i). Specific training requirements are contained in references (j) through (n).

23.3 RESPONSIBILITIES.

23.3.1 Immediate Superior In Command.

- a. Assign a Staff Noise Reduction Officer as a specific point of contact for all matters relating to noise reduction within the Squadron.
- b. Oversee and supervise the Noise Reduction Program within the Squadron, ensuring that assigned units aggressively identify and correct noise deficiencies.
- c. Submit requests for Beartrap Acoustic Radiated Trials (BART) to COMSUBLANT **N454**, or COMSUBPAC N42N, as appropriate.
- d. Schedule acoustic surveys during the operating cycle of submarines **per** reference (d).
- e. Recommend, authorize, **or both**, corrective actions based on the findings of the surveys conducted.
- f. Review Noise Reduction Program records, survey results, procedures and monitoring equipment during material readiness inspections, Tactical Readiness Evaluations and POM **or** DPP certification.
- g. Schedule divers to conduct underwater hull and propeller surveys for noise deficiencies prior to undocking, pre-deployment, post-deployment, and during upkeep.

- h. Report propeller replacements using the message format of Appendix F of this chapter.
- i. Ensure that personnel tasked to support assigned submarines are adequately trained in submarine noise reduction.

23.3.2 Industrial Activity.

- a. Ensure proper handling and repair of noise critical machinery.
- b. Conduct in-shop and in-place balancing of all rotating equipment, both motors and coupled units, repaired by the industrial activity.
- c. Conduct in-place balancing as authorized by work requests.
- d. Assist ships in identifying and correcting noise problems and in conducting noise surveys **following** approved work requests.
- e. Establish new baseline machinery and hull vibration measurement data for repaired units.
- f. Ensure that all applicable personnel are adequately trained in submarine noise reduction.
- g. Conduct underwater hull and propeller surveys for noise deficiencies **per** reference (g).

23.3.3 Submarine Commanding Officer.

- a. Establish and maintain a ship's Noise Reduction Program consistent with this chapter. Appendix C of this chapter provides the basis for a shipboard instruction to meet this requirement.
- b. Appoint a senior Department Head as Noise Reduction Officer and establish a Ship's Noise Reduction Board.

APPENDIX A

SUPPLEMENTAL NOISE MEASUREMENTS

This Appendix provides a brief discussion of the TYCOM sponsored, noise measurements that may periodically be conducted on submarines during their operating cycle.

TECHNICAL ONBOARD MONITORING ASSIST (TOMA)

1. Purpose. TOMAs are conducted on submarines to maintain their acoustic signatures between scheduled radiated noise trials. Major acoustic degradations and their corrective actions are identified, and training is provided to Ship's Force.
2. Procedure. TOMA schedules are coordinated by the TYCOMs and the Squadrons. TOMAs are conducted by Naval Surface Warfare Center Carderock Division (NAVSEAWARCEN CD), with assistance from on-site Performance Monitoring Team (PMT) and Ship's Force personnel. TOMAs need 18 to 30 hours of data acquisition time. Normally, TOMAs are conducted on three to seven-day underways and can be scheduled concurrently with other operations. Tests consist of a series of runs in various machinery line-ups to collect data required to assess the acoustic signature of the submarine. Data is collected using onboard sensors and compared to baseline signatures from previous acoustic trials. A TOMA will serve as the quarterly hull, machinery, and platform noise surveys.
3. Frequency. TOMAs are to be conducted prior to, or early in the POM or DPP cycle when no radiated noise trial is scheduled to occur within one year of the deployment date.

NOTE: A TOMA IS NOT A SUBSTITUTE FOR THE NAVAL SEA SYSTEMS COMMAND ACOUSTIC TRIAL. A TOMA MAY ALSO BE REQUESTED BY THE SUBMARINE'S ISIC.

4. Reports. NSWCCD will issue a "quick look" message from the submarine at the completion of the TOMA. This message will detail significant findings and recommended corrective actions, as well as the status of previous corrective actions. A separate message will be sent by NSWCCD detailing hull and machinery vibration data.
5. Action. Ship's Force and the submarine's ISIC should use the results and recommendations of the TOMA "quick look" message to schedule and implement corrective action. Ship's Force should use the 3-M Maintenance Data System to document deficiencies and corrective actions. For deferred items, the Noise Reduction Officer should develop and implement appropriate corrective action.

APPENDIX B**BEARTRAP ACOUSTIC RADIATED TRIALS (BART)**

1. Purpose. BARTs provide submarines with the opportunity to measure and assess their narrowband radiated noise signatures, identify problems, and provide an opportunity to correct deficiencies and evaluate their acoustic health prior to certain deployments.
2. Procedure. BARTs are initially scheduled by TYCOM prior to major deployments or upon request by the submarine's ISIC. The ISIC is then responsible for updating the TYCOM on schedule changes. BARTs are a structured Beartrap in a designated quiet ocean area **following** the BART agenda. The objective is to collect sufficient data to determine the radiated noise signature and mission readiness of the ship. Data collection on station is accomplished by Commander Patrol Reconnaissance Forces Pacific (COMPATRECONFORPAC) or Commander Patrol Reconnaissance Forces Atlantic (COMPATRECONFORLANT) Anti-Submarine Warfare patrol aircraft and is restricted to a single eight-hour period during ship operations in a designated ocean area.
3. Frequency. For COMSUBPAC units, ISICs should coordinate BART scheduling for their submarines such that each ship will be tested prior, or early in the DPP. The schedule should allow sufficient time for corrective action on noise deficiencies detected during the BART to be planned and accomplished during a DPP upkeep period. For COMSUBLANT units, ISICs should coordinate BART scheduling for their submarines as required.
4. Reports. For Pacific Fleet submarines, COMPATRECONFORPAC will issue a message within 60 days of completion of a BART. For Atlantic Fleet submarines, "quick look" message will be issued **following** Local Operating Instructions.
5. Action. Ship's Force and the submarine's ISIC should use the results of the BART messages to schedule and implement corrective action for noise deficiencies detected during the trial. For deferred items, the Noise Reduction Officer should develop and implement appropriate corrective action.

APPENDIX C
SHIPBOARD NOISE REDUCTION INSTRUCTION

USS (Ship's Name and Hull No.)
Subj: SHIP'S NOISE REDUCTION PROGRAM
Ref: (a) COMUSFLTFORCOMINST 4790.3; Joint Fleet Maintenance Manual, Volume VI, Chapter 23
Encl: (1) Quarterly Noise Reduction Program Status Report
(2) Noise Reduction Surveys
(3) Control Surface Noise Questionnaire

1. Purpose. To establish a ship's Noise Reduction Program to include: a Noise Reduction Board to advise the Commanding Officer concerning appropriate noise reduction procedures; a set of noise surveys to characterize the ship's noise signature; and procedures to ensure proper coordination of efforts in the ship's noise reduction program.

2. Discussion. A great deal of emphasis has been placed on upgrading noise reduction awareness within the submarine force. As required by reference (a), (Ship's Name) must devote continued attention to the detection, correction and prevention of increases in its radiated noise signature. Significant mission degrading radiated noise problems could not be tolerated in wartime. (Ship's Name) must minimize noise to maximize the ships detection range of threats and targets and to reduce the possibility of hostile ships detecting (Ship's Name). Quietness is absolutely essential to the ships primary mission and a continuous, aggressive effort must be made in acoustic housekeeping and noise reduction to ensure a quiet ship. The acoustic surveys considered mandatory for effectively maintaining a quiet ship and improving the ship's acoustic signature during the operating cycle are discussed in this instruction. While these surveys serve as a formal means of noise reduction, each crew member's actions play an equally important role in the noise reduction consciousness of the entire ship. A quiet ship requires involvement of the whole crew. THINK QUIET!

3. Program Organization.

- a. A ship's Noise Reduction Board must be established to assist the Commanding Officer in the development and execution of long and short range plans for maintaining and enhancing the acoustic posture of the ship. The board will recommend appropriate shipboard noise reduction procedures and monitor their execution. The board will consist of the following personnel:
- (1) Executive Officer.
 - (2) Combat Systems Officer.
 - (3) Engineer Officer.
 - (4) Sonar Officer.
 - (5) Electrical Officer.
 - (6) First Lieutenant.
 - (7) Sonar Division Leading Petty Officer.

- (8) Electrical Division Noise Reduction Petty Officer (NRPO).
 - (9) Chief of the Boat.
 - (10) Sail Coordinator.
- b. To assist the board in carrying out their responsibilities, experienced Petty Officers and non-rated personnel who have completed qualification in submarines **must** be assigned in the ship's collateral duties notice as NRPO. Each division will have at least one formally designated NRPO.

4. Program Management.

- a. The Noise Reduction Officer will coordinate all noise reduction activities within the ship. The Noise Reduction Board will meet quarterly and discuss actions completed and further action required to correct outstanding noise deficiencies. Special quarterly noise reduction boards should be held prior to the initial work definition conference for depot availabilities (initial planning meetings are typically scheduled; Selected Restricted Availability **and** Interim Drydocking A-43 weeks, Depot Modernization Period **and** Engineered Refueling Overhaul A-12 months) and prior to POM1 upkeep periods. The Noise Reduction Officer will chair these meetings. The Noise Reduction Officer will ensure that the noise reduction portion of the ESL contains updated entries on all outstanding noise deficiencies. Each of the significant noise deficiencies will be discussed at every meeting. The Commanding Officer will be apprised of the results of the meeting and any unresolved problems shortly after the meeting. Formal written reports summarizing the status of the Noise Reduction Program will be submitted following each meeting to the Commanding Officer using the format of enclosure (1).
- b. Onboard surveys will be conducted **per** this instruction. Noise deficiencies discovered during these surveys or detected during routine ship's operations will be reported to the Noise Reduction Officer. At sea, these reports will be made to the Officer Of the Deck (OOD) who will, in turn, inform both the Noise Reduction Officer and the Commanding Officer. The OOD will initiate corrective action for all significant noise deficiencies and ensure that these items are included in the watch turnover. All deficiencies that are not immediately correctable will be entered in the noise deficiency section of the ESL.
- c. The Noise Reduction Officer **must** ask the following questions during each Noise Reduction Board meeting.
- (1) Have **Ship's Force** effected all corrective action recommendations from **the** latest acoustic trials? Have on board measurement surveys conclusively proven that outstanding noise deficiencies were corrected? Report all unresolved items to the Commanding Officer using the format of enclosure (1).
 - (2) Have any noise sources, especially rattles or control surface transients, been aurally detected during the conduct of the platform noise survey of enclosure (2a)? If rattles or transients are present, have tape recordings or data packages been accomplished **following** platform noise or maintenance manual guidance for submission?

- (3) Have **Ship's Force** conducted a propeller tip cavitation survey **per** enclosure (2b)? Are the measured tip cavitation points acceptable? If cavitation is not acceptable, has a tape package been prepared **per** reference (a)?
- (4) Have any signature degradations been identified from the latest set of towed array, platform noise hydrophone or machinery and hull vibration measurements? If so, have the noise sources been identified? Report unresolved items to the Commanding Officer using the format of enclosure (1).

5. Action.

- a. The Executive Officer **must**:
 - (1) Attend all Noise Reduction Board meetings.
 - (2) Implement a comprehensive, all hands training program to elevate the awareness of Ship's Force personnel to the importance of noise reduction.
- b. The Noise Reduction Officer **must**:
 - (1) Coordinate and administer the ship's Noise Reduction Program.
 - (2) Schedule Noise Reduction Board meetings and chair their meetings.
 - (3) Report the status of noise deficiencies to the Commanding Officer following meetings of the Noise Reduction Board. Submit written summary reports to the Commanding Officer using the format of enclosure (1).
 - (4) Ensure that cognizant divisions enter all noise reduction deficiencies in the ESL, that prompt corrective action is taken by responsible divisions and that work requests are submitted for deficiencies beyond the capability of Ship's Force.
 - (5) Ensure that acoustic trial deficiencies are entered in the ESL and that appropriate corrective action is initiated.
 - (6) Assess the tactical implications of noise deficiencies detected during underway operations and make recommendations to the Commanding Officer as to tactical limitations and required corrective action.
 - (7) Ensure that cognizant divisions have men properly trained in Ship's Force acoustic surveys, noise reduction equipment, proper bearing replacement and in-place balancing of rotating equipment.
 - (8) Ensure that surveys are being conducted by cognizant divisions and that deficiencies are reported to the Commanding Officer.
 - (9) Conduct spot reviews of acoustic survey results.
 - (10) Be inventory manager of all publications required by reference (a), to support the Noise Reduction Program and ensure that divisions have applicable MRCs.
 - (11) Assist the Engineer Officer with the implementation and maintenance of the ship's quiet bills.

- (12) Ensure action is taken, to the maximum extent possible, to complete enclosure (3) for all identified control surface noises.
- c. The Sonar Officer **must**:
- (1) Ensure that the Platform Noise Survey is accomplished, recorded, and analyzed **per** enclosure (2a).
 - (2) Perform Propeller Cavitation Noise Surveys as required **per** enclosure (2b).
 - (3) Develop propeller cavitation curves **per** enclosure (2b) and forward results to the Commanding Officer via the Noise Reduction Officer.
 - (4) Direct the use of the installed sonar systems to assist in the identification and isolation of noise related material deficiencies detected in Topside, Housekeeping, Machinery and Hull Vibration, and Isolation System Surveys. (Enclosures 2c, 2d, 2e, and 2f respectively refer).
 - (5) Ensure that Damping Material Surveys are accomplished, recorded, and analyzed **per** enclosure (2g).
 - (6) Ensure the Airborne Noise Surveys are accomplished, recorded, and analyzed **following** the applicable Maintenance Index Page (MIP). The Sonar Officer **must** ensure that airborne noise levels in all shipboard areas remain within permissible limits. An Airborne Noise survey **must** be conducted when increased airborne noise levels are suspected of exceeding permissible limits. A written report in memorandum form **must** be submitted for each watch station and **must** include, as a minimum, the date of inspection, names of personnel conducting the survey, and the discrepancies noted in the ESL. Review the status of noise level measurements and any affected watch station and report this information to the Commanding Officer and the ship's corpsman.
 - (7) Report immediately any abnormal increase in own ship's noise to the OOD and the Noise Reduction Officer.
 - (8) Ensure that all survey deficiencies are entered in the noise reduction section of the ESL and reported to the Noise Reduction Officer. Ensure that prompt corrective action is taken and that work requests are submitted for deficiencies beyond the capability of Ship's Force.
 - (9) Ensure that personnel assigned to conduct noise reduction surveys under his cognizance are properly trained.
- d. The Electrical Officer **must**:
- (1) Ensure that the Machinery and Hull Vibration Surveys are accomplished, recorded, and analyzed **per** enclosure (2e).
 - (2) Ensure that in-place balancing is conducted on an assembled unit at any time that repairs are made by Forces Afloat that would affect the balance of the equipment.

- (3) Determine the cause of out of specification machinery and hull vibration readings and initiate corrective action.
 - (4) Ensure that prompt corrective action is taken and that work requests are submitted for deficiencies beyond the capability of Ship's Force.
 - (5) Ensure that personnel under his cognizance assigned to conduct noise reduction surveys are properly trained.
- e. The First Lieutenant **must**:
- (1) Ensure that the Topside and Housekeeping Surveys are accomplished, recorded, and analyzed **per** enclosure (2c) and (2d).
 - (2) Ensure that the Sound Absorption Material Survey is accomplished, recorded, and analyzed **per** enclosure (2h).
 - (3) With the assistance of the Supply Officer, ensure that equipment, stores, personal effects, and consumables are stowed in a manner that will not produce noise or transmit noise to the ship's hull or structure.
 - (4) Ensure that all survey deficiencies are entered in the noise reduction section of the ESL and reported to the Noise Reduction Officer. Ensure that prompt corrective action is taken and that work requests are submitted for deficiencies beyond the capability of Ship's Force.
 - (5) Ensure that personnel under his cognizance assigned to conduct noise reduction surveys are properly trained.
- f. The NRPO **must**:
- (1) Promote the Noise Reduction Program in their respective divisions.
 - (2) Perform or assist in the performance of noise reduction surveys under their respective division's cognizance **per** enclosure (2).
 - (3) Enter all survey deficiencies in the noise reduction section of the ESL and report deficiencies to the cognizant Division Officer.
- g. The OOD **must**:
- (1) Remain aware of the status of critical noise deficiencies and operate the ship in a manner that will minimize its radiated noise signature.
 - (2) Report all new noise deficiencies and the correction of existing deficiencies to the Noise Reduction Officer and the Commanding Officer. Ensure new deficiencies are recorded in the noise reduction section of the ESL.
 - (3) Ensure sonar watchstanders conduct aural monitoring of own ship's noise signature upon initial dive and once per watch.

16 Oct 2019

From: Noise Reduction Officer
To: Commanding Officer
Via: Executive Officer
Subj: QUARTERLY NOISE REDUCTION PROGRAM STATUS REPORT FOR PERIOD
ENDING (DATE)

Encl: (1) Noise Reduction Section of ESL

1. The following MRCs associated with the Noise Reduction Program were not accomplished, partially accomplished, or deferred:

MRC No., Deficiency reason or Corrective Action

2. The following noise deficiencies were identified during the current period:

Deficiency, Source, ESL No. or Plan of Action for identification and repair

3. The following previously identified noise deficiencies were corrected during the current period:

Deficiency or Corrective Action

4. The following noise deficiencies from the previous period are outstanding:

Deficiency, Source, ESL No., Diagnostics and repairs performed or Plan of Action for identification and repair

5. Enclosure (1) summarizes all currently outstanding deficiencies associated with the Noise Reduction Program.

Submitted: _____

Noise Reduction Officer

Copy to:
Engineer Officer

Enclosure (1)

NOISE REDUCTION SURVEYS

1. This enclosure contains a description of the onboard surveys conducted in support of the Noise Reduction Program. For each survey, applicable references are cited and a summary of procedures and reporting requirements are presented. Surveys included are:

Enclosure	2a	Platform Noise Survey
	2b	Propeller Cavitation Noise Survey
	2c	Topside Survey
	2d	Housekeeping Survey
	2e	Machinery and Hull Vibration Survey
	2f	Isolation System Survey
	2g	Damping Material Survey
	2h	Sound Absorption Material Survey

Enclosure (2)

PLATFORM NOISE SURVEY

- Reference: (a) Class Applicable Technical Manual for Platform Noise Monitoring Analysis for Noise Reduction
(b) Class Applicable SO-544 MIP/MRCs
(c) OPNAVINST 5513.5A Department of the Navy (DON) Security Classification Guidance for Undersea Warfare Programs

1. Responsibility. Sonar Officer.

2. Procedure.

- a. Platform Noise Surveys **must** be conducted as specified in references (a) and (b).
- b. Sonar supervisors **must** monitor each hydrophone for objectionable noises at least once each watch while underway and report results to the OOD. Problems detected **must** also be recorded in the Noise Reduction section of the ESL. Problem investigation and corrective action **must** be initiated as soon as possible within the current operations schedule.
- c. As soon as feasible, after diving, following an inport period, accomplish the following:
 - (1) Monitor each platform hydrophone for objectionable noise while changing speed in five-knot increments up to Flank speed (monitor all frequency bands where applicable). At slow speed, monitor hydrophones nearest the rudder, stern planes and fairwater planes while each control surface is cycled. Monitor the hydrophone nearest the sail while each mast and antenna is cycled. If control surface deficiencies are found, complete the applicable portions of the Control Surface Noise Questionnaire, enclosure (3), to report control surface noise. This questionnaire assists in troubleshooting.
 - (2) Check at least one point of the propeller cavitation curve. If results are significantly different from the previous data, establish a new cavitation curve at the earliest opportunity as discussed in enclosure (2b).
 - (3) If operations preclude complete accomplishment of **sub-paragraph** (1) and (2), speeds **and** areas not monitored should be noted and carried forward in the sonar supervisor's log until they can be monitored.
 - (4) Results of this monitoring will be reported to the OOD and deficiencies recorded in the ESL.
- d. For any abnormal noises, magnetic tape recordings should be made **per** reference (a). These tape recordings together with complete supporting data **must** be forwarded by priority registered mail second day delivery to:

For COMSUBLANT units:

Carderock Division
Naval Surface Warfare Center
9500 MacArthur Blvd.
West Bethesda, MD 20817-5700
Attn: Code 711 - Fleet Support Program Manager

Enclosure (2a)

16 Oct 2019

For: New London Units, data packages should be forwarded to:

NSSC NEW LONDON CT, N42

For COMSUBPAC units:

Naval Surface Warfare Center

Carderock Division

Bremerton Detachment

530 Farragut Ave

Attn: Code 713

Bremerton, Washington 98314-5215

NOTE: SIPRNET FILES FROM SHIP SHOULD BE LIMITED TO 400KB. HUIITS AND SAILOR-MAIL CAN BE UTILIZED FOR LARGER FILES. MP3 OR OTHER COMPRESSED FORMATS SHOULD BE USED TO SAVE SPACE. 10-15 SECONDS OF AUDIO IS USUALLY ADEQUATE. IF URGENT REQUEST ON EVENINGS, HOLIDAYS, OR WEEKENDS, HAVE SWO CONTACT TYCOM STEALTH OFFICERS TO EXPEDITE. DURING TYCOM WORKING HOURS, NOISE REDUCTION SUPPORT CAN BE PROVIDED VIA CHAT. SUPPORT CAN BE ARRANGED ON EVENINGS OR WEEKENDS THROUGH SWO.

To receive immediate feedback, audio files can be sent via SIPRNET or other secure method to:

For COMSUBLANT units:

To: SUBLANT -

Michael.N.Cowan@navy.smil.mil

CC: csl.swo@navy.smil.mil (if immediate response is required), ISIC, or operational commander as required.

For COMSUBPAC units:

To: SUBPAC - Jeffrey.George@navy.smil.mil

CC: swo.csp@navy.smil.mil (if immediate response is required), ISIC, or operational commander as required.

Units should request analysis and recommendations for corrective action from NSWCCD. The response will be provided by message within 72 hours of receipt of the data package. If the package needs to be expedited, contact TYCOM Noise Reduction Officer prior to submission.

- e. Platform noise hydrophone recordings are classified **CONFIDENTIAL** per reference (c), (Encl 55). If recordings include towed array signature data, then the classification is **SECRET**.

Enclosure (2a)

16 Oct 2019

3. Frequency. Surveys will be conducted as specified within this instruction, reference (a) and applicable MRCs. Additional surveys will be conducted as required to support noise reduction efforts related to other shipboard surveys or whenever such monitoring is required for the identification of noise degradations or to verify the effectiveness of corrective actions.
4. Record. Survey results will consist of platform noise spectra, cavitation data, and entries to the ESL and Sonar Line Log. Records will be kept as specified within this instruction, in reference (a) or as required to meet the needs of noise reduction efforts aboard ship.
5. Review. The Sonar Officer will review results of all surveys weekly and the Noise Reduction Officer will review all records in conjunction with Noise Reduction Board meetings monthly.

Enclosure (2a)

16 Oct 2019

PROPELLER CAVITATION NOISE SURVEY

Reference: (a) Class Applicable Technical Manual for Platform Noise Monitoring Analysis for Noise Reduction

(b) NTTP 3-54.1 Submarine Tactical Security Manual

1. Responsibility. Sonar Officer.
2. Procedure. Propeller cavitation surveys and diagnostic procedures will be conducted as specified in reference (a). Propeller cavitation curves will be developed using the procedural guidance of reference (a), for the various tactical considerations specified in reference (b).
3. Frequency. Since the ship's operating schedule dictates the frequency at which propeller cavitation surveys can be made, no specific frequency can be assigned. However, a complete cavitation survey should be made after any CNO Maintenance Availability or upkeep period. One point of the current cavitation curve should be verified at the beginning of each underway period. If results are significantly different, a complete new curve should be developed.
4. Unacceptable Propeller Tip Cavitation Performance. Propeller replacement due to poor acoustic performance is often based on unacceptable tip cavitation. Naval Surface Warfare Center, Carderock Division (NSWCCD) personnel verify the ship recorded cavitation points and provide feedback to the TYCOM and the ship. Ships with emergent poor cavitation performance should immediately record and forward cavitation curve tapes **per** the Platform Noise Survey Section of this Appendix.
5. Reports. The original and the five most recent cavitation curves will be retained and compared for trend analysis until the propeller is changed.
6. Review. The Sonar Officer **must** compare new cavitation curves to previous ones and forward the results to the Commanding Officer via the Noise Reduction Officer.

Enclosure (2b)

TOPSIDE SURVEY

Reference: (a) MIP SO-591/901 MRC BNJ6 (R-1)

1. Responsibility. Noise Reduction Officer.
2. Procedure. The First Lieutenant **must** ensure that the following items are accomplished **per** reference (a):
 - a. Open and inspect all line lockers and free flood areas for loose gear and other sources of noise, such as loose zincs, rattling pipes, loose grates, etc.
 - b. Check all deck hatches to ensure they shut properly and will not rattle.
 - c. Check that all towed-array fairing plates are properly secured (if applicable).
 - d. Check all cleats for proper operation and ensure that they do not rattle when stowed.
 - e. Check stowage of all portable equipment topside to ensure that proper gasket material is installed, all bolts and wing nuts are present, and equipment is securely held in place when mounted.
 - f. When required, inspect sail area for loose gear and sources of rattles. Particular attention should be given to the mast bearings and operating equipment to ensure that masts will not be damaged or fouled. Before reinstalling sail plates, the sail should be inspected by the Noise Reduction Officer.
3. Frequency. A complete Topside Survey, including the sail, **must** be conducted after any major upkeep or inport period, or whenever major topside work is completed. A sail closeout inspection **must** be conducted by an officer prior to the reinstallation of any sail plate removed. Surveys should be completed as far in advance of underway as possible. Other inspections **must** be conducted as directed by the First Lieutenant.
4. Reports. A written report in memorandum form **must** be submitted to the Commanding Officer at the completion of each inspection. This report **must** include, as a minimum, the date the inspection was made, names of personnel conducting the inspection and uncorrected discrepancies noted in the ESL. Reports **must** be routed via the Noise Reduction Officer, with copies to cognizant Department Heads.
5. Review. A written report in memorandum form will be submitted for each inspection and will include, as a minimum, the date of the inspection, names of personnel conducting the inspection and the discrepancies noted in the Equipment Status Log. This report **must** be reviewed by the First Lieutenant and retained by the Noise Reduction Officer until all discrepancies are corrected.

Enclosure (2c)

HOUSEKEEPING SURVEY

Reference: (a) MIP SO-591/901 MRC BNJ7 (R-2)

1. Responsibility. Noise Reduction Officer.
2. Procedure. It is the responsibility of the NRPO to inspect their division's spaces **per** reference (a) for sound shorts or other silencing discrepancies which may result from improper stowage of loose gear.
3. Frequency. Improper stowage is a continuous problem and should be monitored as such. It is the responsibility of all hands to monitor the stowage of all gear and to ensure that sound shorts are not created by improper stowage. OODs, Engineering Officers Of the Watch and all watchstanders are required by other instructions to inspect various spaces. These inspections should include monitoring for proper stowage and possible sound shorts. Prior to getting underway, all divisions must inspect their spaces for proper stowage at sea. Division Officers should acknowledge by signature on respective pre-underway check sheets that their spaces are stowed for sea.
4. Reports. Potential sound short discrepancies will be reported to the OOD who will inform the Commanding Officer and responsible Department Heads, to ensure that problems are corrected. Discrepancies not immediately corrected **must** be noted in the ESL.
5. Review. The Noise Reduction Officer **must** review all pre-underway check sheets and maintain a record of all noise discrepancy items until corrected.

Enclosure (2d)

MACHINERY AND HULL VIBRATION SURVEY

- Reference: (a) Class Applicable Technical Manual for Machinery and Hull Vibration Testing and Monitoring of SSN/SSBN/SSGN Auxiliary Machinery
(b) MIP 4910/Series Vibration Noise Monitoring

1. Responsibility. Electrical Officer.
2. Procedure. Machinery and hull vibration surveys **must** be conducted as specified in reference (a) and **following** applicable PMS (reference (b)). Items found to be out-of-specification will be logged in the ESL as potential noise deficiencies. Machinery and hull vibration surveys are conducted on all submarines.
3. Frequency. A comprehensive machinery and hull vibration survey should be conducted quarterly by Ship's Force. Results are submitted to PMT, who in turn forwards the packages to the applicable NSWC Detachment. Specific machinery and hull vibration monitoring surveys **must** be conducted by Ship's Force bi-weekly on selected equipment identified in the NSWC, machinery Vibration Deficiency Message and as required to support onboard noise reduction efforts.
4. Reports.
 - a. NSWC evaluates and maintains machinery and hull vibration data collected by Ship's Force. They report out-of-specification equipment or hull vibration levels via message.
 - b. During each machinery and hull vibration survey, a report is submitted to NSWC via the local PMT. This report **must** include the sound cut data and a feedback package.
 - c. For the Hull Vibration Monitoring Program, a message should be sent from the submarine to NSWC within 45 days of receipt of the NSWC hull vibration deficiency message or when operationally feasible. This message should include the results of actions taken to identify and correct the sources of excessive hull vibration levels and to identify platform noise sources.
5. Noise Reduction Training. Crew training in noise awareness and noise reduction is absolutely essential to maintaining a quiet ship. The Submarine Force Training Manual discusses formal training courses and requirements pertaining to noise reduction as well as materials available for onboard training.
6. Review. The Electrical Officer **must** review and forward the results of all machinery and hull vibration measurements to the Commanding Officer via the Noise Reduction Officer and Executive Officer. This report **must** be submitted within five working days of the survey and **must** include a listing of which noise measurements have been taken and any out-of-specification equipment.

Enclosure (2e)

16 Oct 2019

ISOLATION SYSTEM SURVEY

- Reference: (a) NAVSEA S9073-AW-SNC-010/(U) Ship Acoustical Surveys
(b) NAVSEA S9073-AF-SNC-010/(C), Ship Noise Control
(c) Appropriate Noise Control Guidelines, Road Maps, and Equipment Guide Lists
(d) Appropriate System MIPs

1. Responsibility. Noise Reduction Officer.
2. Procedure. The Noise Reduction Officer **must** require Ship's Force to conduct a visual inspection of silencing equipment and components such as resilient mounts, flexible pipe, pipe hangers, ground straps, electrical connections, etc., to ensure they are properly installed, within periodicity, undamaged and not sound shorted. References (a), (b), (c) and (d) apply. When funded, these inspections will be conducted by a NAVSEA designated activity, however, the ship is still responsible for conducting the survey regardless of NAVSEA funding.
3. Frequency. An Isolation System Survey **must** be conducted as specified by reference (d) **per** reference (a). Additionally, a localized isolation system survey **must** be conducted in the area of sound isolated equipment changeouts and in the area of work accomplished on sound isolated systems. When requested and funded, a NAVSEA designated activity **must** provide training and assist in the performance of an isolation system survey.
4. Reports. The Noise Reduction Officer **must** ensure that all defects found are logged in the ESL and **must** report survey results to the Commanding Officer within five working days of completion of the inspection.
5. Review. The Noise Reduction Officer **must** maintain a record of all discrepancies noted until corrected.

Enclosure (2f)

16 Oct 2019

DAMPING MATERIAL SURVEY

Reference: (a) NAVSEA S9073-AW-SNC-010/(U), Ship Acoustical Surveys
(b) NAVSEA S9073-AF-SNC-010/(C), Ship Noise Control

1. Responsibility. Sonar Officer.
2. Procedure. The Sonar Officer **must** ensure that a thorough inspection is conducted of all damping material installed in sonar array areas, fairwater, main ballast tanks, and free flood areas, to ensure that no deterioration has taken place **per** the guidance provided in reference (a). Reference (b) provides specific information relating to these materials.
3. Frequency. A Damping Material survey **must** be conducted as specified at each dry-docking, **per** reference (a).
4. Reports. A written report in memorandum form **must** be submitted for each inspection and **must** include, as a minimum, the date of inspection, names of personnel conducting the inspection, and the discrepancies noted in the ESL.
5. Review. The Sonar Officer **must** review the results of each inspection and forward them to the Commanding Officer via the Noise Reduction Officer within five working days of the completion of the inspection. This report **must** be retained by the Noise Reduction Officer until all discrepancies have been corrected.

Enclosure (2g)

16 Oct 2019

SOUND ABSORPTION MATERIAL SURVEY

Reference: (a) NAVSEA S9073-AW-SNC-010/(U), Ship Acoustical Surveys
(b) NAVSEA S9073-AF-SNC-010/(C), Ship Noise Control

1. Responsibility. First Lieutenant.
2. Procedure. The First Lieutenant will ensure that a thorough inspection of the interior sound absorption and sound transmission loss material is conducted in all spaces. This inspection ensures that no deterioration of these materials has taken place. This inspection is accomplished with guidance from reference (a), while reference (b) provides specific information relating to these materials.
3. Frequency. A Sound Absorption Material Survey **must** be conducted prior to each major CNO Maintenance Availability. An inspection of any system affected by maintenance or other work **must** be conducted following completion of the work.
4. Reports. A written report in memorandum form will be submitted to the Noise Reduction Officer for each inspection and will include, as a minimum, the date of the inspection, names of personnel conducting the inspection, and discrepancies noted in the ESL.
5. Review. The First Lieutenant will review the results of each inspection and forward them to the Commanding Officer via the Noise Reduction Officer within five working days of the completion of the inspection. This report will be retained by the Noise Reduction Officer until all discrepancies have been corrected.

Enclosure (2h)

CONTROL SURFACE NOISE QUESTIONNAIRE

1. The purpose of this questionnaire is to provide more accurate and definitive information than reports of "noise in the fairwater" or "noise in the mud tank". This information can reduce troubleshooting time, prevent unnecessary maintenance, and perhaps prevent an unnecessary and unscheduled dry-docking. It can also furnish vital data to assist in the resolution of a problem and prevent its recurrence. It is very important to monitor the audio during the greasing operations; the effects of greasing for worn bearings can be short.
2. Record audio of all platform noise evaluations **per** reference (a).
3. Perform all evaluations in all modes (Normal, Emergency and Automatic where applicable).
4. Note how long greasing effects the noise characteristics of the control surface (minutes, hours, days or months).

Hull Number: _____

Date: _____

Check the appropriate box or fill in the blanks in response to these questions:

1. Give the date when the noise was first noticed:		
2. Which control surface is suspected of causing the noise?		
a. Fairwater or Bow Planes	Yes ~	No ~
b. Stern Planes	Yes ~	No ~
c. Rudder	Yes ~	No ~
3. Was the noise observed upon leaving port?	Yes ~	No ~
a. If not observed upon leaving port, after how many days at sea?	_____	
4. Was the noise first observed during the first high speed run?	Yes ~	No ~
5. Was any work performed on this system, associated systems, or in its vicinity during the last refit or upkeep period (including welding or sandblasting)?	Yes ~	No ~
a. If yes, describe work _____ _____ _____		
6. How was the noise first detected?		
a. Audible to crew	Yes ~	No ~
b. Self noise monitoring system	Yes ~	No ~
(1) If yes, which system?	_____	
c. Other? (Describe) _____ _____		
7. Is the noise detected on any hydrophones?	Yes ~	No ~
a. If so, which hydrophone displayed the highest levels?	_____	
b. How does this hydrophone level compare to the most recent acoustic trial report or more recent baseline?	_____ _____	

(CONFIDENTIAL when filled in)

Enclosure (3)

8. Is the noise:			
a.	Barely audible?	Yes ~	No ~
b.	Moderate?	Yes ~	No ~
c.	Loud?	Yes ~	No ~
9. Since it was first detected, has the noise level:			
a.	Increased?	Yes ~	No ~
b.	Decreased?	Yes ~	No ~
c.	Remained constant?	Yes ~	No ~
d.	Fluctuated?	Yes ~	No ~
10. During cycling of the control surface, is the noise:			
a.	Constant?	Yes ~	No ~
b.	Intermittent?	Yes ~	No ~
11. If intermittent, has the frequency of the occurrence of the noise:			
a.	Increased?	Yes ~	No ~
b.	Decreased?	Yes ~	No ~
c.	Remained constant?	Yes ~	No ~
12. Describe the type of noise heard.			
a.	Clanking?	Yes ~	No ~
b.	Thudding?	Yes ~	No ~
c.	Groaning?	Yes ~	No ~
d.	Rubbing?	Yes ~	No ~
e.	Squealing?	Yes ~	No ~
f.	Chattering?	Yes ~	No ~
g.	Gallopings?	Yes ~	No ~
h.	Hydraulic flow?	Yes ~	No ~
i.	Other? (Describe) _____		
13. When, during the motion of the cycle of the planes is the noise heard (check all that apply):			
a.	At start of motion towards rise or right?	Yes ~	No ~
b.	At start of motion towards dive or left?	Yes ~	No ~
c.	At the end of motion towards rise or right?	Yes ~	No ~
d.	At the end of motion towards dive or left?	Yes ~	No ~
e.	Entering the rise or right hardstop?	Yes ~	No ~
f.	Entering the dive or left hardstop?	Yes ~	No ~
g.	Leaving the rise or right hardstop?	Yes ~	No ~
h.	Leaving the dive or left hardstop?	Yes ~	No ~
i.	The entire length of travel towards rise or right?	Yes ~	No ~

(CONFIDENTIAL when filled in)

Enclosure (3)

j.	The entire length of travel towards dive or left?	Yes ~	No ~
k.	At some intermediate point(s) while moving towards rise or right? (Indicate degrees of rise or right when heard):	Yes ~	No ~
l.	At some intermediate point(s) while moving towards dive or left? (Indicate degrees of dive or left when heard):	Yes ~	No ~
14.	Is there any unusual hesitancy or motion during operation of the planes:		
a.	Leaving the rise or right hardstop?	Yes ~	No ~
b.	Leaving the dive or left hardstop?	Yes ~	No ~
c.	At any other point(s) in the motion cycle?	Yes ~	No ~
(1)	If yes, describe giving direction of movement and degrees of rise, dive, left, or right when noise occurs:		
15.	Does ship's speed or depth have any effect on whether or not the noise is generated?	Yes ~	No ~
a.	If yes, describe:		
16.	Does ship's speed or depth have any effect on when the noise is detected during the movement cycle as described in question 13?	Yes ~	No ~
a.	If yes, describe:		
17.	Is the noise audible:		
a.	Surfaced, underway?	Yes ~	No ~
b.	At periscope depth?	Yes ~	No ~
c.	Below periscope depth?	Yes ~	No ~
18.	Does sea state affect the degree of noise?	Yes ~	No ~
19.	Does simultaneous operation of the stern planes and rudder cause or increase the degree of noise?	Yes ~	No ~
20.	Are any of the following components very warm to the touch while operating the control surface suspected of causing the noise?		
a.	Hydraulic tail rod (if installed)?	Yes ~	No ~
b.	Hydraulic piston rod?	Yes ~	No ~
c.	Through hull connecting rod?	Yes ~	No ~
21.	On the control surface suspected of causing the noise, perform the appropriate quarterly greasing MRC for the components listed in question 22. Operate the control surface while greasing (except the guide cylinder). Listen to determine if greasing causes any change in the occurrence or loudness of the noise.	Greasing Performed?	
		Yes ~	No ~
22.	Did the noise diminish after greasing the following components?		
	Fairwater or Bow Planes:		
a.	Hull gland:	Yes ~	No ~

(CONFIDENTIAL when filled in)

Enclosure (3)

b.	Lower end of connecting rod: see Note 1	Yes ~	No ~
c.	Upper end of connecting rod: see Note 1	Yes ~	No ~
d.	Port stock bearing:	Yes ~	No ~
e.	Starboard stock bearing:	Yes ~	No ~
Stern Planes:			
f.	Hull gland:	Yes ~	No ~
g.	Forward end of connecting rod: see Note 1	Yes ~	No ~
h.	Aft end of connecting rod: see Note 1	Yes ~	No ~
i.	Port stock bearing: see Note 2	Yes ~	No ~
j.	Starboard stock bearing: see Note 2	Yes ~	No ~
k.	Port pintle bearing:	Yes ~	No ~
l.	Starboard pintle bearing:	Yes ~	No ~
Rudder:			
m.	Hull gland:	Yes ~	No ~
n.	Forward end of connecting rod: see Note 1	Yes ~	No ~
o.	Aft end of connecting rod: see Note 1	Yes ~	No ~
p.	Port stock bearing: see Note 2	Yes ~	No ~
q.	Starboard stock bearing: see Note 2	Yes ~	No ~
r.	Upper rudder stock bearing: see Note 2	Yes ~	No ~
s.	Lower rudder stock bearing: see Note 2	Yes ~	No ~
t.	Rudder carrier bearing (two fittings): see Note 2	Yes ~	No ~
23.	Pump one pound of grease into the guide cylinder grease fitting while the control surface is in the neutral position. Then operate the control surface about five cycles from full rise to full dive or left to right, as appropriate, while listening for the noise. Repeat this procedure for the guide cylinder until the specified amount of grease has been applied.	Greasing Performed? Yes ~ No ~	

(CONFIDENTIAL when filled in)

Enclosure (3)

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- NOTE 1: GREASE UNDERWAY IF THE APPROPRIATE ALTERATION IS INSTALLED TO PERMIT REMOTE GREASING OF THE STERN PLANES AND RUDDER CONNECTING RODS. THE FAIRWATER OR BOW PLANES CONNECTING ROD MAY BE GREASED LOCALLY WHILE UNDERWAY ON THE SURFACE EVEN IF REMOTE GREASING ALTERATION IS NOT INSTALLED.**
- NOTE 2: IF THE STERN PLANES ARE SUSPECTED OF CAUSING THE NOISE AND THE NOISE DID NOT DIMINISH AFTER GREASING THE STERN PLANE COMPONENTS, GREASE THE RUDDER COMPONENTS. IF THE GREASING DID NOT HELP A SUSPECTED NOISY RUDDER, GREASE THE STERN PLANES.**

Deliver this questionnaire to:

For COMSUBLANT units:

Carderock Division
Naval Surface Warfare Center
9500 MacArthur Blvd.
West Bethesda, MD 20817-5700
Attn: Code 711 - Fleet Support Program Manager
For: New London Units, data packages should be
forwarded to:
NSSC NEW LONDON CT, N42

For COMSUBPAC units:

Naval Surface Warfare Center
Carderock Division
Bremerton Detachment
530 Farragut Ave
Attn: Code 713
Bremerton, Washington 98314-5215

The NSWCCD will provide appropriate distribution to NAVSEA PMS 350, SEA 07T, PMS 392, TYCOM, and ISIC.

(CONFIDENTIAL when filled in)

Enclosure (3)

APPENDIX D**PREDEPLOYMENT NOISE INSPECTION**

1. Purpose. To provide requirements for Predeployment Noise Inspections.
2. Policy. This Appendix establishes the requirements for the Under Hull Sound Silencing Survey of all submarines.
3. Under Hull Sound Silencing Surveys. Under Hull Sound Silencing Surveys of submarines (using reference (g)) will be done at the following times:
 - a. Prior to the ship leaving dry-dock.
 - b. Waterborne Under Hull Inspection during the first week of a scheduled upkeep, normally accomplished by the inspecting facilities divers.
 - c. Waterborne Under Hull Inspection prior to deployments of 30 days or greater, normally accomplished by the inspecting facilities divers.
4. Reports. The Senior Hull Inspector of the inspecting facility will conduct an inspection critique for the ship's Noise Reduction Officer and ISIC Material Officer. Copies of the final survey report (a format is provided on the following page) or reference (g) data sheets will be supplied by the inspecting facility to the submarine and cognizant ISIC Material Officer.

SOUND SILENCING SURVEY REPORT

1. Inspection performed by:

Senior Inspector: _____

Inspector #1 _____

Inspector #2 _____

Inspector #3 _____

Inspector #4 _____

2. The following deficiencies were noted:

3. Submitted by:

Senior Inspector

APPENDIX E

SUBMARINE SILENCING PUBLICATIONS

X-Applicability

PUBLICATION Note 1	688	726	21	774	AS
<u>PLATFORM NOISE</u>					
S9073-A4-SNC-010/(C) USS <i>LOS ANGELES</i> (SSN 688) Class Acoustic Stealth Manual	X				X
NSWCCD-71-TR-2001/020 February 2001 USS <i>SEAWOLF</i> (SSN 21) Class Acoustic Stealth Manual			X		
S9073-AS-PNM-010/(C) Platform Noise Monitoring Analysis for Noise Reduction					X
S9073-AT-PNM-010/(C) Platform Noise Monitoring Analysis for Noise Reduction		X			X
NAVSEA SE 394-NO-MMA-030/(C) AN/BSQ-7 Platform Noise Manual					X
(TBD) Platform Noise Monitoring Analysis for Noise Reduction			X(4)	X(4)	
<u>MACHINERY AND HULL VIBRATION</u>					
S9073-AL-SBV-010/(C) Structureborne Noise Criteria for Auxiliary Machinery (U) Operation and Maintenance Instructions		X	X(4)	X(4)	X
S9073-AM-SBV-010/(U) Structureborne Noise Acceptance Tests and Monitoring Program for Submarine Auxiliary Machinery (U) Volume I, Procedure (U)	X		X(4)	X(4)	X
S9073-AM-SBV-020/(C) Structureborne Noise Acceptance Tests and Monitoring Program for Submarine Auxiliary Machinery (U) Volume II, Criteria	X		X(4)	X(4)	X
<u>SUBMARINE SONAR DOMES</u>					
S9165-AC-HBK-010/(U) Submarine Sonar Dome Handbook; Description and Maintenance	X	X	X(4)	X(4)	X
SE300-AY-MMA-010/(U) TRIDENT Glass Reinforced Plastic Bow Sonar Dome		X			X
SE300-AZ-MMA-010 Description, Operation and Maintenance SSN21 Class Sonar Bow Dome			X		
SE300-MA-MMA-011 Glass Reinforced Plastic (GRP) Bow Sonar Dome	X				
<u>MISCELLANEOUS NAVSEA NOISE REDUCTION MANUALS</u>					
S6360-AD-HBK-010 Special Hull Treatment, Maintenance and Repair for Submarines	X	X	X(4)	X(4)	X
S9311-AM-MME-010/(U) Microbalancing of Ship Service Turbine Generator Sets on SSN/SSBN Submarines	X	X	X(4)	X(4)	X

X-Applicability

PUBLICATION Note 1	688	726	21	774	AS
S9561-AQ-MMA-010/(U) Low Noise Electrohydraulic Flow Control Servo Valve Model SV-438-10P; Service Instructions					X
S9073-AW-SNC-010/(U) Ship Acoustical Surveys for Submarines		X	X	X	X
S9073-AF-SNC-010/(C) Ship Noise Control	X	X	X(4)	X(4)	X
S9SSB-X9-SSM-09A/(U) SSBN 726 Class Ship System Manual, Volume II, Part IV, Monitoring Subsystem Note 2		X			X
0900-LP-060-2010(U) Electrical Machinery Repair Manual, Volume I, Electric Motor Repairs (Rev 2)					X
0900-LP-060-2020(U) Electrical Machinery Repair Manual, Volume II, Vibration Analysis and Rotor Balance					X
S0600-AA-PRO-230(U) Underwater Ship Husbandry Manual, Chapter 23, Submarine Pre-Deployment Noise Inspection	X	X	X(4)	X(4)	X
<u>MIPs FOR NOISE MONITORING</u>					
Platform Noise Monitoring MIP SO-544/902	X	SSGN Only	X	X	
TRIDENT Monitoring Subsystem 4190/911 (contains platform monitoring)		X			
Topside and Housekeeping Surveys, reference (g)	X	X	X(4)	X(4)	
Isolation System Survey, Appropriate System MIPs					
Topside and Housekeeping Surveys MIP SO-591/901			X	X	
Vibration Noise Monitoring MIP 4910/Series, See Note 3 (Machinery and Hull)	X	X	X(4)	X(4)	
<u>NOISE CONTROL GUIDELINES</u>					
0900-LP-093-9010/(C) Noise Control Guide for SSBN 640 Class					X
Specifically Applicable Noise Road Maps (Selected Record Drawings)	X	X	X	X	X
<u>TRIAL REPORTS</u>					
NSWCCD or NSWCCD DET BREMERTON: Latest Detection & Detectability Report	X	X	X	X	
NSWCCD or NSWCCD DET BREMERTON: Latest Acoustical Trial Summary Report	X	X	X	X	

X-Applicability

PUBLICATION Note 1	688	726	21	774	AS
<u>LETTERS AND INSTRUCTIONS</u>					
NAVSEAINST C9073.2 (Series) Acoustical Surveys of Submarines (U)	X	X	X	X	X
COMUSFLTFORCOMINST 4790.3; Joint Fleet Maintenance Manual Volume VI, Chapter 23, Submarine Noise Reduction	X	X	X(4)	X(4)	X
<u>NAVSEA SILENCING FILMS</u>					
34547 DN Training Film - Submarine Sound Shorts					X
35350 DN Training Film - Noise Control Guidelines, Running Silent					X
35050 DN Training Film - Shipboard Noise Isolation Devices					X
SAVPIN 803414 DN Sound Silencing Show (Video Tape) - consists of the three films listed.					X
SVT - ST - 9427 - Submarine Rattles	X	X	X	X	X
SVT - ST - 9429 - Submarine Sound Silencing (SSN 688)	X				X
SVT - ST - 9430 - Submarine Sound Silencing (SSBN 726)		X			X
SVT - ST - (TBD) - Submarine Sound Silencing (SSN 21)			X		X
SVT - ST - (TBD) - Submarine Sound Silencing (SSN 774)				X	X

NOTE 1: THE STOCKING OR ORDERING POINT FOR ALL PUBLICATIONS CAN BE FOUND USING TECHNICAL DATA INFORMATION MANAGEMENT SYSTEM (TDMIS)

NOTE 2: THE ORDERING POINT FOR THE ITEM WITH THIS NOTE IS SUPERVISOR OF SHIPBUILDING GROTON

NOTE 3: SPECIFIC MAINTENANCE REQUIREMENTS FOR CONSIDERATION IN THIS LISTING ARE FOR:

- A. INSPECT, CLEAN & REPLACE SOUND WASHERS.**
- B. RECORD MACHINERY VIBRATION LEVELS.**
- C. RECORD HULL VIBRATION LEVELS.**

NOTE 4: APPLICABLE, BUT MAY NOT CONTAIN ALL APPLICABLE INFORMATION UNTIL UPDATED FOR SPECIFIC CLASS

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APPENDIX F**SAMPLE PROPELLER CHANGEOUT MESSAGE**

FM COMSUBRON (AS APPROPRIATE)//
TO COMNAVSEASYS COM WASHINGTON DC//
INFO COMSUBPAC PEARL HARBOR HI//
COMSUBLANT NORFOLK VA//
USS (SHIP'S NAME AND HULL NO.)//
BT
UNCLAS //N09245//
MSGID/GENADMIN/COMSUBRON (AS APPROPRIATE)//
SUBJ/(SUBS) PROPELLER CHANGEOUT//
REF/A/DOC/COMUSFLTFORCOMINST 4790.3//
NARR/REF A IS JOINT FLEET MAINTENANCE MANUAL/VOL VI, CH 23 PROVIDES
GUIDANCE FOR MONITORING PROPELLER VIBRATION DATA AND PROPELLER
CHANGE OUT//
RMKS/1. IAW REF A, FOL PROPELLER DATA REPORTED
 A. SERIAL NO. OF PROPELLER REMOVED
 B. SERIAL NO. OF PROPELLER INSTALLED
 C. REASON PROPELLER REPLACED
 (Poor performance, excessive cavitation, gouged/nicked,
 singing screw, etc.)
2. REQUEST DISPOSITION INSTRUCTIONS FOR REMOVED PROPELLER//
BT

**NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT
AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS
UTILIZED.**

VOLUME VI**CHAPTER 24****PERIODIC MAINTENANCE REQUIREMENT PROGRAM**REFERENCES.

- (a) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
- (b) NAVSUP Publication 485 - Afloat Supply Procedures
- (c) OPNAVINST 3120.33 - Submarine Engineered Operating Cycle (SEOC) Program
- (d) NAVSEA S9592-B3-MAN-010 - Dry Deck Shelter Systems Scope of Certification Notebook

LISTING OF APPENDICES.

- A Submarine Periodic Maintenance Requirement (PMR) Management Process
- B Work Package Supplement - Shipyard Planning and Feedback Report
- C Work Package - Ship's System Work Description, Part 4.13

24.1 PURPOSE. This chapter defines the functions and responsibilities of the submarine Periodic Maintenance Requirements (PMR) Program, and applies to all submarines. Details of PMR documentation are described in Appendix C of reference (a). Unrestricted Operation (URO) PMR guidance is provided in Chapter 25 of this Volume. Hull Integrity Procedure PMR guidance is provided in Chapter 38 of this Volume. Accomplishment of all PMRs is **mandatory**.

- a. The submarine Class Maintenance Plans (CMP) form the basis of a PMR Program which takes the place of the Integrated Maintenance and Modernization Planning Program for these classes and defines the planned, corrective and inactive equipment Maintenance Requirements for all levels of accomplishment.
- b. PMR work requires detailed planning and long lead-time material procurement; therefore, all PMR work has been assigned to the Fleet Maintenance Activity (FMA). Ship's Force is not expected to be called upon for PMR work other than the normal responsibilities for establishing plant conditions, authorizing shipboard work, monitoring work in process, interference removal, delivery of ship to shop items, retesting and accepting work. Ship's Force Work Center (WC) will not be assigned as Lead Work Center (LWC) for I-Level PMR work but may be assigned as an assist WC.

24.2 TYPE COMMANDER SCHEDULING SYSTEM. PMR program management has been assigned to Submarine Maintenance Engineering, Planning and Procurement Activity (SUBMEPP) who develops CMPs, Maintenance Requirement Cards (MRC), Maintenance Repair Standards (MRCs, Technical Repair Standards (TRS) and Submarine Maintenance Standards (SMS)), HIP and URO MRCs, and provides PMR configuration and scheduling information to the Submarine Force. These Inventories and Schedules aid in decisions

concerning PMR scheduling and accomplishment during upkeep, provide visibility to problem areas and facilitate auditing and assessing the material condition of a ship.

- a. For Non-SSBN and SSGN 726 Class submarines. The inventories and schedules include a section of I-Level PMRs coming due within the next xxx months (number of months as requested by ISIC). Additionally, they provide a combined inventory of I and D-Level PMRs. This inventory identifies the availability for which the D-Level PMRs are planned for accomplishment.
- b. For SSBN 726 and SSGN 726 Class submarines and Dry Deck Shelters. This inventory provides all I and D-Level requirements, with their due dates.

24.2.1 Periodic Maintenance Requirements Schedule. The PMR Inventories and Schedules are made available from Maintenance & Ship Work Planning Reports at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm> by SUBMEPP. Appendix A of this chapter provides a flow chart of the Submarine PMR Management System. In addition, scheduling files, configuration files (M79E11) and Master Job Catalog (MJC) update files are distributed to those activities using Micro-PMR for PMR or URO call-down.

24.2.2 Scheduling Periodic Maintenance Requirements Work. The PMR scheduling system is based on calendar periods starting with the month following the completion month of a scheduled Chief of Naval Operations (CNO) Availability, or starting with the month following PMR completion for Fleet availabilities. It is designed to ensure reliable equipment operation during the unit's extended operating cycle. The ISIC, in conjunction with the FMA, will have to smooth the workload by spreading the work over several availabilities by re-planning the scheduled start and completion dates of individual Job Control Numbers (JCN) to ensure they are accomplished prior to the due dates. Once the actual completion dates are reported, subsequent scheduling for the future periods will retain the same relative time frames based on the periodicity of the requirement. The current PMR Inventories and Schedules provided by SUBMEPP must be maintained by the parent ISIC.

24.2.3 Periodic Maintenance Requirements Calldown and Brokering. I-Level PMRs which are due for accomplishment are called down from Maintenance and Shipwork Planning (M&SWP) or the local scheduling system, and brokered by the ISIC. PMRs should be screened to the FMA with a Priority Level of 2.

24.2.4 Calculating Adjusted Last Maintenance Action Date.

- a. If the PMR is accomplished during a Fleet availability (Fleet Maintenance Activity (FMA), Refit, Voyage Repair, Planning), the adjusted Last Maintenance Action (LMA) date will be the first of the month following the completion date listed on the PMR data form.
- b. If the PMR is accomplished during a CNO Availability (Selected Restricted Availability, Interim Drydocking, Extended Refit Period, Depot Modernization Period (DMP), Engineered Refueling Overhaul or a Major Maintenance Period (treated as a CNO availability for scheduling purposes only)), the adjusted LMA date will be the first of the month following the scheduled availability's actual completion date.

NOTE: IMMEDIATE SUPERIORS IN COMMAND (ISIC) OPERATING WITH THE ON-SITE PMR SCHEDULING SYSTEM MUST ENSURE THAT AVAILABILITY DATES ARE ACCURATELY MAINTAINED SO THAT COMPLETED AWR UPLINE REPORTED DATA REFLECTS THE ADJUSTED LMA DATE AND ON-SITE PMR SCHEDULING RECORDS CALCULATE THE PROPER NEXT DUE DATE.

24.2.5 Calculating Due Dates. Next Due Dates are calculated based on an Adjusted LMA date. Due dates are calculated, for scheduling purposes, by taking the adjusted LMA date month **and** year (number) and adding the periodicity months (number) to show the month **and** year due (i.e., an item with an adjusted LMA date of February 2003 (2/03) with a six-month periodicity would be due in August 2003 (8/03). The PMR will be accomplished prior to midnight of the last calendar day of the month due.

24.3 PERIODIC MAINTENANCE REQUIREMENTS ACCOMPLISHMENT. PMR requirements are to be accomplished on or before the scheduled due date listed in the SUBMEPP TYCOM PMR Scheduling System Inventories and Schedules. Accomplishment of all PMRs is **mandatory**. Only by accomplishing PMR maintenance on schedule and **following** specifications can safe and reliable operation be ensured and the period between CNO Availabilities be extended. When PMRs cannot be accomplished by their scheduled due date, they will appear overdue on the PMR Status web page. For overdue PMRs, the SUBMEPP representative assigned to each ISIC **must** identify on the web page the reasons the PMR could not be accomplished. The purpose of the web page is to provide increased visibility of overdue PMRs to aid the ISIC in their PMR Management responsibilities.

24.4 MATERIAL SUPPORT FOR FLEET MAINTENANCE ACTIVITY ACCOMPLISHED PERIODIC MAINTENANCE REQUIREMENTS.

24.4.1 Mandatory Parts. Parent FMAs requisition mandatory parts as specified on TRS, MRC **or** SMS documentation for PMRs that are scheduled to be accomplished by that FMA. Material requisitioning is accomplished by the FMA using standard supply procedures. Material is not normally stocked by the FMA and is requisitioned from the nearest stocking point.

24.4.2 Contingency Parts. Contingency parts will not be procured in advance for PMR requirements and will be ordered only upon determination that a contingency part is required based on observed equipment condition. Parent FMAs may have some high usage contingency material available in stock, as identified by the Tender Load List supplements, **(not applicable to SSBN or SSGN 726 Class submarines)** however, low usage contingency material is stocked only at designated stock points or not at all.

24.4.3 Requisitioning Procedures. Submarine Engineered Operating Cycle (SEOC) PMR material requisitions **must** be submitted through normal channels and **must** use a Project Code of "732". Appendix 6 of Reference (b) refers. Contingency material requisitions **must** be forwarded by message or telephone, and **must** include appropriate "work stoppage" indicator **or** codes. Forward Contingency Material requisitions directly to, Fleet Industrial Support Center San Diego, Pearl Harbor or Submarine Base New London by message or telephone as appropriate; use the phrase "SEOC Requisition" as the subject line on message requisitions.

24.4.4 Material Support Provided by the Advance Equipment Repair Program. Shore based spares are available for replacing some critical equipment, such as seawater system pumps and

motors, during CNO Maintenance Availabilities. The Advanced Equipment Repair Program (AERP) is managed by SUBMEPP under the direction of Naval Sea Systems Command (NAVSEA) and both TYCOMs. AERP equipment scheduled for change-out will be specifically authorized in the ship's Availability Work Package (AWP). Although originally intended to support CNO Availabilities, AERP assets, when available, are used to support Casualty Reports (CASREP). In these instances, a CASREP requisition must be submitted to Naval Inventory Control Point and the shipment of equipment is monitored and tracked until the condition "F" off-load has been returned to the refurbishment activity **or** vendor identified by Naval Inventory Control Point. The expedited return of an AERP off-load is essential to ensure adequate restoration turnaround time is afforded and to minimize AERP impact.

24.4.5 Material Support Provided by the TRIDENT Planned Equipment Replacement Program.

- a. TRIDENT Planned Equipment Replacement (TRIPER) is a rotatable pool program for SSBN **726 and** SSGN 726 Class submarines. TRIPER equipment is removed from the ship via pre-planned access routes and six-foot diameter Logistics and Escape Trunks, using specifically designed handling attachments and procedures. Removed equipment is replaced with fully interchangeable, tested, ready for issue units which can be rapidly installed and made fully operational within a refit period. Equipment replacement periodicity is determined by maintenance and reliability analysis and engineering judgments intended to preclude equipment failure or significant degradation during operational periods. Removed equipment is refurbished by approved Designated Overhaul Points, tested and returned to ready for issue condition for use on another SSBN **726 or** SSGN 726 Class submarine.
- b. Safety spares are made available for CASREPs which are considered as unplanned change outs. The TRIPER Program rotatable pool is managed by NAVSEA (PMS 392) and supported by various agencies and activities. Hull, Mechanical, Electrical, Ordnance and Electronics and Command and Control System equipment comprise the TRIPER inventory pool. Items under the cognizance of the Director, Strategic Systems Project Office and the Deputy Commander, NAVSEA Nuclear Power Directorate are excluded.

24.5 CORRECTIVE MAINTENANCE OF EQUIPMENT USING PERIODIC

MAINTENANCE REQUIREMENTS. Scheduled restoration of equipment by the FMA or industrial activity is done **following** specified maintenance standards (MRC, SMS, TRS, Technical Manual, etc.). Whenever corrective maintenance is required on Hull, Mechanical and Electrical equipment, the SUBMEPP combined I and D-Level PMR inventory **must** be reviewed by the ISIC and FMA. The ISIC and FMA will determine whether to limit repairs to those described by the ship or to have the maintenance standard accomplished. If the corrective maintenance is to include the criteria of the MRC, SMS or TRS, the work request **must** be processed **per** paragraph 24.8.3 and 24.8.4 of this chapter.

NOTE: IN ORDER TO RECEIVE ACCOMPLISHMENT CREDIT, THE ISIC **MUST ENSURE PROMPT COMPLETION REPORTING OF THE PMR. THIS WILL ENSURE THE CORRECT SCHEDULING OF PMRs FOR FUTURE ACCOMPLISHMENT.**

NOTE: EQUIPMENT IS CONSIDERED TO HAVE BEEN RESTORED FOLLOWING PMR CRITERIA WHEN THE FOLLOWING SOFTWARE (MRC, SMS, TRS) REQUIREMENTS HAVE BEEN SATISFIED.

- (1) THE EQUIPMENT IS RESTORED TO PLAN SPECIFICATIONS.**
- (2) THE COMPONENTS SATISFACTORILY PASS THE TEST REQUIREMENTS WITHIN THE MRC, SMS OR TRS.**
- (3) ALL MATERIAL LISTED ON THE MRC, SMS OR TRS AS MANDATORY HAS BEEN REPLACED.**
- (4) COMPONENTS AND EQUIPMENT ARE REPLACED WITH SUPPLY SYSTEM, AERP, OR TRIPER ASSETS.**

24.6 PERIODIC MAINTENANCE REQUIREMENTS ACCOMPLISHMENT DURING CHIEF OF NAVAL OPERATIONS MAINTENANCE AVAILABILITIES. PMRs to be accomplished by the industrial activity will be included in the SUBMEPP PMR Inventories and Schedules.

a. For SSN 688, SSN 774 and SSN 21 Class submarines:

- (1) The AWP prepared by SUBMEPP will reflect all PMRs authorized for shipyard accomplishment during the CNO Availability period at the AWP Ship Work List Item Number (SWLIN) level. The Work Package Supplement (WPS) accompanying the AWP will identify a specific PMR to the applicable AWP SWLIN paragraph. Appendix B of this chapter provides an example of the WPS format. In addition, the DMP and overhaul AWP will contain an I-Level PMR work package cross-index. This cross-index will enable maintenance planners to readily determine the I-Level PMRs accomplished incidental to accomplishing higher D-Level PMRs or other industrial activity authorized work. The cross-index will also identify I-Level PMRs which will become overdue by availability completion plus six months. These I-Level PMRs should only be listed in the cross index as a reference and not listed in the body of the AWP. Appendix C of this chapter provides an example of the cross-index format. This ISIC will report any I-Level PMRs from the cross-index that will not be completed prior to the arrival conference for adjudication.
- (2) Upon receipt of Issue Two of a 6 month or greater scheduled CNO availability AWP the ISIC will review the AWP against the schedules and inventories and add those PMRs not covered by the Work Package (WP) coming due within 6 months after availability completion that aren't assigned to shipyard to a fleet maintenance availability prior to the CNO period, to a concurrent availability, or to a future availability with TYCOM concurrence.
- (3) For I-Level PMRs assigned to the depot, or I-Level PMRs covered by higher-level maintenance assigned to the depot, the ISIC will enter "Assigned to <depot name> by AWP <AWP number>" in the Remarks or Completion block of the PMR Schedule and Inventory, Part 2 Section III and in the local scheduling system.

- (4) Completions and MCA data for PMRs accomplished by the industrial activity during CNO Availabilities will be retrieved from the appropriate maintenance database. The WPS, or comparable report, annotated by SUBMEPP to show PMR completions and material condition feedback categories, will be retained by SUBMEPP upon completion of the availability. The PMR Schedule and Inventory and local scheduling system will be updated by SUBMEPP.
- b. For SSBN 726 and SSGN 726 Class submarines:
 - (1) The Engineered Overhaul Work Package prepared by SUBMEPP will reflect all PMRs authorized for accomplishment during the CNO Maintenance Availability period at the SWLIN level. For each SWLIN, the specific PMRs will be identified to the applicable component level. The Engineered Overhaul Work Package preparation process ensures all PMRs due prior to the first availability following the subject availability period are included in the Engineered Overhaul Work Package. The preparation process also includes review and inclusion of appropriate items from the ship's Current Ship's Maintenance Project (CSMP), Ship's Force originated deficiencies, and alterations screened for industrial activity accomplishment.
 - (2) Completions and Material Condition Assessment data for PMRs accomplished by the industrial activity during CNO Availabilities will be retrieved from the appropriate maintenance database. The WPS, or comparable report, annotated by SUBMEPP to show PMR completions and material condition feedback will be retained by SUBMEPP upon completion of the availability. The PMR inventories and schedules and local scheduling system will be updated by SUBMEPP.
 - (3) Completions and MCA data for PMRs accomplished by TRIDENT Refit Facility Kings Bay or NAVIMFAC PACNORWEST during CNO availabilities will be called down and reported using their local scheduling system as identified in paragraph 24.2.3 of this chapter.
- c. Operating Cycle and Interval Extension. An audit plan to assess the material condition of a ship prior to extending their operating cycles or intervals beyond PMR periodicity due to changing CNO Maintenance Availability dates is addressed in reference (c). Procedures and responsibilities are contained in Volume II, Part I, Chapter 3 of this manual.

24.7 PERIODIC MAINTENANCE REQUIREMENT ACCOMPLISHMENT DURING DRY DECK SHELTER MAINTENANCE AVAILABILITIES.

24.7.1 Regular Overhaul.

- a. The AWP prepared by SUBMEPP will reflect all PMRs authorized for accomplishment by the Industrial Activity (IA) during the regular overhaul (ROH) period. The Work Package Supplement (WPS) accompanying the AWP will identify a specific PMR to the applicable AWP SWLIN paragraph. Appendix E of this chapter provides an example of the WPS format.

- b. During the ROH, the IA **must** use the WPS to document completion of PMRs by annotating in the remarks block of each line item, the Task Group Instruction (work package) used to accomplish the PMR. The IA will provide a copy of the completed WPS along with all OQE to the sustaining activity at the completion of the ROH. At the end of the availability, the IA also provides a Certificate of Completion (COC) letter detailing the status of all work and testing accomplished. Within the COC, the IA **must** make a positive statement that each PMR identified under tasking has been completed by separate line items. If a PMR is not accomplished in its entirety or is changed, the IA **must** include this information by annotating the applicable line item within the COC and in the remarks block of the WPS. PMRs not accomplished in their entirety also require an evaluation be performed to determine if a departure from specification (DFS) will be required.
- c. After completion of overhaul and upon receipt of the WPS and COC from the IA, the sustaining activity **must** make red-line changes to the local copy of the PMR I-level or D-level inventory and submit these updates to SUBMEPP via the ISIC.

24.7.2 Restricted Availabilities (RAV). For restricted availabilities, the sustaining activity and ISIC **must** identify PMRs to be assigned to the IA and forward a list to the TYCOM via formal correspondence. TYCOM will evaluate the request and may approve or modify it as necessary by issuing an endorsement letter to PMS399 who initiates the work by tasking the IA **following** the current contract requirements. PMR completion reporting is then accomplished following the guidelines of paragraph 24.7.1.b. and 24.7.1.c. of this chapter except the WPS is not used. In this case, the COC and supporting OQE will be the only required documents to verify completion status of each PMR.

24.8 RESPONSIBILITIES.

24.8.1 Type Commander.

- a. The TYCOM is responsible for providing an overall scheduling system for the accomplishment of PMRs for assigned ships.
- b. Perform periodic audits of ISICs and FMAs to verify full compliance with the provisions of this chapter.
- c. Provide guidance to the ISICs, obtaining NAVSEA concurrence **per** Volume V, Chapter 8, paragraph 8.2.4 of this manual.

24.8.2 Submarine Maintenance Engineering, Planning and Procurement Activity.

- a. Receive reports of the completion of PMRs from industrial activities and extract Maintenance and Material Management (3-M) data from NAVSEA Logistics Center, Mechanicsburg PA of all Forces Afloat accomplished PMRs containing "JC" WC.
- b. Review completion reports for any change in material condition status and analyze 3-M data for Material Condition Assessment to determine validity of requirements.
- c. Update schedules to reflect new LMA and next due dates.
- d. Ensure the PMR Inventories and Schedules are available on <https://ebusiness.navy.mil/eBusiness/index.cfm>.

- e. Provide quarterly or more frequent (if requested) scheduling **and** configuration files (M79E11) and MJC update files to each parent ISIC using a local scheduling system.
- f. Provide quarterly MJC update files to the ISIC brokering systems.
- g. Adjust the due dates for any PMRs that are accomplished within ten months of the major CNO availability start date that will come due again during the availability by the number of months of the availability duration.
- h. (SSBN **726 and** SSGN 726 Class submarines) Provide Refit Work Package electronic files which reflect PMR scheduling to the TRIDENT Refit Facility Kings Bay at the arrival minus 60-day milestone.
- i. Prepare and issue AWP in support of CNO availabilities. Ensure the I-Level PMR section of AWP (Part 4.13) is updated on each issue of the AWP.
- j. Manage AERP, Corporate Component Repair Program **and** TRIPER programs.
- k. Extract PMR completion verification and documentation for SEOC availabilities from the appropriate maintenance database.
- l. Update Overdue PMR Status web page (https://ebiz.submepp.navy.mil/fs/pmr_status/) with the reason for D-Level PMRs not meeting the due date.

24.8.3 Immediate Superior In Command.

NOTE: FOR DRY DECK SHELTERS, THE ISIC IS RESPONSIBLE FOR SCHEDULING AND ENSURING COMPLETION OF ALL PMR WORK.

- a. Although the responsibility for the accomplishment of PMRs must rest with the ship's Commanding Officer, the ISIC is responsible for scheduling and ensuring completion of all I-Level PMR work within the planned periodicity in the CMP. Normally, PMR work is accomplished by the FMA which maintains the unit's CSMP. However, when submarines are assigned availabilities to other than the parent FMA, and that FMA is authorized by the TYCOM to perform PMRs, an agreement between the parent ISIC and the accomplishing FMA will identify the PMRs to be accomplished and any associated logistics.
- b. For submarines, call-down all I-Level PMRs planned for accomplishment into the CSMP by availability dates. For SSBN **726 and** SSGN 726 Class submarines, this **must** be 45 days prior to refit start. For non-726 Class submarines, 60 days prior to fleet maintenance availability. This ISIC must be proficient in these procedures to preclude erroneous or duplicate data from entering the CSMP. If the inventories and schedules contain errors **or** omissions, report the discrepancies to SUBMEPP.
- c. Maintain auditable records of PMR accomplishment for each submarine or DDS. These records will include the current SUBMEPP Quarterly PMR Inventories and Schedules. For submarines, this will also include the last completed AWR for PMRs completed by the parent FMA, whether or not reflected in the SUBMEPP Quarterly PMR Inventories and Schedules. At sites which have access to electronic certified Task Group Instructions, these Task Group Instructions can be used in place of completed AWRs as an auditable record of PMR accomplishment.

- d. At Naval Intermediate Maintenance Facility Pacific Northwest, PMR and non-controlled URO inspection scheduling, completion, LMA date establishment and next due date scheduling **must** be maintained in the appropriate automated database for SSBN 726 and SSGN 726 Class submarines. This database will contain the complete history for all occurrences (past), dates of completion, frequency of occurrence, next due dates and future scheduling data for each PMR **or** non-controlled URO inspection. Data will be entered from Objective Quality Evidence from refit closeout processes and the Departure and Assessment report.
- e. Notify SUBMEPP Code 1814 if unable to create PMR Inventories and Schedules from Maintenance & Ship Work Planning Reports (M&SWP) at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm>.
- f. Keep the local scheduling system correct and accurate. This should be done by periodically doing a check of the data against the inventories and schedules, M&SWP and, for submarines, the ship's CSMP. Ensure the SUBMEPP representative assigned to each ISIC updates the Overdue PMR Status web page (https://ebiz.submepp.navy.mil/fs/pmr_status/) with the reason for I-Level PMRs not meeting the due date.
- g. The ISIC should make every attempt to accomplish PMRs on or before the next scheduled due date that appears in SUBMEPP Inventories and Schedules. Ensure PMRs which are not accomplished by the SUBMEPP scheduled due date are rescheduled.
- h. Ensure that all I-Level PMRs, which will become due during a scheduled CNO Availability (but not authorized for industrial activity accomplishment), are scheduled for accomplishment by the FMA prior to the end of the availability. The PMRs may be assigned to an FMA concurrent availability with an end date the same as the CNO availability. This will allow for a more appropriate Adjusted LMA Date.
 - (1) Any I-Level PMR that is overdue by the availability start date minus 6 months and is identified in the AWP **or** WPS by SUBMEPP to be accomplished by the industrial activity does not have to be done prior to the availability start. This includes I-Level PMRs for which the higher tier D-Level PMR is authorized in the AWP **or** WPs.
 - (2) Notify the TYCOM representative at the Pre-Arrival Conference of any I-Level PMRs that will either not be accomplished prior to the availability start date or will become due during the availability.
 - (3) Any PMR accomplished within ten months prior to start of a major CNO Availability that becomes due again during the availability, will have their scheduled due date adjusted by SUBMEPP by the number of months of the availability duration.
- i. Review completed AWRs or electronic certified Task Group Instructions prior to closeout of PMRs to resolve any discrepancies.
- j. Transferring Periodic Maintenance Requirements to other Fleet Maintenance Activities for Accomplishment. When submarine availabilities are accomplished by

other than the parent FMA (whether another FMA in the same geographic area or due to deployment), the parent ISIC will take the following action:

- (1) Coordinate with the parent FMA to select only those PMRs for accomplishment for which all plans and materials will be available and ready for shipment prior to the availability or deployment of the submarine.
- (2) Dispatch a message to the submarine, the recipient squadron and FMA identifying by JCN the PMRs to be accomplished, confirming that plans and materials are being shipped or will be carried by the deploying submarine and that the submarine's total CSMP tape will be either retained by the parent ISIC or transferred to the recipient squadron, Regional Support Group or Regional Maintenance Center as mutually agreed prior to the availability or deployment.
 - (a) If the CSMP is retained by the parent ISIC, an AWP tape (MM6031) will be provided to the recipient FMA which will maintain it as I-Level (only AWR completions for the tended submarine accomplished by the FMA will be passed upline). The submarine will forward all 3-M transactions to the parent ISIC.
 - (b) If the total CSMP is transferred, the recipient FMA will maintain it as level II (the submarine will pass all 3-M transactions to the availability FMA). In addition, the PMR configuration and scheduling file will be transferred to the recipient FMA for URO, PMR and Calibration scheduling purposes.
 - (c) When the submarine departs from the tending FMA, the CSMP and PMR data files will be updated and returned to the parent ISIC with the letter of transfer. FMAs receiving only the work package tape will create a CSMP transfer out tape and transmittal letter for return to the parent ISIC. The parent ISIC Maintenance Document Control Officer (MDCO) will reconcile the master CSMP with the returning submarine's 3-M coordinator.
- (3) Ensure that the FMA properly packages by JCN all materials, plans, drawings, etc., for dispatch to the receiving FMA or for custodial turnover to the submarine's Engineer Officer for delivery to the deployed FMA.
- (4) Ensure MDCO and Analysis, Records and Reports Section (ARRS) takes coordinated action to provide a correct CSMP tape and letter of transmittal. The parent ISIC MDCO must retain copies of transfer-out and in letters for MJC Job Sequence Number control.

NOTE: ONCE A DEFERRAL HAS INITIALLY BEEN ENTERED IN THE COMPUTER AT THE ORIGINATING FMA, IT IS AUTOMATICALLY PASSED TO THE TYCOM MASTER CSMP. SUBSEQUENT TAPE TRANSFERS BETWEEN FMAs WILL NOT CAUSE THE DEFERRAL TO PASS AGAIN TO THE TYCOM PROVIDING THAT MDCO INPUTS THE TRANSFER TAPE (MM6031) TO MAINTENANCE RESOURCE MANAGEMENT SYSTEM (MRMS) PROGRAM 173 NOT 174.

- k. Non-Scheduled Repairs of PMR components. The ISIC must add to the ship's CSMP those PMRs to be accomplished in conjunction with a repair action, in lieu of a repair action, or to be credited subsequent to a repair or replacement action. One of the following actions must be taken by the ISIC and MDCO:
- (1) When a ship's submitted deferral references a PMR for concurrent accomplishment with the repair action, or if ISIC or FMA planners recommend a PMR, the ISIC must make the decision whether or not to invoke the PMR in conjunction with or in lieu of the requested repair. This will result in two AWRs being created. The planner will have work accomplished under one JCN (EA01) and use the second JCN (EAJC) for administrative completion crediting of the PMR.
 - (2) If the repair job has resulted in replacement of the PMR component or if the maintenance standard requirements were completely accomplished prior to retrieving the PMR from the MJC, call down the item from the local scheduling system. The ISIC should instruct FMA to report its completion including the added narrative to identify the originally assigned ship's JCN. Though the materials used cannot be re-identified to the PMR JCN, it is recommended that the total man hours expended also be reported on the PMR AWR or subsequent analysis of required PMR support.
- l. Training. The parent ISIC is responsible to provide assigned ship's training in the TYCOM PMR Scheduling System. Such training should include an overview of the SEOC Program, PMR scheduling products, SMS Library and PMR program accomplishment and reporting systems. Emphasis should be placed on the ship's responsibilities to the PMR program as identified in paragraph 24.8.5 of this chapter.

24.8.4 Fleet Maintenance Activity.

- a. The FMA is responsible for accomplishing all PMR work as scheduled to the required repair standards.
- b. Commence the planning and material procurement function when the PMR is called down by the ISIC from the local scheduling system and brokered to the FMA.
- c. Progress the job, ensuring that the LWC coordinates with ship superintendent and all Assist WCs and that production time and current status is reflected in the local scheduling system.
- d. Complete the job, report its accomplishment and as found material condition feedback code on the AWR. Any significant findings should also be documented on the AWR. The LWC then completes the AWR by filling in action taken codes, signing for completion and then obtains acceptance signature from Ship's Force. The AWR is then returned to ARRS. The ARRS will verify that all participating WCs have documented completion of their assigned tasks and then pass the AWR to the ISIC for review and updating of SUBMEPP inventories and schedules prior to closeout of the AWR by ARRS. The material condition feedback codes are described in Appendix B of reference (a) as part of the action taken code, and are:

NOTE: THE MATERIAL CONDITION FEEDBACK CODES MUST DESCRIBE THE

“AS FOUND” CONDITION OF THE COMPONENTS AND NOT THE AFTER REFURBISHED CONDITION OF THE COMPONENTS.

- (1) Code “A” means the material condition of the component being refurbished could have allowed the PMR to be deferred (extend the periodicity).
- (2) Code “B” means the material condition of the component being refurbished justified the scheduled PMR.
- (3) Code “C” means the material condition of the component being refurbished should have mandated an earlier completion of the PMR (shorten the periodicity).

NOTE: VARIATIONS TO THESE CODES MAY BE DESCRIBED IN INDIVIDUAL PMR MJC NARRATIVES.

- e. ARRS will verify that all participating WCs have documented completion of assigned tasks, Ship’s Force acceptance signature is on AWR and the final action taken code (2 characters) is entered. Prior to closeout of the AWR, ARRS will pass the AWR to the ISIC for review. For MRMS FMA sites, it is essential that ARRS verify that the MRMS Availability file has the proper scheduled completion date and code to identify that it is a scheduled availability. This is done by showing a “Y” in answer to “Is this a CNO Availability” on the appropriate screen.
- f. Adjustments of scheduled start and completion dates of the PMR and factual reporting of status codes.
- g. Review corrective action request submitted by Ship’s Force via an OPNAV 4790/2K to determine if the corrective action is to include the criteria of MRC, SMS or TRS requirements.
- h. If the PMR maintenance procedure has a material condition feedback form, fill out the form and submit **following** the reporting requirements defined in the procedure.
- i. Report to the ISIC when PMRs are met **per** paragraph 24.5 of this chapter, due to the expansion of work boundaries.
- j. At the conclusion of an availability (not later than the Departure and Assessment Conference), in which I-Level PMRs were screened for FMA accomplishment, provide to the ISIC, verbally or by memo, the reason that any PMRs could not be accomplished (e.g., parts, manpower not available) as scheduled.

24.8.5 Submarine Commanding Officer.

- a. The ship’s Commanding Officer is responsible for the execution of PMR work on the ship.
- b. All discovered maintenance deficiencies which affect the equipment and systems covered by the PMR program should be documented to reflect the possible PMR with which the deficiency is associated. This will provide the ISIC with the alternative of simultaneously imposing repairs to the criteria of the specified Maintenance Standard and credit PMR accomplishment.

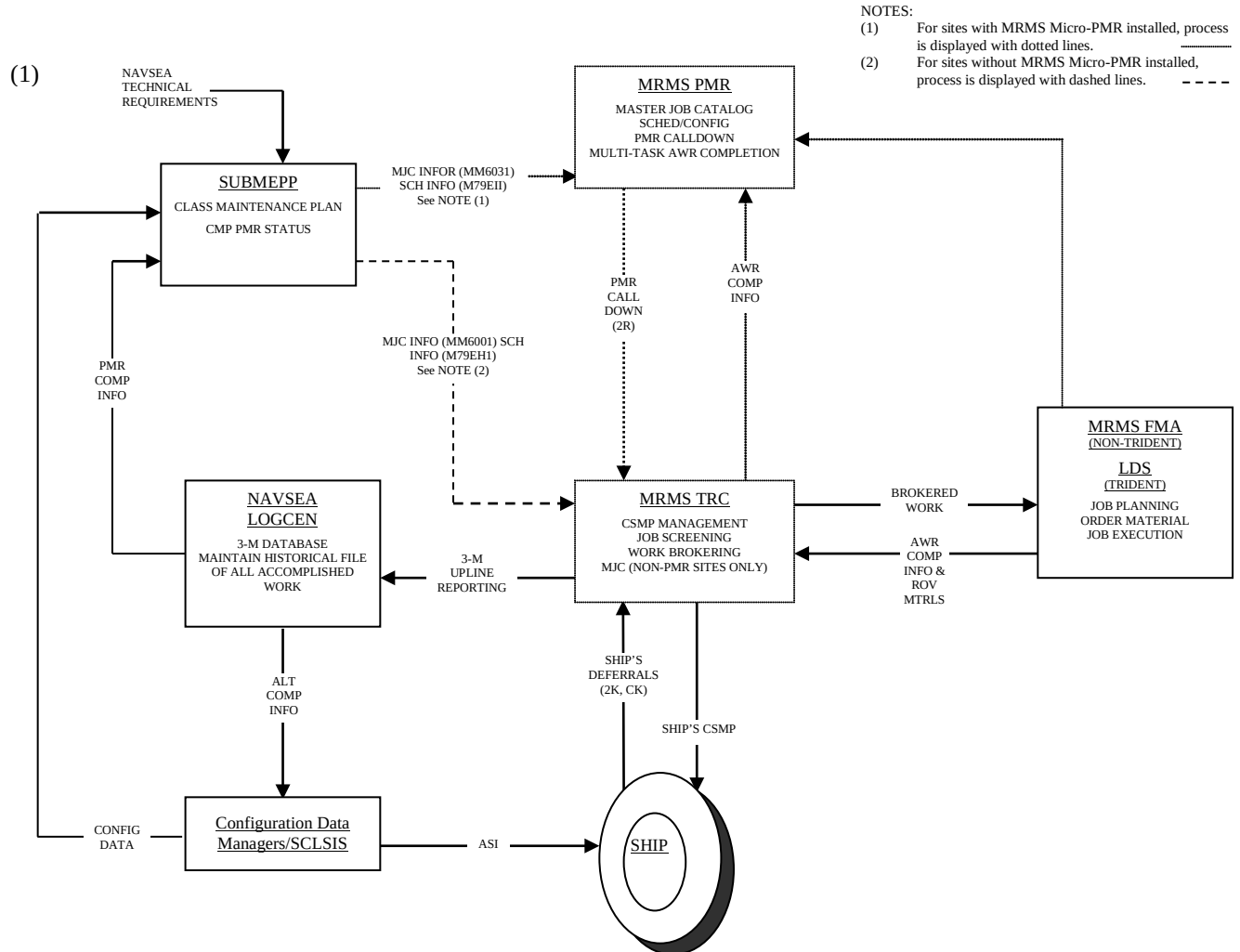
- c. All maintenance deficiencies will reflect in Block 46 (TYCOM SPECIAL PURPOSE), of the OPNAV 4790/2K whether or not quality control and Quality Assurance standards are required.
- d. Review Depot Availability Work Packages and provide comments to the TYCOM and SUBMEPP representatives during the work package review.
- e. Review CSMP reports with parent ISICs prior to upkeep periods in order to assist in planning for accomplishment of required PMR maintenance.
- f. Ensure that the current MRCs, Maintenance Requirements and TRSs applicable to the ship class are carried on board.
- g. Ensure that MRCs, SMSs and TRSs, which provide detailed information and repair guidance, are referenced and used during equipment maintenance.
- h. If Ship's Force accomplishes a repair of a PMR component to an MRC, SMS or TRS, report same to the ISIC Material Officer so that the SUBMEPP can receive credit for accomplishment of PMR per paragraph 24.5.
- i. Ensure all completed AWRs for PMRs are signed as accepted by Ship's Force.
- j. At the conclusion of an availability (not later than the Departure and Assessment Conference), in which I-Level PMRs were screened for FMA accomplishment, provide to the ISIC, verbally or by memo, the reason that any PMRs could not be accomplished (e.g., parts, manpower not available) as scheduled.

24.8.6 Deep Submergence System Commanding Officer.

- a. Ensure all PMRs are accomplished within the required periodicity as specified by SUBMEPP.
- b. Review Depot Availability Work Packages and provide comments to the TYCOM and SUBMEPP representatives during the work package review.
- c. Review the status of PMR maintenance in the SUBMEPP Quarterly PMR inventories and schedules with the ISIC prior to upkeep periods in order to assist in planning for accomplishment of required PMR maintenance.
- d. Ensure that the current SUBMEPP Quarterly PMR Inventories and Schedules CD-ROM, MRCs, Maintenance Requirements and TRSs applicable to the ship class are carried on board.
- e. All maintenance deficiencies which affect the equipment and systems covered by the PMR program should be documented to reflect the possible PMR with which the deficiency is associated. Whenever possible, corrective repairs should be performed to the criteria of the specified TRS in order to credit PMR accomplishment. If Ship's Force accomplishes a repair of a PMR component to an MRC or TRS, report the repair by making redline changes to the local copy of the PMR I-level and D-level inventory and submit to SUBMEPP via the ISIC.
- f. At the conclusion of an availability, review the COC provided by the industrial activity to verify all scheduled PMR work was accomplished. Ensure that redline

| changes are accordingly made to the PMR I-level and D-level inventory and sent to
SUBMEPP via the ISIC.

16 Oct 2019

APPENDIX A**SUBMARINE PERIODIC MAINTENANCE REQUIREMENT (PMR) MANAGEMENT PROCESS**

APPENDIX B

<u>USS (SHIP'S NAME AND HULL NO.) CHGS 010-037 WP</u> <u>PART 4.13 FMA SCHEDULED PERIODIC MAINTENANCE REQUIREMENTS</u> CUT-OFF DATE: <u>1/23/2013</u> <u>WORK PACKAGE STATUS</u> (AUTHORIZED BY)						
SYSTEM ID CHG	GCMA/MRN	COMP ID MA DESCRIPTION	LMA	DUE DATE	MJC#	SWLIN SECT
1110	<u>27.0040.0900</u>	SAFE TRACKS TEST	Apr10	Apr12	N0002WKCC6363	
1110	<u>27.0060.0902</u>	DAVIT TEST; REPAIR	Jul10	Jan13	N0002WKCC6132	
2015	<u>44.2380.0090</u>	HS-607 TEST	May06	May11	N0006EXCAC832	
2015	<u>44.2380.0900</u>	HS-621 TEST	Dec04	Dec09	N0006EXCAC832	
2030	<u>44.2560.0900</u>	HSS-037 TEST	May03	May08	N0006EXCAC830	
2040	<u>29.0040.1300</u>	SNORKL MAST INSPECT	Jul10	Jul12	N0002EACC8973	
2070	<u>70.0140.1627</u>	GMS8A01 CONDUCT VISUAL INSPECTION	Jan11	Jan12	N0002EMCC6141	
2080	<u>70.0380.1627</u>	GCF8A01 CONDUCT VISUAL INSPECTION	Jan11	Jan12	N0002EMCC6145	
2090	<u>37.0020.22A2</u>	PUMP-1 INT REPLACE INGERSOL RAND MSW PUMP PARTS (DESIGN B)	Apr09	Apr12	N0002EMCC6241	
2090	<u>44.2380.0900</u>	MSW-035 TEST	Mar08	Mar12	N0006EXCAC729	
2090	<u>44.2380.0900</u>	MSW-036 TEST	Mar08	Mar12	N0006EXCAC729	
2090		MSW-060	Mar08	Mar12	N0006EXCAC729	
PART 4.13 FMA SCHEDULED PERIODIC MAINTENANCE REQUIREMENTS (SAMPLE)						

APPENDIX C

WORK PACKAGE - SHIP'S SYSTEM WORK DESCRIPTION PART 4.13 (SAMPLE)

USS (SHIP'S NAME AND HULL NO.) SHIP SYSTEM WORK DESCRIPTION – ISSUE TWO PART 4.13 FMA SCHEDULE PERIODIC MAINTENANCE REQUIREMENTS								
								WORK PACKAGE STATUS (AUTHORIZED BY)
CHG	WPS SWAB GCMA	MA DESCRIPTION WPS COMPID	PER	LMA VIT	DUE DATE	MJC#	SWLIN SECT	ASSN
059	5520 79.0280.2100	RESTORE ACC IND LEAD		JUL85 3		02EECC5309	552A01 79.0280.2100	SY
<u>REMARKS:</u> Restoration of contents indicator is required because lead accumulator maintenance is being replaced by AERP in Section 38.0078.2222.								
059	5520 79.0300.2100	RESTORE ACC IND PORT		JUL85 3		02EECC5309	SEE REMARKS	
<u>REMARKS:</u> No fixed periodicity. Accomplish only if accumulator maintenance is performed.								
059	5520 79.0300.2100	RESTORE ACC IND STBD		JUL85 3	JUL93	02EECC5309	SEE REMARKS	
<u>REMARKS:</u> No fixed periodicity. Accomplish only if accumulator maintenance is performed.								
059	5610 37.0320.U006	URO REQUIREMENT ASW PUMP-1	096	JUL85 1	JUL93	08EMCKC741	561A01 37.0320.U006	SY
<u>REMARKS:</u> -								
059	5610 37.0320.U006	URO REQUIREMENT ASW PUMP-2	096	JUL85 1	JUL93	08EMCKC741	561A01 37.0320.U006	SY
<u>REMARKS:</u> -								
059	5610 37.0320.U006	URO REQUIREMENT ASW PUMP-3	096	JUL85 1	JUL93	08EMCKC741	561A01 37.0320.U006	SY
<u>REMARKS:</u> -								
059	5610 44.0020.U009	URO REQUIREMENT ASW-030	036	JAN91 1	JAN94	08EMCKC918	561A01 44.0020.U009	SY
<u>REMARKS:</u> -								
059	5610 44.4285.1300	INSPECT ASW-067	012	OCT90 1	OCT92	07EMCF0004	561A01 44.4285.1300	FMA
<u>REMARKS:</u> FMA accomplish prior to ship entering the shipyard for DMP.								
PART 4.13 FMA SCHEDULED PERIODIC MAINTENANCE REQUIREMENTS PAGE 8 OF 13								

VOLUME VI
CHAPTER 25
UNRESTRICTED OPERATIONS

REFERENCES.

- (a) NAVSEA 0924-062-0010 - Submarine Safety (SUBSAFE) Requirements Manual
- (b) OPNAVINST 3120.33 - Submarine Engineered Operating Cycle (SEOC) Program
- (c) COMSUBLANT/COMSUBPAC NOTE C3120 - Submarine Operating Restrictions and Depth Authorization

LISTING OF APPENDICES.

- A URO MRC Automated Work Request for Ship's Force Accomplishment
- B URO MRC Automated Work Request for FMA Accomplishment
- C SUBMEPP URO MRC Inventory
- D SUBMEPP URO MRC Schedule
- E Request for URO MRC Periodicity Extension Format
- F Sample Work Package Supplement

25.1 PURPOSE. This chapter provides guidance and definition for the requirements, responsibilities and actions for continued submarine Unrestricted Operation (URO) to design test depth. The URO Maintenance Requirement Card (MRC) program is invoked on all Submarine Safety (SUBSAFE) certified submarines.

25.2 UNRESTRICTED OPERATION MAINTENANCE SCHEDULING, PLANNING AND REPORTING.

25.2.1 Maintenance Requirements for Continued Unrestricted Operation to Design Test Depth. Reference (a) establishes the Maintenance Requirements and identifies the responsibilities and actions required to support continued unrestricted submarine operations to design test depth. In conjunction with reference (a), Naval Sea Systems Command (NAVSEA) has issued individual manuals containing required, periodic SUBSAFE maintenance actions for each ship or class. The URO MRCs in these publications will identify degradation of the material condition of the hull integrity boundary and of those systems affecting ship's recoverability. The requirements set forth in these publications are, in addition, defect monitoring requirements, established on an individual ship basis, for submarines in which known uncorrected deficiencies exist. SUBSAFE certification indicates that a valid recommendation for URO to design test depth can be made. Maintenance of certification is dependent on both the positive control of all re-entries into the SUBSAFE boundaries per Volume V, Part I, Chapter 5 of this manual, the satisfactory and timely completion of applicable URO MRCs as required by reference (a) and any necessary repairs. Accomplishment of the URO MRCs specified with this program identify changes within the SUBSAFE boundary which result from inadvertent error or from degradation caused by the service environment.

25.2.2 Scheduling and Reporting. In order for the Type Commanders (TYCOM) to carry out their responsibilities in the material certification of submarines and to aid in decisions

concerning operational restrictions, an auditable system of scheduling the performance and reporting of URO MRCs has been developed. This system provides visibility to problem areas, facilitates verification and provides a permanent record of URO MRC accomplishment in the ship's Maintenance and Material Management (3-M) machinery history maintained at the **Naval Sea Logistical Center (NAVSEALOGCEN)**.

25.2.2.1 Non-SSBN 726 or SSGN 726 Class Ships. Submarine Maintenance Engineering, Planning and Procurement Activity (SUBMEPP) provided Periodic Maintenance Requirement (PMR) Inventories and Schedules and the 3-M Master Job Catalog (MJC) Programs are used for scheduling and reporting. The scheduled URO MRC requirements added to the Current Ship's Maintenance Project (CSMP) from the local scheduling system and the Automated Work Requests (AWR) produced will contain unique Job Control Numbers (JCN) consisting of ship's Unit Identification Code (five characters) plus WC (Department or Division + JC) (four characters) plus Job Sequence Number (four characters). Appendices A and B of this chapter show a URO AWR for Ship's Force and Fleet Maintenance Activity (FMA) accomplishment respectively. Appendices C and D of this chapter show examples of the SUBMEPP URO MRC inventories and schedules respectively.

25.2.2.2 SSBN 726 and SSGN 726 Class Ships. SUBMEPP provided URO MRC inventories, schedules, Master Job File, as well as the Refit Work Planning System, are used for scheduling and reporting. The scheduled URO MRC requirements added to the CSMP from the local scheduling system and the AWRs produced will contain unique JCNs consisting of ship's Unit Identification Code (five characters) plus WC (Department or Division + JC) (four characters) plus Job Sequence Number (four characters). Appendices A and B of this chapter show a URO MRC AWR for Ship's Force and FMA accomplishment respectively. Appendices C and D of this chapter show examples of the SUBMEPP URO inventories and schedules respectively.

25.2.2.3 SUBMEPP Activity Inventories and Schedules. The SUBMEPP inventories and schedules can be created from Maintenance & Ship Work Planning Reports (M&SWP) at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm>.

25.2.3 Baseline and Due Dates. The baseline date for determining URO MRC due dates is the Last Maintenance Action (LMA) date. LMA dates for new requirements will be based on the Change Issue Date of the URO MRC invoking the new requirement unless otherwise directed from NAVSEA. Due dates are calculated based on LMA dates per paragraph 25.2.3.2 of this chapter. It is recognized that upkeep and docking schedules for ships which are well into the operating cycle may not permit full compliance with the scheduled due dates. In such cases, a Departure From Specification (DFS) for the URO MRC will be addressed on a case-by-case basis as specified in Volume V, Part I, Chapter 8 of this manual. LMA dates and URO MRC due dates are determined in the following manner:

25.2.3.1 Last Maintenance Action Date. For new construction ships, all URO MRCs have an initial LMA date established at delivery from new construction or from Post Shakedown Availability to start the operating cycle following the applicable URO MRC manual. During the operating period between commissioning and start of Post Shakedown Availability and during the operating cycle following Post Shakedown Availability, an adjusted LMA, as discussed in sub-paragraphs a and b, is used for URO MRCs. Calculate the adjusted LMA date in the following manner:

- a. If the PMR is accomplished during a period other than a scheduled availability (e.g., voyage repair periods, at sea, port calls, etc.) the adjusted LMA date will be the first of the month following the completion date listed on the PMR data form.
- b. If the PMR is accomplished during a scheduled availability (e.g., Selected Restricted Availability, Extended Refit Period, Depot Modernization Period, Engineered Refueling Overhaul, Interim Dry Docking, other Chief of Naval Operations (CNO) Availabilities, CMAV, MMP or upkeep), the adjusted LMA date will be the first of the month following the scheduled availability's actual completion date.

NOTE: IMMEDIATE SUPERIORS IN COMMAND (ISIC) OPERATING WITH THE ON-SITE PMR SCHEDULING SYSTEM MUST ENSURE THAT AVAILABILITY DATES ARE ACCURATELY MAINTAINED SO THAT COMPLETED AWR UPLINE REPORTED DATA REFLECTS THE ADJUSTED LMA DATE AND ON-SITE PMR SCHEDULING RECORDS CALCULATE THE PROPER NEXT DUE DATE.

25.2.3.2 Calculating Due Dates. Next due dates are calculated based on an adjusted LMA date. Due dates are calculated, for scheduling purposes, by taking the adjusted LMA date month (number) and adding the periodicity months (number) to show the month due (i.e., an item with an adjusted LMA date of February 2003 (2/03) with a six-month periodicity would be due in August 2003 (8/03)). The PMR will be accomplished prior to midnight of the last calendar day of the month due.

25.2.4 Periodicity Extensions. When determining the due date for URO MRC inspections 001, 004, and 005 for an individual submarine, inactive time (defined as the number of days pierside plus the number of days in dry-dock) may be excluded from the time elapsed since the last inspection. When determining the due date for URO MRC 002, 003 (certain portions) and 035, only the time in dry-dock may be excluded from the elapsed time. The ships' deck log, engineering log or the ship's coolant discharge log will be used to determine the number of day's pierside or the number of days in drydock. Ship's Force will perform this review and provide the applicable dry-dock or inactive time via official correspondence to the ISIC. Extensions of periodicity from the next due date identified in the SUBMEPP PMR inventory for these URO MRCs can be authorized by the TYCOM without further NAVSEA approval. However, they are not automatic and such requests **must** be submitted by letter, in the format of Appendix E of this chapter, to SUBMEPP via the TYCOM. Upon receipt of TYCOM authorization, SUBMEPP will reflect the periodicity extension and the revised due date in the next issue of the ship's PMR inventories and schedules.

25.2.5 Scheduling, Planning and Reporting Unrestricted Operation Accomplishment at Ship or Fleet Maintenance Activity Level.

25.2.5.1 Scheduling. The TYCOM PMR Scheduling System Inventories and Schedules can be created from Maintenance & Ship Work Planning Reports (M&SWP) at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm>. Except at NAVIMFAC PACNORWEST, along with the Inventories and Schedules, electronic update files are provided to keep the local scheduling systems up to date with the Class Maintenance Plan (CMP). As a minimum, ISICs will schedule applicable URO MRCs 40 days (SSBN 726 and SSGN 726 Class submarines) or 40 days (non-SSBN 726 or SSGN 726 Class submarines), as applicable prior to

refit fleet maintenance availability. Those URO MRC AWRs requiring work packages or other planning are forwarded to the FMA Planning Section.

25.2.5.2 Planning. FMA Planners will requisition materials, obtain plans and drawings, prepare Formal Work Packages or Controlled Work Packages and coordinate the scheduling with the Ship Superintendent, Production Officer and ISIC Material Office. Then the job will be turned over to the production WC for accomplishment. The Maintenance Document Control Office (MDCO) will adjust the scheduled start and completion date within the local scheduling system.

25.2.5.3 Reporting. Each URO MRC AWR contains specific instructions on reporting the completed action and on use of a special feedback code to identify the material condition, or that a change in inspection frequency is required. In order to ensure URO MRCs are correctly accomplished and reported to SUBMEPP, action is to be taken prior to closeout of the AWR by Analysis, Records and Reports Section (ARRS). FMA Lead Work Centers (LWC) completing URO MRC AWRs must ensure that all assist WCs have completed their work. The LWC then completes the AWR by filling in action taken codes, signing for completion and obtains acceptance signature from Ship's Force. The AWR is then returned to ARRS. The ARRS will verify that all participating WCs have documented completion of their assigned tasks and then pass the AWR to the ISIC for review and updating of SUBMEPP inventories and schedules prior to closeout of the AWR by ARRS.

25.2.6 Unrestricted Operation Maintenance Requirement Card Accomplishment During Chief of Naval Operations Maintenance Availabilities.

- a. The Availability Work Package (AWP) prepared by SUBMEPP will reflect all URO MRCs authorized for accomplishment during the availability at the AWP Ship Work List Item Number (SWLIN) level. The Work Package Supplement (WPS), accompanying the AWP, will identify a specific URO MRC requirement to the applicable AWP SWLIN paragraph. Appendix F of this chapter provides an example of the WPS format.
- b. For URO MRCs assigned to the depot, the ISIC will enter "Assigned to <depot name> by AWP <AWP number>" in the Remarks or Completion block of the URO MRC Schedule and Inventory and in the local scheduling system.
- c. URO MRC completions by an industrial activity during CNO Availabilities will be, for non-SSBN 726 or SSGN 726 Class submarines, retrieved from the shipyard information system by SUBMEPP. For SSBN 726 and SSGN 726 Class submarines, completions will be retrieved from the appropriate maintenance database. The WPS, or comparable report, annotated by SUBMEPP to show URO PMR completions and material condition feedback categories, will be retained by SUBMEPP upon completion of the availability. The ISIC will verify that all URO MRCs assigned to the shipyard were reported and subsequently updated by SUBMEPP.

25.2.7 Unrestricted Operation Maintenance Requirement Card Completion Reporting.

- a. Within 30 days after the completion of an availability the activity accomplishing the URO MRC is required to provide a report of accomplishment to SUBMEPP and the ship's ISIC as well as other technical codes as designated in the URO MRC. Specific information to be included in the report is identified in the applicable URO MRC. The

accomplishing activity **must** retain a legible copy of the most current inspection report until the ship is disposed of or stricken from the Naval Register.

- b. Prior to Fast Cruise for CNO Availabilities, the industrial activity is required to provide the ship and ISIC with a letter of certification (including final inspection categories A, B, or C when applicable) that certifies all required inspections have been satisfactorily completed. For items which must be accomplished in dry-dock, the industrial activity is required to provide such certification prior to undocking.
- c. Upon identifying a material condition that would result in a reduced inspection periodicity if not restored to Category A condition during the availability in which the condition was found, a special report is required to be submitted by the accomplishing activity **per** the applicable URO MRC and, if applicable, the AWP. This special report **must** be provided immediately to NAVSEA (SEA 07), TYCOM, ISIC, and SUBMEPP indicating:
 - (1) Applicable MRC.
 - (2) Equipment component identification.
 - (3) Inspection category.
 - (4) The reduced or deferred periodicity of each equipment component that should be inspected at less than its normal periodicity. This reduced periodicity report requirement is in addition to the completion reporting requirements of paragraphs 25.2.7.a and **25.2.7.b**.

25.2.8 Operating Cycle and Interval Extensions. An Audit Plan to assess the material condition of ships prior to extending their operating cycle **or** intervals beyond URO MRC periodicities due to changing CNO Availability dates or operational schedules is addressed in reference (b). Additional guidance and responsibilities are contained in Volume II, Part I, Chapter 3 of this manual.

25.3 RESPONSIBILITIES.

25.3.1 Type Commander.

- a. Perform periodic audits of the ISICs and FMAs to verify full compliance with the provisions of reference (a), Volume V, Part I, Chapter 9 of this manual and this chapter.
- b. Provide guidance to the ISICs, obtaining NAVSEA concurrence as necessary, when deviations in the scheduling or accomplishment of maintenance or repairs are required by a DFS request and resolution per Volume V, Part I, Chapter 8 or this manual.

25.3.2 Submarine Maintenance Engineering, Planning and Procurement Activity.

- a. Receive reports of completion of URO MRCs from all completing activities.
- b. Review completion reports for compliance with the scheduled periodicity requirements and any change in the status category.
- c. Establish an LMA date per paragraph 25.2.3.1 of this chapter.

- d. Revise the periodicity and next due dates in ship URO MRC inventories and schedules to reflect any NAVSEA approved periodicity change, TYCOM approved periodicity extensions for URO MRCs 001 through 005, and 035 as allowed for in paragraph 25.2.4 of this chapter and NAVSEA approval of Major DFSs for extending URO MRC requirements.
- e. Notify the TYCOM via the on-site SUBMEPP Representative of any URO MRC beyond periodicity for TYCOM resolution.
- f. Provide updated:
 - (1) For SSBN 726 and SSGN 726 Class ships, provide Refit Work Package electronic files which reflect URO MRC scheduling to the Trident Refit Facility at the arrival minus 60-day milestone.
 - (2) For those ISICs using Micro-PMR, provide scheduling and configuration files to process in the local scheduling system and FMA database quarterly.
 - (3) Provide MJC update files which reflect URO MRC changes to the ISIC or TYCOM at least quarterly or upon request.
- g. Quarterly provide a list of URO MRCs that appear overdue in the schedules and a list of URO MRCs that have been reported complete by the fleet but Objective Quality Evidence has not been received by SUBMEPP.
- h. Receive and review URO MRC Objective Quality Evidence for technical accuracy and maintain URO MRC completion history.

25.3.3 Immediate Superior In Command.

- a. Maintain auditable records of URO MRC accomplishment for each submarine. These records **must** consist of:
 - (1) SUBMEPP Quarterly Schedules and Inventories.
 - (2) The last copy of letter of completion and inspection report for each O Level URO MRC.
 - (3) The last copy of letter of completion and inspection report for each I and D Level URO MRC. These may be disposed of once accomplishment is captured electronically on ISIC provided SUBMEPP Schedules and Inventories.”
- b. Conduct periodic audits of assigned FMAs and units to verify full compliance with the provisions of reference (a), Volume V, Part I, Chapter 9 of this manual and this chapter.
- c. In addition to the records of audits, maintain a file, by ship, of the current URO MRC inventories and schedules as provided by SUBMEPP. The schedules (Appendix D of this chapter) for each ship **must** be annotated with the Job Sequence Number (JSN), the new adjusted LMA date and the next due dates for the completions and any periodicity extensions authorized.
 - (1) Although the responsibility for the accomplishment of URO MRCs must rest with the ship’s Commanding Officer, the nature and scope of the URO MRCs dictate that the ISIC coordinate the accomplishment of URO MRCs **following**

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the SUBMEPP provided PMR inventories and schedules. Accordingly, the ISIC **must** assist in the preparation of, and approve each submarine's URO MRC performance schedule. Monitor the URO MRC, Deep Submergence System **and** Hull Integrity Procedure Status Web Site periodically to identify potentially overdue URO MRC, Deep Submergence System **or** Hull Integrity Procedures. The SUBMEPP representative assigned to each ISIC **must** add information, in the form of a comment to the **web** Site, addressing any overdue or potentially overdue items. Upon completion of a Ship's Force accomplished URO (e.g., 016, 022, 025, 026, 029, 036), the ISIC URO Coordinator **must** update the SUBMEPP URO status web site by creating a comment, located at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm>, with the following information until the correct information is reflected on the web page:

- (a) Name of person entering data
 - (b) URO completion date
 - (c) New LMA Date
 - (d) New Due Date
- (2) In addition, the ISIC **must**:
- (a) Unless previously notified by SUBMEPP of delays, notify the SUBMEPP Representative at TYCOM of the non-receipt of schedules and reports.
 - (b) Upon printing a new URO MRC Inventories and Schedules, perform a line-by-line verification of each ship's new URO MRC Inventory and Schedule against the URO MRC Inventory and Schedule report held by the ISIC. At a minimum, this verification will include a review of each URO MRC LMA, Due Date, and Periodicity to ensure any recent completion data or rescheduling data that has been submitted to SUBMEPP has been accurately incorporated into the new Inventory and Schedule. PMRs accomplished during the month preceding the quarterly report may or may not be reflected in the issue received. Similarly, upon receipt of URO MRC changes, audit the individual URO MRC procedural and schedule information against each ship's PMR Inventory and Schedule held by the ISIC to verify that the component **or** equipment and periodicity has not changed and that provided changes do not impact current schedules. Resolve identified deficiencies through the SUBMEPP Representative at TYCOM.
 - (c) Review the enclosures to the PMR procedural inventories and the schedule forwarding letter and advise SUBMEPP of the completion dates and JSNs for URO MRCs listed. Forward copies of completed Data Report Forms for these and any other URO MRC completions identified by SUBMEPP as having missing Data Report Forms.
 - (d) Quarterly, the ISIC **must** provide a copy of the individual ship's URO

MRC Inventory and Schedule that has been customized by the ISIC, as necessary, to reflect the most current URO MRC status.

- d. Control input of the SUBMEPP scheduling file (M79EII) to the local scheduling system and resultant calldowns to the CSMP, which will produce the JCN and products for job completion.
- e. Ensure that all URO MRC requirements with the appropriate screening (Ship's Force, FMA) are in the CSMP for subsequent development by SUBMEPP of forthcoming CNO Availability AWP's.
- f. In the event that deviations from required periodicities or full requirements of the URO MRCs are required, request approval from the TYCOM by submitting a DFS request **per** Volume V, Part I, Chapter 8 of this manual. Such DFS requests will be a Major DFS for URO MRC program deviations. DFS requests are also to be submitted when repairs arising from the URO MRC inspections cannot be completely accomplished. Periodicity extension requests for URO MRC 001, 002, 003, 004, 005 and 035 **must** be submitted **per** paragraph 25.2.4 of this chapter.
- g. Establish procedures to affect routing of completed AWRs from the FMA ARRS through the ISIC for all URO MRC transactions. The ISIC should ensure proper documentation has been completed as described in the special reporting procedures of the AWR. This must include the material condition feedback code as part of the final action, if required. A rejection series code (6A-6I) should not be accepted unless the FMA Repair Officer cannot accomplish the URO MRC at that site. Delays in accomplishment are to be reported as status changes so that the job remains in the production system and is visible as a "to-be-done" requirement. If the URO MRC requirement cannot be accomplished at the site, the ISIC must ensure update (re-screening) of the CSMP concurrently with DFS notification, if necessary. Each processed AWR is to be validated with the PMR Special Report described in the Maintenance Resource Management System section of Volume II, Part I, Chapter 2 of this manual and, if satisfactory, passed to the Automated Data Processing Center for computer input. Upon receipt of the report of maintenance action accomplishment from an assigned unit or the FMA, review the report for completeness, consistency, acceptability of conditions and material trends. Where unsatisfactory conditions are found, direct repairs. Where repairs cannot be made, submit a DFS **per** Volume V, Part I, Chapter 8 of this manual. Ensure SUBMEPP inventories and schedules are updated **per** paragraph 25.3.3(c) of this chapter. Clear URO MRC major DFS upon TYCOM or NAVSEA approval and upon printing of the SUBMEPP Quarterly PMR inventories and schedules, and ensure they accurately reflect the new due date of the URO MRC as stated in the approved DFS.
- h. Upon identifying a material condition that would result in a reduced inspection periodicity, ensure the accomplishing activity immediately reports the condition found via faxed letter to NAVSEA (SEA 07), the TYCOM and SUBMEPP **per** paragraph 25.2.7.c of this chapter.
- i. Monitor the timely submission of URO MRC data report forms and the report of accomplishment for URO MRCs completed by the FMA and Ship's Force to ensure

required documentation is submitted **per** paragraph 25.2.7 of this chapter. Ensure data report forms are submitted to report component replacement, repair **or** operation out of specification. Review all Ship's Force accomplished URO MRC data for compliance with the requirements of the URO MRC Program prior to submittal to SUBMEPP.

- j. Prior to a ship's underway period, review the ship's certification continuity report, if submitted, to ensure the ISIC and ship's records (including the CSMP) accurately reflect URO MRC status.
- k. The Parent ISIC of deploying ships will:
 - (1) Ensure that any URO MRC due for accomplishment by the ship during its deployment period is identified in the CSMP transfer file and that the ship possesses the URO MRC data report forms (if applicable) for reporting job completion.
 - (2) Provide a message to the applicable deployed FMA **or** Squadron identifying any URO MRC expected to be accomplished by the deployed FMA and the status of required materials for each submarine deploying to cover the period of the deployment.
- l. Deployed Squadrons will review the URO MRC status of deployed submarines upon in-chop. Perform the function of the Parent ISIC in ensuring all URO MRCs are accomplished and reported within the required periodicity while the submarine is deployed.

NOTE: THIS IN NO WAY RELIEVES THE PARENT ISIC OF THE RESPONSIBILITY TO ENSURE THAT THE REQUIRED URO MRCs ARE ACCOMPLISHED WITHIN THE SPECIFIED PERIODICITIES.

- m. Prior to the start of a CNO availability, ISIC URO coordinators will:
 - (1) Assign JCNs to URO MRC items assigned to Forces Afloat in the AWP and screen them to an availability prior to the start of the CNO availability or to the concurrent availability **following** the directions in the AWP. Forces Afloat items are accomplished by Ship's Force or Performance Monitoring Team. Care must be taken to appropriately assign URO MRC items to the correct accomplishing activity.
 - (2) ISIC URO coordinators will not assign JCNs to URO MRC items assigned to the shipyard in the AWP. In the URO MRC inventories and schedules, in the remarks **or** completion information area, enter "assigned to (name of shipyard) by AWP (name and number of availability)". The shipyard is responsible for performing, auditing and reporting all URO MRC items assigned by the AWP.
 - (3) URO MRCs assigned to Forces Afloat by the AWP for accomplishment prior to the start of the depot period, but for some reason were not completed, will be reassigned to a concurrent availability or formally reassigned to the shipyard via a supplemental work request.
- n. During a CNO availability, URO MRCs assigned to the shipyard by the AWP which are not accomplished during the depot period will be placed on the guarantee list or

reassigned to a fleet availability by the TYCOM following the depot period provided the URO MRC does not exceed its due date. The ISIC will be notified of this reassignment by formal correspondence which will include justification and reason why the scheduled and planned requirements were not met.

- o. Prior to CNO availability completion, ISICs will audit URO MRCs assigned to Forces Afloat by the AWP and ensure all have been satisfactorily completed and documented within the required periodicity. The ISIC audit will also verify that all URO MRC items coming due within six months of availability completion are complete or assigned to a follow-on fleet availability. Under no circumstances are URO MRC due dates to be exceeded. ISIC Quality Assurance Officers will not be responsible for auditing URO MRCs assigned to the depot in the AWP.
- p. Following CNO availability completion, the ISIC URO coordinator will ensure that all URO MRCs assigned to the shipyard were reported and subsequently updated by SUBMEPP. ISICs will only upline the closed JCNs for URO MRCs completed by Forces Afloat.

25.3.4 Submarine Commanding Officer.

- a. Ensure all URO MRCs are accomplished within the required periodicity as specified by reference (a), Volume V, Part I, Chapter 5 of this manual and this chapter.
- b. For visual inspections in between URO MRC 003 inspections, see Volume V, Part I, Chapter 5, paragraph 5.4.3.d. of this manual for a description of requirements to inspect submarine hull structure in between the periodic URO MRC 003 inspections.
- c. Maintain auditable records of the accomplishment of URO MRCs to permit verification of compliance with reference (a), Volume V, Part I, Chapter 10 of this manual and this chapter. These records **must** consist of:
 - (1) A copy of the TYCOM and NAVSEA SUBSAFE Material Certification message from new construction, Depot Modernization Period or overhaul until the ship's current status is reflected in reference (c). When the ship's current status is reflected in reference (c) the messages may be destroyed and the current notice will be retained.
 - (2) Copies of letter of completion for all URO MRC work accomplishment by other activities, including most recent FMA URO Accomplishment Letter. These may be disposed of once accomplishment is captured electronically on ISIC provided SUBMEPP Schedules and Inventories.
 - (3) Copies of letters of completion and inspection reports for work accomplished by Ship's Force. The ship **must** retain a legible copy of the most current inspection report (or required Data Report Form), until the ship is disposed of or stricken from the Naval Register. The required report forms are located at the end of the individual URO MRCs. A copy of each completed report **must** be submitted to the ISIC for review a minimum of 24 hours prior to underway.
 - (4) One copy each of the current Quarterly URO MRC inventories and schedules by SUBMEPP via the ISIC. Annotate the URO MRC Inventory Report when accepting completed work requests from the FMA or Ship's Force (LWC 991).

It is the ship's responsibility for ensuring that the reports reflect the actual configuration, especially with regards to the equipment identity and the Allowance Parts List.

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APPENDIX A**URO MRC AUTOMATED WORK REQUEST FOR SHIP'S FORCE
ACCOMPLISHMENT**

IER622 *** AUTOMATED WORK REQUEST *** 03 DEC 92 (92338)
 OPNAV 4790/2R/Q DEFERRAL AVAIL: P106 (01JAN93-31MAR93)
 *****SECTION I. IDENTIFICATION*****
 1. UIC: 05152 2. OWC: EAJC 3. JSN: 3171 4. APL: 520175132 AILSN: 5520
 A. NAME: FINBACK 5. EQUIP: ACCUMULATOR-HYD 13. IDENT: ACCUM MNA FC
 B. HULL: SSN 670 14. EIC: TV01 16. LOCATION: 15. SAFE: NO
 6. WHEN DISC: 0 7. EQ STAT: 0 8. CAUSE: 0 9. DEF REA: 6 10. : 11. : 12. :
 18. CAT SHIP ALT # RN PC F\$ 19. PI 20. INSURV # 21. SUF 22. MDG 23. SAF 24. P/E
 18A. MJC: N0008EAEACKS026
 *****SECTION II. DEFERRAL ACTION*****
 26. DEF DATE: 23 NOV 92 27. OMA MHR REM: AUTO 28. DEALN DATE: 31 JAN 93 9. DEF REA: 6
 *****SECTION III COMPLETED ACTION*****
 29. A/T: 30. OMA MHR EXP: 0000 31. DATE COMP:
 SELECT EQUIPMENT 32. AMT: 33. TI: 0 34. METER READING:
 *****SECTION IV. REMARKS/DESCRIPTION*****
 35. REMARKS: CHECK HYD SYS FLOOD CONTROL ACCUMULATORS IAW URO MRC 026 XXX
 LAST COMPLETED 90001 NEXT DUE DATE 93001
 MDCO PASS TO SHIP'S FORCE. S/F COMPLY WITH URO 026, COMPLETE
 BLOCKS 102-104 AND RETURN THIS AWR TO MDCO FOR ADP PROCESS.
 CONSULT THE TYCOM PMR SCHEDULING SYSTEM FOR SHIP OR COMPONENT
 SPECIFIC INFO SUCH AS "DD", SPECIAL REQ-MTS, PERIODICITY
 OR LEVEL OF ACCOMPLISHMENT.
 37. CSMP SUMMARY: ACCOMPLISH URO MRC 026
 38. 1ST CON: 39. 2ND CON:
 41. PRI: 2 42. T/A: 2 43. INT PRI: 44. IUC SCRN: 2 45. TYC SCRN:
 46. SPECIAL PURPOSE: A- B- C- D- E- F- G- H- I- J- K- L-
 E. CO F. TYCOM
 *****SECTION V. SUPPLEMENTARY INFORMATION*****
 48. REP TM: MRC URO MRC 026 ON BRD: NO
 49. PREARV:
 50. PLNRMK: MRC URO MRC 026
 *** COMPLETE INSPECTION FINDINGS AND FORWARD IAW URO 026 ***
 50A. IUCRMK:
 50B. TYCRMK:
 50C. IMARMK:
 *****SECTION VI. PLANNING*****
 51. PMR: URO MRC 026 52. PER: 000 53. ISS: 7512 54. SPEC DATA: HP JC008638
 QLV: 55. QA S/S: YES NUC LI: 1NUC WPR: SP CLN: SPECID: RADCON:
 LI: NON DT: SAE DIV: SP TST: NOISE: OTHCON:
 56. SR K E: 0091 SP INT: YES D/D REQ: PREOVH: AFTOVH: DEPART:
 K.E.: UROS DUE K.E. DATE: NORMALLY DONE BY:
 *****SECTION VII. REPAIR ACTIVITY PLANNING/SCHEDULING ACTION*****
 57. L/A RWC 58. SKD STRT 59. SKD COMP 60. PMHR 61. K/O 62. TASK
 L 991 01 JAN 93 30 JAN 93 008 001
 93. RAUIC: 05851 L Y SPEAR 94. WK RTN #: 99. JOB ORDER NO:
 95. EST M/D: 96. EST M/D \$: 97. EST MATL \$:
 98. EST TOT \$: 100. LEAD P&E: 101. DATE OF ESTIMATE: 23 NOV 92
 102. FAT: 103. ACT MHRs EXP: 104. DATE COMP:
 G. COMPLETED: H. ACCEPTED BY:
 *****SECTION VIII. SUPPLY DATA*****
 PRI DOC NUM NIIN/PART# DESC QTY STATUS

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APPENDIX B**URO MRC AUTOMATED WORK REQUEST FOR FMA ACCOMPLISHMENT**

IER622 *** AUTOMATED WORK REQUEST *** 03 DEC 92 (92338)
 OPNAV 4790/2R/Q DEFERRAL AVAIL: A015* (04JAN93-07FEB93)
 *****SECTION I. IDENTIFICATION*****
 1. UIC: 05152 2. OWC: EMJC 3. JSN: 3170 4. APL: 884305120 AILSN: 2090
 A. NAME: FINBACK 5. EQUIP: VALVE B 3.00 IPS 13. IDENT: MSW-108
 B. HULL: SSN 670 14. EIC: FB08 16. LOCATION: 15. SAFE: NO
 6. WHEN DISC: 0 7. EQ STAT: 0 8. CAUSE: 0 9. DEF REA: 6 10. : 11. : 12. :
 18. CAT SHIP ALT #RN PC F\$ 19. PI 20. INSURV # 21. SUF 22. MDG 23. SAF 24. P/F
 18A. MJC: N0008EMCKC918
 *****SECTION II. DEFERRAL ACTION*****
 26. DEF DATE: 23 NOV 92 27. OMA MHR REM: AUTO28. DEADLN DATE: 9. DEF REA: 6
 *****SECTION III. COMPLETED ACTION*****
 29. A/T: 30. OMA MHR EXP: 0000 31. DATE COMP: _____
 SELECT EQUIPMENT 32. AMT: _____ 33. TI: 0 34. METER READING: _____
 *****SECTION IV. REMARKS/DESCRIPTION*****
 35. REMARKS: INSPECT BALL VALVE STEM IAW URO MRC 009
 LAST COMPLETED 90001 NEXT DUE DATE 93001
 CONSULT THE TYCOM PMR SCHEDULING SYSTEM FOR SHIP OR
 COMPONENT SPECIFIC INFO SUCH AS "DD", SPECIAL REQ-MTS,
 PERIODICTY, OR LEVEL OF ACCOMPLISHMENT
 37. CSMP SUMMARY: ACCOMPLISH URO MRC 009
 38. 1ST CON: LPO 39. 2ND CON: _____
 41. PRI: 2 42. T/A: 2 43. INT PRI: 44. IUC SCRIN: 2 45. TYC SCRIN: _____
 46. SPECIAL PURPOSE: A- B- C- D- E- F- G- H- I- J- K- L-
 E. CO _____ F. TYCOM _____
 *****SECTION V. SUPPLEMENTARY INFORMATION*****
 48. REP TM: MRC URO MRC 009 ON BRD: NO
 49. PREARV: *** COMP INSP FINDINGS AND FORWARD IAW URO/LID MRC 009 ***
 50. PLNRMK:
 THIS DEPOT JOB IS ASSIGNED TO IMA BY TYCOM
 *** REPORT INSPECTION FINDINGS AND FORWARD IAW URO 009 ***
 50A. IUCRMK:
 50B. TYCRMK:
 50C. IMARMK:
 *****SECTION VI. PLANNING*****
 51. PMR: URO MRC 00952. PER: 000 53. ISS: 7302 54. SPEC DATA: HP1JC006547
 QLV: 55. QA S/S: YES NUC LI:NUC WPR: SP CLN: SPECID: RADCON:
 LI: NON DT: SAE DIV: SP TST: NOISE: OTHCON:
 56. SR K E: 0091 SP INT: YES D/D REQ: PREOVH: AFTOVH: DEPART:
 K.E.: UROS DUE K.E. DATE: NORMALLY DONE BY: 1 DEP
 *****SECTION VII. REPAIR ACTIVITY PLANNING/SCHEDULING ACTION*****
 57. L/A RWC 58. SKD STRT 59. SKD COMP 60. PMHR 61. K/O 62. TASK
 L 10C 04 JAN 93 18 JAN 93 0002 001 PACKAGE
 A 38A 04 JAN 93 18 JAN 93 0027 001 INSP
 A 93A 04 JAN 93 18 JAN 93 0008 001 INSP
 A 93B 04 JAN 93 18 JAN 93 0002 001 QA
 93. RAUIC: 05851 L Y SPEAR 94. WK RTN #: _____ 99. JOB ORDER NO: _____
 95. EST M/D: _____ 96. EST M/D \$: _____ 97. EST MATL \$: _____
 98. EST TOT \$: _____ 100. LEAD P&E: _____ 101. DATE OF ESTIMATE: 23 NOV 92
 102. FAT: _____ 103. ACT MHR\$ EXP: _____ 104. DATE COMP: _____
 G. COMPLETED: _____ H. ACCEPTED BY: _____
 *****SECTION VIII. SUPPLY DATA*****
 PRI DOC NUM NIIN/PART# DESC QTY STATUS

URO CHANGE NO: 119 Mar 2003
PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO/HIP SORTED BY SYSTEM

REPORT DATE: 10 APRIL 2003

SSSU NLON
NSSF NLON 68316

R			M			REMARKS/COMPLETION INFO										
COMPID	LINE	COMP		PROC	MAINTENANCE		M	D	LAST	C	LMA	DUE				
HSC	ITEM	SERIAL	MJC NO	TYPE	INSTRUCTION	STAT	L	D	WRK	C	DATE	DATE	PER	ALT	JSN	DATE
	RIC	EIC			DOC				CTR	JSN						
SYSTEM: 0611 AUDITS AND CERTIFICATION																
SOE DOCUMENT	005716	P10001	N0008EXCKS036	URO	036	IS	O		EXJC1967A		Sep 2002	Sep 2006	48M/R			
0611X5000B	X90613CM140		UE0000													R=T34 Complete at the end of each depot availability but not to exceed 48 months.
VITAL EQUIP	001252	P10001	N0008EXCKS029	URO	029	IS	O			X	Jan 2001	Jan 2005	48M/R			
0611X1000A	X90613V0001		IC03000													R=T34 Complete at the end of each depot availability but not to exceed 48 months.
SYSTEM: 1110 SUPERSTRUCTURE AND FAIRWATER																
FAIRWATER	001257	P1005	N0007WKCKC920	URO	003	IS	D	D			Feb 1994	Feb 2004	120M			
1111X1000J	X90613V0001		A600000													
SYSTEM: 1310 PRESSURE HULL																
ASW1/2	007333	P10035	N0007WKCKC920	URO	003	IS	D	D		X	Jan 2001	Jan 2007	72M			
1311XAB11C	X90613CM027		1108000													
ASW29/30 INS	007334	P10034	N0007WKCKC920	URO	003	IS	D	D		X	Jan 2001	Jan 2007	72M			
1311XAB12C	X90613CM027		1108000													
ASW80/81	007335	P10033	N0007WKCKC920	URO	003	IS	D	D		X	Jan 2001	Jan 2007	72M			
1311XAA73C	X90613CM027		1108000													
CD 35 INSR	007336	P10031	N0007WKCKC920	URO	003	IS	D	D		X	Jan 2001	Jan 2007	72M			
1311XA781C	X90613CM027		1108000													
CD 4 INSR	007337	P10032	N0007WKCKC920	URO	003	IS	D	D		X	Jan 2001	Jan 2007	72M			

APPENDIX C
SUBMEPP URO MRC INVENTORY

1311XA711C	X90613CM027	1108000										
CD 1/2 INSR	007338	P10029	N0007WKCKC920	URO	003	IS	D	D	X	Jan 2001	Jan 2007	72M
1311X8980C	X90613CM027	1108000										

URO CHANGE NO: 119 Mar 2003 PERIODIC MAINTENANCE REQUIREMENTS REPORT DATE: 10 APRIL 2003
INVENTORY URO/HIP SORTED BY SYSTEM CUTOFF DATE: 01 OCT 2003

SSSU NLON
NSSF NLON 68316

		R		M												REMARKS/COMPLETION INFO	
<u>COMPID</u>	<u>LINE</u>	<u>COMP</u>	<u>MJC NO</u>	<u>PROC</u>	<u>MAINTENANCE</u>	<u>STAT</u>	<u>M</u>	<u>D</u>	<u>LAST</u>	<u>C</u>	<u>LMA</u>	<u>DUE</u>	<u>PER</u>	<u>ALT</u>	<u>JSN</u>	<u>DATE</u>	
<u>HSC</u>	<u>RIC</u>	<u>EIC</u>		<u>TYPE</u>	<u>INSTRUCTION</u>		<u>L</u>	<u>D</u>	<u>CTR JSN</u>	<u>C</u>	<u>DATE</u>	<u>DATE</u>					
<u>SYSTEM: 5182 STEERING AND DIVING (STRUCTURAL, MECHANICAL, AND ELECTRICAL CONTROL)</u>																	
LKG STDIV DR	003361	P12140	N0008EACKS016	URO	016	IS	O/		EAJC1962A		Sep 2002	Sep 2003	9M/R	12M			
5182X1811B	X90613CM100		TL06000						R=260 Complete at the end of each depot availability but not to exceed 9 months from the last accomplishment								
<u>SYSTEM: 5400 NORMAL AND EMERGENCY BALLAST TANK BLOW (TITLE FOR 688 CLASS IS EMBT BLOW)</u>																	
RISE BLOW	003813	P12548	N0008EACKS022	URO	022	IS	O		EAJC1963	X	Jan 2002	Jan 2003	12M				
5401X0101A	X90613BL001		TF01000														
STATBLOW LOC	003814	P12546	N0008EACKS022	URO	022	IS	O		EAJC1963	X	Jan 2002	Jan 2003	12M				
5401X0105A	X90613BL001		TF01000						R=260 Complete at the end of each depot availability but not to exceed 12 months from the last accomplishment.								
STATBLOW REM	003815	P12547	N0008EACKS022	URO	022	IS	O		EAJC1965	X	Jan 2001	Jan 2007	72M				
1311XAB11C	X90613CM027		1108000						R=260 Complete at the end of each depot availability but not to exceed 12 months from the last accomplishment.								
<u>SYSTEM: 5520 MAIN AND VITAL HYDRAULIC (TITLE FOR 688 CLASS IS SHIP'S SERVICE HYDRAULICS)</u>																	
HULL CLOSURE	004440	P13205	N0008EACKS025	URO	025	IS	O		EAJC2188	X	Jan 2002	Jun 2003	72M				
1311XAB12C	X90613CM027		1108000						R=261 Complete at the end of each depot availability but not to exceed 7 months from the last accomplishment.								

APPENDIX E

REQUEST FOR URO MRC PERIODICITY EXTENSION FORMAT

4790
Ser

From: Commander, Submarine Squadron
To: Commanding Officer, Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity
Via: Commander Submarine Force, (Atlantic **or** Pacific Fleet)
Subj: REQUEST FOR EXTENSION OF PERIODICITY FOR URO MRC(S) _____ ON USS (Ship's Name and Hull No.)
Ref: (a) Applicable URO MRC
(b) COMUSFLTFORCOMINST 4790.3; Joint Fleet Maintenance Manual, Volume VI, Chapter 25
(c) COMSUB(LANT **or** PAC) ltr 4790 Ser ____ of (previous letter granting extension of periodicity)

1. **Per** references (a) and (b), request extension of URO MRC periodicity for USS (Ship's Name and Hull No.) to coincide with Selected Restricted Availability, Overhaul, Depot Modernization Period **or** Interim Dry-Docking **using the data in this table:**

URO MRC	Equipment Guide List Item Number or Component Ident	LMA Date	Current Due Date	Inactive Time		Extension Required	Required Next Due Date
				Pierside Days *	Drydock Days		
001	All	June 82	Apr 91	200 days	100 days	7 months	Nov 91
002	All	June 82	Aug 91	N/A	100 days	3 months	Nov 91
003	4.b	June 82	Aug 91	N/A	100 days	3 months	Nov 91
004	INT Welds	June 84	Apr 91	200 days	100 days	7 months	Nov 91
005	INT Welds	June 84	Apr 91	200 days	100 days	7 months	Nov 91
035	All	June 84	Aug 91	N/A	100 days	3 months	Nov 91

* Credit for pierside days is awarded for days the ship is tied to the pier. No credit is given if the ship is underway anytime during the day.

2. Inactive time identified for the URO MRCs listed in paragraph 1 is the actual allowable time accrued to date since URO MRC was last accomplished **or** previous extension of periodicity was granted by reference (c).

Copy to:
COMNAVSEASYS COM (SEA 07) (080)
Commanding Officer, USS (Ship's Name and Hull No.)

APPENDIX F
SAMPLE WORK PACKAGE SUPPLEMENT

OWP ISSUE: PROPOSED		USS JACKSONVILLE (SSN 699) SEA 1-2		PART 1 - SWLIN 131A01	
URO CHANGE NO. 076		WORK PACKAGE SUPPLEMENT		23OCT92	
SWLIN 131A01: PRESSURE HULL		SHIPYARD PLANNING & FEEDBACK REPORT			
WP					
ALIGN	COMP IDENT	APL/RIC	HSC	SS DD PAR NUMBER	MAINTENANCE STANDARD
REMARKS	SURVEILLANCE OF ITEM NO. 12 HULL WELDS				R/D CONDITION
WP		WP SECTION: 27.0136.0001			
EXTERNAL FRAME HULL WELD DISCONTINUITIES		ITEM-12 NONE		SS DD URO-001 URO MRC 001 A B C	
WP		WP SECTION: 27.0144.0005		LVL: SY LOWEST LVL: I	
EXT WELDS NONE		PRESSURE HULL (VISIBLE FROM DRYDOCK)		SS DD URO-005 URO MRC 005 A B C	
WP		WP SECTION: 27.0165.0003		LVL: SY LOWEST LVL: I	
P/H VIS DD NONE		EGL ITEM 13A		SS DD URO-003 URO MRC 003 A B C	
TAPPED HOLES FOR DRY DOCK CONNECTIONS & STRAINER PLATES		WP SECTION: 27.0305.1302		LVL: SY LOWEST LVL: D	
SYSTEM ZINCS		TAPPED HOLES NONE		TRS 7650-086-001 A B C	
WP		WP SECTION: 74.0020.1303		LVL: IMA LOWEST LVL:	
ZINCS NONE		ZINCS NONE		DD 131-0095-02 MRC 087-0021-02 A B C	
SWLIN 131A01		PART 1 PAGE - 1			

VOLUME VI
CHAPTER 26
OPERATING DEPTH POLICY

REFERENCES.

- (a) NAVSEA S9086-DA-STM-000 - NSTM Chapter 100 (Hull Structures)
- (b) COMNAVSUBFOR OPORD 2000
- (c) NAVSEAINST C9094.2 - Submarine Valve Operation Requirements for Builders and Post Overhaul Sea Trial Test Dives

26.1 PURPOSE. To provide Type Commander (TYCOM) policy with respect to the maximum allowable operating depths during trials, evolutions to be performed at the various depths, and the prescribed maximum water depth applicable in each case. Some deep diving submarines are limited to depths less than designed test depth pending accomplishment of certain hull and system modifications prescribed by Naval Sea Systems Command (NAVSEA) as necessary to permit certification to design test depth. As these modifications are accomplished during the availability, the integrity of the ships will be certified and they will be permitted to operate down to their design test depth either periodically or without restriction.

- a. The sequence of events leading to authorization for operations at the maximum operating depth during postindustrial availability or new construction trials for SUBSAFE ships is:
 - (1) Upon completion of the authorized industrial facility work, NAVSEA reviews the scope, degree and manner of accomplishment and recommends to the TYCOM that the submarine be authorized to test hull strength and integrity at an appropriate maximum keel depth during trials. This depth may be the designed test depth or a lesser depth.
 - (2) Based on this recommendation the TYCOM will normally authorize operation to the NAVSEA recommended keel depth by message to the ship, information to the applicable Immediate Superior In Command (ISIC), Supervising Authority **or** Industrial Activity (as applicable), NAVSEA, Fleet Commander and Chief of Naval Operations.
- b. In every instance where the maximum authorized operating depth is exceeded, a report **must** be made **per** reference (a). In addition to those addressees listed in reference (a), an information copy **must** be provided to the applicable TYCOM and ISIC.

26.2 INITIAL TIGHTNESS DIVE. The initial tightness dive following an industrial availability or new construction will be conducted **following** carefully planned procedures.

- a. The initial tightness dive will be an especially deliberate, planned, step-by-step evolution using conservative angles and moderate speed, or slower, **following** the approved Sea Trial Agenda. Caution is required not only because the material condition of the ship is untested at any depth following major industrial facility work, but also because of the crew's lack of recent submerged operational experience. Reference (b) applies.

- b. The maximum water depth allowable during the initial tightness dive will be as specified by reference (b). The approved Sea Trial Agenda and reference (c) describe those events to be conducted during the initial tightness dive and provide the requirements of the initial tightness dive. The approved Sea Trial Agenda also describes those events immediately following the initial tightness dive. The maximum operating keel depth will be 200 feet.

26.3 DEEP DIVE OR CONTROLLED DIVE. After demonstrating satisfactory hull strength and integrity during the initial tightness dive, the requirement exists to test the hull at submerged depths down to the maximum operating depth. The first approach to these depths subsequent to the repair of major hull or sea connected systems work will be made **per** the following subparagraphs 26.3.1 through 26.3.4.

26.3.1 Depth Limitations. The Deep Dive **or** Controlled Dive **must** be made to the maximum operating depth in water specifically designated for such trials and under specific water depth restrictions **per** reference (b), and as promulgated in the appropriate TYCOM **or** ISIC Operation Order.

26.3.2 Conduct of Deep Dives **or** Controlled Dives. Deep Dive **or** Controlled Dive depth changes should be conducted in no greater than 200-foot increments when above one-half the maximum operating depth and in no greater than 100-foot increments when below one-half the maximum operating keel depth. Moderate speeds (within the limits of the submerged operating envelope) and angles must be used. Trim must be continually adjusted to provide neutral buoyancy.

26.3.3 Deep Submergence Bill. The Deep Submergence Bill **must** be in effect with systems in the maximum secure condition and all unnecessary sea connected systems isolated. The main ballast tank blow system **must** be lined up with all banks within 200 psi of full pressure. Cycling of the rudder and planes through full travel should be limited to the maximum authorized operating depth minus 100 feet at a moderate speed.

26.3.4 Valve Operation. Seawater system valve operations during postindustrial availability and new construction Sea Trials will be **per** reference (c).

VOLUME VI
CHAPTER 27
SCHEDULED PRESERVATION UPKEEP
COORDINATED EFFORT

REFERENCES.

- (a) NAVSEA S9510-AB-ATM-010 - Nuclear Powered Submarine Atmosphere Control Manual, Volume 1
- (b) NAVSEA S9510-AB-ATM-020 - Nuclear Powered Submarine Atmosphere Control Manual, Volume 2
- (c) NAVSEA S9086-VD-STM-010 - NSTM Chapter 631 (Preservation of Ships In-Service - General)
- (d) SMS 6310-081-015 - Submarine Preservation General Painting
- (e) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- (f) SOBT Video SVT-GT-9336 - Submarine Preservation

LISTING OF APPENDICES.

- A SPRUCE Key Event Schedule
- B SPRUCE Report Form
- C SPRUCE Check List

27.1 PURPOSE. The Scheduled Preservation Upkeep Coordinated Effort (SPRUCE) program has been established to ensure internal preservation is maintained at the highest possible level throughout the life of the ship. As a result of increased intervals between submarine Chief of Naval Operations Maintenance Availabilities, effective SPRUCE upkeeps are of prime importance. SSBN 726 and SSGN 726 Class submarines are exempt from SPRUCE upkeeps. Under special circumstances, requests for SPRUCE upkeeps on SSBN 726 or SSGN 726 Class submarines will be considered and **must** be conducted **per** this chapter.

27.2 SCHEDULING.

- a. Immediate Superiors In Command (ISIC) **must** schedule a three-week SPRUCE below decks every 48 months. The SPRUCE **must** contain a 14-day production period which will not be scheduled to commence sooner than two days following an underway period. Per references (a) and (b), underway periods **must** not be scheduled within five days of completion of the production period. In summary:

Ship returns to port	0 days
Preparation period	2 days
Production period	14 days
Gas off period	5 days
TOTAL	21 days

- b. ISICs **must** utilize every effort to accomplish a full three week SPRUCE consisting of 14 days of production. ISICs may approve a shorter SPRUCE below decks of 5 to 14 days of production time on a case-by-case basis due to operational requirements. Total allotted time for SPRUCE will at no time be less than 12 days to encompass preparation and gas off periods. A shorter production period will equate to a corresponding reduction in the overall amount of square footage accomplished during the scheduled period. When a shorter period is executed for below decks SPRUCEs, meticulous attention should be given toward the accomplishment of additional below deck SPRUCE periods to ensure sufficient preservation is achieved to facilitate 33+ years hull life. SPRUCEs not meeting three weeks in duration **must** be properly documented by ISICs to ensure a complete history of ship's preservation is available.

Ship returns to port 0 days

Preparation period 2 days

Production period XX days

Gas off period 5 days

TOTAL 7+XX days

- c. ISICs **must** schedule a one-week SPRUCE for the sail interior every 24 months. Sail SPRUCEs can be coincidental with routine availabilities.
- d. A SPRUCE **must** not be scheduled during other Ship's Force or Fleet Maintenance Activity (FMA) upkeeps with the exception of the five-day gas off period which may be scheduled during a follow-on upkeep. A SPRUCE should not be scheduled within the six-month period prior to a Chief of Naval Operations Maintenance Availability. A SPRUCE should not be scheduled within six months after a Depot Modernization Period (DMP), Engineered Refueling Overhaul, or Engineered Overhaul because of the industrial activity's preservation programs.
- e. The initial base date for scheduling is the official completion date of the ship's last DMP, Engineered Refueling Overhaul or Engineered Overhaul.

27.3 RESPONSIBILITIES.

27.3.1 Type Commander.

- a. Administer the SPRUCE program.
- b. Maintain a file of SPRUCE lessons learned and distribute to ensure that all commands concerned have the latest information available.

27.3.2 Immediate Superior In Command.

- a. Schedule and coordinate SPRUCE upkeeps per the Key Event Schedule of Appendix A of this chapter.
- b. Coordinate submarine crew training.
- c. Monitor the effectiveness of the SPRUCE program.

- d. Chair a SPRUCE debrief with Ship's Force and FMA to review the effectiveness of the SPRUCE and generate lessons learned. The results of this meeting will be included in the Ship's SPRUCE completion letter.

27.3.3 Fleet Maintenance Activity.

- a. Provide training, tools, consumables, services, and required support personnel.
- b. Provide technical guidance consisting of around the clock coverage by a coatings inspector trained to the requirements of reference (c) and reference (d), as applicable. The coatings inspector will perform all inspections necessary to ensure proper preservation is accomplished and will complete Appendix B of this chapter for each area preserved. All completed forms from Appendix B of this chapter will be submitted to the ship for inclusion into their SPRUCE completion letter.

27.3.4 Submarine Commanding Officer.

- a. Ensure preservation is performed by Ship's Force using the procedures contained in references (c) and (d), as applicable, through (f).
- b. Ensure Ship's Force personnel are relieved of all requirements other than those necessary to maintain the safety and security of the ship during the SPRUCE.
- c. Designate an officer or Chief Petty Officer (CPO) to serve as the SPRUCE Manager.
- d. Ensure the ship is divided into preservation zones. Each zone will have an officer or CPO in charge during the SPRUCE. Conduct a thorough preservation inspection of each zone, assisted by an FMA coatings inspector (if possible) at least 90 days prior to the start of the SPRUCE to determine and prioritize the preservation to be accomplished. Appendix C of this chapter **must** be reviewed as part of this inspection.
- e. Submit completion letter to the Type Commander (TYCOM) via the chain of command. This letter **must** report results of the SPRUCE, problems encountered, lessons learned, and **must** contain completed forms from Appendix C of this chapter.

APPENDIX A

SPRUCE KEY EVENT SCHEDULE

1. The ISIC is responsible for ensuring adherence to the following schedule to assure the effective planning of a SPRUCE upkeep. The ISIC will act for the ship to complete items should an underway period preclude timely accomplishment. The ISIC will alert the ship's Commanding Officer and the TYCOM in the event that any of the following time frames will be exceeded.

<u>DAY</u>	<u>ACTION</u>

-90	ISIC ensure SPRUCE is on the ship's operating schedule. Schedule the SPRUCE with the FMA. Notify TYCOM (N3, N4, or both) of planned SPRUCE dates.
-90	Commanding Officer assign SPRUCE manager and zone supervisors. Ship and FMA conduct preservation inspection.
-90	Commanding Officer submit OPNAV 4790 2K or 2L requests for powder coating services. Ships must make effective use of these services to enhance the effectiveness of preservation for components located in hostile environments.
-90	ISIC and Commanding Officer arrange for respiratory protection physicals, initial respiratory training for the ship's Hospital Corpsman, and respirator fit-checks for crew by FMA Occupational Safety and Health personnel. The crew must be trained in respirator use by the ship's Hospital Corpsman.
-90	ISIC and Commanding Officer make plans for crew technical training.
-30	Commanding Officer establish painting "Tiger Team" and ensure adequate number of personnel are assigned to accomplish the upkeep commensurate with ship checks. The Tiger Team should include personnel not necessary to maintain the safety and security of the ship. Issue a SPRUCE watchbill.
-30	Commanding Officer review and conduct training with assigned personnel and Work Center Supervisors. Establish a General Military Training program incorporating requirements of references (c) and (d), as applicable, (e), and (f) and the ship's paint schedule. Provide the SPRUCE Plan of Action and Milestone to the ISIC for review.

2. Conduct a 21-Day SPRUCE in the following manner:

<u>DAY</u>	<u>ACTION</u>

-2	Tiger team make preparations for SPRUCE.
1-2	Ship's Force preparations for SPRUCE.
3-16	Ship's Force execute SPRUCE preservation work.

<u>DAY</u>	<u>ACTION</u>

16	ISIC, Commanding Officer, FMA conduct SPRUCE debrief. Commanding Officer submit SPRUCE completion letter.
21	Ship's first available underway date.

APPENDIX B

SPRUCE REPORT FORM

SPRUCE REPORT FORM 4790.3

INSPECTOR

Ambient Conditions		Location Fr#	Date	Time	Date	Time	Date	Time			
Air Temperature											
Wet Bulb Temperature											
Relative Humidity											
Surface Temperature											
Dew Point											
Hours Left Uncoated (Bare Metal)											
Coat #	Paint Manufacturer's Name and Description	Batch Number	Application Method	Time Allowed to Cure	DFT Before this coat	WFT Measurements	M i n	M a x	DFT Measurements	M i n	M a x
Coat #	Mixing				Holidays		Defects/Comments				

Surface Preparation

Pre-Inspection Comments

Defects Corrected

Pre-Cleaning Method

Comments

APPENDIX C
SPRUCE CHECK LIST

1. Has a Navy Occupational Safety and Health **or** Environmental Protection Agency representative been onboard to ensure compliance with occupational health and environmental regulations?
2. Is the ship aware of all required training (Hazardous Material, Respirator, Technical)?
3. Assess level of effort required to accomplish SPRUCE. Assess type **and** quantity of tools and paint required. FMA informed for planning purposes.
4. FMA coatings inspector review SPRUCE report form (Appendix A of this chapter) of this chapter requirements with the ship. Discuss why, how, and when these inspections are required.
5. Does the ship have a copy of Submarine On Board Training Video SVT-GT-9336 (Submarine Preservation)?
6. Does the ship hold the most recent revisions to NSTM Chapter 631 (Preservation of Ships In-Service - General) and reference (d)?
7. Is the ship aware of the appropriate uses of powder coatings?
8. Does the ship hold the most recent "lessons learned" distribution from the TYCOM?

VOLUME VI
CHAPTER 28
CABLEWAY ASSESSMENT

REFERENCES.

- (a) NAVSEAINST 9304.1 - Shipboard Electrical Cable and Cableway Inspection and Reporting Procedures
- (b) DOD-STD-2003 - Military, Standard, Electric Plant Installation Standard Methods for Surface Ships and Submarines

LISTING OF APPENDICES.

A Sample Cableway Assessment Message

28.1 PURPOSE. The Cableway Assessment Program is a comprehensive inspection of shipboard electrical and fiber optic cables, conducted by Fleet Maintenance Activity (FMA) cableway assessment teams. The requirements for cableway assessments are contained in reference (a), which defines the training requirements, assessment criteria, and reporting procedures relevant to the assessments.

28.2 HAZARD CATEGORIES. The surface force ships and aircraft carriers electrical cable and cableway assessment program is designed to identify and correct cable and cableway safety hazards in a prioritized, orderly manner, consistent with ship and personnel safety. The three categories of deficiencies are defined as:

- a. Category 1 - IMMEDIATE HAZARD: Deficiencies which are, or have the immediate potential to be, personnel safety hazards, electrical fire hazards, or which negate firebreak integrity.
- b. Category 2 - POTENTIAL HAZARD: Deficiencies which require corrective action to ensure continued reliable safe performance or to maintain watertight integrity, but are not an immediate danger to personnel or equipment.
- c. Category 3 - NON-HAZARDOUS: Deficiencies which are not hazardous to personnel or equipment but are not in compliance with approved standard installation practices.

28.3 DEFICIENCY CORRECTION. The intent of this program is to ensure that deficiencies classified as Category 1 are corrected immediately. Deficiencies classified as Category 2 should be scheduled for repair during the ship's next regularly scheduled industrial availability as work priority permits. Category 3 deficiencies should be corrected whenever such repairs can be accomplished in conjunction with other scheduled repairs or alterations involving the cables or cableway in which the deficiencies exist.

28.4 ASSESSMENT SCHEDULING.

28.4.1 Initial Assessment. Initial cable and cableway assessments are conducted on each ship to establish a baseline configuration to ensure compliance with reference (b).

28.4.2 Follow-up Assessments. Follow-up assessments **must** be conducted within 12 months prior to a major or minor Chief of Naval Operations availability. The purpose of this assessment is to validate the integrity of ship's cableways, identify discrepancies that require depot or commercial level work effort, and to train responsible Ship's Force personnel to meet requirements of paragraph 28.6.5 of this chapter. Both the initial and follow-up assessments will be comprehensive, complete ship assessments.

28.4.3 Partial Assessments. Following availabilities which modify shipboard cableways, ships may request partial assessments to validate the quality of the modified or newly installed cableways.

28.5 CABLEWAY ASSESSMENT ASSIST TEAM COMPOSITION AND PROCEDURES.

- a. FMA Electrical Cableway Assessment shops ideally consist of 12 FMA personnel. The recommended shop manning is six certified personnel and six personnel in training. Certified personnel must have satisfactorily completed a cableway assessment **or** repair training course and satisfactorily demonstrated their practical knowledge based on enclosure (1) of reference (a). Personnel in training may assist in cableway assessments after satisfactorily completing the classroom training modules per reference (a) and satisfactorily demonstrating their practical knowledge to an FMA appointed certifying assessor. Assessors should be E5 or above, with shipboard experience, and from the following source ratings: AE, EM, ET, EW, FC, FT, GM, GSE, IC, IT, STG, and STS.
- b. For assessment **or** assist visit purposes, the FMAs should establish sub-teams of one certified assessor, one trainee, and one Ship's Force member. Assign as many sub-teams as necessary to assess the entire ship. The assessed ship will assign a minimum of one Ship's Force person per FMA sub-team from the source ratings **in sub-paragraph a**, for the purpose of training, and to assist in shipboard assessment and repairs. Each FMA will assign one HT (qualified welder) to assist during shipboard cableway repairs.
- c. In addition to technical training, all team members **must** be trained to administer Cardio-Pulmonary Resuscitation.
- d. Upon completing the assessment of the entire ship, assessment teams will assist in the correction of cableway deficiencies as time and schedules permit. Repair efforts will concentrate on removal of dead-ended cables, correction of watertight integrity items, and Category 1 discrepancies.

28.6 RESPONSIBILITIES.

28.6.1 Immediate Superior In Command. Ensure assigned ships are scheduled to receive required cableway assessments and training.

28.6.2 Regional Maintenance Center. Schedule assigned ships for cableway assessments **or** assist visits and coordinate the training effort of Ship's Force personnel by the FMA.

28.6.3 Fleet Maintenance Activity.

- a. Establish the following to support the Electrical Cableway program:

- (1) Electrical Cableway Assessment and Repair Teams for the accomplishment of scheduled cableway assessments.
 - (2) Training program to support FMA training needs as specified in Part II of enclosure (1) of reference (a).
 - (3) Training program for ship's personnel. Training of Ship's Force personnel will include classroom training before the assessment and shipboard practical training during the assessment.
- b. Give daily progress reports (briefing, if possible) to ship's Commanding Officer, identifying Category 1 findings and any other areas of concern.
 - c. Upon completion of the assessment, submit a final report per Appendix A of this chapter to the applicable Type Commander (TYCOM) (N434), info the Immediate Superior In Command (ISIC) and the Regional Maintenance Center. The final report should contain a list of Ship's Force personnel trained as cableway assessors **or** repairmen, including names and rate **and** rank.

28.6.4 Cableway Assessment Team.

- a. Locate, identify, and categorize electrical cableway discrepancies on ships.
- b. Train Ship's Force to assess, repair, and maintain shipboard cableways.
- c. Correct identified discrepancies which are beyond Ship's Force capability, or document discrepancies for future correction.
- d. Provide guidance for the repair of deferred discrepancies.

28.6.5 Ship Commanding Officer.

- a. Assign Ship's Force personnel (E4 or above) from source ratings listed in paragraph 28.5.a of this chapter for FMA cableway assessment repair training. After completing training, they will serve as quality assurance personnel to minimize future discrepancies by contractors and electrical installation teams. They should identify, track, and repair cableway discrepancies within their departments.
- b. Correct outstanding discrepancies listed in the final cableway assessment report.
- c. Within 30 days of completion of the assessment, enter all unrepaired Category 1 discrepancies in the Current Ship's Maintenance Project. Schedule these items for corrective action at the earliest opportunity.

28.7 REPORTS. Upon completion of the cableway assessment, the assessing agency must submit a final report using the format of Appendix A of this chapter.

16 Oct 2019

APPENDIX A**SAMPLE CABLEWAY ASSESSMENT MESSAGE**

FM (FMA)//
 TO USS (SHIP'S NAME AND HULL NO.)//
 INFO ISIC//(AS APPROPRIATE)
 RSG/RMC//(AS APPROPRIATE)
 BT
 UNCLAS //N04790//
 MSGID/GENADMIN/(ORIGINATING FMA)//
 SUBJ/ ELECTRICAL CABLEWAY ASSESSMENT REPORT FOR USS (SHIP'S NAME
 AND HULL NO.)//
 REF/A/DOC/COMUSFLTFORCOMINST 4790.3//
 AMPN/REF A IS JOINT FLEET MAINT MAN/VOL VI CH 28 PROVIDES GUIDANCE IN
 CABLEWAY INSPECTIONS//
 RMKS/1. CABLEWAY ASSESSMENT OF USS (SHIP'S NAME AND HULL NO.) WAS
 CONDUCTED **PER** REF A FROM (START DATE) TO (COMPLETION DATE) BY
 (INSPECTING UNIT). RESULTS ARE:

	CAT 1	CAT 2	CAT 3	TOTAL
ITEMS IDENTIFIED	_____	_____	_____	_____
ITEMS CORRECTED	_____	_____	_____	_____
ITEMS REMAINING	_____	_____	_____	_____
ITEMS DOWNGRADED	_____	_____	_____	_____

2. CABLE/CABLEWAY DISCREPANCIES.

	QUANTITY	PERCENTAGE
DEAD-ENDED CABLES	_____	_____
IMPROPER EQUIPMENT/BULKHEAD PENETRATIONS	_____	_____
COLLARS/CHAFING RINGS WITHOUT FIRE STOP	_____	_____
MISSING CABLE HANGERS	_____	_____
TUBES NOT PACKED	_____	_____
TUBES NOT BLANKED	_____	_____
CHAFED CABLES	_____	_____
EQUIPMENT IMPROPERLY MOUNTED	_____	_____
CONNECTERS MISSING TEMPSEAL	_____	_____
IMPROPER SPLICES	_____	_____
EXCESSIVE SLACK IN CABLES	_____	_____
INCORRECT BEND RADIUS	_____	_____
MISSING COVERS	_____	_____

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IMPROPER BANDING	_____	_____
IMPROPER CABLE RUNS	_____	_____
FIRE BOUNDARIES MISSING FIRE PROTECTIVE COATING	_____	_____

3. THE FOLLOWING ITEMS WERE CORRECTED:

	QUANTITIES
DEAD ENDED CABLES	_____
DEAD ENDED CABLES PROPERLY END SEALED	_____
NEW CABLES INSTALLED	_____
IMPROPER EQUIPMENT PENETRATIONS DOWNGRADED WITH APPROVED METHODS	_____
FIRE BOUNDARIES TREATED WITH FIRE PROTECTIVE COATING	_____

(LIST ANY OTHER TYPES OF DISCREPANCIES AND QUANTITIES CORRECTED)

4. FIRE PROTECTIVE COATING (TYPE) HAS BEEN APPLIED TO ALL ELECTRICAL PENETRATIONS THROUGH DESIGNATED FIRE ZONE BOUNDARIES (IF ALL DESIGNATED BOUNDARIES WERE NOT COATED, IDENTIFY REMAINING BOUNDARIES TO BE COATED).

5. ELECTRICAL CABLE/CABLEWAY INSPECTION IS COMPLETED (OR) ELECTRICAL CABLE/CABLEWAY INSPECTION IS COMPLETE WITH THE FOLLOWING EXCEPTIONS (LIST COMPARTMENTS OR IDENTIFY BOUNDARIES).

6. THE FOLLOWING SHIP'S FORCE PERSONNEL WERE TRAINED AND HAVE SATISFACTORILY DEMONSTRATED THEIR PRACTICAL KNOWLEDGE IN CABLEWAY INSPECTION AND REPAIR TECHNIQUE. PERSONNEL HAVE BEEN INFORMED OF THEIR RESPONSIBILITY FOR QUALITY ASSURANCE OF CABLEWAYS INCLUDING INSPECTION AND MAINTENANCE OF CABLEWAYS:

NAME	RATE/RANK	DOD ID#
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

BT

NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.

VOLUME VI**CHAPTER 29****HEAT STRESS CONTROL AND REPAIR OF
THERMAL INSULATION**REFERENCES.

- (a) NAVSEA S9086-VH-STM-010 - NSTM Chapter 635 (Thermal, Fire and Acoustic Insulation)
- (b) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- (c) NAVSEA S9086-RQ-STM-010 - NSTM Chapter 510 (Heating, Ventilation, and Air Conditioning Systems for Surface Ships)

LISTING OF APPENDICES.**A Inspection Guide for Excessive Heat**

29.1 PURPOSE. To provide guidance for reducing excessive heat generation and the control of asbestos lagging and insulation material.

29.2 HEAT STRESS.

- a. Excessive temperatures not only cause discomfort to personnel and the risk of burns from hot surfaces, but also lead to inattentive or inefficient watch standing, and the inability to perform maintenance. They also lead to jury-rigging of ventilation systems, often making the situation more severe. While the principal problems are centered in the engineering spaces, these conditions also exist in other heat producing spaces (i.e., laundries, sculleries, and auxiliary machinery spaces).
- b. The causes of excessive temperatures in ship machinery spaces are:
 - (1) Radiant heat from steam piping valves and machinery which has missing, water-soaked, or deteriorated insulation.
 - (2) Steam and water leaks.
 - (3) Boiler air casing leaks.
 - (4) Ventilation system deficiencies, such as, inadequate cleaning, improper maintenance or grooming, and design inadequacies.
- c. Several steps have been taken toward correcting the problem of heat stress.
 - (1) Fleet Maintenance Activities (FMA) have increased their capability to accomplish lagging of piping and machinery.
 - (2) Special teams have been set up in some FMAs to aid ships in inspecting for insulation deficiencies.
 - (3) FMAs are outfitted with hand held pyrometers.

- (4) Fire room lagging repairs are priority items during Chief of Naval Operations Maintenance Availability.

29.2.1 Measurement of Insulation Surface Temperatures.

- a. Check and calibrate the pyrometer per the instrument directions. Checking for the proper emissivity setting is particularly important. The following emissivities apply to this procedure:
 - (1) Navy white paint (clean) - 0.9
 - (2) Navy aluminum paint (clean) - 0.4
- b. Sight the pyrometer on the object to be inspected. Record pyrometer readings for each location tested. Measure and record ambient dry bulb readings in proximity to the surface being inspected for each location being inspected. When inspecting piping systems, scan the pipe run with the pyrometer. When a location with deteriorated insulation, producing a hot spot, is passed, the readings will increase significantly. Record this location as requiring insulation replacement.
 - (1) Items or systems being inspected **must** be at normal operating conditions and temperatures.
 - (2) If the pyrometer acts erratically (i.e., zero not adjustable), place the instrument in a cool air stream until the instrument stabilizes and then proceed with the readings.
 - (3) When not in use, store the pyrometer in an area having an ambient temperature of less than 100 degrees F.
- c. Determine the maximum allowable surface temperature, as shown in reference (a). If the recorded temperature exceeds the maximum allowed per reference (a), corrective action must be taken.
- d. Appendix A of this chapter is a checklist guide to be used in locating areas of excessive heat generations.

29.2.2 Heat Stress Area Stay Times. Heat stress is measured with a Wet Bulb Globe Thermometer **per** the instructions contained in reference (b). Using the Wet Bulb Thermometer readings, calculate stay times from the Stay Time Tables of reference (b).

29.3 INDUSTRIAL AVAILABILITY LAGGING PLAN. For any industrial availability period where major lagging work is expected, prepare an overall lagging plan, and schedule repairs that permit coordination with other planned work. The plan must show which areas to be repaired contain asbestos. Visual inspection and use of a pyrometer, when underway, is normally sufficient to reveal areas needing repair or replacement. For each piping system inspected, mark up a copy of the system piping diagram to show specific repairs needed, and attach the marked up diagram to an OPNAV 4790/2K work request.

29.4 ASBESTOS LAGGING **AND** INSULATION.

29.4.1 Asbestos Control and Safety. All personnel **must** understand and adhere to the policies and procedures provided in references (a) and (b) regarding the handling of asbestos. Those

persons that meet the criteria in reference (b) **must** be enrolled in the Asbestos Medical Surveillance Program.

29.4.2 Repairs to Asbestos Lagging **or** Insulation. Exposed asbestos thermal insulation poses a danger to personnel who may breathe in the airborne fibers. Damaged asbestos insulation **must** not be left unattended. Corrective measures include:

- a. Application of ARABOL (MIL-A-3316) for minor insulation damage.
- b. Use of aluminized fibrous glass to protect insulation in high traffic area.
- c. Use of chafing gear and other protection to reduce damage.
- d. Training work center or work party personnel who may be contributing to excessive insulation damage.
- e. Alerting all shipboard personnel to report any insulation damage.

29.4.3 Removal of Asbestos Lagging **or** Insulation.

- a. If removal of asbestos lagging is required to carry out equipment repairs, request that the Type Commander arrange for a special asbestos handling team. The team will be assigned from either an FMA or contractor, depending on the size of the job.
- b. If the ship is away from its homeport and damage occurs, remove minor areas of defective asbestos insulation using the methods specified in reference (a). Ship's Force must be made aware of the health hazards involved in removing asbestos, and know the measures required for personnel safety.
- c. To simplify cleanup and reduce health hazards from dust, collect any debris from removed asbestos lagging in containers, **per** the requirements of reference (a).

APPENDIX A
INSPECTION GUIDE FOR EXCESSIVE HEAT

1. Insulation.

- a. Visually check piping, lagging pads, and bulkhead insulation for:
 - (1) Deteriorated (crushed or frayed) lagging or pads.
 - (2) Wet or oil soaked lagging or pads.
 - (3) Missing pads. This is also a burn hazard!
 - (4) Surface temperature.

2. Valves.

- a. Visually check valves for:
 - (1) Leaking bonnet or spiral wound metal gaskets.
 - (2) Proper packing adjustment.
 - (3) Damaged or worn valve stems.
 - (4) Proper lagging.

3. Boiler Casing Joints.

- a. Visually check casing for leaks.

4. Drains.

- a. Visually check steam drains for leakage and system misalignment.
- b. Check funnel drains for overflow conditions or missing contamination covers.
- c. Periodically check orifice plates for oversize conditions.
- d. Inspect for leaking or bypassed steam traps.

5. Bilge Levels.

- a. Dry bilges. Visual, no water present.
- b. Wet bilge. Visual, minimize bilge levels to control humidity levels.

6. Deck Plates.

- a. Ensure proper deck plate types (solid or open grate) are in place. Ensure proper airflow pattern.

7. Ventilation.

- a. Visually inspect for system cleanliness **per** reference (c). Particular attention **must** be paid to clogged exhaust screens, dirty ventilation ducting, missing or mutilated ductwork and misdirected terminals.
- b. Check system for breaks or openings due to corrosion. The system must be intact to deliver the proper velocity (minimum 250 Cubic Feet per Minute at each station).

Check for closed or partially closed “Circle William” dampers and inoperative fan motors and controllers.

- c. Main spaces should have a negative air pressure differential of 1/4” to 1/2” (water) with supply and exhaust systems running at normal settings.

VOLUME VI**CHAPTER 30****PORTABLE TOOL ASSISTANCE PROGRAM**

30.1 PURPOSE. To provide guidance in the acquisition of portable tools, not normally carried onboard ship, and the priorities for loaning these tools to a ship in an availability.

30.2 PORTABLE TOOL INVENTORY POLICY. Shipboard preservation conducted during a Chief of Naval Operations Maintenance Availability requires an inventory of power tools beyond a ship's daily needs or normal allowance. Ships in Naval industrial activities can borrow the necessary tools directly from the activity's tool inventory under the Fleet Support Program. Such service is not routinely available to ships undergoing availabilities in a private industrial activity, because the private activity cannot legally be funded to perform this function. For ships undergoing availabilities in private facilities, tools are available in varying degrees from most Fleet Maintenance Activities (FMA).

30.2.1 Distribution Priorities. The FMAs should maintain an adequate inventory to meet anticipated needs of assigned ships. When the demand exceeds the availability, the distribution of portable tools will be based on the following priority:

- a. Priority I - Ships in availabilities in private industrial activities.
- b. Priority II - Ships in Fleet Maintenance Activity Availabilities.
- c. Priority III - Ships in availabilities in Naval industrial activities.
- d. Priority IV - All other ships.

30.2.2 Borrowing Procedures.

- a. The borrowing unit advises the lending FMA of the type, quantity, and date tools are required and the scheduled availability completion date.
- b. FMA personnel assemble a tool package in the variety and quantity requested.
- c. When the tools are picked up, an inventory receipt must be signed by an authorized representative from the borrowing command. The borrowing unit is financially responsible for the tools.

30.2.3 Borrowing Ship's Responsibilities.

- a. The borrowing unit is financially responsible for the tools.
- b. Routine maintenance (electrical safety check, fitting replacement, etc.) must be accomplished by the borrowing command.
- c. Tools and equipment must be returned promptly upon job completion or no later than the due date.
- d. Upon return and inspection of the tools, charges will be levied to the borrowing ship **in the following manner:**
 - (1) Lost Tools (to include tools not returned when due). Ships that fail to return tools when due will be reminded by letter or message that they have overdue

tools. If no response is received within 30 days, the ship will be charged for the missing tools.

- (2) Damaged tools (to include missing parts).

VOLUME VI**CHAPTER 31****SURFACE FORCE SHIP MAINTENANCE PLACEMENT
AND OVERSIGHT BUSINESS RULES**REFERENCE.

- (a) NWP 1-03.1 - Naval Warfare Publication Operational Report

LISTING OF APPENDICES.

A RMC Spotlight Reports

31.1 PURPOSE. The purpose of this chapter is to provide procedures and guidance regarding ship maintenance placement and oversight business rules. These procedures and guidance affect Regional Maintenance Centers (RMC), Type Commanders (TYCOM) and Ship Maintenance Teams.

31.2 BACKGROUND. Current directives demand a culture of readiness. The process described here addresses the need for a flexible maintenance support system that increases efficiency without compromising effectiveness, and defines a common planning process for ship maintenance and modernization. These processes need to be disciplined with objective measurements and institutionalized with a continuous improvement methodology.

31.3 SHIP MAINTENANCE FUNDING MANAGEMENT BUSINESS RULES.

31.3.1 Scope. The goals of the entitled funding process are to reduce premiums paid for maintenance while simultaneously improving the ability to respond to maintenance and operational requirements. The funding business rules establish the central role of the Ashore Ship's Maintenance Manager working with the ship's Commanding Officer to manage the funds required to support all maintenance for a given ship. Starting with the submission of an overall Maintenance and Modernization Business Plan (MMBP), the Ashore Ship's Maintenance Manager will establish the quarterly distribution of controls from the established annual maintenance target needed to accomplish the ship's maintenance in the most efficient manner. The process provides the ship with a level of funding stability that will provide for the execution of an effective maintenance plan.

31.3.2 Ship and Maintenance Team Business Responsibilities.

- a. Each ship's Maintenance Team is led by the Ashore Ship's Maintenance Manager. The Ashore Ship's Maintenance Manager coordinates with the RMC to execute maintenance **following** Fleet and TYCOM maintenance policies and directives. The TYCOM **must** ensure that each ship's Business Plan is tailored to fit unique geographic and business climate situations.
- b. The Maintenance Team (primarily the ship's Commanding Officer working with the Ashore Ship's Maintenance Manager) supports the Fleet Maintenance Officer and TYCOM in identifying budget needs based on well documented requirements in the Current Ship's Maintenance Project (CSMP), the Class Maintenance Plan, the Baseline Availability Work Package, the class Technical Foundation Paper and historical data. The Ship's MMBP identifies the total funding budgeted to support the

ship during the execution year, along with advance planning funding for availabilities to be executed in future years. The TYCOM determines how much of the Ship's MMBP they can fund (controls) of the total requested, and how much money per quarter (phasing plan) they can provide for executing the Ship's MMBP. The following guidelines are not all-inclusive but should be considered when structuring the phasing plan:

- (1) The Maintenance Team will receive their actual spending levels or controls from the TYCOM. The RMC, with the TYCOM's approval, may adjust controls between maintenance teams as required during the course of the execution year. The goal is to establish controls before the execution year starts and then maintain these controls fixed throughout the execution year.
 - (2) The Maintenance Team provides the RMC and TYCOM with a quarterly spending or phasing plan based on their Ship's controls. The plan should be consistent with the ship's operational cycle and predefined maintenance periods. For example, deployments and underway periods in a given quarter should cause the displacement of Continuous Maintenance (CM) controls to other quarters where the maintenance is likely to occur.
 - (3) Funds will be provided to Maintenance Teams early enough to avoid premiums associated with late contract award, definitization or assignment of work.
- c. Significant deviations from the final negotiated MMBP or controls will be documented in a Summary of Events. It is recognized that the drivers for MMBP changes are often outside the direct control of the Maintenance Team and will be documented as such. The fundamental guidelines for executing at MMBP financial control levels are:
- (1) Follow the guidance in Volume II, Part II, Chapter 1 of this manual regarding screening and brokering of work candidates.
 - (2) During the execution of an availability, growth and new work should be authorized only if the Business Case Analysis indicates that this is the best course of action, taking into consideration all applicable business and operational risks and factors.
- d. The Maintenance Team, with the TYCOM's approval, may shift controls between the Chief of Naval Operations (CNO) availability and CM budget lines in order to most efficiently accomplish required maintenance and modernization.
- e. The Maintenance Team **must** schedule continuous maintenance availabilities per Volume II, Part II, Chapter 2 of this manual. Adjustment of Continuous Maintenance Availability dates **must** be coordinated with the RMC and requested from the Immediate Superior In Command via naval message. Date changes **must** be minimized in order to realize the maximum benefit from advance planning work. The Maintenance Team may not change CNO availability dates. The Maintenance Team **must** resolve CNO availability scheduling issues with the TYCOM via the RMC. The TYCOM **must** include Program Executive Office (PEO) Ships in any discussions resulting in availability date changes when Program Alterations are scheduled for the availability.

- f. The Maintenance Team **must** review proposals for fair and reasonable costs, work scope and applicable technical aspects prior to the Technical Analysis Report (TAR) process.
- g. The Maintenance Team has the authority to adjust the MMBP in response to changes in ship operations, planned maintenance periods, and other business case reasons provided the intended distributions do not exceed the total remaining annual budget requirement allocated for that ship. This redistribution will be documented via a revised quarterly phasing plan, a Summary of Events prompting the change, and a formal recovery plan, which will be submitted to the TYCOM via the RMC for approval and adjustment of the Maintenance Team controls. Over the course of the fiscal year, some minor adjustments to the phased funding requirement can be expected. The cognizant RMC, with approval from the TYCOM, will establish funding redistribution limits below which a formal recovery plan would not be required, however, the revised quarterly phasing plan and Summary of Events would still be needed for approval. Ship's Commanding Officers **must** ensure that their Immediate Superior In Command is advised of any proposed changes to their MMBP which may affect operational schedules or planned modernization.
- h. The Maintenance Team may not unilaterally adjust the MMBP when the adjustments would exceed the total remaining funding controls allocated for the ship. Any requirement in excess of the total MMBP currently approved will require the submission of a revised quarterly phasing plan, a Summary of Events related to the change, and a formal recovery plan. The RMC will evaluate the increased requirement and will make their recommendation for approval to the TYCOM based on total controls available. The RMC may not exceed an individual ship's total funding controls.
- i. Depot level maintenance will normally be screened to the Private Sector Industrial Activity (PSIA) contractor. The Maintenance Team may go to other contracting vehicles when:
 - (1) The PSIA contractor and government cannot agree on cost and scope.
 - (2) The PSIA contractor does not have the capability or capacity.
 - (3) Indefinite Delivery, Indefinite Quantity **or** Commercial Industrial Services (or Simplified Acquisition Purchases and a qualified vendors list) is available.
 - (4) Other organic RMC assets are available and have the capability for the work.
 - (5) Work is to be accomplished outside of homeport area.
 - (6) Work is to be accomplished by an Alteration Installation Team (AIT).
- j. During the execution of a maintenance availability, it is anticipated that deficiencies will be identified that could be accomplished as either growth or new work on the existing contract. The Maintenance Team **must** perform a Business Case Analysis to decide whether or not to add the work to the current availability or schedule it during another maintenance opportunity.

- k. When work deferral reduces the total cost of the job or maintenance completes with a cost under-run and funds can be recaptured, the funding controls will normally remain under the control of the respective Maintenance Team. If the funds are needed for critical work on another ship or to cover a funding shortfall at the TYCOM **or** Fleet level, the TYCOM will redistribute as necessary. The change will be documented in a revised quarterly phasing plan and the Maintenance Team(s) should provide to the RMC an impact statement and recommended plan to mitigate the effects of the plan change.
- l. The RMC coordinates with the Maintenance Teams to comply with their approved ship's MMBPs. The RMCs **must** make a monthly MMBP execution report to the TYCOM.
- m. Maintenance Teams will issue funds to the appropriate executing activity by submitting a planning estimate to the TYCOM (via the RMC) and the TYCOM will issue the actual funding document.
- n. PSIA contractors normally submit cost reports to Maintenance Teams on a bi-weekly basis. The Maintenance Team will utilize these reports to assess the cost performance of the PSIA contractor and address items of concern to the RMC or TYCOM.

31.3.3 Regional Maintenance Center Business Responsibilities.

- a. The RMC Commander has the authority to execute Surface Force Ship maintenance and **must** do so **following** Fleet and TYCOM policies and directives.
- b. The RMC Commander develops an execution year spending plan for the TYCOM's approval based on the TYCOM approved MMBPs.
- c. The Fleet Commander spending controls are issued to the TYCOM who then assigns spending controls to each Maintenance Team, informing the RMC. The RMC issues quarterly spending controls to all of the Maintenance Teams **following** the TYCOM's final TYCOM approved MMBP for each ship.
- d. The RMC Commander will evaluate MMBP adjustment requests based on the Summary of Events, recovery plan, and quarterly adjustment provided by the Maintenance Teams. If the RMC supports the request, the RMC will forward the issue to the TYCOM for approval.
- e. The RMC Commander **must** request approval from the TYCOM whenever redistribution of annual ship funding is required. The RMC **must** provide the TYCOM a record of all control changes for tracking purposes. Redistribution of funds between Active Fleet and Reserve Fleet funding lines or between different TYCOMs requires approval by the Fleet Commander.
- f. In the event of significant program wide control changes the RMCs **must**:
 - (1) Provide an impact statement to the TYCOM regarding the effect on the execution of maintenance.
 - (2) Provide a recommendation to minimize the impact on Force readiness.

- g. The RMC **must** evaluate the financial status of each of the Maintenance Teams on a monthly basis.
- h. The RMC **must** submit monthly financial summary reports to the respective surface TYCOM. This report provides a comparison of actual versus planned funding execution. The last report for the execution year will include an annual summary showing how the funds were utilized, sorted by Naval Operations resource sponsor.
- i. C3**and** C4 Casualty Reports (CASREP), or a C2 CASREP with reasonable potential to become a C3 **or** C4 CASREP, are identified as emergent maintenance and will be funded with emergent dollars. Emergent work will be scheduled to minimize premiums in as much as the operational schedule will permit. C2 CASREPs will normally be corrected using the CM Process. Consideration will be given to schedule all maintenance, including emergent, at an opportune time to reduce premiums. The RMC Commander may, with the respective TYCOM's prior approval, convert Emergency Maintenance funds to execute CNO availability or CM maintenance.
- j. Except as stated in paragraph 31.3.3i. of this chapter, C2 CASREPs will be corrected during CM periods (both scheduled Continuous Maintenance Availabilities and maintenance Windows of Opportunity) using CM funds. C2 CASREPs discovered during a CNO availability or Continuous Maintenance Availability will be addressed as new work. C2 CASREPs may be allowed to "age" until the appropriate repair opportunity. The RMC Commander has the responsibility to request TYCOM authorization when Emergency Maintenance funds should be used for the correction of C2 CASREPs or other non-CASREP related, but nonetheless urgent maintenance. The RMC is required to approve any planned delay of action on a CASREP. In the event that the delay effectively constitutes a CASREP deferral **per** reference (a), the RMC will forward the deferral recommendation to the TYCOM for approval.
- k. The RMC Commander will generate monthly maintenance availability metrics for all assigned ships planning for a CNO availability and ships in a CNO availability. These metrics will be briefed at least monthly to the TYCOM at Surface Team 1 Maintenance and Modernization Continuous Improvement Team meetings. The business rules for preparation of these forms are included in Appendix A.

31.3.4 Type Commander Responsibilities.

- a. The TYCOM establishes Force maintenance policies and directives, consistent with Fleet Commander guidance, and authorizes the Maintenance Team and RMC to act as the principal agent to execute those policies and directives.
- b. The TYCOM will provide a list of Fleet Alteration requirements for the execution year as input to the ship's business plan no later than 15 February in the year prior to execution. To assist with business plan development, the TYCOM will identify which alterations are scheduled for accomplishment and will provide the Maintenance Team and RMC with the cost estimates for accomplishment.
- c. When the Fleet issues the spending controls to the TYCOM, the TYCOM will in turn issue spending controls to the RMC and update those spending controls on a quarterly basis.

- d. The TYCOM has the authority to recapture spending controls previously issued to the Maintenance Teams and RMCs in response to unforeseen Force budget requirements. This will be used as a last resort, as the goal is to maintain stable funding plans in support of ships' MMBPs.
- e. If it is determined that the best course of action is not to fund a CNO availability, the TYCOM must (with concurrence from United States Fleet Forces or Commander, Pacific Fleet, whichever is appropriate) approve the removal of funds before the RMC initiates this action. The TYCOM **must** ensure PEO Ships is included in the decision process to not fund any availability where Program Alterations are scheduled for accomplishment during that availability.
- f. The TYCOM will evaluate MMBP adjustment requests forwarded by the RMC based on the Summary of Events, recovery plan, and quarterly adjustment provided by the Maintenance Team. If the TYCOM supports the request but lacks spending "controls" required, the TYCOM will forward the issue to the Fleet for approval and additional controls.
- g. The TYCOM will evaluate the RMC's end of month financial status reports to assess the degree of conformance to the approved RMC consolidated spending plan.

31.4 MAINTENANCE PROPOSAL REVIEW. The maintenance process must be flexible enough to be able to respond to changing operational requirements. The key to this flexibility is to reduce the cycle time involved prior to the actual execution of the maintenance. The Continuous Estimating, Incremental Planning Review Process guidelines will be utilized by the Maintenance Team to approve all proposed maintenance actions within time and budget constraints. The guidelines apply equally to Advance Planning, Long-Lead-Time Material, CNO, CM and Emergent Maintenance work.

31.4.1 Concept. The entitled process concept enables the Maintenance Team to review planned work items and estimates on a continuous basis as they are received. The Ashore Ship's Maintenance Manager is empowered to shift work items from CNO to CM or vice versa to optimize work scheduling and reduce premium exposure and overall cost.

31.4.2 Business Rules.

- a. The Ashore Ship's Maintenance Manager, with support from the Maintenance Team **and Government Availability Planning Managers, must** analyze the work package against the availability schedule. In general, Maintenance Teams should consider scheduled availability lengths fixed and attempt to adjust the work package to ensure it can be completed within the scheduled dates. When justification exists, the Maintenance Team should recommend availability length adjustments to the TYCOM to minimize premiums.
- b. The Ashore Ship's Maintenance Manager, with support from the Maintenance Team **and Government Availability Planning Managers, must** analyze the work package against potential CM windows of opportunity to maintain the scheduled dates of the availability, to best level load the contractor, and to minimize premiums.
- c. The Maintenance Team may not change CNO availability dates and **must** resolve scheduling issues with the TYCOM via the RMC. The TYCOM **must** include PEO

Ships in any discussions resulting in availability date changes when Program Alterations are scheduled for the availability.

- d. Work packages **must** be developed on a continuous basis in order to realize cost savings and avoid premiums associated with late identification of work **following** the business rules contained in Volume II, Part II, Chapter 2 of this manual.
- e. When capability and capacity allow, work **must** be brokered to the Fleet Maintenance Activity, otherwise, Depot level maintenance will normally be screened to the PSIA contractor. The Maintenance Team may go to other contracting vehicles when:
 - (1) The PSIA contractor and government cannot agree on cost and scope.
 - (2) The PSIA contractor does not have the capability or capacity.
 - (3) Other organic RMC assets are available and have the capability for the work.
 - (4) Work is to be accomplished outside of homeport area.
 - (5) AIT **or** Indefinite Delivery, Indefinite Quantity has been identified by the Naval Supervisory Authority (NSA) as the preferred provider.
- f. The Maintenance Team **must** review proposals for fair and reasonable costs, work scope and applicable technical aspects prior to the TAR process.

31.4.3 Continuous Estimating Incremental Planning Review Process. The Continuous Estimating Incremental Planning Review Process (CEIPRP) is the process by which the Maintenance Team continuously compares PSIA contractor work item estimates to independently developed government work item estimates throughout the development of the work package. Completion of package development and submission of the 100% Work Package Proposal is followed by the Technical Cost and Scope analysis, proposal revisions, TAR, establishment of the Prorate, Pre- and Post-Business Clearance, and signing of the bi-lateral contract modification (definitization).

31.4.3.1 Concept. Use of the CEIPRP is intended to achieve flow of work items into the work package up to 100% lock while continuously comparing government to contractor estimates to avoid last minute surprises due to estimate differences. This process also allows for flexibility up to the 100% lock in order to develop a package that best addresses the material condition of the ship as it begins the availability. Following the planning activity specification development, the PSIA contractor continuously submits a Class C Planning Estimate. Simultaneously, the government Maintenance Team continuously develops the Independent Government Estimate (IGE). These two estimates are then compared and any differences in scope and price (generally those in excess of 10% difference) are resolved. Resolving these differences during work package development also reduces the amount of time required for the TAR process. Following the 100% package lock, the planning activity completes planning, the PSIA contractor assembles and submits the 100% package proposal. Based on the 100% package proposal, an estimate of prorates is communicated to resource sponsors along with a final funding notification (as early as possible but no later than 14 days prior to the need date) in order to ensure on-time funding. This is followed by accomplishment of the TAR and business clearance processes.

31.4.3.2 Business Rules.

- a. The contractor **must** continuously submit Class C estimates for each work item as a bottom line work item cost. The Planning Estimate provides a budget level tracking and establishes a basis for determining cost reasonableness. Paragraph cost estimates will be provided by the PSIA contractor when requested by the government to resolve differences between the contractor's Planning Estimate and the IGE.
- b. The IGE is the government's detailed estimate to the trade and paragraph level. The IGE provides budget level tracking and establishes a basis for determining cost reasonableness allowing the government to validate the Planning Activity Estimate and resolve any differences in scope or cost estimates.
- c. The package will be assessed at the 50% and 80% budget to ensure that work has been brokered to planning activities continuously. These milestones also reinforce timely identification of work by Ship's Force. Following the 50% and 80% milestones, the planning activity will complete planning and estimating for all work brokered to date.
- d. Upon completion of the Planning Activity Estimate, that estimate will be compared to the IGE to gage whether the government and the Planning Activity are estimating a similar scope of work. If the individual work item Class C estimates vary by more than 10% or \$10,000 (whichever is higher), the government Program Manager will establish a scoping conference to discuss **or** resolve the scope of work.
- e. The 100% package lock is the official milestone to mark identification of 100% of the work requirements for an availability based on the MMBP budget. All work added to or deleted from the package after the 100% lock will be via an errata, addendum or inducted as new work via the Request for Contractual Change Process.
- f. The Final Funding Notification with Estimates of Prorates will be a formal communication with resource sponsor (E-mail or Naval Message) with funding requirements. Estimate prorates based on Basic Work Package Proposal man-hour estimates, historical prorate data and sponsor requirements. The Maintenance Team should ensure that estimates provided to various sponsors throughout the planning process include anticipated prorate amounts.
- g. The TAR will include all necessary information to develop a negotiation strategy, pricing recommendation and rationale to support a scope conference, if necessary, and subsequent work package cost definition. It **must** include background information, essential contractor proposal information, method of evaluation, scope of work, analysis of work items with rationale to support questionable costs and summary of pricing recommendations.
- h. A scoping conference, if necessary, **must** include the appropriate members of the Project Team, Technical Analyst, Administering Contracting Officer (ACO) or Contract Negotiator and contractor. All work items with unsubstantiated differences identified in the TAR are discussed to reach agreement on the scope of work and contractor's proposal. When all differences have been resolved, the conference **must** end with an agreement on labor hours, subcontracts and materials between the contractor and ACO or Contract Negotiator.

- i. The ACO or Contract Negotiator will take the work scope conference results and ensure correct application of indirect rates, fees and prepare appropriate documentation for signature and cost definition.
- j. The ACO representative will negotiate target costs for new work.
- k. The Project Team will minimize growth and overtime. Prior to definitization, growth items that cannot be settled by the Project Team **must** be forwarded to the Technical Analyst to be settled in the TAR process. For Surface Force ships only, the NSA Chief Engineer will review requested growth and new work items for technical compliance.

31.4.3.3 Schedule Modification. Operational commitments, port loading or other reasons may require modification to availability schedules and milestones may need to be adjusted accordingly as discussed in further detail in Volume II, Part II, Chapter 2, paragraph 2.5 of this manual.

31.5 GUIDANCE FOR FIRM FIXED PRICE CONTRACTS.

31.5.1 Overall Process. Unless specifically noted otherwise, the following are common practices in both the PSIA and Firm Fixed Price (FFP) contracting environments:

- a. Validation, screening, and brokering process.
- b. Maintenance Teams.
- c. Planning Board for Maintenance.
- d. MMBPs.
- e. Movement of work between CNO and CM.
- f. Maintenance Team metrics.

31.5.2 Firm Fixed Price Planning. Government activities **must** accomplish FFP planning with the goal of compiling a complete, clear, concise and well-defined work package. The Ashore Ship's Maintenance Manager **must** work with the Maintenance Team to define the work scope and solicitation in a FFP environment. The following points **must** be considered in the planning process for FFP contracts:

- a. Assessments are an important part of the planning phase of any availability. The Ashore Ship's Maintenance Manager **must** ensure assessment results are considered for inclusion into the work package. The Ashore Ship's Maintenance Manager **must** also determine if additional assessments should be accomplished so that the material condition of critical systems and equipment can be determined prior to the work package lock date.
- b. Proper work screening between CNO and CM availabilities is critical in order to reduce costs and premiums.
- c. Work placed in a CNO FFP Availability should be limited to work requiring a facilitated shipyard, work that cannot be accomplished in short CM availabilities, or work that must be accomplished in the availability to support operational readiness.

- d. When work, following the guidelines identified in paragraph 31.4.2b. of this chapter, cannot be accomplished in the designated time period without excessive premiums or with a low probability of success, the RMC Commander **must** be informed. Conversely, the RMC Commander **must** also be informed when there is insufficient work to justify a CNO availability.
- e. The use of proven, re-useable FFP work specifications by Maintenance Teams and planning activities should be the norm, not the exception.
- f. Ashore Ship's Maintenance Manager with assistance from the Maintenance Team **must** review all contract work specifications prior to issue, and specification review changes **must** be recorded and tracked by the planning activity.

31.5.3 Firm Fixed Price Placement. When building the availability package in preparation for contract placement, consideration **must** be given to risk mitigation to avoid premiums during execution due to late work identification. The use of Reservations and Option Items builds in flexibility to FFP contracts when it is impossible or impractical to adequately define all requirements.

- a. Option Item guidelines:
 - (1) Option Items are to be utilized in a contract solicitation when there is a strong expectation the work will be accomplished if the prerequisite conditions requiring the work are met as a result of an event, inspection, or milestone.
 - (2) Prior to solicitation, the availability schedule **must** be evaluated to ensure each Option Item can be accomplished during the contract performance period.
 - (3) Material status **must** be confirmed to ensure Option Item material will be available to support the production schedule.
 - (4) Funding for Option Items will be managed by the Project Manager within the ship's designated annual funding allowance under their MMBP, by either designating Reservations in the availability budget or by using CM funds.
 - (5) Option Items **must** be invoked as early as possible, preferably during the period between contract award and the start of the availability. The later an option is exercised, the greater the probability that premiums will be paid for its execution.
 - (6) A listing of all Option Items, including their respective "Not Later Than" invocation dates, **must** be provided to the RMC by the planning activity in the turnover letter. The Project Manager must be made aware of all Option Items and invocation dates well in advance of the availability start date. (The Maintenance Team provides the Option Items and invocation dates. This is discussed in the contract solicitation review board.)
 - (7) Option Items are not to be used as a "shopping list", and are reserved for work with a high expectation of being required. Lack of funds for a specific work item **must** not be used as justification for including that work as an Option Item.

- b. During FFP solicitation, bidder's questions may be submitted to the Procurement Contracting Officer. The following processes related to bidder's questions should be followed:
- (1) The Maintenance Team **must** not respond directly to bidder's questions. There must be a single point of contact for bidder's questions and answers. If queried directly, the Maintenance Team **must** refer the bidder to the Advance Planning Manager.
 - (2) The RMC Procurement Contracting Officer **must** ensure the Maintenance Team is provided with e-mail notification of all bidder's questions.
 - (3) The Maintenance Team **and Government Availability Planning Managers must** provide inputs to bidder's questions to the Procurement Contracting Officer within 24 hours (unless the response is required immediately, or another time period is agreed upon).
 - (4) The Maintenance Team **and Government Availability Planning Managers** input **must** be considered when formulating the Government's response.
 - (5) The final answer to bidder's questions **must** be made available to the Maintenance Team **and Government Availability Planning Managers** via e-mail or other electronic means.
- c. FFP Oversight. During FFP availability execution, oversight of contract changes is critical to managing costs and reducing premiums. Processes that assist in the management of funds and reduction of premiums include:
- (1) Conduct a business case for all growth and new work to determine the most efficient and cost effective time to execute the work.
 - (2) Recognize that late work premiums exist, and account for these premiums when it is necessary to add growth or new work to the availability.
 - (3) The RMC Project Manager **must** identify and record all validated Delay and Disruption charges paid by the Government using growth codes as a result of Navy actions. Discuss each Delay and Disruption event during Planning Board for Maintenance to prevent repeat occurrences.
 - (4) Project Manager, with the Maintenance Team, **must** document "lessons learned" during availabilities and provide these to the RMC for proper distribution and training of other Maintenance Teams.
 - (5) Departure Reports **must** be provided to the Maintenance Team, ensuring all applicable safeguards are in place to handle Business Sensitive Information.

APPENDIX A

RMC SPOTLIGHT REPORTS

1. PURPOSE. Establish guidelines for preparing an RMC Spotlight Presentation. This presentation is applicable to all ships undergoing planned (CNO **or** CMAV) availabilities.
2. SCOPE.
 - a. This business rule describes the format and processes required to compile an RMC Spotlight Presentation.
 - b. Applies to all Regional Maintenance Centers (RMC).
 - c. Implements the standardized process to be used by all RMCs.
3. GENERAL REQUIREMENTS **AND** BACKGROUND.
 - a. The RMC Spotlight Presentation consists of six sections: Project Spotlight Chart, Premium Performance Chart, Package Build Chart, Hot Wash Status Report, and Global Hot Wash Data.
 - b. The Project Spotlight Chart is a snapshot of the planning milestone status and execution performance for the RMC's CNO availabilities. Examples of FFP and PSIA Spotlight Charts are given in this appendix.
 - c. The Premium Performance Chart is a snapshot of the performance with regard to premiums and churn for a specific ship in the execution phase of a CNO availability. An example Premium Performance Chart is given in this appendix.
 - d. The Package Build Chart is a snapshot of the relationship between the value of the work package, as it is being developed, to the planned and budgeted limits for a specific ship in the planning phase of a CNO availability. It is extracted from the budget tab in Navy Maintenance Database (NMD). An example Package Build Chart is given in this appendix.
 - e. The Hot Wash Status Report is a snapshot of an RMC's local and global Hot Wash issues from past CNO availabilities. An example Hot Wash Status Report is given in this appendix.
 - f. The Global Hot Wash Data Report provides amplifying information regarding current global Hot Wash issues. An example Global Hot Wash Data Report is given in this appendix.
4. PROCESS.
 - a. This appendix defines the RMC Spotlight Presentation, but additional slides may be included for amplification on a conservative basis. The RMCs **must** comply with standard formats.
 - b. Project Spotlight Chart.
 - (1) The left column of the chart **must** list all upcoming CNO availabilities for the port within the A-360 window and the next availability to reach A-360 at a minimum.

- (2) The columns for the milestone will be populated and colored **using** the following guidelines:
 - (a) The top row contains the scheduled milestone date.
 - (b) The bottom row is populated with the actual date the milestone was accomplished.
 - (c) The top row is colored red, yellow **and** green after the milestone has been accomplished.
 - 1 Green – milestone met on schedule.
 - 2 Yellow – milestone 1-7 days late.
 - 3 Red – milestone >7 days late.
 - (d) The bottom row is colored with a **Red, Yellow and Green** hash pattern depending upon impact to the next milestone. The bottom row is only colored for accomplished milestones and the follow-on milestone. It may be acceptable to color a future milestone if there exists substantial evidence that it will not be accomplished on time and will have a significant impact on the follow-on milestone.
 - 1 Green hash – next milestone will be met.
 - 2 Yellow hash – moderate risk for next milestone.
 - 3 Red hash – high risk for next milestone.
 - (3) Comment blocks **or** balloons may be used to provide amplifying information as necessary.
- c. Premium Performance Chart.
- (1) The Premium Performance Chart is developed by exported data from NMD to an Access database. Commander, Navy Regional Maintenance Center metrics division is the point of contact for the procedure.
 - (2) Premium Performance Charts are ordered in the sequence listed on the Project Spotlight Chart.
 - (3) Comment blocks **or** balloons may be used to provide amplifying information as necessary.
- d. Package Build Chart.
- (1) The Package Build Chart is developed with the package build data from NMD. The information is available in the planning side of NMD under planning budget.
 - (2) Package Build Charts are ordered in the sequence listed on the Project Spotlight Chart.
 - (3) Comment blocks **or** balloons may be used to provide amplifying information as necessary.

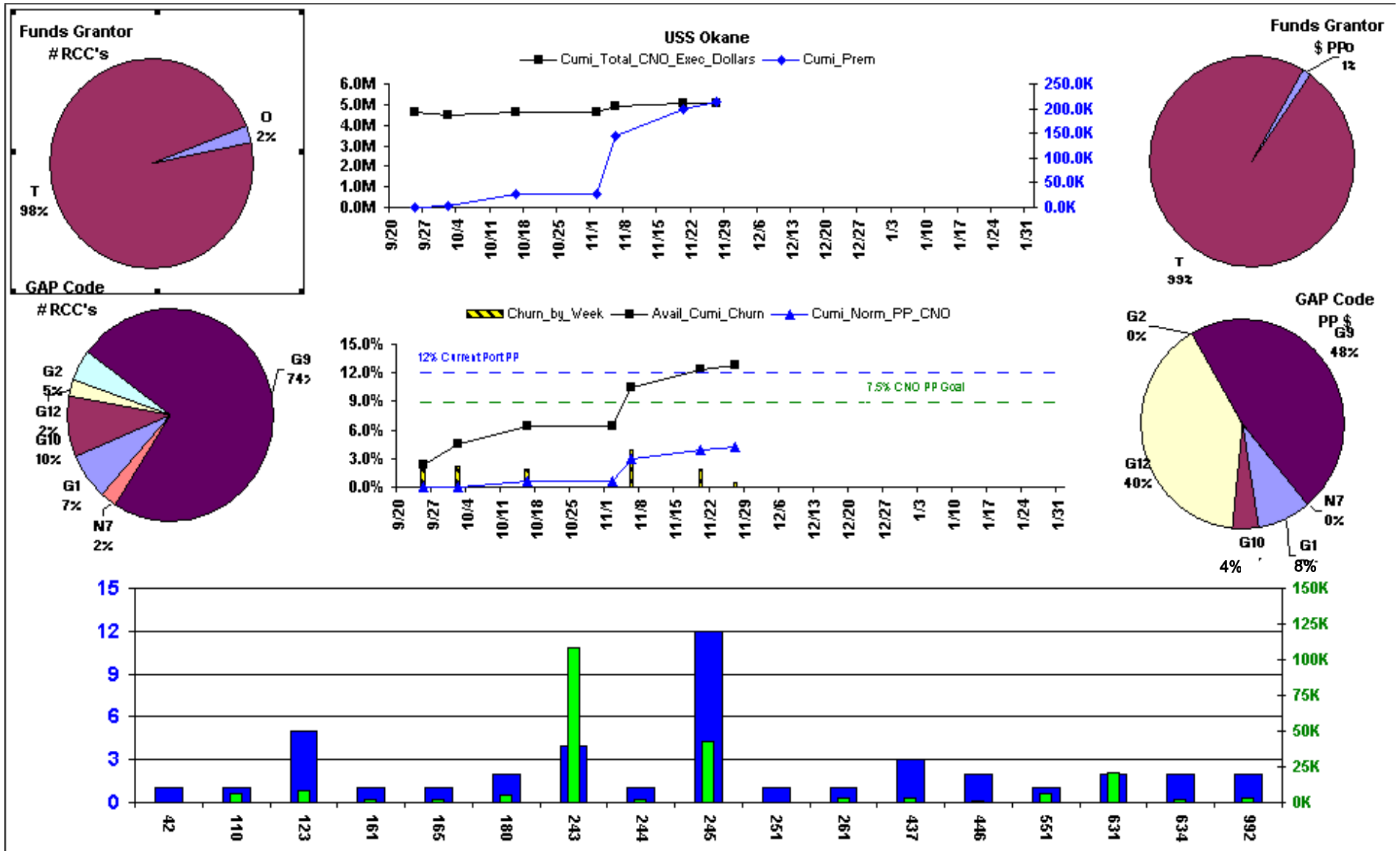
- e. The Hot Wash Status Report is maintained by the RMC Hotwash Coordinator.
- f. The Global Hot Wash Data Report is to include the following, at a minimum, for the reporting period in which input is received:
 - (1) Discussion of best practices.
 - (2) Discussion of global issues including resolutions.
 - (3) Premium goal vs. actual (and if exceeded, an explanation as to why).
 - (4) Identification of premium drivers.

PROJECT SPOTLIGHT CHART

[illegible]

PROJECT SPOTLIGHT CHART													
SHIP/HULL	Scheduled CNO Avail Dates (Start/ Compl)	Controls \$M (TYCOM/ Program)	Issue HMP/ LOA incl AITs (Sched / Actual)	Task/Fund SID Developmt (Sched/ Actual)	Issue/ Deliver SIDs to NSA for Contractors and AITs (Sched/ Actual)	Provide Avail Funding for Modern. to RMC (Sched/ Actual)	PSIA 100% D-Lvl maint work pkg 2K's locked (Sched /Actual)	PSIA Contractor Publish pkg in NMD (Sched/ Actual)	PSIA Definitize Work Package (Sched/ Actual)	Actual CNO Avail Dates (Start/ Compl)	Churn Percent (TYCOM / Program)	Growth & New Work \$K (TYCOM/ Program)	Premium Percent (TYCOM/ Program)
			SPM/ NAVSEA/ TYCOM	SPM/NSA/ AIT/TYCOM RMC Mgr	Planning Yard	SYSCOM/ PEO/ TYCOM	MT	PSIA Contractor	RMC				
			A-360	A-330	A-180	A-75	A-75	A-60	A-45				
LEGEND													
	MILESTONE MET ON SCHEDULE												
	MILESTONE 1-7 DAYS LATE												
	MILESTONE >7 DAYS LATE												
	NEXT MILESTONE WILL BE MET												
	MODERATE RISK FOR NEXT MILESTONE												
	HIGH RISK FOR NEXT MILESTONE												

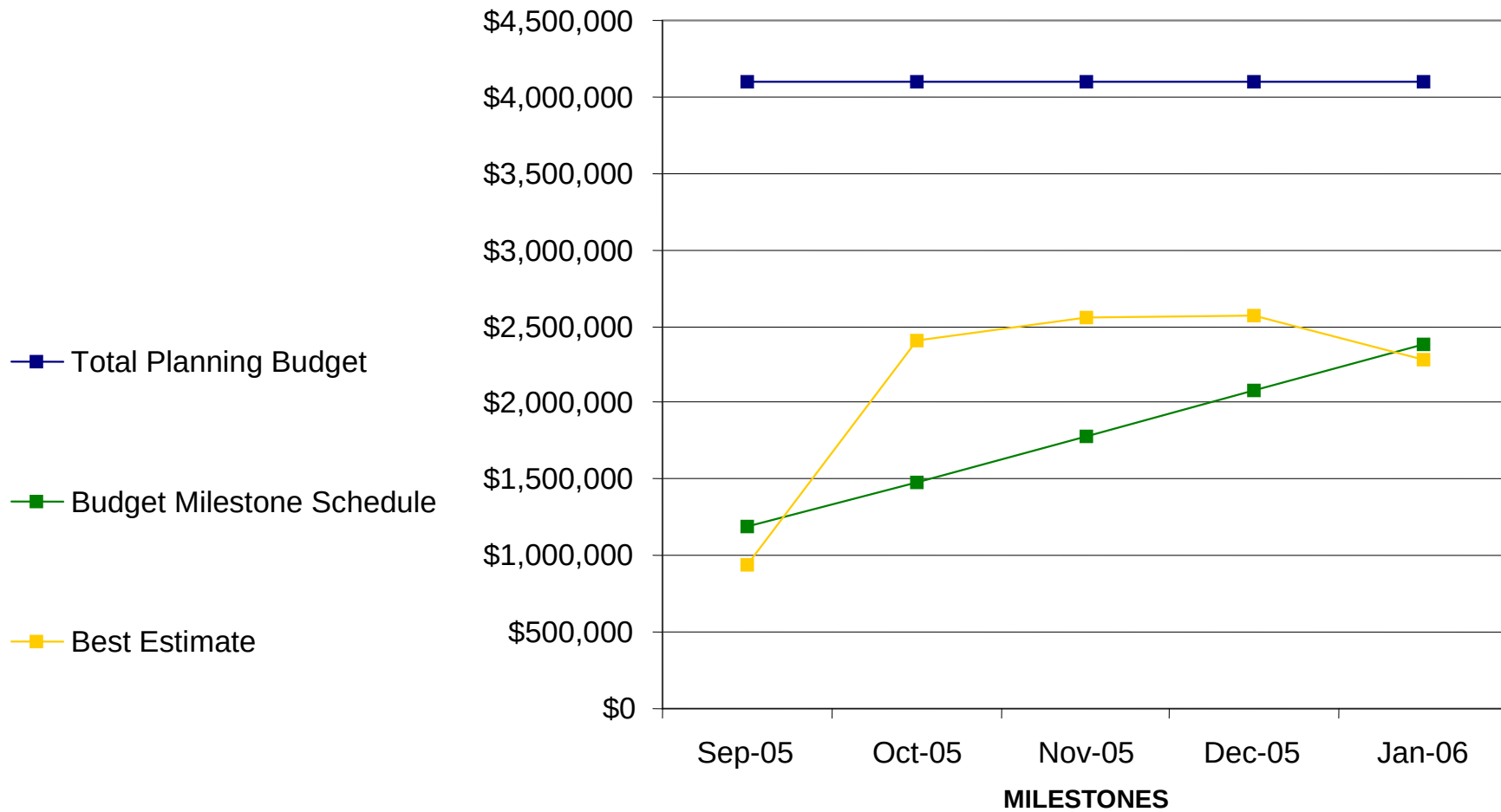
Premium Performance Chart



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APPENDIX A

USS CRUISER Package Build Chart 9/05-1/06

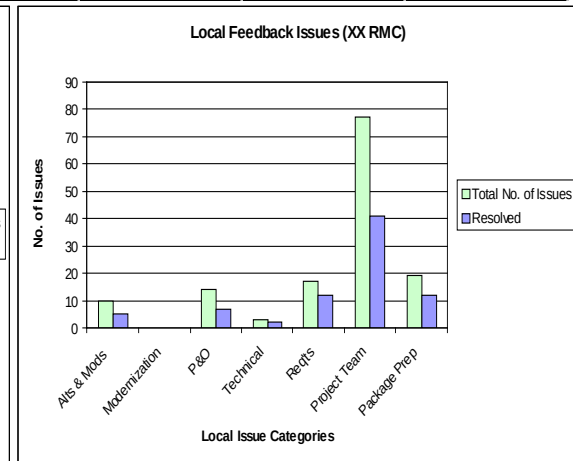
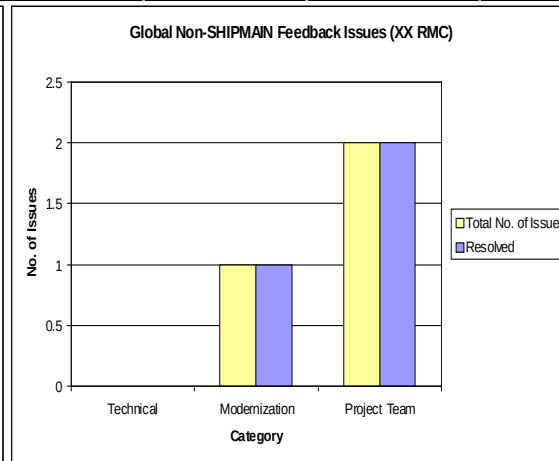
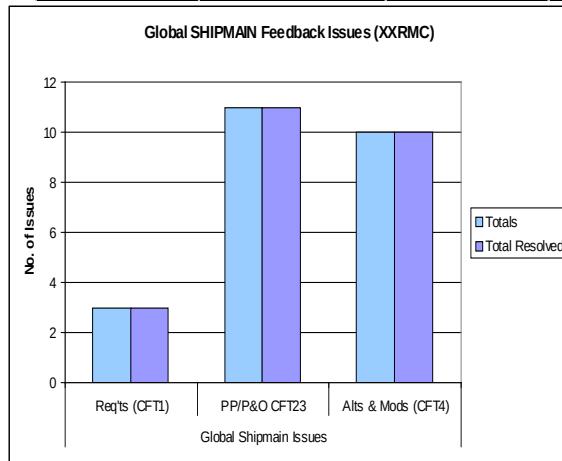


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APPENDIX A

Hot Wash Status Report

HRMC FEEDBACK ISSUE METRICS									
Ship / Hull		USS PORT ROYAL (CG 73)	USS R JAMES (FFG 57)	USS RUSSELL (DDG 59)	USS CROMMELIN (FFG37)	USS SALVOR (ARS 52)	USS HOPPER (DDG 70)	Totals	Total Resolved
EOA		9/8/04	12/1/04	12/15/04	3/23/05	6/15/05	9/7/05		
HW Mtg Date		10/7/04	1/25/05	1/26/05	3/31/05	7/11/05	9/28/05		
Global Shipmain Issues	Req'ts (CFT1)	0	1	2	0	0	0	3	3
	PP/P&O CFT23	0	1	1	3	4	2	11	11
	Alts & Mods (CFT4)	1	1	3	0	0	5	10	10
Total		1	3	6	3	4	7	24	24
Global Non-Shipmain Issues	Technical	0	0	0	0	0	0	0	0
	Modernization	0	0	1	0	0	0	1	1
	Project Team	0	0	0	0	0	2	2	2
Total		0	0	1	0	0	2	3	3
Local Issues	Alts & Mods	2	0	0	1	2	5	10	5
	Modernization	0	0	0	0	0	0	0	0
	P&O	3	2	1	3	2	3	14	7
	Technical	0	0	0	0	3	0	3	2
	Req'ts	5	5	1	2	4	0	17	12
	Project Team	16	10	8	8	13	22	77	41
	Package Prep	5	4	2	2	5	1	19	12
Total		31	21	12	16	29	31	140	79



Global Hot Wash Data

Bullets include as a minimum:

- Discussion of best practices.
- Discussion of global issues.
- Premium goal vs. actual
(and if exceeded, an explanation as to why).
- Identify premium drivers.

VOLUME VI
CHAPTER 32
TOP MANAGEMENT ATTENTION
TOP MANAGEMENT ISSUES

REFERENCES.

- (a) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (b) OPNAVINST 3000.12 - Operational Availability of Equipments and Weapons Systems

LISTING OF APPENDICES.

A Top Management Attention and Top Management Issues Flowchart

32.1 PURPOSE. Reference (a) provides Chief of Naval Operations (CNO) Maintenance Policy for U.S. Navy Ships, which includes the Top Management Attention and Top Management Issues (TMA, TMI) program for addressing chronic maintenance problems. Commander, United States Fleet Forces Command (COMUSFLTFORCOM) is tasked with developing and forwarding Hull, Mechanical and Electrical (HM&E) and Combat System (CS) Technical Ticklers to identify common maintenance issues between Fleets. This chapter provides USFLTFORCOM policy, procedures and standardized metrics for selecting systems and equipment for inclusion in the TMA- TMI process.

32.2 BACKGROUND. The TMA-TMI process is the Navy's priority corrective action process for USFLTFORCOM, Fleet Commanders, Type Commanders (TYCOM), Systems Commands (SYSCOM) and Office of the CNO (OPNAV) Resource Sponsors. This process is the means to identify top material readiness and cost problems and develop solutions that effectively and efficiently achieve approved levels of performance while realizing near-term returns on investment.

32.3 APPLICABILITY AND SCOPE.

- a. The TMA-TMI process encompasses all surface force, aircraft carrier and submarine installed equipment and systems, including aviation-oriented items that are integral parts of the ship. This process supports Navy goals and initiatives that improve fleet material readiness and increase the operational availability of those items that are identified by the fleet as needing primary attention and action. The TMA-TMI process excludes equipment under the responsibility of Director, Strategic Systems Programs and Director of Naval Nuclear Propulsion Program.
- b. The TMA-TMI process uses data from diverse sources to:
 - (1) Objectively identify critical fleet problems that impact material readiness, maintenance cost and manpower or skill requirements, and warrant top-level attention.
 - (2) Focus management attention and resources needed to correct these problems.

- (3) Enhance communication among CNO Resource Sponsors, Fleet Commanders, TYCOMs and Systems Command Program Offices.
 - (4) Execute the TMA-TMI process **following** the TMA-TMI Process Flowchart in Appendix A.
- c. The TMA-TMI process is the Navy's priority corrective action process for Fleet Commanders, SYSCOMs and OPNAV Resource Sponsors. This process is the means for the Fleet, OPNAV, and SYSCOMs to identify top material readiness and cost problems and develop solutions that effectively and efficiently achieve approved levels of performance while realizing near-term Returns on Investment (ROI).
 - d. The TMA candidate selection process uses a variety of sources including Maintenance and Material Management (3-M) data prepared by the TMA-TMI Analysis Center to objectively identify critical fleet HM&E and CS problems that impact material readiness, maintenance cost and manpower **or** skill requirements and warrant top-level attention. Fleet and TYCOMs use this data to aid in the selection of their TMA-TMI candidate systems **or** equipment. Fleet and TYCOMs may also solicit topic input from subordinate Commanders for problems having significant negative impact on readiness.
 - e. Candidate systems **or** equipment metrics are forwarded from the TYCOMs to Naval Sea Systems Command (NAVSEA) for inclusion in the TMA process. The candidate selection process is a semi-annual process commencing immediately after TMA Fleet Week and culminating at Mid-Cycle with the nomination of new systems **or** equipment.
 - f. TMI topics are selected by the TMA panel from the topics presented at TMA which require flag level attention.

32.4 RESPONSIBILITIES.

32.4.1 Commander, United States Fleet Forces Command. **COMUSFLTFORCOM** Maintenance Officer (N43) is the Staff Officer responsible for implementation of this chapter and may direct HM&E and CS **or** equipment be included in the TMA-TMI process. TYCOM Maintenance Officers **must**:

- a. Develop TYCOM HM&E and CS Technical Ticklers and identify common issues between ships every six months. Establish a priority ranking of systems based on selected attributes (e.g., man-hours, cost, readiness). Forward TYCOM HM&E and CS Technical Ticklers to Commander, Naval Sea Systems Command (COMNAVSEASYSKOM) 05 for surface force ships. For submarines, provide TMA issues to COMNAVSEASYSKOM 07, with copy to OPNAV Resource Sponsors and other cognizant SYSCOMs as appropriate, via a coordinated **or** joint cover letter.
- b. Coordinate TMI Panel agendas and dates with TMA-TMI Working Group Chair(s).
- c. Participate on TMA panels and chair TMI Panels.
- d. Chairs the TMI panel at least annually either through established Enterprise Board of Directors meetings or as a separate TMI panel.

- e. Coordinate Fleet participation in the TMA and TMI process (TYCOMs and Regional Maintenance Center Supports).

32.4.2 Naval Sea Systems Command. NAVSEASYS COM coordinates overall SYS COM participation in the TMA. Specifically, SEA 07 coordinates the efforts for submarine platforms. SEA 05 coordinates efforts for surface and carrier platforms.

32.4.2.1 Commander, Naval Sea Systems Command (05). COMNAVSEASYS COM (05) for surface force ships and aircraft carriers **must**:

- a. Form the TMA-TMI Working Groups and Panels and staff with appropriate representatives.
- b. Receive and disseminate the TYCOM HM&E and CS **or** C4I Surface Force Ship Technical Ticklers to the appropriate TMA-TMI Working Groups.
- c. Review and forward Plan of Action and Milestones and ROIs, or other technical presentations from TMA-TMI Working Groups to Fleet and TYCOMs.
- d. Chair the surface force ships and aircraft carrier TMI Panel and establish the NAVSEA response to Fleet identified TMI issues.

32.4.2.2 Naval Sea Systems Command 07 **and** Program Executive Officer Submarines. SEA 07 **and** Program Executive Officers (PEO) Sub **must**:

- a. Form the TMA-TMI Working Groups and Panels and staff with appropriate representatives.
- b. Receive and disseminate the TYCOM HM&E and Nuclear Planning and Execution System TMA issue letter to the appropriate program offices for action.
- c. Review and forward Plan of Action and Milestones, Business Case Analyses or other appropriate technical presentations to Fleet and TYCOMs.

32.4.2.3 Commander, Naval Sea Systems Command Program Offices.

COMNAVSEASYS COM Program Offices (and Commander Space and Naval Warfare System Command for subparagraphs b. through f. of this paragraph) **must**:

- a. Chair TMA Panels **per** paragraph 32.4.2.1.5 of this chapter.
- b. Participate on TMA and TMI Panels as requested.
- c. Develop Plan of Action and Milestones and Business Case Analyses to address TYCOM HM&E and CS Technical Tickler issues.
- d. Coordinate other activities as required to determine root causes and develop corrective actions.
- e. Review minutes from TMA and TMI Panels and take action as appropriate.
- f. Work with TYCOMs for resolution of HM&E and Nuclear Planning and Execution System Technical Issues and Action Items.

32.4.2.4 Program Executive Officers and Direct Reporting Program Managers. PEO and Direct Reporting Program Managers **must**:

- a. Assign representatives to the appropriate TMA-TMI Working Groups.

- b. Chair the applicable submarine TMI Panels as described in paragraph 32.4.2.1.5 of this chapter.
- c. Review minutes from TMA-TMI Panels and take action as appropriate.

32.4.3 Top Management Attention-Top Management Issues Panels. The TMA-TMI Panels must:

- a. Review, discuss, and agree on the course of action to resolve each technical issue presented.
- b. Publicize minutes of the Panel Meetings.

32.4.3.1 Top Management Attention Panels. TMA Panels meet every six months, to assess the applicability of Plan of Action and Milestones and ROIs, and monitor the progress of issues. TMA panels are meetings chaired at the O-6 level. In general, TMA Panels discuss those issues that can be handled within the SYSCOM organizations. The TMA Panel will identify top issues based on specific attributes (e.g., man-hours, cost, readiness) for presentation at TMI.

- a. TMA Panels: TMA Panel composition and agendas are coordinated between applicable TYCOM staffs, Fleet staffs and SYSCOM Program Offices. Attendees to the appropriate TMA Panels include, but are not limited to, the following:
 - (1) COMNAVSEASYSYSCOM (05) representative as chairman for the Surface Force, Aircraft Carrier and CS panels and COMNAVSEASYSYSCOM (SEA 07) representative as chairman for the Submarine Force panel.
 - (2) CNO (N43) and applicable Resource Sponsor (N8, N6) representative(s).
 - (3) Maintenance and Supply representatives from Fleet, TYCOMs, and Regional Maintenance Centers (RMC).
 - (4) COMNAVSEASYSYSCOM Program Offices, engineering codes and logistics codes representative(s).
 - (5) Commander, Space and Naval Warfare Systems Command (COMSPAWARSYSYSCOM) Program Office representative(s) as requested.
 - (6) Commander, Naval Air Systems Command (COMNAVAIRSYSYSCOM) Engineering representative(s) as requested.
 - (7) In-Service Engineering Agent representatives.
 - (8) Naval Inventory Control Point (NAVICP) representative.
 - (9) Training Command representative.
 - (10) Naval Research Laboratory representative.
 - (11) Board of Inspection and Survey representative.
- b. Submarine Force TMI Panel: The Submarine Force TMI Panel is chaired by COMSUBFOR. The TMI is normally conducted as a part of the Undersea Enterprise Board of Directors meeting. COMSUBFOR and COMSUBPAC Directors for Maintenance and Material Readiness coordinate the agenda with the COMSUBFOR Enterprise office. Panel Members may include, but are not limited to, the following:

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- (1) COMSUBFOR, SEA 07, PEO SUBS.
 - (2) CNO (N43) and applicable Resource Sponsor (N8, N6) representative(s).
 - (3) COMSUBFOR and COMSUBPAC Maintenance and Supply Officers.
 - (4) COMNAVSEASYSYSCOM program offices, engineering code and logistics code representatives.
 - (5) COMSPAWARSYSCOM representative.
 - (6) COMNAVVAIRSYSCOM representative.
 - (7) In-Service Engineering Agent representative(s).
 - (8) Commander, Navy Regional Maintenance Center and RMC representatives.
 - (9) NAVICP representative.
 - (10) Chief of Naval Education and Training representative.
- c. Surface Force Ship **and** Aircraft Carrier TMI Panels: The Surface Force Ship **or** Aircraft Carrier TMI Panel is chaired by NAVSEA 05. NAVSEA 05, PEO Theater Surface Combatants, PEO Expeditionary Warfare, PEO Mine and Undersea Warfare, PEO CARRIERS and PEO Surface Strike jointly coordinate the agenda. Attendees of the appropriate TMI Panels include, but are not limited to, the following:
- (1) PEO Expeditionary Warfare, PEO Theater Surface Combatants, PEO CARRIERS (Surface **and** Carrier), PEO Mine and Undersea Warfare, PEO Surface Strike, SEA 07 (Submarine).
 - (2) CNO (N43), and applicable Resource Sponsor (N8, N6) representative(s).
 - (3) COMLANTFLT, COMPACFLT, COMNAVSURFLANT, COMNAVSURFPAC, COMNAVVAIRLANT, COMNAVVAIRPAC, COMSUBLANT, and COMSUBPAC Maintenance and Supply Officers.
 - (4) COMNAVSEASYSYSCOM program offices, engineering code and logistics code representatives.
 - (5) COMSPAWARSYSCOM representative.
 - (6) COMNAVVAIRSYSCOM representative.
 - (7) In-Service Engineering Agent representative(s).
 - (8) RMC and RMC representatives.
 - (9) NAVICP representative.
 - (10) Chief of Naval Education and Training representative.
 - (11) Naval Research Laboratory representative.
 - (12) Board of Inspection and Survey representative.
- d. Combat Systems: The CS Troubled Systems Process supports the TMA-TMI process with selected inputs for the COMLANTFLT **or** COMPACFLT CS Technical Tickler.

32.4.3.2 Top Management Attention-Top Management Issues Working Groups. The TMA-TMI Working Groups **must**:

- a. Receive TYCOM HM&E and CS Technical Ticklers or Issues White Papers as appropriate from NAVSEA 05 for surface force ships **and** aircraft carriers or from NAVSEA 07 for submarines and identify common and platform specific issues as appropriate.
- b. Review TYCOM HM&E and Nuclear Planning and Execution System Technical Ticklers, White Papers or Action Items. Verify applicability of Fleet-recommended actions and achieve agreement with appropriate Fleet and TYCOM staff(s) as appropriate.
- c. Notify appropriate COMNAVSEASYS COM Program Offices and other SYSCOMs when equipment or systems under their care are identified as fleet material readiness issues.

32.4.3.3 Review. TMA-TMI Working Groups, comprised of SYSCOM representatives designated by NAVSEA 05 and 07, PEO SUBS, PEO Ships, PEO Integrated Warfare Systems, and PEO CARRIERS, review Fleet inputs to determine common and platform specific issues and assign issues to the appropriate SYSCOM Program Offices.

32.4.4 Top Management Attention-Top Management Issues Analysis Center.

32.4.4.1 Candidate Identification. The TMA-TMI Analysis Center will provide a combined Ranking Matrix to help determine the relative ranking of systems **and** equipment on a Navy wide basis. The TMA-TMI Analysis Center, using the TYCOM input plus RMC and TYCOM technical experts, will prepare a preliminary set of Fleet generated system problems and potential solutions, the Technical Tickler, for the systems **and** equipment chosen for inclusion in the TMA-TMI process. The TMA-TMI Analysis Center, using 3-M data, also provides the TYCOMs with a Ranking Matrix, Figures 32-1 and 32-2, and Impact Chart, Figure 32-3, by Allowance Parts List (APL) and Equipment Identification Code (EIC) for their review. The Ranking Matrix will be TYCOM specific, using the Ranking Matrix as a guide. The TYCOMs select systems **or** equipment for further evaluation and possible induction into the TMA-TMI process.

32.4.4.2 Candidate Expanded Metrics. The TMA-TMI Analysis Center provides the TYCOMs with a tailored TMA Report for their identified systems **or** equipment. This report contains a Balanced Score Card (BSC), Problem Free Time, Failure Rate, Parts Ranking and modified Ship's Logistics Indicator Computerized Report (SLICR) for the specific candidate system **or** equipment defined by APL or EIC nominated by the TYCOM. These are 3-M based reports that require no special data collection or analysis efforts.

32.4.5 Type Commanders. The TYCOMs, using the data provided in the TMA Report and other (RMC, SYSCOMs, etc.) Casualty Report (CASREP), maintenance, logistics or training inputs will determine which systems **or** equipment to nominate for inclusion into the TMA-TMI process. The nomination should include the TMA Metrics plus additional justification including the TYCOM's initial Root Symptom Analysis as to the causes of poor performance. Systems **and** equipment will be nominated at the lowest component level that can be identified as the reliability or cost driver. When multiple APLs or EICs from the same "System" appear at or near the top of the Ranking Matrix, the entire "System" can be nominated.

32.5 METRICS. Metrics used are generated directly from the 3-M database via Open Architecture Retrieval System (OARS) and require no subsequent data collection or analysis efforts. All Navy systems and equipment that generate maintenance data are included and considered as part of this methodology. This is a three-month process, starting after Fleet Week and culminating at the Mid-Cycle review that gets new systems nominated by the Fleet to TMA. Systems not selected for TMA can be re-nominated by a TYCOM Representative at least 4.5 months prior to any future Fleet Week.

32.5.1 Top Management Attention-Top Management Issues Candidate Selection. There are two methods used to select topic candidates for TMA-TMI. TYCOMs may use any combination of the two methods to select topic candidates.

- a. The first method entails soliciting fleet commanders, maintenance officers and TYCOM staff members for candidate topics. Candidate topics are then reviewed by both TYCOM maintenance officers and selected or rejected as TMA topics.
- b. The second method is by a ranking matrix where costs, man-hours, CASREP volume and other attributes are measured and a “top ten” selection process is then employed.

32.5.1.1 Top Management Attention-Top Management Issues Ranking Matrix Method. Six attributes are used to rank systems and equipment as TMA-TMI Program candidates. Data for five of the attributes are downloaded directly from the 3-M database via OARS. The CASREP Volume data is extracted and sanitized from the NAVICP CASREP Database. The attributes are:

- a. 2-Kilo Volume - Total number of Maintenance Actions (2-Kilos) generated by the system or equipment.
- b. Man-hours - Total Ship’s Force and Intermediate Maintenance Activity (IMA) man-hours expended on system or equipment maintenance.
- c. Parts Cost - Total net cost of repair parts used to support the system or equipment.
- d. Hi-Priority Failures - Total number of 2-Kilos that are Status 2 or 3 and Priority 1, 2 or 3 2-Kilos generated for a system or the equipment.
- e. Hi-Priority Down Time - Total days of down time for the system or equipment based on hi-priority failures.
- f. CASREP Volume - Number of CASREPs generated by the system or equipment.

32.5.1.2 Data on each attribute is collected over a two-year period. The Ranking Matrix is a multivariable pareto ranking technique that avoids the distortion inherent in ordinary ranking schemes where variables representing different aspects of a system or equipment may have different units of measurement with widely differing scales. The technique gives full visibility to systems where even only one of the descriptive attributes has a high impact level. As a result, the “top ten pareto” of each of the attributes winds up on or near page one of the overall ranking. The process is easily automated in MS Excel or MS Access. This method is applied to approximately 43,000 APL and 4,200 EIC systems and equipment. The resultant Ranking Matrix provides Fleet decision makers a list of potential TMA-TMI candidates.

32.5.1.3 Ranking Matrix Calculation. Data for each attribute are scaled, normalized or standardized (depending on the language in your field of study) in a way that creates unit vectors

(0 to 1, with a few high outliers > 1) in statistical units (Standard Deviation multiples sometime referred to as “Z” scores). The scaling used results in the 3-sigma value of the data being scaled to equal one. The 99.86th percentile of the data is used to locate that value in the ranked raw data, which is a percentile commonly used for “normal” distributions with a single tail as being equivalent to the 3-sigma value. Although **the** five attribute distributions are not “normal”, they are close to being “log normal” so the percentile technique works. The percentile technique works well regardless since the data is a 100% sample and the statistical distribution (which should be known if samples are used for estimating) is not a critical issue. After scaling the attributes, the vector equivalents are then combined using vector addition to create a balanced rank value that can be used for final ordering of the ranking. The vector addition technique is straightforward (Pythagorean). For over three years this has produced a tight pattern of the top ten for each attribute falling within the top 50 fleet-wide. The method is objective, repeatable, and robust and uses the “actual data”, not a representation of the data.

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Figure 32-1 Sample TMA APL Ranking Matrix

FUNCTIONAL AREA (L1)	EIC	EIC NOMENCLATURE (L2)	APL	APL NOMENCLATURE (L3)	apl_population	jcn_count	jcn_rank	total_mantb	rank	total_repat	repat_rank	hi_priority	hpf_rank	hi_priority	hpf_rank	casrep_ra	casrep_ra	BAL_VEC	BAL_RANK	MDT	MTBF	A(j)	R(m)	P(m)	\$Failure	
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	006090237	MK7MOD0,RADAR ASSEMBLY,MODULE	237	6721	1	17235	3	18715213	1	1463	1	64877.77	2	471	1	17.18	1	44	79	64.0%	10.2%	89.8%	\$17,504	
GENERATION SYSTEMS, ELECTRIC POWER	37	GENERATOR SYSTEM, 100KW, STEWART AND STEVE	006090238	ENGINE DSL 16 1140001 1800 1800RPM	106	3016	2	258700	1	3501167	20	809	2	5992.96	3	122	3	9.71	2	70	64	47.5%	6.0%	94.0%	\$17,119	
PROPULSION SYSTEM, MAIN GAS TURBINE, MD1	MD1	GAS TURBINE MODULE, PROPULSION	052050008	GAS GENERATOR ASSY&GTURB MN PROSN 7LM2500PB1C	137	1794	9	158811	4	15281673	2	456	6	3540.58	9	115	4	8.85	3	76	146	65.9%	29.2%	70.8%	\$47,268	
GENERATION SYSTEMS, ELECTRIC POWER	36	GENERATOR SET, GAS TURBINE	052090005	ENG ASSY GAS TURB MCL 501H34	117	1249	27	59905	14	11631984	4	189	32	10109.13	136	76	17	5.69	4	53	301	84.9%	55.0%	45.0%	\$74,223	
NAVIGATION SYSTEMS (ELECTRONIC AND NON LB	GV	GYROCOMPASS (CIRCUIT LC AND YLC)	282000010	ANWISN-2 SET, GYROCOMPASS, STABILIZED	62	242	446	5592	699	1265477	3	72	238	4821.532	508	36	68	5.48	5	67	419	86.2%	65.1%	34.9%	\$179,016	
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	006090238	MK20M000,ELECTRONIC ASSEMBLY,ENCLOSURE	237	2019	8	52239	21	4025599	17	482	5	18453.1	38	143	2	5.02	6	38	239	86.2%	47.2%	52.8%	\$12,687	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	782982335A	QJ-194(V)UYA-4(V) LESS JP-1091	192	595	103	178316	2	1469130	73	144	63	6989.946	277	14	288	4.95	7	49	649	93.0%	75.8%	24.2%	\$69,735	
MISSILE SYSTEMS, SURFACE	51	FIRE CONTROL SYSTEM, GUNMISSILE, MK 92 MOD 2	006080059	MK92M002,FIRE CONTROL SYSTEM (BASELINE)	18	1350	18	34045	47	4320047	14	579	3	35400.09	8	97	7	4.88	8	61	15	19.8%	0.0%	100.0%	\$9,813	
HULL STRUCTURE	AD	DOORS, HATCHES, MANHOLES, SCUTTLES AND CLOS	319990011	WATERTIGHT DOORS, HATCHES, SCUTTLES NO OTHER AP	3364	2057	6	36801	38	202509	537	243	20	75146.83	1	1	3073	4.77	9	309	6741	95.6%	97.4%	2.6%	\$6,891	
GUN SYSTEMS	GV	WEAPON SYSTEMS, GUN	006040508	MK46M000,OPTICAL SIGHT	34	246	434	15632	180	10683999	5	79	195	6291.344	335	58	27	4.76	10	80	210	72.5%	42.4%	57.6%	\$143,154	
AUXILIARY SYSTEMS	TF	AIR SYSTEMS, COMPRESSED	061430285E	COMPRESSOR AIR HIGH PRESSURE 20CFH 3000PSI	57	1299	23	61519	13	1947981	47	520	4	28820.28	13	88	9	4.35	11	55	53	49.1%	3.4%	96.6%	\$8,478	
GENERATION SYSTEMS, ELECTRIC POWER	31	PLANTS, GENERATING, SHIPS SERVICE	052090002	ENGINE GAS TURBINE SHIPS SER GEN	78	1297	24	81095	5	4969783	11	317	13	12899.61	83	85	10	4.16	12	41	120	74.6%	22.3%	77.7%	\$25,910	
PROPULSION SYSTEM, MAIN GAS TURBINE, MD1	MD1	GAS TURBINE MODULE, PROPULSION	052050018	GAS GENERATOR ASSEMBLY MCL L25250G12	66	964	88	41219	33	9613557	6	160	50	11454.33	107	42	56	4.12	13	72	201	73.7%	40.8%	59.2%	\$64,139	
COMMUNICATION AND DATA SYSTEMS	QF	CRYPTOGRAPHIC EQUIPMENT	88633651	TA-970V, TELEPHONE SET	4786	2832	3	17859	141	482109	220	427	7	21860.75	29	0	5983	3.77	14	51	5457	99.1%	96.8%	3.2%	\$2,802	
DISTRIBUTION SYSTEMS, ELECTRICAL POWER	45	DISTRIBUTION SYSTEM, AC LIGHTING	249990001	FIXTURE LGTG FLRSLIT MS17179-7.4	108040	2548	4	44648	29	927524	105	369	10	25459.73	21	0	5979	3.61	15	71	147890	100.0%	99.9%	0.1%	\$7,588	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	ME01556A	AM-6800/SPY-1A CG4759, AMPLIFIER,RADIO FREQ	48	1151	32	72676	9	4080216	15	335	12	13133.13	79	19	169	3.45	16	40	72	64.0%	8.1%	91.9%	\$21,433	
GENERATION SYSTEMS, ELECTRIC POWER	31	PLANTS, GENERATING, SHIPS SERVICE	66888004L	ENGINE DIESEL GEN 36S3SV-AM MCL 2894F01-GEN 6CY	36	1490	14	36978	37	3982757	19	237	21	14055.93	62	92	8	3.42	17	62	74	54.5%	8.8%	91.2%	\$23,046	
DISTRIBUTION SYSTEMS, ELECTRICAL POWER	45	DISTRIBUTION SYSTEM, AC LIGHTING	249990138	LANTERN ELEC 115VAC SYM 101.2	71182	2221	5	31077	57	325997	343	395	9	23916.33	25	2	1982	3.39	18	61	87745	99.9%	99.8%	0.2%	\$3,972	
PROPULSION SYSTEM, MAIN DIESEL, MECHAN	B1	ENGINE AND CONTROLS, DIESEL	668880032L	ENGINE DIESEL 36S3SV-AM MCL 2894F01 6CYL	48	1538	13	36021	41	4013172	18	179	36	15643	55	80	14	3.20	19	87	131	59.9%	25.2%	74.8%	\$33,469	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	ME4033291	AM-7159/SPY-1B DOG51T90, AMPLIFIER,RADIO FREQ	120	833	62	16563	162	5525954	8	156	52	3220.242	910	46	41	3.19	20	21	375	94.8%	61.8%	38.2%	\$46,079	
ADMINISTRATION HABITABILITY, OUTFIT/FURNI	1A	EQUIPMENT AND FURNISHINGS, UTILITY SPACE	439990247	PLANT PROCESSOR MELT UNIT 593-6961200	390	1064	40	45175	26	1043398	91	259	17	29559.29	14	71	19	3.04	21	110	739	98.9%	78.2%	21.8%	\$11,168	
RADAR AND IFF SYSTEMS	P3	RADAR, AIR SEARCH	59228606	AS-3263/SPS-49(V), ANTENNA	77	240	450	8509	431	6843212	7	47	435	3554.825	796	24	127	3.03	22	76	798	91.3%	79.8%	20.2%	\$154,970	
RADAR AND IFF SYSTEMS	P1	RADAR, SURFACE SEARCH	57041000	ANSPS-45, RADAR SET	81	813	64	17709	145	2216016	38	219	25	13163.55	78	112	5	2.98	23	60	180	75.0%	36.8%	63.2%	\$13,353	
AUXILIARY SYSTEMS	TF	AIR SYSTEMS, COMPRESSED	061430287	COMPRESSOR UNIT 20.0CFH 3000PSI	36	736	75	51315	24	1446433	74	253	19	30990.66	11	55	29	2.96	24	122	69	36.1%	7.4%	92.6%	\$13,830	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	ME01556B	AM-6889/SPY-1A CG4759, AMPLIFIER,RADIO FREQ	72	719	79	77050	8	3498322	21	201	29	3048.992	356	24	125	2.92	25	30	174	85.5%	35.6%	64.4%	\$32,738	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	ME403311	T-1348/SPS DOG51T90, TRANSMITTER,RADAR	120	940	52	24141	84	5475373	9	132	78	4160.215	624	55	31	2.91	26	32	443	93.4%	66.6%	33.4%	\$48,796	
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	006090242	M61A1 20MM GUN	237	1408	16	61981	12	2826316	29	222	24	8212.5	210	43	50	2.90	27	37	520	93.4%	70.7%	29.3%	\$23,899	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	ME4033292	AM-7159/SPY-1B DOG51T90, AMPLIFIER,RADIO FREQ	80	1088	35	18087	137	5225554	10	176	39	3551.882	797	43	54	2.83	28	20	221	91.6%	44.3%	55.7%	\$33,790	
PROPULSION SYSTEM, MAIN DIESEL, MECHAN	B1	ENGINE AND CONTROLS, DIESEL	668880067M	ENGINE DSL D36S3SV-AM MCL 2949F01 8 CYL	24	1167	31	35619	44	1934152	52	167	43	11568.15	106	98	6	2.82	29	69	70	50.3%	7.6%	92.4%	\$19,514	
GENERATION SYSTEMS, ELECTRIC POWER	31	PLANTS, GENERATING, SHIPS SERVICE	L665360269	DIESEL ENG. MCL 38M08 1-8 12 CYL	32	962	50	79314	7	800932	121	162	47	19018.27	35	39	60	2.82	30	117	96	45.0%	15.4%	84.6%	\$24,528	
COMMUNICATION AND DATA SYSTEMS	QF	TRANSMITTERS (COMMUNICATION)	00008485	AM-3924D(P)URT, AMPLIFIER,RADIO FREQUENCY	434	1329	20	17252	149	1645025	64	354	11	16015.85	53	48	37	2.80	31	45	597	93.0%	74.0%	26.0%	\$6,596	
AUXILIARY SYSTEMS	TF	AIR SYSTEMS, COMPRESSED	883050754	H.P. AIR SYSTEM CARTRIDGE VALVE REPAIR PARTS	119	1280	25	18287	135	62050	1741	405	8	17610.27	45	2	1984	2.77	32	43	143	76.7%	28.4%	71.6%	\$1,959	
MISSILE SYSTEMS, SURFACE	53	FIRE CONTROL SYSTEMS, GUNMISSILE	006080067	MK92M006,FIRE CONTROL SYSTEM (BASELINE)	12	679	85	19143	125	4857678	13	161	49	18615.98	36	51	33	2.72	33	116	36	23.9%	0.7%	99.3%	\$33,251	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	00034338	QJ-451(V)UYO-21(V) ROLL-UP	465	1677	12	31517	54	1920930	48	268	16	9951.075	145	16	223	2.54	34	37	845	95.8%	80.8%	19.2%	\$11,872	
PROPULSION SYSTEM, MAIN GAS TURBINE, MD1	MD1	GAS TURBINE MODULE, PROPULSION	059970003	BASSE ENCL & GTRB ASSEMBLY FFG-7 L25040G01	60	880	58	27353	69	681950	151	292	14	25721.71	19	26	106	2.48	35	88	100	53.2%	16.5%	83.5%	\$6,082	
AUXILIARY SYSTEMS	TF	PLUMBING INSTALLATIONS	017000043	PUMP CTFGL 100GPM 30PSI 1750RPM MCC VLT	231	466	167	28432	64	209336	527	134	77	39702.58	5	25	116	2.48	36	296	839	73.9%	80.7%	19.3%	\$10,049	
MISSILE SYSTEMS, SURFACE	54	LAUNCHING SYSTEM, GUIDED MISSILE, MK 13 MOD 4	004020386	MK13MOD4,LAUNCHING SYSTEM,GUIDED MISSILE	30	1011	44	36101	40	938992	104	167	34	25403.8	22	44	46	2.39		37	136	78	36.5%	10.0%	92.4%	\$12,733
AUXILIARY SYSTEMS	TC	SCUPPERS AND DECK DRAINS	679990055	DRAIN DK SZ 2.000 IN	7370	792	67	9984	358	113682	1004	177	38	35907.37	6	0	5975	2.30		38	203	20274	99.0%	99.1%	0.9%	\$2,899
COMMUNICATION AND DATA SYSTEMS	QF	AMPLIFIERS, AUDIO	00023028	AM-3729/SP, AMPLIFIER,AUDIO FREQ	7333	1738	10	10073	355	329355	338	160	51	25033.9	23	0	5980	2.30		39	156	22316	99.3%	99.2%	0.8%	\$4,577
AUXILIARY SYSTEMS	TD	FILLING, VENT AND TRANSFER SYSTEM (FUEL AND D	00602049340A	VALVE GATE 6.00IPS FLGE STL	248	46	2916	1660	2344	2167	12573	36	641	4257.48	4	0	5974	2.30		40	1183	3354	73.9%	94.8%	5.2%	\$1,905
SONAR SYSTEMS	R4	SONAR SYSTEMS, CLASSIFICATION	00030785	TB-30C(S)Q-3(V), TOWED BODY	26	529	122	16155	170	2910221	28	122	93	6087.268	350	81	13	2.30		41	50	104	67.5%	17.6%	82.4%	\$29,151
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	006090222	MK15MOD12,WEAPON SYSTEM,CLOSE-IN	113	1020	43	25802	73	1397838	75	148	57	7345.134	255	80	16	2.29		42	50	372	88.2%	61.6%	38.4%	\$16,418
GUN SYSTEMS	G3	FIRE CONTROL SYSTEM, GUN, MK 86	45402746	ANSPSO-9A,RADAR SET	37	490	147	26400	72	1814938	55	145	62	10138.56	135	84	11	2.28		43	70	124	64.0%	23.5%	76.5%	\$19,800
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK7 MODS	00030000	QJ-663(V)UYO-21(V), CONSOLE,COMBAT DISPLAY	318	1420	15	18517	132	1722120	58	224	23	11739.85	103	37	66	2.25		44	52	691	93.0%	77.1%	22.9%	\$10,995
AUXILIARY SYSTEMS	T1	HEATING SYSTEMS	021450091	WASTE HEAT BOILER MCL BWCC 150 PSIG FWT 180 F	69	927	54	52533	19	380427	283	147	59	21458.47	30	23	131	2.23		45	146	229	61.0%	45.5%	54.5%	\$16,883
AUXILIARY SYSTEMS	TK	DISTILLING PLANTS	080030086E	DISTILLATION UNIT 4000GPD	52	561	113	39559	42	410971	261	255	18	20593.06	31	31	84	2.21		46	81	99	55.1%	16.3%	83.7%	\$7,252
COMMUNICATION AND DATA SYSTEMS	QF	COMMUNICATION SYSTEMS, SATELLITE	00019597	RT-1107(V)M5C-3, RECEIVER,TRANSMTR,LOS	1721	1241	28	12220	272	898647	106	283	15	13122.34	80	20	156	2.18		47	46	2961	98.5%	94.1%	5.9%	\$4,903
PROPULSION SYSTEM, MAIN GAS TURBINE, MD1	MD1	GAS TURBINE MODULE, PROPULSION	346030003	STARTER ENG AIR GTRB MCL ATS100-388B	372</																					

Figure 32-2 Sample TMA EIC Ranking Matrix

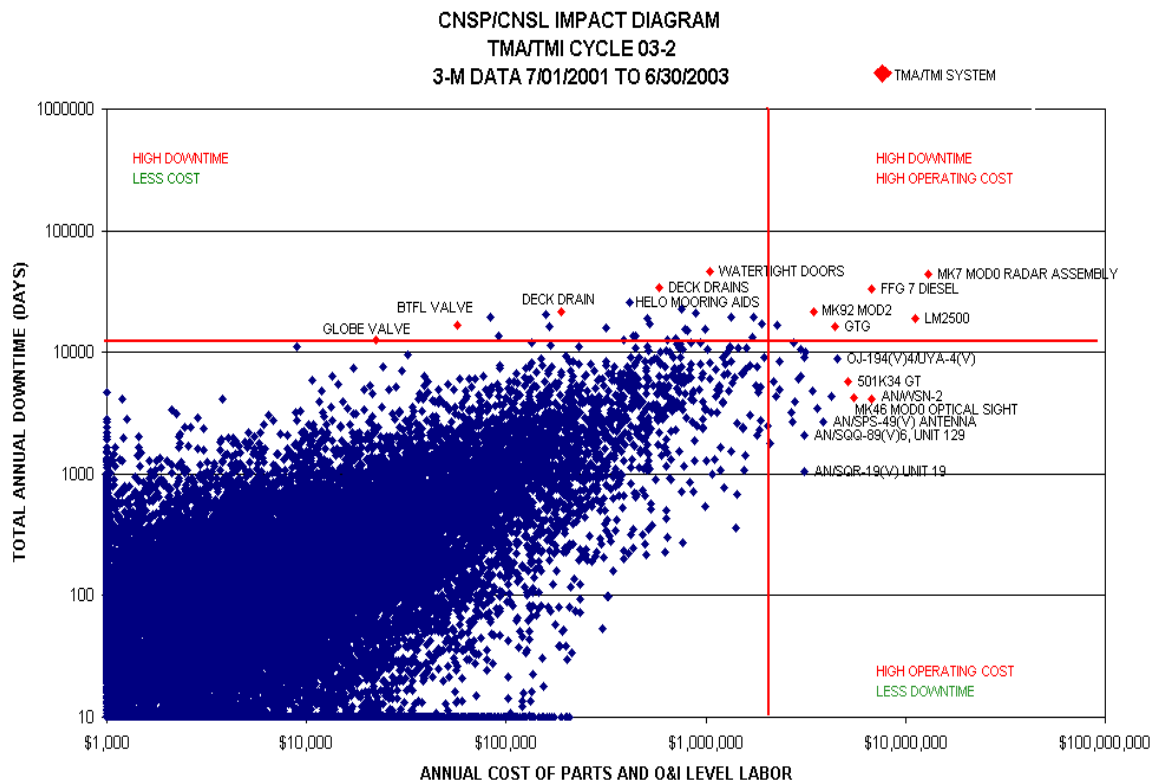
EIC	EIC NOMENCLATURE	FUNCTIONAL AREA	jcn_count	jcn_rank	jan_hours	tmh_rank	total_repair	trrc_rank	hi_priority	hpf_rank	hi_priority	hpdtd_rank	casrep_vc	casrep_ra	BAL_VEC	BAL_RANK
U000	SUPPORT SERVICES, MAINTENANCE	SUPPORT SERVICES, MAINTENANCE	183,743	1	6,132,518	1	\$25,751,114	4	17905	1	4,046,753	1	421	7	41.99	1
1000	ADMINISTRATION HABITABILITY, OUTFIT/FURNISHINGS	ADMINISTRATION HABITABILITY, OUTFIT/FUR	40,913	3	1,333,477	4	\$5,812,668	37	6085	2	1,374,829	2	24	282	11.50	2
A905	COMPARTMENTS	HULL STRUCTURE	56,132	2	1,575,477	3	\$2,220,421	100	4103	6	1,086,529	3	15	421	11.44	3
Z000	SPECIAL/MISCELLANEOUS/UNCODED ITEMS	SPECIAL/MISCELLANEOUS/UNCODED ITEMS	27,685	5	1,633,924	2	\$37,960,095	3	2988	10	410,674	10	73	95	9.45	4
AD01	DOORS	HULL STRUCTURE	40,661	4	712,558	7	\$7,877,630	21	4198	5	870,775	4	95	69	8.23	5
T801	FIREMAINS	AUXILIARY SYSTEMS	19,247	12	591,128	8	\$10,819,978	16	4390	4	815,003	5	637	1	7.72	6
1805	LOCKERS, DAMAGE CONTROL	ADMINISTRATION HABITABILITY, OUTFIT/FUR	24,547	6	728,980	6	\$13,264,377	11	4912	3	612,214	6	20	332	6.59	7
D111	GENERATOR ASSEMBLY, GAS	PROPULSION SYSTEM, MAIN GAS TURBINE	7,361	38	474,096	11	\$38,386,681	2	1679	25	117,104	46	308	10	6.38	8
5612	TRANSMITTER GROUPS (AN/SPY-1)	MISSILE SYSTEMS, SURFACE	9,923	21	320,727	23	\$38,454,563	1	1700	23	64,308	84	276	13	6.23	9
3108	GENERATOR SET, 60HZ, GAS TURBINE DRIVEN	GENERATION SYSTEMS, ELECTRIC POWER	11,571	15	883,518	5	\$16,253,348	6	2847	11	169,960	28	563	3	5.92	10
TF01	AIR SYSTEMS, HIGH PRESSURE	AUXILIARY SYSTEMS	20,573	9	461,414	13	\$12,792,343	13	3851	7	371,861	12	501	4	5.78	11
TF03	AIR SYSTEMS, LOW AND MEDIUM PRESSURE	AUXILIARY SYSTEMS	18,272	13	522,940	10	\$13,197,387	12	3340	9	295,402	17	563	2	5.69	12
1B01	GALLEY EQUIPMENT (COMMISSARY SPACES)	ADMINISTRATION HABITABILITY, OUTFIT/FUR	23,144	7	354,346	21	\$4,808,712	44	3544	8	423,713	9	92	72	4.71	13
T30B	FAN UNIT (TYPE A, VANEAXIAL)	AUXILIARY SYSTEMS	8,689	24	234,068	34	\$2,091,720	104	2330	14	470,081	8	353	9	4.09	14
B101	ENGINE, DIESEL	PROPULSION SYSTEM, MAIN DIESEL, MECH	9,587	22	273,377	28	\$12,351,988	14	1554	29	134,713	37	458	6	3.91	15
T40S	CONDITIONING SYS, AIR (R-114 CHILLED WATER PLANT)	AUXILIARY SYSTEMS	12,995	14	365,132	19	\$5,967,372	36	2415	13	366,808	13	204	21	3.73	16
4505	FIXTURES, LIGHTING, PERMANENT MOUNTED	DISTRIBUTION SYSTEMS, ELECTRICAL POW	20,131	10	362,859	20	\$4,937,186	42	2703	12	246,527	20	8	625	3.70	17
T706	PIPING AND VALVE GROUP	AUXILIARY SYSTEMS	10,537	18	262,186	30	\$3,130,625	68	1995	17	496,523	7	64	105	3.64	18
7C1C	AIRCRAFT RECOVERY EQUIPMENT GENERAL ARRANGEMENT, MK 7	AVIATION SHIP INSTALLATION	21,233	8	461,127	14	\$10,376,460	17	185	228	69,568	76	21	318	3.51	19
7A11	CATAPULT GENERAL ARRANGEMENT C13/C13-1/C13-2	AVIATION SHIP INSTALLATION	19,771	11	582,583	9	\$6,842,689	29	410	112	67,447	78	18	357	3.45	20
T806	AUXILIARY SEA WATER SERVICE SYSTEM	AUXILIARY SYSTEMS	11,020	17	403,072	17	\$6,673,045	31	2106	16	269,111	19	231	17	3.39	21
3701	GENERATOR SET, 60HZ, DIESEL ENGINE DRIVEN	GENERATION SYSTEMS, ELECTRIC POWER	8,594	26	448,990	15	\$6,189,991	35	2212	15	161,341	31	286	12	3.29	22
3101	GENERATOR SET, 60HZ, DIESEL ENGINE DRIVEN	GENERATION SYSTEMS, ELECTRIC POWER	8,673	25	267,790	29	\$9,680,634	19	1249	32	99,833	52	373	8	3.23	23
GV23	RADAR-WEAPON ASSEMBLY 5543003	GUN SYSTEMS	7,264	40	186,791	41	\$18,210,968	5	1363	31	67,058	80	172	26	3.23	24
GV00	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	GUN SYSTEMS	1,846	140	55,909	134	\$3,197,582	67	442	104	33,195	175	484	5	3.06	25
T300	VENTILATION SYSTEMS	AUXILIARY SYSTEMS	8,557	27	170,682	43	\$2,095,440	103	1742	22	393,807	11	162	29	3.05	26
T404	AIR CONDITIONING PLANT, CHILLED WATER (R-12) 80 TON	AUXILIARY SYSTEMS	7,601	34	212,030	36	\$3,455,803	61	1974	18	312,106	16	220	19	2.94	27
A500	PLATFORMS, FLATS AND DECKS	HULL STRUCTURE	10,495	19	315,058	24	\$722,116	251	1631	26	335,634	14	15	422	2.85	28
F101	BOILERS, D-EXPRESS-HEADER TYPE, PRPLN SYS, MAIN STEAM	PROPULSION SYSTEM, MAIN-STEAM, MECH	7,402	37	437,143	16	\$5,179,471	38	1682	24	226,238	21	162	30	2.83	29
T605	FUELING SERV, XFR AND BLENDING SYSTEM, AVI JP-5	AUXILIARY SYSTEMS	9,470	23	273,973	27	\$5,055,032	39	1808	20	315,318	15	74	93	2.83	30
T803	WATER SYSTEM, POTABLE	AUXILIARY SYSTEMS	10,434	20	277,612	26	\$6,619,149	32	1825	19	209,837	25	158	32	2.74	31
TK03	DISTILLING PLANT, LOW PRESSURE FLASH TYPE	AUXILIARY SYSTEMS	7,702	33	258,056	31	\$6,879,203	27	1746	21	195,523	26	222	18	2.70	32
D701	SERVICE SYSTEM, FUEL OIL	PROPULSION SYSTEM, MAIN GAS TURBINE	7,520	35	399,221	18	\$7,374,117	23	1596	27	132,404	40	192	24	2.70	33
5646	AN/SPG-62(SERIES), RADAR SET	MISSILE SYSTEMS, SURFACE	5,414	49	111,779	69	\$14,534,374	8	751	57	38,609	147	217	20	2.69	34
GV20	WEAPON SYSTEMS, CLOSE-IN, MK 15 MODS 11-14 (PHALANX)	GUN SYSTEMS	8,108	29	180,214	42	\$10,197,047	18	1166	38	56,343	99	272	14	2.68	35
5622	DISPLAY GROUP, COMMAND AND DECISION	MISSILE SYSTEMS, SURFACE	6,938	43	462,580	12	\$6,948,534	25	1224	33	64,784	83	108	58	2.44	36
1A01	LAUNDRY-TAILOR SHOP EQUIPMENT	ADMINISTRATION HABITABILITY, OUTFIT/FUR	11,420	16	204,488	38	\$2,314,806	94	1577	28	209,992	24	68	99	2.33	37
LB3E	AN/WSN-2, GYROCOMPASS SET, STABILIZED	NAVIGATION SYSTEMS (ELECTRONIC AND N	436	475	8,766	560	\$15,594,245	7	123	352	9,553	456	44	165	2.30	38
4101	SWITCHBOARD, SHIPS SERVICE, 60HZ	DISTRIBUTION SYSTEMS, ELECTRICAL POW	5,106	51	152,708	47	\$4,080,244	49	1097	41	102,675	51	295	11	2.29	39
G611	WEAPON SYSTEM, GUN, MK 34 MOD 0	GUN SYSTEMS	2,675	104	68,606	116	\$13,525,878	10	355	132	25,221	218	148	36	2.23	40

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32.5.2 Charts and Graphs.

32.5.2.1 Impact Chart. The Impact Chart provides a means of plotting the Ranking Matrix and showing, using a two-axis display, the TMA-TMI systems or equipment and potential candidate systems or equipment. Annual Cost of Parts and Labor are combined to form the X-axis and Days Down Time the Y-axis, providing a visual “high cost”, “high down time” display of TMA-TMI current and candidate systems or equipment.

Figure 32-3 Sample Impact Diagram



32.5.2.2 Balanced Score Card.

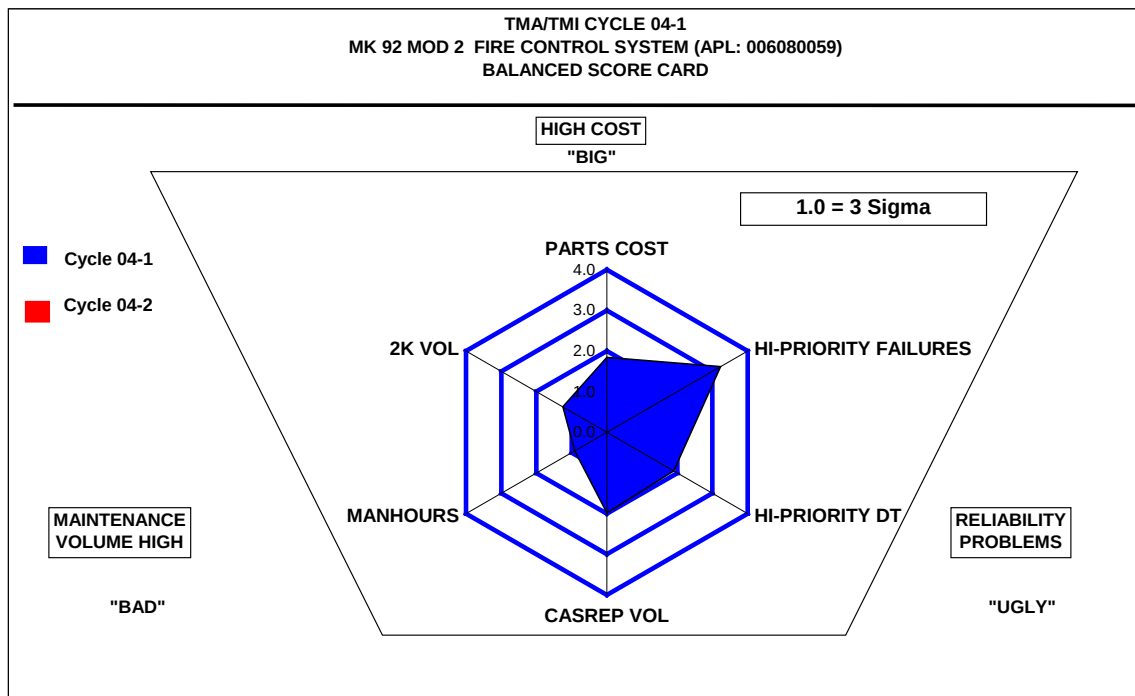
- a. Ratio analysis is a valuable tool for interpreting financial and operating data (from balance sheets, profit-and-loss statements, production data, etc.) to detect favorable or unfavorable conditions in business performance.
- b. Ratios are used to show the proportional relationship of data from a variety of sources. Business owners should compare their ratios for a specific period with previous periods to ascertain possible reasons for change. They may also choose to compare the ratios for their operation with the industry standard.
- c. After an operation has been in existence for a reasonable time, the ratios tend to stabilize and in many industries, desirable ratios are well established. Therefore, there is a minimum percentage that an operation can cost (manpower or capital) and still provide proper service, and a maximum that it can cost before the operation is shut down or re-engineered.

d. This business approach can be applied to the management of systems in the fleet. The BSC developed by the TMA-TMI Analysis Center allows the user to:

- (1) Observe the shape, or system behavior **and** maintenance strategy (relative proportions or ratios, variable to variable).
- (2) Compare a single variable with the entire fleet (since the data is scaled using the upper control limit of all fleet data for each variable as the 100% mark).
- (3) Observe the enclosed area which is proportional to the TMA-TMI balanced ranking value.
- (4) Identify problem areas for follow-on analysis.

Notice that ratios of variables that have the same value on the grid (1:1) are at the fleet average or norm. For example, if Hi-Priority Failures and Hi-Priority Downtime are equal, the connecting line is parallel to the grid and that system has an Average Logistics Response Time equal to the fleet average. Other ratios behave in the same way. A typical BSC has six sides representing the six TMA-TMI attributes. Additional variables from other data sources may be added and, if scaled to the upper control limit of that data source, will achieve similar results.

Figure 32-4 Sample BSC



32.5.2.3 Time (problem free). Reference (b), establishes Operational Availability (Ao) as the primary measure of material readiness for navy mission-essential systems, subsystems and equipment installed in platforms. Ao represents the expected percentage of time that system or individual equipment will be ready to perform satisfactorily in an operating environment when called for at any random point in time. To provide the primary measure of material readiness for the TMA-TMI systems **or** equipment, the TMA-TMI Analysis Center has developed a measure

of Ao for selecting, tracking and trending TMA-TMI systems and equipment called Time Problem Free (T (pf)).

- a. T (pf) uses the mathematical description of Ao provided by reference (b). Generally, Ao is interpreted as the percentage of time that the system will be ready to perform satisfactorily in an operating environment. T (pf) is interpreted as the percentage of time that the system or equipment is free of hi-priority failures during that same period. Quantitatively, this is expressed in the formula:

$$Ao = \text{Uptime} \text{ divided by } (\text{Uptime} + \text{Downtime})$$

For the purposes of describing TMA-TMI systems or equipment, Uptime is equal to Mean Time Between Failure (MTBF) and Downtime is equal to Mean Down Time (MDT). The TMA-TMI formula for T (pf) becomes:

$$T \text{ (pf)} = \text{MTBF} \text{ divided by } (\text{MTBF} + \text{MDT})$$

Data to calculate T (pf) is extracted from the Navy's 3-M Database via the OARS. OARS provides a ten-year maintenance history of system and equipment performance.

MTBF (in days) is calculated using the formula:

$$\text{MTBF} = 1 \text{ divided by } (\text{No. Failures} \text{ divided by } (30.44 * 0.667 * \text{Population}))$$

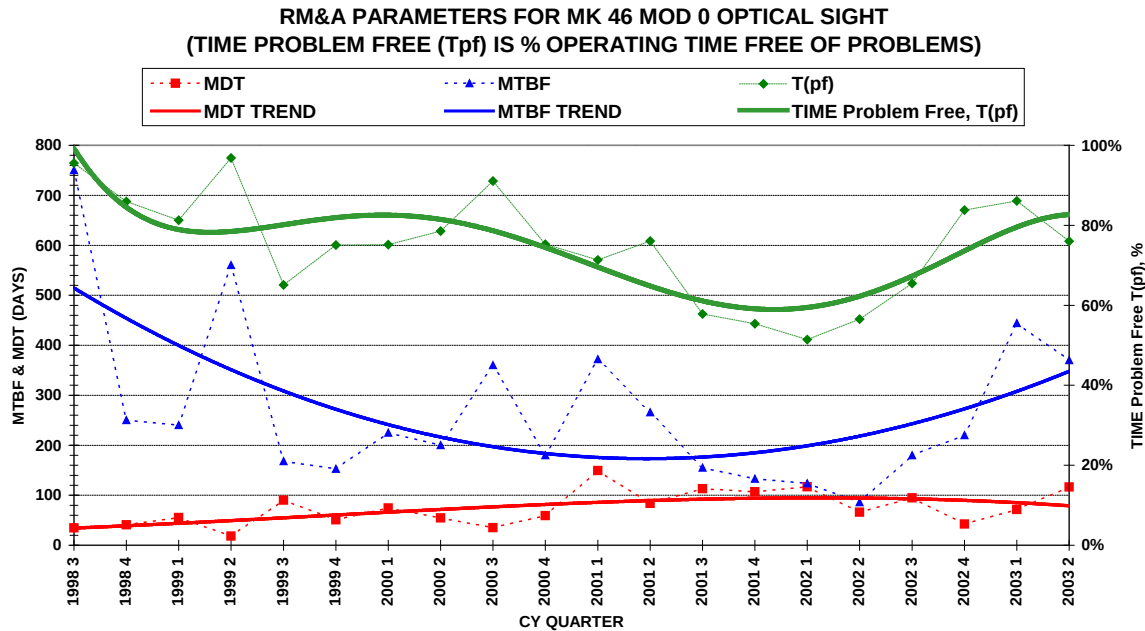
where

- b. No. Failures = the number of Status 2 and 3 2-Kilos written per month. Status 2 is defined by 3-M as inoperative and Status 3 is degraded performance. Limiting 2-Kilo data to Status 2 and 3 eliminates approximately 75% of all 2-Kilos written and provides the basis for measuring mission-degrading performance. Together the TMA-TMI process identifies these as "Deck Plate" CASREPs or maintenance actions that reduce a system or equipment's ability to satisfactorily perform in an operating environment. $30.44 * 0.667 = 30.44$ days in an average month times 0.667, which is defined by reference (b) as "the percentage of time that the system will be ready to perform satisfactorily in an operating environment". For sea-going systems, this operating tempo is approximated as 2/3-calendar time.
- c. Population = the actual population of the system or equipment under evaluation or the number of platforms the system or equipment is installed in. Actual numbers of equipment are generally used for CS and larger HM&E items such as Main Engines or Ships Service Generators. Number of platforms is used for multiple installations of smaller HM&E items such as pumps or valves.
- d. MDT is computed by month directly from OARS and is the mean number of days from the opening of Status 2 or 3 2-Kilos until the Deck Plate CASREPs are corrected and the 2-Kilos closed. MDT is all-inclusive. It contains such items as Mean Logistics Delay Time, Administrative Time, Mean Total Time to Repair, etc. Breaking MDT down into the contributing elements requires expensive data collection and analysis and is not necessary for TMA-TMI purposes.
- e. Time (problem free) Assessment. The resultant T (pf) meets the requirements of reference (b) and provides a means of assessing:

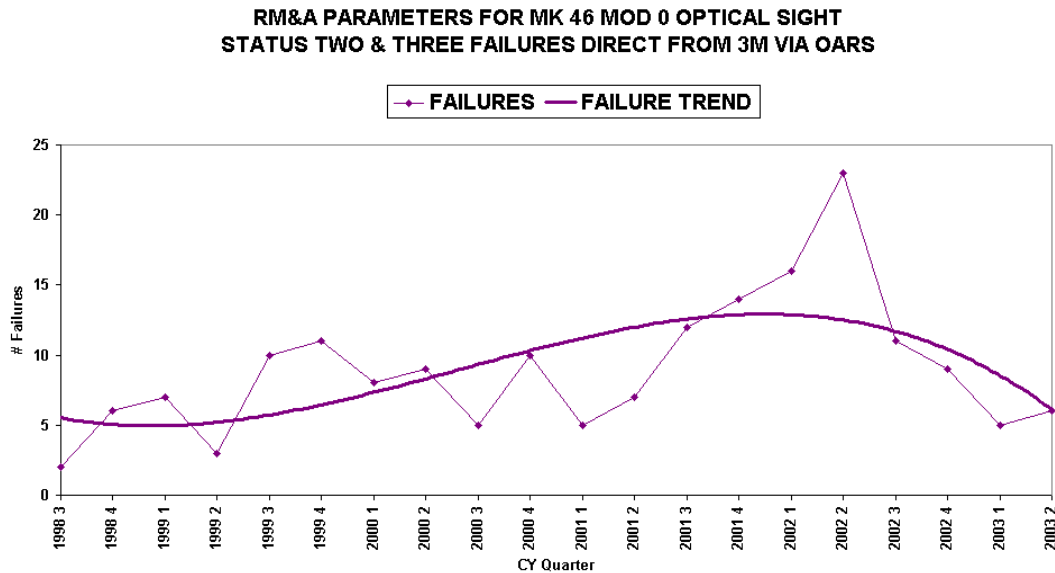
- (1) Operational Availability of TMA-TMI systems or equipment.

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- (2) Effectiveness of the TMA-TMI program in resolving chronic problems in those systems **and** equipment.
- (3) Systems **or** equipment trends in T (pf), MTBF and MDT over time.

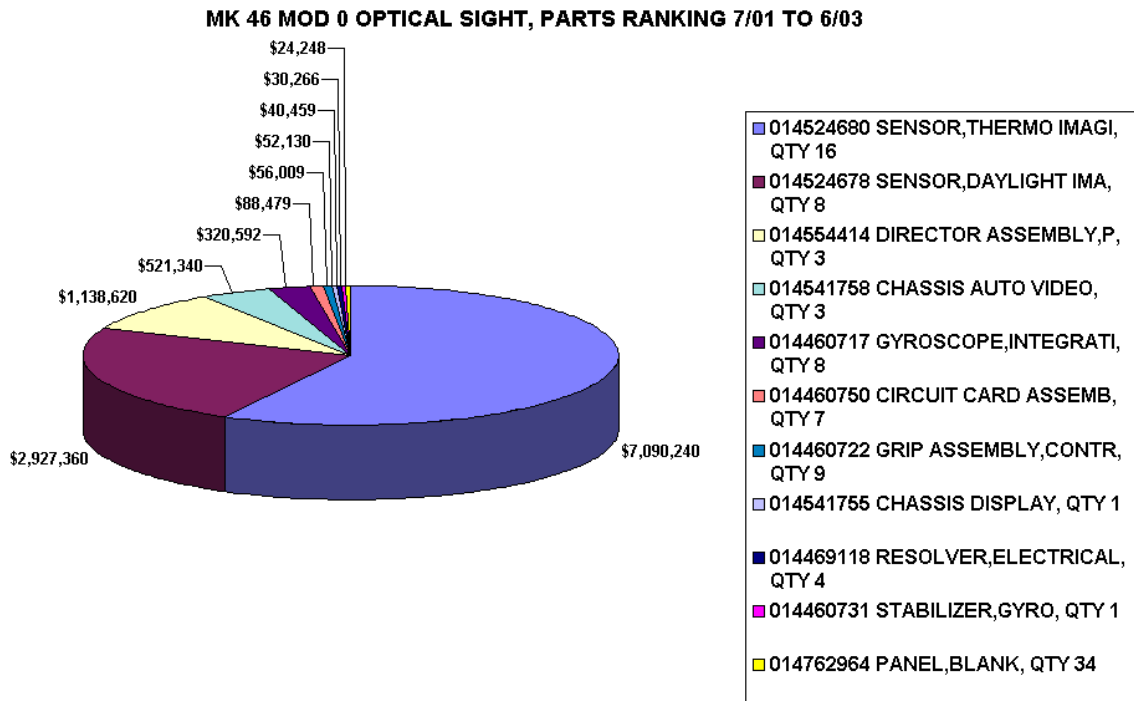
Figure 32-5 Sample T(pf)

32.5.2.4 Failure Trend. The failure trend provides a failure history for the candidate TMA-TMI system **and** equipment. Hi-Priority Failures are plotted quarterly for the past five years and a polynomial trend line provides the direction of movement.

Figure 32-6 Sample Hi-Priority Failure Trend

32.5.2.5 Parts Ranking. The Supply Parts Ranking Report, L0201, is a Ships 3-M Standard Report extracted from OARS. This report provides a quick method for determining fleet material problems based on total parts issued and total cost. Parts Ranking is the ten highest “TOTAL_PRICE” parts extracted from OARS. This represents total cost to the Navy, not necessarily to the individual unit. Cost to the unit will be increased for failure to turn in a Depot Level Repairable carcass. The Parts Ranking provides the National Item Identification Number (NIIN), abbreviated NIIN nomenclature, quantity and total cost per NIIN for the ten most expensive repair parts for the candidate system or equipment.

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Figure 32-7 Sample Parts Ranking

32.5.2.6 Ship's Logistics Indicator Computerized Report. The SLICR, L0106, is a Ship's 3-M Standard Report extracted from OARS. The SLICR is intended to identify problem equipment within the fleet. The SLICR provides the following metrics:

- a. APL/EIC.
- b. APL_NOMENCLATURE/EIC_NOMENCLATURE.
- c. FAILURES: Count of maintenance actions with Status_Code 2 or 3.
- d. SF_MNHRS: Total number of Ship's Force man-hours expended by Ship's Force personnel or other installing personnel in completing and documenting the maintenance action.
- e. PART_ISSUES: Total number of 1250 and 1348 Supply Order Forms processed in support of maintenance.
- f. REPLCMNT_COST: The cost to replace parts used in maintenance with new (not refurbished) parts.
- g. IMA_MNHRS: Total number of IMA man-hours expended in completing and documenting the maintenance action.
- h. VISITS: The count of maintenance actions with TYCOM screening code = 1, 2 or 3.
- i. ACTIONS: A count of deferral, non-deferral and IMA maintenance actions.

- j. OWNSHP_COST: The sum of the cost of the labor of Ship's Force personnel, the cost of labor of the IMA personnel, the cost to replace non-repairable items and the cost to fix repairable items for a group of Job Control Numbers for a given APL or EIC.
- k. COSAL: COSAL Effectiveness is the probability a requested item is stocked onboard whether or not it is available when requested.
- l. NET_COSAL: NET Effectiveness is the probability that a stocked item is onboard when requested.
- m. GROSS_COSAL: GROSS Effectiveness is the probability that any requested item is onboard when needed and is the product of COSAL*NET effectiveness.
- n. LOG_TIME: The sum of (issue date – open date) divided by the total number of issues; average waiting time for a part issue in days.
- o. MAINT_EFFECT: The probability of all required repair parts for a given maintenance action being onboard.

Figure 32-8 Sample SLICR Report

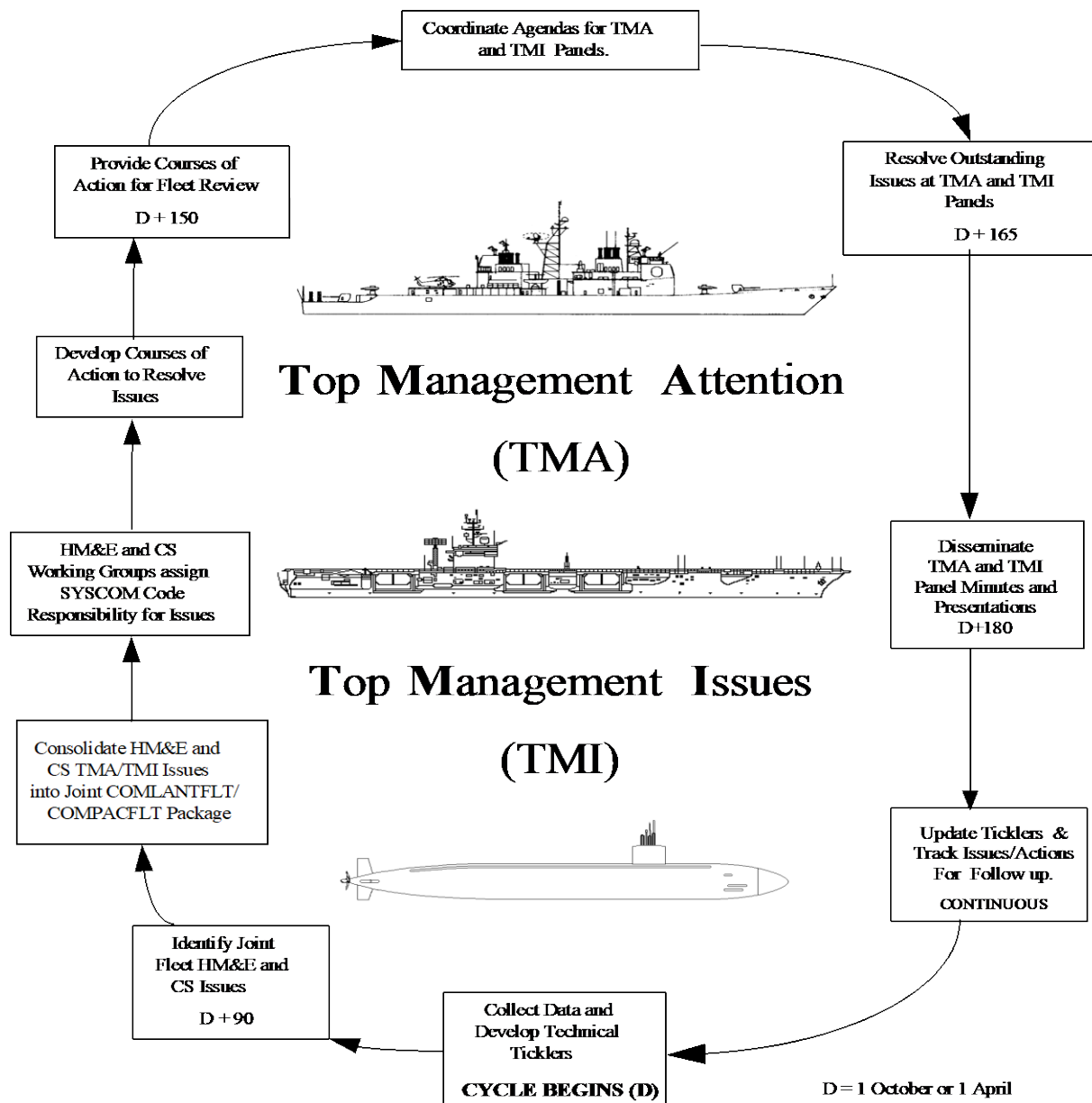
APL	APL_NOMENCLATURE	FAILURES	SF_MNHRS	PART_ISSUES	REPLCMNT_COST	IMA_MNHRS	VISITS	ACTIONS	OWNSHP_COST	COSAL	NET_COSAL	GROSS_COSAL	LOG_TIME	MAINT_EFFECT
006040508	IMK46MOD0,OPTICAL SIGHT	79	6952	185	\$10,375,646	48	12	139	\$10,255,325	45.7	69.4	31.7	77	23.3

32.5.2.7 Ranking Matrix. The Ranking Matrix is similar to the TMA Ranking Matrix except that it provides data for all six TYCOMs and contains data on over 60,000 APLs. This fleet wide Ranking Matrix allows the Fleet to prioritize TMA-TMI selections on a Navy wide basis.

Figure 32-9 Sample Ranking Matrix

FUNCTIONAL AREA (L1)	EIC	EIC NOMENCLATURE (L2)	APL	APL NOMENCLATURE (L3)	apl_population	cn	count	cn	total	mar	h	rank	total	repair	trc	rank	hi	priority	hpf	rank	hi	priority	hpf	ran	casper	yc	casper	ra	BAL_VEC	BAL_RANK	MDT	MTBF	A(j)	R(m)	P(m)	Failure	
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	060690237	MK7MOD0 RADAR ASSEMBLY MODULE	270	7592	1	203717	2	121	680	449	1	1639	1	71419	1	501	1	19	1	19	1	501	1	19	1	19	1	1	44	80	64.8%	10.6%	89.4%	\$18,314	
GENERATION SYSTEMS, ELECTRIC POWER	37	GENERATOR SYSTEM, 100KW, STEWART AND STEVENSON M0166778001E	0606778001E	WATERLIGHT 16 1140001 1600 1800RPM	106	3016	3	258700	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	47	64	47.5%	6.0%	94.0%	\$17,119		
HULL STRUCTURE	AD	DOORS, HATCHES, MANHOLES, SCUTTLES AND CLOSURES	319990011	WATERHIGHT DOORS, HATCHES, SCUTTLES NO OTHER APL	9229	2978	4	527993	25	12366	466	378	12	112546	12	1	3170	9	75	3	268	11888	97	66	98.5%	1.5%	66	98.5%	1.5%	66	98.5%	1.5%	66	98.5%	1.5%	\$6,291	
PROPULSION SYSTEM, MAIN GAS TURBINE, MECHANICAL DRIVE	D1	GAS TURBINE MODULE, PROPULSION	050260008	GAS GENERATOR ASSY&GTURB MIN PROSN TJM0500P0101	137	1794	12	158811	4	115	281	673	2	456	9	34541	9	115	4	9	34	1	9	34	1	9	34	1	1	76	146	65.9%	29.2%	70.8%	\$47,268		
ADMINISTRATION HABITABILITY, OUTFIT/FURNISHINGS	1A	EQUIPMENT AND FURNISHINGS, UTILITY SPACE	439990247	PLASTIC PROCESSOR MELT UNIT 599-6661200	530	1831	11	63246	16	12	167	163	43	471	8	62184	8	77	17	6	37	5	13	548	80	65.0%	72.0%	28.0%	510	1036						\$70,235	
GENERATION SYSTEMS, ELECTRIC POWER	35	GENERATOR SET, GAS TURBINE	050290005	ENG ASSY GAS TURB M01 501134	117	1249	34	59305	19	111	631	384	4	189	38	10109	38	76	19	5	67	1	5	67	1	5	67	1	1	53	301	84.9%	55.0%	45.0%	\$74,223		
NAVIGATION SYSTEMS (ELECTRONIC AND NON-ELECTRONIC)	LB	GYROCOMPASS (CIRCUIT LC AND VILC)	262000101	ANWMSH2 SET GYROCOMPASS STABILIZED	62	242	560	5592	826	12	1665	477	3	72	269	4822	269	36	74	5	60	1	5	60	1	5	60	1	1	67	241	86.2%	66.1%	34.9%	\$179,016		
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	060690238	MK7MOD0 ELECTRONIC ASSEMBLY ENCLOSURE	270	2267	7	61719	17	14	504	972	14	545	4	21048	4	196	2	5	79	8	39	241	86.2%	47.4%	52.6%	912	96						\$12,796		
MISSILE SYSTEMS, SURFACE	51	FIRE CONTROL SYSTEM, GUN/MISSILE, MK 92 MOD 2	060680059	MK92MOD2 FIRE CONTROL SYSTEM (BASELINE)	18	1360	24	34045	53	14	320	477	15	579	3	35400	3	97	7	5	31	9	61	15	19.8%	0.0%	100.0%	49	913						\$9,913		
DISTRIBUTION SYSTEMS, ELECTRICAL POWER	45	DISTRIBUTION SYSTEM, AC LIGHTING	249990138	LANTERN ELEC 115VAC SYM 101.2	89256	2829	6	39048	41	1414	519	296	535	5	40573	5	2	3168	5	08	10	78	61233	99.9%	99.8%	0.2%	3	619							\$3,619		
GUN SYSTEMS	G6	WEAPON SYSTEMS, GUN	060640508	MK46MOD0 OPTICAL SIGHT	34	246	552	15632	216	10	638	399	5	79	226	6291	226	58	2	5	11	80	2120	72.5%	42.4%	57.6%	1143	164							\$143,154		
MISSILE SYSTEMS, SURFACE	51	WEAPON SYSTEM, AEGIS, MK 7 MODS	752982335A	QJ-154(VM/YA-4VM) LESS P-1091	192	595	135	178318	3	1	469	130	80	144	79	69890	79	14	270	4	91	12	49	649	93.0%	75.5%	24.2%	693	756							\$69,736	
AUXILIARY SYSTEMS	TF	AIR SYSTEMS, COMPRESSED	061430285E	COMPRESSOR AIR HIGH PRESSURE 20CFH 3000PSI	57	1299	28	61519	18	1	947	981	51	520	6	28820	6	88	9	4	63	13	55	53	49.1%	3.4%	96.6%	86	478							\$8,478	
DISTRIBUTION SYSTEMS, ELECTRICAL POWER	45	DISTRIBUTION SYSTEM, AC LIGHTING	249990001	FIXTURE LGTG FLRINT	128672	2938	5	50774	31	1	142	422	95	397	11	30912	11	0	4948	4	38	14	78	157813	100.0%	99.9%	0.1%	87	993							\$7,993	
PROPULSION SYSTEM, MAIN GAS TURBINE, MECHANICAL DRIVE	D1	GAS TURBINE MODULE, PROPULSION	050260018	GAS GENERATOR ASSEMBLY M01 L2505012	66	664	114	41219	39	89	613	567	6	160	60	11457	60	42	58	4	36	15	72	201	73.7%	40.0%	59.2%	664	139							\$64,139	
COMMUNICATION AND DATA SYSTEMS	Q7	CRYPTOGRAPHIC EQUIPMENT	88633651	TA8701, TELEPHONE SET	5623	3157	2	20692	128	626	730	230	490	4	7	2473	7	0	4947	4	30	16	50	5488	99.1%	96.8%	3.2%	82	755							\$82,755	
GENERATION SYSTEMS, ELECTRIC POWER	31	PLANTS, GENERATING, SHIPS SERVICE	050280002	ENGINE GAS TURBINE SHIPS SER GEN	78	1297	29	81095	6	14	969	783	11	317	15	12900	15	85	11	4	27	17	41	120	74.6%	22.3%	77.7%	625	910							\$625,910	
AUXILIARY SYSTEMS	TF	FIREMAINS, FLS, SPKL, WASHDOWN AND SALT WATER SER	1882051261	VALVE GLB 2.5IPS 250PSI FLGE X MSHST BRZ	10551	892	74	23665	106	1	916	813	639	186	43	49673	43	0	4957	4	25	18	267	1220	99.0%	99.4%	0.6%	46	190							\$46,190	
PROPULSION SYSTEM, MAIN-STEAM, MECHANICAL DRIVE	F7	PIPING, VALVES AND ACCESSORIES, MAIN STEAM	887054053R	VALVE GLB STP 50IPS 300PSI SWLGD STL	5706	1034	51	23170	108	87	177	1790	43	567	42	4783	567	0	5129	3	62	19	995	54612	98.5%	99.7%	0.3%	323	216							\$323,216	
GENERATION SYSTEMS, ELECTRIC POWER	31	PLANTS, GENERATING, SHIPS SERVICE	668880044L	ENGINE DIESEL GEN 36SS9V-AM M01 284F01 GEN 6CY	36	1490	19	36978	44	13	982	757	19	237	23	14666	23	92	8	3	58	20	62	74	54.5%	8.8%	91.2%	623	046							\$623,046	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK 7 MODS	ME015664	AMP/DR SPY-1A C64758, AMPLIFIER RADIO FREQ	48	1151	43	72676	10	1	480	218	16	336	14	1313	14	19	177	3	52	21	40	72	64.0%	8.1%	91.9%	321	433							\$321,433	
AUXILIARY SYSTEMS	TF	AIR SYSTEMS, COMPRESSED	061430287	COMPRESSOR UNIT 20.0CFH 3000PSI	36	736	97	51315	30	1	446	433	81	253	20	30991	20	55	28	3	49	22	122	69	36.1%	7.4%	92.6%	813	030							\$813,030	
AUXILIARY SYSTEMS	TF	FIREMAINS, FLS, SPKL, WASHDOWN AND SALT WATER SER	1989890513	NOZZLE TYPE SB WASHDOWN COUNTERMEASURES	10225	349	327	15134	223	115	318	1152	136	89	41816	89	3	2037	3	49	23	307	36689	99.2%	99.5%	0.5%	65	299								\$65,299	
RADAR AND IFF SYSTEMS	P3	RADAR, AIR SEARCH	95228806	AS-3263SP3-49(V), ANTENNA	90	274	480	12303	265	17	495	364	7	51	448	3977	448	25	121	3	47	24	78	6608	91.7%	91.1%	18.9%	1567	147							\$1567,147	
AUXILIARY SYSTEMS	TD	FILLING, VENT AND TRANSFER SYSTEM (FUEL AND DIESEL) OIL	8820449342	VALVE GATE 6.00PSI FLGE STL	248	46	3483	1660	2790	12	167	14891	36	732	42575	732	0	5193	3	44	25	1183	3354	73.3%	94.8%	5.2%	81	905								\$81,905	
AUXILIARY SYSTEMS	TD	PLUMBING INSTALLATIONS	017000043	PUMP CTRFL 100GPM 30PSI 1750RPM MCC VLT	255	466	212	26421	75	1	409	366	602	134	93	39703	93	25	130	3	44	26	296	854	74.2%	91.0%	14.0%	610	049							\$610,049	
PROPULSION SYSTEM, MAIN DIESEL, MECHANICAL DRIVE	B1	ENGINE AND CONTROLS, DIESEL	668880032L	ENGINE DIESEL 36SS9V-AM M01 284F01 6CY	48	1538	18	38021	47	14	013	172	18	179	46	15643	46	80	15	3	39	27	87	131	59.9%	25.2%	74.8%	830	489							\$830,489	
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK 7 MODS	ME403291	AMP/DR SPY-1B D0681790, AMPLIFIER RADIO FREQ	120	833	84	18653	194	16	525	654	8	156	65	3220	65	46	4	3	28	31	259	94.6%	61.8%	36.2%	646	079								\$646,079	
HULL STRUCTURE	31	DOORS, HATCHES, MANHOLES, SCUTTLES AND CLOSURES	319990037	MISC STEEL W/TAIT CLOSURE COMMON REPAIR PARTS	731	1175	40	86638	5	6	450	599	183	138	87	24884	87	0	4967	3	31	29	180	2575	93.5%	93.1%	6.7%	629	726								\$629,726
COMMUNICATION AND DATA SYSTEMS	QD	TRANSCIVERS (COMMUNICATION)	00014637	AN/PRC-114(V), RADIO SET	1004	927	69	8932	483	1	240	689	508	190	36	37361	36	0	4963	3	29	30	197	2573	92.9%	93.2%	6.8%	43	147								\$43,147
AUXILIARY SYSTEMS	TC	SCUPPERS AND DECK DRAINS	679990055	DRAIN CK SZ 2.000 IN	10075	840	81	10993	388	11	117	398	1131	190	37	37488	37	0	4964	3	28	31	197	2584	92.9%	93.0%	6.7%	42	869								\$42,869
GUN SYSTEMS	GV	WEAPON SYSTEM, CLOSE-IN, MK 15 (PHALANX)	060690242	ME1A1 20MM GUN	270	1555	16	67966	12	13	337	383	25	246	21	8752	21	44	56	19	32	36	5319	93.8%	91.7%	28.6%	623	799								\$623,799	
RADAR AND IFF SYSTEMS	P1	RADAR, SURFACE SEARCH	57041000	AN/SPS-45, RADAR SET	81	813	87	17709	174	12	216	016	42	219	28	13164	28	112	5	3	18	33	60	180	75.0%	36.8%	63.2%	813	353								\$813,353
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK 7 MODS	ME403311	T-1348/SPG D0681790, TRANSMITTER RADAR	120	940	64	24141	101	15	475	375	9	132	95	4180	95	56	29	3	03	34	32	143	93.4%	66.6%	33.4%	646	796								\$646,796
MISSILE SYSTEMS, SURFACE	53	LAUNCHER SYSTEMS	060680067	MK92MOD06 FIRE CONTROL SYSTEM (BASELINE)	12	679	112	19143	148	14	587	678	13	161	58	18616	58	51	38	3	02	35	116	36	23.9%	0.7%	99.3%	833	251								\$833,251
GENERATION SYSTEMS, ELECTRIC POWER	31	PLANTS, GENERATING, SHIPS SERVICE	1466536289	DIESEL ENCL M01 380D 1-8 12 CYL	32	962	62	79314	8	800	932	141	162	57	19018	57	39	65	001	36	117	96	45.0%	15.5%	84.6%	624	528										\$624,528
GUN SYSTEMS	GW	HANDLING EQUIPMENT, AMMUNITION	860530047	HOIST CHN AIR OPER CAP 4000LBS	193	47	3410	1513	3020	69	595	1324	33	801	38676	801	0	5220	2	98	37	1117	2848	71.0%	93.4%	6.1%	84	852									\$84,852
PROPULSION SYSTEM, MAIN DIESEL, MECHANICAL DRIVE	B1	ENGINE AND CONTROLS, DIESEL	668880067M	ENGINE DSI 036SS9V-AM M01 284F01 8 CYL	24	1167	42	35619	50	1	834	152	56	167	54	11588	54	96	6	2	96	38	69	70	50.3%	7.6%	92.4%	819	514								\$819,514
MISSILE SYSTEMS, SURFACE	56	WEAPON SYSTEM, AEGIS, MK 7 MODS	ME015659	AMP/DR SPY-1A C64758, AMPLIFIER RADIO FREQ	72	719	99	77050	9	13	498	322	21	201	33	6049	33	24	129	2	95	39	30	174	85.3%	35.6%	64.4%	623	788								\$623,788
COMMUNICATION AND DATA SYSTEMS	Q7	AMPLIFIERS, AUDIO	00023228	AMP 3729V, AMPLIFIER AUDIO FREQ	9129	1895	10	11203	369	3729	486	338	189	38	7052	38	0	4965	2	90	40	143	23														

APPENDIX A TOP MANAGEMENT ATTENTION AND TOP MANAGEMENT ISSUES FLOWCHART



VOLUME VI**CHAPTER 33****MAINTENANCE AND MODERNIZATION BUSINESS PLAN**REFERENCES.

- (a) OPNAVENOTE 4700 - Representative Intervals, Durations, Maintenance Cycles, and Repair Mandays for Depot Level Maintenance Availabilities of U.S. Navy Ships

LISTING OF APPENDICES.

- A. Executive Summary Sheet

33.1 MAINTENANCE AND MODERNIZATION BUSINESS PLAN.

- a. The Maintenance and Modernization Business Plan (MMBP) identifies the total private sector maintenance funding budget available to support the ship during the execution year and advance planning and funding needs for availabilities to be executed in future years. The MMBP also includes funding for modernization. This includes funding for all Fleet Alterations and those Program Alterations managed by the Type Commander (TYCOM) or Naval Supervisory Authority (NSA) (Regional Maintenance Center (RMC), Naval Shipyard or Supervisor of Shipbuilding). The MMBP does not include funding for modernization that is managed by the Ship's Program Manager (SPM) or Participating Acquisition Resource Manager and accomplished by Alteration Installation Teams through separately administered contracts.
- b. MMBPs will be developed for all ships that will be in commission at the start of the upcoming Fiscal Year (FY). A second MMBP will be developed for any ship scheduled to start a Chief of Naval Operations (CNO) Availability in the first quarter of the following FY. This second business plan will address only the CNO Availability controls, a Risk Assessment and will not include Continuous Maintenance (CM) controls. The TYCOM will normally use the same TYCOM Target Controls for these out-year CNO Availabilities as used for the upcoming FY CNO Availability controls. These out-year MMBPs will require additional refinement in the next MMBP cycle.

33.2 MMBP RESPONSIBILITIES.

33.2.1 Maintenance Team Responsibilities. The Maintenance Team identifies budget needs to the NSA and the TYCOM based on well-documented work in the Current Ship's Maintenance Project (CSMP) and Class Maintenance Plan. The Maintenance Team MMBP identifies the total maintenance funding.

- a. The Maintenance Team establishes the funding phasing plan that will roll up to the Fleet Commander's overall phasing plan. It should be noted that the accuracy of the phasing plan is critical to the Fleet and TYCOM's ability to provide timely and stable funding. A Maintenance Team over executing or under executing its budget will cause unnecessary funding churn. For this reason, Maintenance Teams and NSAs should develop phasing plans that are accurate and reasonably achievable. For

example, if a CNO Availability is scheduled to start in the first month of a quarter, the funding for that availability will be required in the previous quarter and should be phased in the earlier quarter. CM phasing will depend largely on ships' schedules and should not simply be divided into four equal quarters in the phasing plan.

- b. Each Maintenance Team will include an assessment of known material readiness risks associated with the MMBP funding levels in their initial MMBP submittal. In a case where there is unacceptable risk associated with the assigned funding controls, the TYCOM may agree to adjust assigned controls.
- c. Maintenance Teams **must** use the format provided in Appendix A for MMBP submission.

33.2.2 NSA Responsibilities. For submarines and aircraft carriers, actions assigned to the NSA may be performed directly by the TYCOM or a designated agent (i.e., Immediate Superiors In Command (ISIC), Trident Refit Facility, or Naval Submarine Support Center).

- a. The NSA has the authority to execute ship maintenance and **must** do so **following** Fleet and TYCOM policies and directives.
- b. When conditions warrant, the NSA will develop a Business Adjustment Factor (BAF) percentage for CNO Availabilities to account for local business conditions. BAFs are established as a percentage of the availability budget, similar to the growth or award fee percentages. The BAF is an adjustment or hedge against impacts to the man-day rate or premium levels for specific CNO Availabilities due to factors such as high or low port loading. Examples of other situations that may require an allowance in the BAF are seasonal adverse weather patterns, anticipated labor union issues, anticipated labor rate adjustments or the general business conditions in the port.
- c. The NSA will make any additional adjustments to TYCOM target controls based on prioritization of the work package, risk analysis and Business Case Analysis (BCA) included in the Maintenance Team's MMBP submissions. The overall, total NSA CNO Availability funding controls and total CM funding controls provided to the NSA by the TYCOM may not be exceeded in these adjustments.
- d. (Surface Ships only) During the year of MMBP execution, changes to individual ship controls exceeding 10% require TYCOM notification; changes in excess of 20% require TYCOM approval. In the event adjustments are required that exceed available funds, the NSA will provide a written justification supporting the change and a formal recovery plan to the TYCOM for approval.
- e. Appendix A may be modified as required, with TYCOM concurrence, for unique NSA processes or circumstances.

33.2.3 TYCOM Responsibilities (Surface Force Ships only).

- a. Establish Force maintenance policies, directives and authorize the NSA to execute those policies and directives.
- b. Provide Target Controls to the NSA in March of each year and review those controls as required by the budget approval process. These controls are between the TYCOM and the Port Engineer.

- c. Ensure the established modernization plan is accurate and issue Fleet Alteration Letters of Authorization.
- d. Validate MMBPs and **issue** approved CNO availability and Continuous Maintenance funding controls in naval message format at the beginning of each fiscal year.
- e. Align Surface Warfare Enterprise processes with established waterfront support organizations and establish the readiness and cost control processes required to provide greater overall enterprise effectiveness.
- f. Support the ISIC with warships ready for tasking by aligning manning, training, equipping and maintaining processes of ships by class.
- g. Assess current readiness, analyze metrics, examine trends, determine root causes, establish lessons learned and provide recommendations and solutions, while emphasizing readiness and cost control.
- h. The TYCOM will provide the RMCs with TYCOM Target Controls in March of each year and will revise these controls as required by the budget approval process.

33.2.4 TYCOM Responsibilities (Aircraft Carriers and Submarines only). The TYCOM establishes Force maintenance policies and directives and authorizes the NSA to execute those policies and directives.

- a. The TYCOM ensures that the established modernization plan is accurate and issues Fleet Alteration Letters of Authorization.
- b. The TYCOM has final approval of all MMBPs and will **issue** approved CNO Availability and CM funding controls in naval message format.

33.2.5 Ship Program Manager Responsibilities. The SPM ensures that the Letter of Authorization for Program Alterations is accurate and includes Program Alterations funding estimates.

33.3 THE MMBP SUBMISSION.

33.3.1 MMBP Spreadsheet. The required format for submission of MMBPs is provided in Appendix A of this chapter. As noted in paragraph 33.2.2.e. of this chapter, changes may be made to Appendix A to reflect NSA unique circumstances.

33.3.1.1 General Description. The MMBP provides the maintenance team's description of the planned maintenance and funding phasing.

33.3.1.2 Executive Summary Sheet.

- a. Section I: The Schedule Overview is intended to illustrate major milestones in the current and upcoming year: assessments, deployments, availabilities, decommissioning, etc.
- b. Section II: This section begins with initial controls (CNO and CM) and applies adjustments to those controls by TYCOM and RMC. The final numbers in each of these categories are funds available for assignment to CM and CNO work as appropriate. Particular care must be taken to ensure that the sign (where subtraction has a "-" or a number is preceded and followed with parentheses, e.g., "(10)")

indicating a negative number) of these numbers are correct, as they are linked to the CONTROLS AND PHASING sheet.

- c. Section III: Ensure that program alterations (K-Alterations) are included here and not included in other locations. D-Alterations, Machinery Alterations, and Ship Change Documents should be located in Section II.
- d. Section IV: This section provides an area for the maintenance teams to indicate areas of risk associated with the particular FY's maintenance plan. This section does not include topics that are not applicable to the execution FY risk. Areas to be discussed here:
 - (1) Work items identified in the UNFUNDED REQUIREMENTS sheet, and their impact to current or future operations.
 - (2) Upcoming assessments that may identify serious discrepancies.
- e. Section V: This section provides a general rollout of the work planned for the execution FY. Items in this section need not be identified by Job Control Number **or** Job Sequence Number, but rather a general layout of work to be brokered to individual availabilities and their notional values; this should include historical repairs from assessments. The bottom of this sheet sums items from other portions of the workbook for comparison purposes. Items of note in this section:
 - (1) The items identified in the "green" section of Section V are planned for completion in the execution FY and therefore are not elements of risk.
 - (2) The "shortfall" cell should be equal to or less than the UNFUNDED cell.
 - (3) The Risk section on the bottom of the spreadsheet feeds directly from the UNFUNDED REQUIREMENTS SHEET. This section sums the unfunded items by funding type and then by associated risk (see paragraph 33.3.1.4 of this chapter).

33.3.1.3 Controls and Phasing Sheet. This sheet applies changes (growth pools, overhead, award fees, and the business adjustment factors) to the adjusted controls. This sheet provides a further adjustment to the controls, as well as a phasing of the controls that should be completed by the Maintenance Teams so as to reflect the maintenance schedule. Particular care should be taken to ensure that sums are correct, since TYCOMs use this sheet to plan quarterly cash flows.

33.3.1.4 Unfunded Requirements Sheet.

- a. This sheet identifies those items in the Class Maintenance Plan or validated maintenance items in the ship's CSMP that cannot be completed in the execution FY due to funding constraints. To be included in the UNFUNDED REQUIREMENTS list, the following conditions must be satisfied:
 - (1) The work can be accomplished in the time available if additional funding is applied, or
 - (2) The work can be accomplished in the execution year if additional Continuous Maintenance Availability (CMAV) **or** CNO time were allotted.

- b. The column marked “Funding Type” has permissible entries: CM, CNO and AP. They are meant to indicate the most likely funding areas to which the work would be brokered if funding were available.
- c. The “Risk” column has permissible entries of “High,” “Medium” and “Low” as determined by a BCA guided by Volume II, Part I, Chapter 4, Appendix D of this manual. These columns must be populated in order to properly assess the risk associated with the MMBP, as well as to feed properly to the Executive Summary Sheet.

33.3.2 Prioritization. Maintenance Teams should use any and all resources at their disposal to prioritize the work for which funds are available. The prioritized work should support the ship’s current readiness requirements as well as work designed to ensure the ship can operate effectively its full service life.

33.3.3 Maintenance Summary and Risk Assessment. The Maintenance Team and TYCOMs will address any known maintenance risks based on Funding Controls or ship’s maintenance schedule for the upcoming FY. This risk assessment must provide sufficient detail to enable NSA **or** TYCOM to make critical decisions with respect to funding adjustments. Photographs, inspection reports, docking reports, operating logs, vibration analysis, Maintenance Figure of Merit (MFOM) data and other objective evidence of important maintenance which is not able to be accomplished within the Maintenance Teams funding controls should be included.

33.4 BUDGET PROCESS AND MMBP DEVELOPMENT TIMELINE.

33.4.1 Guidance. In order to develop MMBPs prior to the start of the FY in which they will be executed, it is necessary to begin the process well before the final budget is approved and financial controls are passed to the Fleet Commanders, TYCOMs, and eventually to the Maintenance Teams. Maintenance Teams **must** develop MMBPs using the following guidance and timeline. For submarines and aircraft carriers, actions assigned to the NSA may be performed directly by the TYCOM or a designated agent (i.e., ISICs, TRIDENT Refit Facility, or Naval Submarine Support Center).

33.4.2 Initial Budget Guidance (March).

- a. The TYCOM, in coordination with the Fleet Maintenance Officer, will establish an initial estimate of the expected funding controls for the next FY. Based on this information, TYCOMs will develop a common maintenance funding strategy, establish initial TYCOM Target Controls for each ship’s CNO Availability and each ship’s CM budget. The CM budget provides funds for both the yearlong continuous availability and scheduled CMAVs. TYCOM Target Controls are passed from the TYCOM to the Maintenance Team as the initial input to the MMBP process.
- b. The TYCOM and the SPM will ensure Letters of Authorization accurately reflect the modernization plan. SPMs and Participating Acquisition Resource Managers will provide installation estimates for Program Alteration installations or installation support services for which funding will be provided to the Maintenance Team. The TYCOM Target Controls will be separated into Fleet maintenance and Fleet funded alteration controls by the TYCOM before the controls are passed to the NSA.

33.4.3 Provide Controls to Maintenance Team (April).

- a. The Maintenance Teams will use the Class Maintenance Plan to develop assessment schedules with NSA for inclusion in individual MMBPs.
- b. ISIC **must** provide ship operational schedule information to the Maintenance Team. This information is used to schedule CMAVs and Assessments for the upcoming year.
- c. The NSA will establish BAF if required for each CNO Availability, anticipated CNO Availability and CM growth percentages, support service percentages and Award Fee percentages as applicable for entry into the MMBP Budget Planning Sheet, Appendix A. For surface ships, Maintenance Teams may modify target controls for ships within a class based on their relative material condition.
- d. Maintenance Teams will develop MMBPs based on these initial controls. This iterative process will involve risk assessment and a BCA of any differences between the Maintenance Teams identified funding needs and the funding controls established for them.

33.4.4 Execution Strategy Adjustments (May). The TYCOM in coordination with Fleet Commanders will determine if adjustments to the TYCOM Target controls are required. For surface force ships, the TYCOM will provide the NSA with direction for the adjustment of controls.

33.4.5 (Surface Ships only) Maintenance Team Submit MMBPs for Approval via NSA (June). The NSA approves, consolidates and submits copies of each assigned ship's MMBP to the TYCOM for review and approval.

33.4.6 TYCOM Approves MMBPs (July).

- a. The TYCOM approves MMBPs and **issues** final approved CNO availability and CM controls.
- b. The TYCOM **or** RMC provides final CNO budget controls and CM controls to the Maintenance Teams.

33.4.7 Submit Phasing Plans (August).

- a. The NSA funds administrators will review and adjust each Maintenance Team's phasing plan to correspond with the total controls. Each NSA will provide the Maintenance Team phasing plans to TYCOM.
- b. The TYCOM will submit phasing plans to the Fleet Commander.
- c. The Project Manager is responsible for ensuring all MMPB related information is entered in the Navy Maintenance Database for all surface ship availabilities, including the TYCOM Annual Operating Controls. If the TYCOM controls are unknown at time avail is established within NMD, then a Notional Control **must** be entered in the interim until an actual control is established.

33.5 BUSINESS PLAN RESOURCES. The following resources and information **must** be reviewed and considered in the development of MMBPs. This list is not intended to be all-inclusive and is provided as a starting point.

- a. The notional CNO man-day requirements used by the TYCOM to establish initial TYCOM Target Controls.

- b. The ship's CSMP.
- c. The ship's Baseline Availability Work Package.
- d. The Class Maintenance Plan.
- e. Areas of specific concern that will be assessed or inspected prior to the availability.
- f. Modernization Plan - Program and Fleet Alterations.
 - (1) Program Ship Change (SC) Authorization letters provided by Program Executive Officer Ships include NAVSEA, Space and Naval Warfare Systems Command (SPAWAR), Naval Supply Systems Command and Naval Air Systems Command (NAVAIR) planned installations.
 - (2) Fleet SC Authorization letters provided by the TYCOM include Fleet Alterations, Alterations Equivalent to Repair and Machinery Alterations.
 - (3) Information contained in Program Executive Officer **or** Systems Command and TYCOM SC authorization letters will be consolidated into Hull Modernization Plans. Hull Modernization Plans will list all SCs (Program and Fleet Alterations) programmed for installation on each ship for the entire FY.
- g. Deployment and operational schedules.
- h. Assessment and inspection schedules (Hull, Mechanical, Electrical Readiness Assessment (HMER), Command, Control, Communications, Computers and Combat Systems Readiness Assessment (C5RA), Board of Inspection and Survey (INSURV), etc.).
- i. Ship's event schedules (Change of Command, etc.).
- j. Long-term ship's CNO Availability and decommissioning schedule.
- k. CNO Availability and CMAV Planning Milestones.
- l. Departures from Specifications.
- m. Habitability Project Plan **or** Schedule (TYCOM provide).
- n. Other Availability Programs (TYCOM provide).
 - (1) Underwater Hull Cleaning.
 - (2) Calibration.
 - (3) Other miscellaneous.

APPENDIX A EXECUTIVE SUMMARY SHEET

USS XXX (XX-XX)
MAINTENANCE AND MODERNIZATION BUSINESS PLAN
FY 2010

PORT ENGINEER:

PE

PROJECT MANAGER:

PM

I. SCHEDULE OVERVIEW

	EVENT	DATES	
A.	CNO Availability (Start-End)		
B.	Continuous Maintenance Avails (CMA)		
	CMA 0A1 (Start-End)		
	CMA 0A2 (Start-End)		
	CMA 0A3 (Start-End)		
	CMA XA4 (Start-End)		
C.	Surge Ready Asset		
	(Start-End)		
	(Start-End)		
D.	Assessments - Major		
	PSART (Start)		
	C5RA (Start)		
	Main Propulsion Plant Assessment DEI 1, 3 SSDG (Start)		
	Main Propulsion Plant Assessment Gas Turbine Inspections (Start)		
	Total Ship Readiness Assessment (TSRA) (1, 2, 3, 4) (Start)		
E.	Training Cycle		
	Ultra E + C (Engineering and Combat Readiness Training Assessment, 12M Cert) (Start)		
	Ultra S+ (Sustainment, 12M Cert) (Start)		
	Group Exercise (Start)		
	Group Certification (Start)		
F.	Deployment		
		Deploys	Returns

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APPENDIX A
EXECUTIVE SUMMARY SHEET (Cont'd)

	EVENT	DATES	
G.	INSURV (Last-Next)		
		Deploys	Returns
H.	Out-Year CNO Availabilities		
	(Start-End)		
	(Start-End)		
	(Start-End)		
I.	Docking CNO Avail - Next (Start-End)		
J	Planned DECOMM Date (End)		

II. TYCOM FUNDING CONTROLS

A.	MFOM Data		
	a.	Class Average Weighted MROM (MFOMw)	\$0
	b.	MFOMw	\$0
B.	Continuous Maintenance & I - Level Expenditures		
	a.	Initial TYCOM CM Target Control (total)	\$0
	b.	CM Control Designated for Fleet Alterations	\$0
	c.	RMC Net Target Control for Maint (c+d)	\$0
	d.	Prior Year Funds Available	\$0
	e.	RMC Adjustments (Indicate + or -)	\$0
	f.	FY-10 TYCOM Funding CM CONTROL (Maint) e+f+g	\$0
	g.	FY-10 TYCOM Funding DIL CONTROL (Maint)	\$0
	h.	Total TYCOM CM & DIL Control (h+b+i)	\$0
C.	FY-10 CNO Avail		
	a.	Initial TYCOM Target Control (total)	\$0
	b.	CNO Avail Control Designated for Flt Alts	\$0
	c.	CNO Maint Control before Adjustment(a-b)	\$0
	d.	RMC Net Target Control for Maint	\$0
	e.	Prior Year Funds Available	\$0
	f.	RMC Adjustments (Indicate + or -)	\$0
	g.	TYCOM Funding CNO CONTROL (Maint) (e+f+g)	\$0
	h.	Total TYCOM CNO Control (h+b)	\$0
D.	Advance Funding Previously Obligated on FY-10 CNO Avail		
	a.	FY-08 Advance Funding	\$0
	b.	FY-09 Advance Funding	\$0
	c.	TOTAL	\$0

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APPENDIX A**EXECUTIVE SUMMARY SHEET (Cont'd)**

E.	Advance Funding for FY-11 CNO Avail		
	a.	FY-09 Advance Funding	\$0
	b.	FY-10 Advance Funding	\$0
F.	Habitability (TYCOM N43 Managed & Funded)		
G.	ORATA (TYCOM N43 Managed & Funded)		
	a.	Underwater Hull Cleaning	\$0
	b.	Calibration, other Misc ORATA Programs	\$0
	c.	Total	\$0
H.	Assessments (Mission Funded - estimates for RMC budgeting only)		
	a.	HMER A	\$0
	b.	C5RA	\$0
	c.	TSRA	\$0
	d.	Total	\$0

III. PROGRAM ALTERATION FUNDING CONTROLS (Funding Managed by RMC)			
A.	NAVSEA (PEO-SPM)		
	a.	CNO Avail Program Alteration Controls	\$0
	b.	CM Program Alteration Controls	\$0
B.	SPAWAR		
	a.	CNO Avail Program Alteration Controls	\$0
	b.	CM Program Alteration Controls	\$0
C.	NAVAIR		
	a.	CNO Avail Program Alteration Controls	\$0
	b.	CM Program Alteration Controls	\$0

IV. NARRATIVE RISK ASSESSMENT

A. Schedule Summary		
	a. CNO avail:	
	b. Deployment cycle (Training sched):	
	c. INSURV	
	d. CMAV	

APPENDIX A
EXECUTIVE SUMMARY SHEET (Cont'd)

	e. Out-Years (Future major events, AP CNO, Home port shift, etc.)	
B. Assessment-Repair Summary		
	a. Main Propulsion	
	b. Auxiliary Equipment	
	c. Distributive Systems	
	d. Combat Systems	
C. Corrosion Control Summary		
	a. Tanks b. Decks/ Bilges c. Structural (fan rooms, stacks)	
D. CLASS Specific Major Anticipated Repairs.		
	a.	
	b.	
	c.	
E. TYCOM Unscheduled Modernization		
	a. Fleet Alts	
F. Summary Risk Assessment.		
	a. Risk Assessment Narrative:	

V. PLANNED WORK ROLLUP

Target	Item	Notional Cost

APPENDIX A
EXECUTIVE SUMMARY SHEET (Cont'd)

V. PLANNED WORK ROLLUP (Cont'd)

Target	Item	Notional Cost
UNF	Unfunded Avail Total (RMAIS)	\$0
AP	Advanced Planning (Next FY Avail)	\$0
CNO	Fleet Alts	\$0
N/A	Award Fees (Auto fill from Controls & Phasing)	\$0
N/A	Services (Auto fill from Controls & Phasing)	\$0
Total Requirement		\$0
Total MMBP		\$0
SHORTFALL		\$0
CNO Risk		\$0
High		\$0
Medium		\$0
Low		\$0
CM Risk		\$0
High		\$0
Medium		\$0
Low		\$0
AP/AF Risk		\$0
High		\$0
Medium		\$0
Low		\$0

APPENDIX A
EXECUTIVE SUMMARY SHEET (Cont'd)

CONTROLS AND PHASING								
FYxx xxRMC BUDGET FOR USS XXX (XX-XX)								
			Total/Phasing	Q1	Q2	Q3	Q4	
FY xx TYCOM Budget			\$0	\$0	\$0	\$0	\$0	
FY xx DIL Budget			\$0	\$0	\$0	\$0	\$0	
FY xx PROGRAM Alt Budget			\$0	\$0	\$0	\$0	\$0	
FY xx TOTAL MMBP Budget			\$0	\$0	\$0	\$0	\$0	
FYxx xxRMC TYCOM CNO BUDGET								
FYxx CNO BUDGET		TOTAL		Phase check sum	Q1	Q2	Q3	Q4
		\$0		\$0	\$0	\$0	\$0	\$0
				Budget	Comments			
	1.	Maintenance		\$0	Estimate			
	2.	Fleet SHIPALTS			Based on Modernization Plan, LOAs			
Sum of 1,2,c,d		a.	Package Subtotal	\$0				
	b.	Growth %	12.00%	\$0	% of (a) based on RMC policy, cannot exceed 12%			
	c.	Service / Support %	17.00%	\$0	Historical percentage of (a) for 800/900's, adjusted for program Alt prorated costs			
	d.	LLTM		\$0	As required			
Change if 10% is not correct	e.	Award Fee % of (a+b+d)	11.23%	\$0	For Cost contracts only Max % possible based on contract terms			
	f.	Other costs		\$0	Work accomplished outside of Avail contract			
	g.	Pierside Refurb		\$0	As applicable at each RMC			
Business Adj Factor	h.	BAF % of (a+b+e)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost			
CNO AVAIL BUDGET				\$0				
FY xx FUNDING REQ				\$0	IF AN AVAIL CROSSES FISCAL YEARS, PREDICT GROWTH AND ASSOCIATED AWARD FEE FOR THE FOLLOW ON FY			
FY xx FUNDING REQ				\$0				
TOTAL CNO Execution Control				\$0	As established by RMC / TYCOM			
Prior FY Funds				\$0	AP or PSIA contractor funds still available in execution			
TOTAL CNO CONTROL				\$0	Total SERMC CNO Avail Funding Available			
FYxx xxRMC TYCOM CM BUDGET								
FYxx CM BUDGET		TOTAL		Phase check sum	Q1	Q2	Q3	Q4
		\$0		\$0	\$0	\$0	\$0	\$0

APPENDIX A

EXECUTIVE SUMMARY SHEET (Cont'd)

CONTROLS AND PHASING (Cont'd)								
				Budget	Comments			
	1.	Maintenance		\$0	Estimate. Before growth			
	2.	Fleet SHIPALTS		\$0	Estimate			
Sum of 1,2	a.	CM Package Subtl		\$0	Base Budget. No Growth or Fees.			
	b.	Growth %	12.00%	\$0	% of (a) based on RMC policy, cannot exceed 12%			
Change if 10% is not correct	c.	Award Fee % of (a+b)	0.00%	\$0	For Cost Contracts only Max % possible based on contract terms			
	d.	Other costs		\$0				
CM Budget				\$0				
FYxx CM Control				\$0	As established by RMC/TYCOM			
Prior FY Funds				\$0	AP or PSIA contractor funds still available in execution			
TOTAL CM CONTROL				\$0	Total SERMC CM Funding available			
Advance Planning Budget					Q1	Q2	Q3	Q4
FY xx CNO Avail Advance Planning				\$0	\$0	\$0	\$0	\$0
FY xx CNO Avail Advance Planning				\$0	\$0	\$0	\$0	\$0
FY10 SERMC TYCOM DIL Budget								
FY xx DIL Budget		TOTAL		Phase check sum	Q1	Q2	Q3	Q4
		\$0		\$0	\$0	\$0	\$0	\$0
				Budget	Comments			
	1.	Maintenance		\$0	Estimate. Before growth			
	2.							
Sum of 1,2	a.	DIL Package Subtl		\$0	Base Budget. No Growth or Fees.			
	b.	Growth %	12.00%	\$0	% of (a) based on RMC policy, cannot exceed 12%			
Change if 10% is not correct	c.	Award Fee % of (a+b)	0.00%	\$0	For Cost Contracts only Max % possible based on contract terms			
	d.	Other costs		\$0				
DIL Budget				\$0				
FYxx DIL Control				\$0	As established by RMC/TYCOM			
Prior FY Funds				\$0	AP or PSIA contractor funds still available in execution			
TOTAL DIL CONTROL				\$0	Total SERMC DIL Funding available			

APPENDIX A
EXECUTIVE SUMMARY SHEET (Cont'd)

CONTROLS AND PHASING (Cont'd)								
FYxx CNO AVAIL Program ALT Modernization Budget								
NAVSEA Program Alts		TOTAL		Phase check sum	Q1	Q2	Q3	Q4
		\$0			\$0	\$0	\$0	\$0
				Budget	Comments			
	1.	Labor & Matl		\$0	From Mod Plan, LOAs			
	2.	Services		\$0	Negotiated with RMC for 800/900's			
Sum of 1,2	a.	Package Subtotal		\$0	Base Budget. No Growth or Fees.			
	b.	Growth %	10.00%	\$0	% of (a) based on RMC / PARM policy			
	c.	Award Fee % of (a+b)	11.23%	\$0	For Cost contracts only Max % possible based on the contract			
	d.	BAF % of (a+c)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost			
	e.	Other costs		\$0	Explain in comments			
NAVSEA Budget				\$0	Budget cannot exceed control			
FYxx NAVSEA Control				\$0	From Mod Plan, LOAs			
SPAWAR Program Alts		TOTAL		Phase check sum	Q1	Q2	Q3	Q4
		\$0			\$0	\$0	\$0	\$0
				Budget	Comments			
	1.	Labor & Matl		\$0	From Mod Plan, LOAs			
	2.	Services		\$0	Negotiated with RMC for 800/900's			
Sum of 1,2	a.	Package Subtotal		\$0	Base Budget. No Growth or Fees.			
	b.	Growth %	10.00%	\$0	% of (a) based on RMC / PARM policy			
	c.	Award Fee % of (a+b)	11.23%	\$0	For Cost contracts only Max % possible based on the contract			
	d.	BAF % of (a+c)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost			
	e.	Other costs		\$0	Explain in comments			
SPAWAR Budget				\$0	Budget cannot exceed control			
FYxx SPAWAR Control				\$0	From Mod Plan, LOAs			
NAVAIR/ OTHER ALTS		TOTAL		Phase check sum	Q1	Q2	Q3	Q4
		\$0			\$0	\$0	\$0	\$0
				Budget	Comments			
	1.	Labor & Matl		\$0	From Mod Plan, LOAs			
	2.	Services		\$0	Negotiated with RMC for 800/900's			

APPENDIX A

EXECUTIVE SUMMARY SHEET (Cont'd)

CONTROLS AND PHASING (Cont'd)						
Sum of 1,2	a.	Package Subtotal		\$0	Base Budget. No Growth or Fees.	
	b.	Growth %	10.00%	\$0	% of (a) based on RMC / PARM policy	
	c.	Award Fee % of (a+b)	11.23%	\$0	For Cost contracts only Max % possible based on the contract	
	d.	BAF % of (a+c)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost	
	e.	Other costs		\$0	Explain in comments	
NAVAIR/OTHER ALTS Budget				\$0	Budget cannot exceed control	
FYxx NAVAIR/OTHER Control				\$0	From Mod Plan, LOAs	
NAVSEA Program Alts		TOTAL		Phase check sum	Q1	Q2
		\$0		\$0	\$0	\$0
				Budget	Q3	Q4
					\$0	\$0
					Comments	
	1.	Labor & Matl		\$0	From Mod Plan, LOAs	
	2.	Services		\$0	Negotiated with RMC for 800/900's	
Sum of 1,2	a.	Package Subtotal		\$0	Base Budget. No Growth or Fees.	
	b.	Growth %	10.00%	\$0	% of (a) based on RMC / PARM policy	
	c.	Award Fee % of (a+b)	11.23%	\$0	For Cost contracts only Max % possible based on the contract	
	d.	BAF % of (a+c)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost	
	e.	Other costs		\$0	Explain in comments	
NAVSEA ALTS Budget				\$0	Budget cannot exceed control	
FYxx NAVSEA Control				\$0	From Mod Plan, LOAs	
SPAWAR Program Alts		TOTAL		Phase check sum	Q1	Q2
		\$0		\$0	\$0	\$0
				Budget	Q3	Q4
					\$0	\$0
					Comments	
	1.	Labor & Matl		\$0	From Mod Plan, LOAs	
	2.	Services		\$0	Negotiated with RMC for 800/900's	

APPENDIX A

EXECUTIVE SUMMARY SHEET (Cont'd)

CONTROLS AND PHASING (Cont'd)							
Sum of 1,2	a.	Package Subtotal		\$0	Base Budget. No Growth or Fees.		
	b.	Growth %	10.00%	\$0	% of (a) based on RMC / PARM policy		
	c.	Award Fee % of (a+b)	11.23%	\$0	For Cost contracts only Max % possible based on the contract		
	d.	BAF % of (a+c)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost		
	e.	Other costs		\$0	Explain in comments		
SPAWAR ALTS Budget				\$0	Budget cannot exceed control		
FYxx SPAWAR Control				\$0	From Mod Plan, LOAs		
NAVAIR/ OTHER ALTS	TOTAL		Phase check sum	Q1	Q2	Q3	Q4
	\$0		\$0	\$0	\$0	\$0	\$0
				Budget	Comments		
	1.	Labor & Matl		\$0	From Mod Plan, LOAs		
	2.	Services		\$0	Negotiated with RMC for 800/900's		
Sum of 1,2	a.	Package Subtotal		\$0	Base Budget. No Growth or Fees.		
	b.	Growth %	10.00%	\$0	% of (a) based on RMC / PARM policy		
	c.	Award Fee % of (a+b)	11.23%	\$0	For Cost contracts only Max % possible based on the contract		
	d.	BAF % of (a+c)	0.00%	\$0	Enter positive percent value if Gov Estimate expected to be LOWER than winning Bid / negotiated Target Cost		
	e.	Other costs		\$0	Explain in comments		
NAVAIR/OTHER ALTS Budget				\$0	Budget cannot exceed control		
FYxx NAVAIR/OTHER Control				\$0	From Mod Plan, LOAs		

UNFUNDED REQUIREMENTS

[illegible]

VOLUME VI
CHAPTER 34

CHAPTER DELETED - SAVE FOR FUTURE USE

VOLUME VI**CHAPTER 35****REGIONAL MAINTENANCE CENTER I-LEVEL MAINTENANCE CAPABILITIES****LISTING OF APPENDICES.****A Regional Maintenance Center I-Level Maintenance Capability Matrix**

35.1 **PURPOSE.** This chapter provides a listing of Regional Maintenance Centers (RMC) I-Level maintenance capabilities for Surface Force ships and defines related reporting requirements.

35.2 **BACKGROUND.** The primary mission of an RMC is to promote surface ship readiness via assessment, troubleshooting, and repair of systems and equipment which are beyond the technical capability or capacity of Fleet units. A secondary mission of an RMC is to provide enough production work experience and on-the-job training to sailors for them to improve their technical knowledge and, where appropriate, earn a Navy Enlisted Classification (NEC) code used to fill Navy Afloat Maintenance Training Strategy (NAMTS) billets when returning to sea duty. An RMC accomplishes both of these missions, in part, with the sustainment and utilization of their I-Level maintenance capability.

35.2.1 **Onboard Support.** In addition to ship-to-shop and standard shipboard repair and maintenance work, the RMC I-Level capability is utilized to provide onboard Maintenance Assist Team (MAT) I-Level support to ships in port. The MAT concept was designed to bring RMC repair and maintenance training capability to bear on shipboard systems to improve Ship's Force repair, self-assessment, maintenance and equipment operations capability.

35.2.2 **Applicable Regional Maintenance Centers.** There are five RMCs with existing surface ship I-Level workforce: three of which are stand-alone Activities and two that are incorporated within Naval Shipyards. Southwest Regional Maintenance Center (SWRMC) is located in San Diego, CA. Hawaii Regional Maintenance Center (HRMC) is a function incorporated within Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY&IMF). Northwest Regional Maintenance Center (NWRMC) is a function incorporated within Puget Sound Naval Shipyard and IMF (PSNS&IMF). NWRMC also includes Everett, WA maintenance operations. Mid Atlantic Regional Maintenance Center (MARMC) is located in Norfolk, VA. Southeast Regional Maintenance Center (SERMC) is located in Mayport, FL.

35.3 RESPONSIBILITIES.

35.3.1 **Fleet Commanders.** (individually or jointly, as appropriate).

- a. Approve changes, additions and deletions to the I-Level Capabilities Matrix (Appendix A) as recommended by the Type Commanders (TYCOM).
- b. Approve recommended changes to the NAMTS NEC At-Sea Requirements Matrix as provided by the TYCOMs.
- c. Approve and forward, with endorsement, NAMTS NEC modifications as developed and recommended by Commander, Navy Regional Maintenance Center (CNRMC) with TYCOM concurrence, to the Navy Enlisted Occupational Classification System Board.

- d. Review, approve and submit Billet Change Requests (BCR) developed by CNRMC, to support the sea and shore rotation requirements.
- e. Request additions and deletions to the I-Level capabilities listed in Appendix A and corresponding capacities at each RMC based on utilization metrics and written Business Case Analysis to the cognizant Fleet Commander.
- f. Ensure full utilization of the full range of organic RMC I-Level capability identified in Appendix A.
- g. Establish and communicate work priorities to CNRMC and cognizant RMCs. Resolve work priority conflicts as necessary.
- h. Regularly assess NAMTS maintenance skills required on respective afloat units.
- i. Approve CNRMC recommended, or recommend additional changes to specific NAMTS maintenance skills and required training for billets on respective afloat units.
- j. In collaboration with CNRMC, review and recommend NAMTS NEC At-Sea Requirements Matrix revisions to the cognizant Fleet Commander(s).
- k. Review and approve establishment and disestablishment of MATs, as recommended by CNRMC. Optimize utilization of MATs capacity within existing total I-Level workload in each cognizant RMC.

35.3.2 Commander, Navy Regional Maintenance Center. CNRMC will:

- a. Provide the capabilities identified in Appendix A following all applicable policy, regulations and technical requirements. Ensure detailed capability manuals are issued by each RMC to expound on and clarify the exact capabilities identified in Appendix A.
- b. Coordinate with the TYCOMs to ensure full utilization of the funded capacity, adjusting capacity as necessary. Include utilization analysis and NAMTS Program inspections in Fleet Maintenance Activity Assessments of RMCs.
- c. Provide cost estimates and implementation plans to the Fleet Commanders for proposed additions and deletions to capabilities in Appendix A, as well as increases or decreases to capacity at any and all RMCs.
- d. Establish policy, requirements and direction for NAMTS program management and execution at RMCs.
 - (1) Provide oversight of NAMTS program execution and qualifications to ensure:
 - (a) Compliance with NAMTS roles, responsibilities and program execution per the NAMTS desk guide, CNRMC M-4700.12.
 - (b) NAMTS enrollment and qualification is maximized.
 - (c) “Hands-on” journeyman-level skills training is an integral part of Job Qualification Requirement (JQR) qualification.
 - (d) The number of experienced JQR journeyman qualified personnel produced, is adequate to fill NAMTS NEC-coded afloat billet requirements established by the cognizant Fleet Commander(s).

- (2) Provide NAMTS JQR Life Cycle Management including the following:
 - (a) Coordinate with TYCOMs, Surface Warfare Officer's School - Fleet Enlisted Engineering Training and RMCs to ensure JQRs meet NAMTS NEC requirements. Changes to NAMTS NEC requirements may result from ship system modifications, upgrades or new acquisitions.
 - (b) Develop, review, coordinate feedback or revise JQRs as required. At a minimum, coordinate JQR reviews every three years.
 - (c) Approve new **and** changes to JQRs. Determine **or** approve which JQRs are executed at RMCs.
 - (d) For new JQRs, coordinate the development and submission of Course Identification Number packages to support NEC management and training accomplishment.
 - (e) Maintain Master JQR Library.
- (3) Maintain and monitor a master test question data bank to support pre- and post-JQR examinations and JQR qualification oral boards.
- (4) Promote NAMTS program awareness among Fleet activities and sailors, to include:
 - (a) Host and maintain an information web site that supports NAMTS program management and awareness, training materials and metrics.
 - (b) Publish newsletters and other media to enhance program awareness.
 - (c) Establish and maintain a system of metrics to reflect NAMTS program performance including eligibility, enrollment and qualification trends.
- (5) Establish a manpower and NAMTS NEC At-Sea Requirements Matrix and coordinate periodic reviews with TYCOMs.
 - (a) Develop quarterly review schedules to ensure Ship Manning Documents for all afloat units are reviewed annually at a minimum.
 - (b) In conjunction with manpower reviews, the NAMTS NEC At-Sea Requirements Matrix **must** be reviewed annually.
 - (c) Review sea **and** shore rotation impacts resulting from recommended NEC changes.
 - (d) Submit review results and recommendations to United States Fleet Forces **or** Commander, Pacific Fleet via TYCOMs prior to BCR submissions.
 - 1 NAMTS NEC At-Sea Requirements Matrix changes.
 - 2 NAMTS NEC modifications through the Navy Enlisted Occupational Classification System Board process.
 - 3 Navy Manpower Analysis Center NEC changes.

- (6) Conduct Quarterly NAMTS Program Reviews with RMC representatives. Reviews **must** include at a minimum:
 - (a) Eligibility, enrollment, qualification and NECs award trends.
 - (b) Status of manpower, NAMTS NEC At-Sea Requirements Matrix reviews, BCRs, NEC modifications, feedback reports or other pending actions.
- (7) Develop a series of metrics to measure and monitor the performance and overall health of the NAMTS program. In particular, eligibility, enrollment, qualification and NEC award trends, accounting for all Sailors in NAMTS NEC source ratings, **must** be measured and analyzed. Metrics **must** be developed to support both program monitoring within the NAMTS organization and up line reporting as required.
- e. As MAT Program Manager, establish requirements and guidance for the execution of MATs at the RMCs, including reporting requirements.
- f. Coordinate with the cognizant TYCOM on the establishment, disestablishment and utilization of MATs.

35.3.3 Regional Maintenance Center.

- a. RMC areas of responsibility are the same as those identified in Volume II, Part I, Chapter 2, paragraph 2.1.1, Table 2.1 of this manual. The RMC **must** exercise all I-Level functions and responsibilities when services are required or requested by fleet activities within these areas unless assigned to another RMC by the Fleet Maintenance Officer. This includes utilization of the I-Level capability as appropriate.
- b. Include details of I-Level capabilities in RMC capability manuals.
- c. Identify and communicate shop loading to applicable Forces Afloat and TYCOMs to ensure full utilization of the funded capacity. This includes the use of this capacity to establish MATs.
- d. These requirements apply to Naval Shipyards when they are assigned RMC functions.

35.4 REGIONAL MAINTENANCE CENTER PERFORMANCE MEASURES. RMC I-Level capability performance will be reported monthly to CNRMC **per** guidelines in Volume II, Part I, Chapter 4, paragraph 4.6.5.1 of this manual for continuous evaluation.

- a. MAT utilization and performance measures **must** be included in the RMC monthly I-Level Reports.
- b. CNRMC will provide quarterly summary reports of I-Level performance, including MATs, to the cognizant TYCOM and Fleet Maintenance Officer.

APPENDIX A**REGIONAL MAINTENANCE CENTER I-LEVEL MAINTENANCE CAPABILITY MATRIX**

CATEGORY	CAPABILITY	MARMC	SERMC	SWRMC	NWRMC	HRMC
I	EXECUTION OF ASSIGNED SHIP REPAIR AND MAINTENANCE	X	X	X	X	X
I-A	Perform structural repairs (Shipfitter)	X	X	X	X	X
I-B	Perform pipe repairs (Pipefitter)	X	X	X	X	X
I-C	Perform insulation and lagging services	X	X	X	X	X
I-D	Perform repair and maintenance of ship's RHIBs	X	X	X	X	X
I-E	Perform (Inside Machinist) machining services	X	X	X	X	X
I-F	Perform diesel engine governor and injector repairs and maintenance	X	X	X	X	X
I-G	Perform valve repair and maintenance	X	X	X	X	X
I-H	Perform diesel engine repair and maintenance	X	X	X	X	X
I-I	Perform hydraulics system repair and maintenance	X	X	X	X	X
I-J	Perform pump repairs and maintenance	X	X	X	X	X
I-K	Perform gas turbine repairs and maintenance	X	X	X	X	X
I-L	Perform (Outside Machinist) machinery repairs and maintenance	X	X	X	X	X
I-M	Perform air conditioning and refrigeration repair and maintenance	X	X	X	X	X
I-N	Perform flex hose fabrication and testing	X	X	X	X	X
I-O	Provide mechanical and photo engraving services	X	X	X	X	X
I-P	Provide key and lock repair services	X	X	X	X	X
I-Q	Perform repairs and maintenance to heat exchangers	X	X	X	X	X
I-R	Perform inside electrical repair and maintenance, including motor troubleshooting	X	X	X	X	X
I-S	Provide sound vibration analysis of rotating equipment (both in place and in shop)	X	X	X	X	X
I-T	Perform outside electrical repair and maintenance	X	X	X	X	X
I-U	Perform cableway inspections	X	X	X	X	X
I-V	Perform repair and maintenance of interior communication systems	X	X	X	X	X
I-W	Perform test, repair and maintenance of electronic modules (2M)	X	X	X	X	X
I-X	Perform repair and maintenance of electronics systems	X	X	X	X	X
I-Y	Perform repair and maintenance of sonar systems	X	X	X	X	X
I-Z	Perform repair and maintenance of fire control and weapons systems	X	X	X	X	X
I-AA	Perform repair and maintenance of antennas	X	X	X	X	X

CATEGORY	CAPABILITY	MARMC	SERMC	SWRMC	MWRMC	HRMC
I-AB	Provide corrosion control services (also as part of all NAMTS NECs)	X	X	X	X	X
I-AC	Perform repair and maintenance of HLS and RAST systems	X	X	X	X	X
I-AD	Perform repair and maintenance of life rafts	X	X	X	X	X
I-AE	Repair and overhaul CIWS and 25mm chain guns	X	X	X	X	X
I-AF	Perform repair and maintenance of mine warfare specific systems		X	X		
I-AG	Provide diving services, including hyperbaric chamber	X	X	X	X	X
I-AH	Perform rigging, weight testing and manufacture of weight handling devices	X	X	X	X	X
I-AI	Provide oil analysis, spectral analysis, fluid contamination and particle contamination services	X	X	X	X	X
I-AJ	Perform non-destructive testing	X	X	X	X	X
I-AK	Provide weld qualification services	X	X	X	X	X
I-AL	Provide the services of a certified Marine Gas Turbine Inspector	X	X	X	X	X
I-AM	Provide various calibration services not provided by regional calibration centers	X	X	X	X	X
I-AN	Provide SISCAL Level II services	X	X	X	X	X
I-AO	Provide shipboard welding and brazing services	X	X	X	X	X
I-AP	Provide SCBA Cylinder testing and mask flow testing	X	X	X	X	
I-AQ	Provide Maintenance Assist Teams (MAT)	X	X	X	X	X
I-AR	Provide test, repair and maintenance of fiber optics	X	X	X	X	X

VOLUME VI**CHAPTER 36****SURFACE FORCE SHIP AND AIRCRAFT CARRIER MODERNIZATION PROGRAM
REFERENCES.**

- (a) NAVSEA SL720-AA-MAN-030 - Navy Modernization Process Management and Operations Manual (NMP-MOM)
- (b) COMUSFLTFORCOMINST/COMPACFLTINST 4720.3 - Commander United States Fleet Forces Command (COMUSFLTFORCOM)/Commander Pacific Fleet (COMPACFLT) C5ISR Modernization Policy
- (c) DODINST 5000.2 - Operation of the Defense Acquisition System

LISTING OF APPENDICES.

- A Modernization Plan Flowchart
- B Ship Change Document Template
- C Technical Assessment Flowchart
- D Cost Benefit Analysis Flowchart
- E Alteration Figure of Merit Flowchart
- F Voting Database Flowchart

36.1 **SCOPE.** This chapter is applicable to all Surface Force and Aircraft Carrier ships and shore activities involved in ship modernization. The provisions of this chapter have been developed in collaboration with Naval Operations (OPNAV). Where there are conflicts with reference (a), this chapter **must** take precedence until such time as OPNAV implementing directives can be modified and issued. References (b) and (c) govern the management of afloat Combat Systems and Command, Control, Communications, Computers, Collaboration and Intelligence installations and improvements, and Initial Adversary Vulnerability Assessment policies and remain in effect as written. Type Commander (TYCOM) Maintenance Directorates **must** be the lead for ensuring implementation. Ships will continue the current practice of forwarding change requests to the Immediate Superior In Command (ISIC), who will forward the change request to the respective TYCOM for entry into the Navy Data Environment (NDE). Only alterations entered in NDE will be considered for inclusion in Modernization Programs. This chapter is not applicable to submarines. Submarines will continue to utilize existing instructions.

36.2 **PURPOSE.** The purpose of this chapter is to document the Surface Force Ship and Aircraft Carrier Modernization Program, which emphasizes early decisions under the control of United States Fleet Forces Command (USFFC), Pacific Fleet, and Navy Cyber Forces (CYBERFOR), and expands on the decision process for deciding which alterations and modifications will be developed, procured, certified and installed on all surface force ships and aircraft carriers. The objective is to assure that fleet modernization investments address the fleet's greatest concerns and are integrated and prioritized across Strike Groups, ships, systems and warfare areas. The process directly involves Navy leadership at all levels (Fleet, OPNAV, Force TYCOMs, Systems Commands (SYSCOM) and Program Executive Offices (PEO)) in the programming, planning and installation of modernization in a consistent and disciplined manner.

36.3 **BACKGROUND.** The End-to-End Ship Maintenance and Modernization (previously Ship Maintenance (SHIPMAIN)) was developed to concentrate on the early decision process regarding which alterations are to be accomplished. This process provides timely Fleet involvement and the assurance that changes are driven by current fleet requirements. The Modernization Program itself was implemented to modify the Entitled Process (formerly the Fleet Modernization Program (FMP)) due to Fleet concerns which included alterations developed and hardware procured but never installed. It was to also alleviate concerns over significant changes to availability work packages after authorization letter issuance, and alteration installation problems caused by failure to satisfy planning milestones. While these issues are often times driven by overall funding instability in Navy budgets and changing priorities, the associated costs consume modernization funding minimizing the ability to modernize. The Navy Modernization Process (NMP) has replaced the FMP, and is documented in reference (a). The NMP provides a structure for the orderly identification, approval, design, planning, programming, budgeting, installation, life cycle support and configuration control of technical and survivability improvements to all ships of the active and reserve fleets. This chapter also provides overall prioritization in the alterations to be accomplished and discipline and accountability in the adherence to NMP processes.

36.4 **PROCESS.** Appendix A provides a flowchart of the entitled modernization process decision and prioritization.

36.4.1 **Key Elements.** Key elements of the Surface Force Ship and Aircraft Carrier Modernization Program are:

- a. A single process to identify, evaluate and approve all hardware and computer software modifications to all ships and ship's systems. The Entitled Modernization Process is owned by the Fleet and executed through SYSCOM and TYCOMs. The Commander, Naval Sea Systems Command (COMNAVSEASYSYSCOM) acts as the executive agent for the Chief of Naval Operations (CNO) in the execution of Navy Modernization. Following the "Virtual SYSCOM Engineering and Technical Authority Policy", the SYSCOMs execute technical authority within their areas of responsibility, technical integrity and expertise. The process operates in concert with Acquisition Program processes of reference (b).
- b. Consolidation of all alterations into two types:
 - (1) Fleet alterations funded by the Fleet.
 - (2) Program alterations funded by the SYSCOMs and PEOs.
- c. The Entitled Process is comprised of five distinct phases and three Decision Points to take a proposed change from conception to completion. This process is executed using the Ship Change Document (SCD). Senior Fleet and OPNAV personnel comprise the Decision Boards identified in paragraph 36.6 of this chapter. Provisions exist to combine Phases II and III for less complex changes as delineated in paragraph 36.4.8 of this chapter. Any major changes encountered during Ship Integration will require reporting back to Decision Point 3 for approval to continue the Ship Change.
- d. A single database, maintained by Naval Sea Systems Command (NAVSEA) 04 (currently NDE for Surface Force and Aircraft Carrier Modernization).

- e. The Fleet and TYCOMs collaborate with OPNAV, SYSCOMS and PEOs in the decision making process, utilizing three boards of stakeholders at the O-6, one and two-star Admiral, and three-star Admiral level. Voting members of the boards represent appropriate Fleet and OPNAV organizations. SYSCOM and PEO representation is included to validate the readiness of the alteration to proceed to the next step. Paragraph 36.5.2 of this chapter addresses the business rules associated with the voting process. Depending on cost and impact thresholds, decisions are made by one of the three boards. An electronic voting capability (eVote), embedded in NDE, will be used on a continuing basis to facilitate timely action by the boards, and minimize the need for boards to formally convene. NAVSEA 04 will ensure data is available to voting members 10 to 14 days prior to the required voting date. As noted on the Modernization Plan Flowchart, Appendix A of this chapter, Technical Assessments are conducted at three points in the process, and in conjunction with the Alteration Figure of Merit (AFOM) and Cost Benefit Analysis (CBA) blocks, are assembled in a Recommended Change Package (RCP) which provide the basis for decisions made by the O-6, 1 and 2 Star and 3 Star Boards.
 - (1) The O-6 level board approves Fleet alterations except in cases where the scope and complexity dictate referral to a higher level board, makes the majority of decisions involving the lower cost and lesser impact Program alterations, and provides recommendations for the higher level boards.
 - (2) The one and two-star board validates the O-6 board decisions and provides Fleet, OPNAV and claimant recommendations to Acquisition Category (ACAT) III and ACAT IV and below program milestone decision authorities.
 - (3) The three-star board sets overall priorities, makes the decisions involving the higher cost and higher impact alterations, validates one and two-star board decisions, provides Fleet, OPNAV and claimant recommendations to ACAT I and ACAT II program milestone decision authorities, and approves the Surface Force Ship or Aircraft Carrier Modernization Pre-Overseas Movement (POM) Submission (Capability Plan).
- f. The Modernization process is designed to accommodate initial submission of an SCD early in the life of requirements definition for a ship or system capability or program. This is accomplished by submitting an SCD for the system or program across the Five Year Defense Program (this includes all software support programs). As changes are more definitively identified, separate SCDs will be developed as supportive to the capability or program SCD (examples of supportive SCDs can include hardware updates, software upgrades, Hull, Mechanical and Electrical (HM&E) changes, etc.).

36.4.2 Decision Points. There are three main decision points exercised by the review boards (Steps 60, 140 and 220 of Appendix A); and all three are supported by technical assessments, cost benefit analyses and figure of merit assessment reviews.

- a. Decision Point 1: The purpose of Decision Point 1 is to approve the entry of the concept design and to include the proposed change in the Modernization Plan. Approval at this point constitutes Resource Sponsor commitment to fully fund the change in the POM. It is recognized that follow-on budget decisions beyond the

control of the Resource Sponsor may require relief from that commitment, however, the Resource Sponsor will then advise the Voting Boards for consideration of the change in future budgets. Some programs **or** capabilities may not be defined to the alteration level based on the need for further technical definition. In those cases, the program **or** capability will be submitted as a single SCD for consideration at Decision Point 1. In Phases II and III, the program **or** capability will be defined in multiple alterations as required.

- b. Decision Point 2: The purpose of Decision Point 2 is to validate **or** update the Modernization Plan and to proceed with design development, with Resource Sponsor confirmation that funds exist in the budget to fully execute the Ship Change.
- c. Decision Point 3: The purpose of Decision Point 3 is to validate **or** update the Modernization Plan and to proceed with material procurement and scheduling installations with Resource Sponsor confirmation that funds exist in the budget to fully execute the Ship Change.

36.4.3 Ship Change Document. The principal document used in the Technical Assessments is the SCD, illustrated in Appendix B, which remains with an alteration throughout its development. The SCD replaces the Justification Cost Form, In-service Engineering Change Proposal, the Ship Alteration Record and all other alteration documents (e.g., Field Change, Ordnance Alteration) which were used in the former FMP. The SCD is prepared by any activity and must meet specific minimum requirements addressed in paragraph 36.5 of this chapter, in order to proceed beyond Block 10. After the SCD is prepared it is forwarded to an authorized submitting activity for entry into NDE. For SCDs submitted as described in paragraph 36.4.1 of this chapter, all cost information **must** be complete and cover the entire program. A submitted supportive SCD's costs will be decremented from the capability **or** program SCD. Authorized submitting activities are:

- a. TYCOMs.
- b. OPNAV.
- c. PEOs.
- d. Participating Acquisition Resource Managers (PARM).
- e. Life Cycle Managers.
- f. Fleet Commanders.

36.4.3.1 Phase I. The Phase I steps consist of:

- a. The initiator **must** provide data for all SCD Phase I fields at a minimum prior to submission to the submitter.
- b. A preliminary tracking number **must** be automatically assigned by the system (NDE).
- c. The initiator and the submitter **must** have the ability to review the draft SCD at any time in the preparation process.
- d. This form **must** be able to be viewed at any point in the process once submitted.
- e. Minimum header data required uniquely defining the Configuration Change (functional definition, class affectivity, functional areas).

- f. Fleet requirement, description of change, and impact to the Fleet if not accomplished.
- g. The submitter will either approve the change and put into NDE officially or kill the change. Entering an SCD at this point establishes that the SCD has officially entered the Entitled Process.
- h. The submitter will ensure there are no duplicate SCDs.
- i. The submitter **must** be able to expedite Alterations that are considered to be critical by Fleet by setting an “Expedite” flag in SCD. Expedited SCDs are considered first in any process work queue.
- j. The submitter **must** be able to identify previously shelved alterations and resubmit to the process using previously assigned SCD identification via TYCOM or OPNAV Sponsor.
- k. The “expedite alert” box should be checked “yes” when operational readiness (i.e., correction of a C4 Casualty Report) or safety to personnel is effected.
- l. All authorized SCDs **must** be assigned a sequential Ship Change Number by the system (NDE).

NOTE: THE PROCESS ENABLES LESS COMPLEX CHANGES TO COMBINE PHASES II AND III, AS DETERMINED IN THE INITIAL TECHNICAL ASSESSMENT.

36.4.3.2 Phase II. The Phase II steps consist of:

- a. The Submitter receives approval of SCD Phase I and notification to complete SCD Phase II or IIa, if approved by Voting Board, form.
- b. The submitter will utilize internal processes to complete preliminary engineering and provide a draft SCD Phase II to the Change Manager in the respective Ship Program Manager Office.

36.4.3.3 Phase III. The Phase III steps consist of:

- a. Submitter receives approved SCD Phase II.
- b. The submitter will utilize internal processes to complete engineering and design development and provide a draft SCD Phase II (a) or III.

36.4.4 Technical Assessment Teams. Technical Assessment Teams (TAT) are assigned at NAVSEA and will be made up of subject matter technical experts related to the scope of the SCD.

36.4.4.1 Technical Assessments. Technical Assessments are performed at three separate stages in the process to support decisions to complete preliminary engineering, design development and detail specifications.

36.4.4.2 Technical Assessment Business Rules. Appendix C reflects the Technical Assessment flowchart.

36.4.4.3 Phase I Technical Assessment Rules. The following Phase I Technical Assessment Business Rules apply:

- a. Ship's Program Manager (SPM) cannot send a change idea to history.
- b. TAT review process will take no longer than 5 days.
- c. Any negative recommendation must include a justification.
- d. Due to limited engineering requirements and limited impacts to existing equipment and the ships, some changes may be permitted to have Phase II and Phase III combined. In order to determine if there is sufficient reason to combine these two phases for a particular change, the TAT must consider the Scope (SCD Phase I, Item 3.a) of the change.

36.4.4.4 Technical Assessment Teams. TATs will be allowed to change fields to correct data. If any information is changed, a record of the change will be kept and the submitting Point of Contact notified for concurrence.

36.4.4.5 Changes. Identify changes that may supersede or be redundant with an existing change. Should the SPM require additional clarification, endorsement will not be forwarded prior to attempting issue resolution via TAT Lead. Unresolved issues will be noted in the Technical review comments and forwarded.

36.4.4.6 Phase II Technical Assessment Rules. Should the SPM require additional clarification, endorsement will not be forwarded prior to attempting issue resolution via TAT Lead. Unresolved issues will be noted in the Technical Assessment comments and forwarded. TAT will take no longer than 45 days to complete.

36.4.4.7 Phase II(a) Update Technical Assessment. In this phase, complete technical data will be available for review in the draft Phase II(a) SCD. Phase II(a) will combine Phases II and III in order to streamline the process. The same basic tenets of the process described for Phases II and III will apply. The TAT will complete their review within 60 days.

36.4.4.8 Phase III Technical Assessment Rules. In this phase, complete technical data will be available for review in the draft Phase III SCD, but the basic tenets of the process described for Phases I and II will apply. TAT will complete their review in this phase in no more than 60 days.

36.4.5 Cost Benefit Analysis. A CBA is conducted at step 40 of the process, and then updated at steps 120 and 200, to support Modernization Plan decisions by the three established review boards. Appendix D reflects the Cost Benefit Analysis Flowchart. It is imperative that sound cost estimates be developed to make these analyses valid. The CBAs, the Technical Assessments and AFOM assignments together form the RCP which are provided to the respective review boards to support board decisions on proposed shipboard changes. These analyses are accomplished by Independent Cost Review (ICR) Teams under the direction of NAVSEA 017. All cost data to support the CBA process is derived from the SCD, initially submitted by the activity proposing the change, and then updated throughout the process.

36.4.5.1 Phase I Preliminary Analysis Business Rules. In this phase, the purpose of the ICR Team is to review cost data entered in the SCD for completeness and reasonableness to support Decision Point I. The input to the CBA process is an affirmative designation by the Technical Analysis Team. In this phase, the ICR Team is expecting high-level cost information (e.g. Concept Development Cost, Preliminary Engineering Cost, Design Development Cost, Procurement Cost and Installation Cost). This cost data will be provided by responsible PARMs

and SPMs as direct inputs into the SCD resident in NDE. NDE maps this data into a Cost Reduction and Effectiveness Improvement (CREI) document designated as the CREI Template which automatically calculates cost metrics such as Return on Investment, Net Present Value (NPV) and Payback Period. When the calculations have been made by the CREI Template, a notification is electronically forwarded to Subject Matter Expert (SME) members of the ICR Team. The cost data fields in NDE will be locked precluding uncontrolled changes and can only be unlocked by a member of the ICR Team. If the ICR Team has questions about the data, they will be provided back to the data source through a “feedback” loop managed by NAVSEA 017. The feedback process will only be exercised one time (if necessary), and will then be forwarded to the Decision Board for their review and decision. The ICR Team will not alter cost data; but will use the feedback loop as the conduit for questioning submitted cost data. Should the source of the cost data determine a change to submitted cost information is warranted based on ICR Team questions, he or she will enter the corrected data in NDE after consultation with the NAVSEA 017 Area Coordinator. The Area Coordinator will obtain concurrence from respective ICR Team members and unlock applicable cost data fields. The source of the cost data will have two (2) working days to make the change to appropriate fields, at which time the fields will again lock and the data passed to the RCP and review by the appropriate board. In those instances, where the source of the cost data does not agree with changes proposed by the ICR Team, the unaltered data will be forwarded for inclusion in the RCP as well as the ICR Team comments.

36.4.5.2 Phase II Concept Design Cost Benefit Analysis Update. In this phase, the ICR Team is looking for more fidelity in the cost data provided to support Decision Point 2. The basic CBA Process in this phase mirrors Phase I, with the following exceptions or additions:

- a. If the Program Manager (PM) experiences cost growth of greater than 10% in the total program budget, the PM **must** notify the appropriate Sponsor (Fleet or OPNAV). The Sponsor may decide to address this issue with the Decision Board.
- b. The Sponsor **must** be notified if, in the year of execution, a cost shortfall identified that is within the Program Managers ability to cover, or adjustments are made to the Modernization Plan.
- c. If the total cost estimate of an alteration exceeds the appropriate threshold for the respective phase (i.e. 40% Phase I, 25% Phase II, 15% Phase III), the PM **must** notify the appropriate Sponsor (Fleet or OPNAV). At that point, the Sponsor may decide to address the issue with the Decision Board.

36.4.5.3 Phase III Design Development Cost Benefit Analysis Update. In this phase, the ICR Team is expecting detailed cost data to be available to support Decision Point 3, however, the basic CBA Process mirrors that conducted in Phases I and II.

36.4.6 Alteration Figure of Merit. The AFOM is used in concert with the Technical Assessment and the CBA to form the RCP, which is provided to and forms the basis for the Board Decisions. The AFOM is initially calculated prior to Decision Point 1, and then updated to support Decision Points 2 and 3. The AFOM is defined as the quantitative “War Fighting or Readiness Benefit” assigned to each proposed alteration. Appendix E reflects the AFOM Flowchart. Fleet and OPNAV members of the 3-Star Board weight this structure annually, on or about October of the fiscal year, using United States Fleet Forces Command guidance which is based on numbered Fleet and TYCOM Integrated War Fighting and Readiness priorities and additional inputs from

the CNO Campaign Analysis and Sea Trials processes. There are two components to the process of assigning AFOMs to each SCD:

- a. The annual establishing of weights based on Fleet priorities.
- b. The continuous action by respective TYCOMs to assign index values to standardized rating scales that address:
 - (1) Suitability (Reliability, Maintainability, Operational Availability, Supportability, Safety).
 - (2) Quality of Service **or** Quality of Life (QOS **or** QOL).
 - (3) Capability.

Separate from this annual event, TYCOMs continue to review and assign index values to the previously noted standard rating scales for each change as part of the throughput of SCDs. Commander, Naval Surface Forces **or** Commander, Naval Air Forces (COMNAVSURFOR **or** COMNAVAIRFOR) will rate each proposed alteration using established rating scales and Fleet Staff SME recommendations to calculate the AFOM through a Flag-weighted algorithm that resides in NDE. The TYCOM Rating Scale Index Value assignments are entered in NDE and calculated to provide an overall AFOM and nested AFOMs that articulate the change benefits of Capability, Suitability and QOS **or** QOL to the Entitled Process Decision Board members.

36.4.7 Annual Assignment of Weights. The annual assignment of weights is a key component of the AFOM assignment and ensures the AFOM process remains current with Fleet **and** Navy priorities. The weights are the foundation of the algorithm in NDE which calculates the AFOM assignment for each alteration.

- a. The Entitled Process 3 Star Board **must** annually determine the numerical weights of the Naval Power 21-based AFOM Benefit Structure using the Merit Assessment Questionnaire. The determination of AFOM Benefit weights will be executed using a pair-wise mathematical analysis tool. Each Entitled Process Fleet 3 Star Board member indicates his **or** her preferences using the formatted pair-wise questionnaire provided in the Merit Assessment Questionnaire.
- b. Respective TYCOMs will continue to review and assign initial AFOMs as dictated by the throughput of SCDs, using SMEs from activities in the area associated with each SCD. Each SCD that successfully completes the Technical Assessment block in each phase is mapped by the submitter in NDE by Naval Capability and routed to cognizant TYCOMs. The TYCOMs will canvass appropriate SMEs for input, providing relevant TYCOM-generated questions to the SME to assist in their review. Using these questions, the TYCOM SME representative will review the information listed in the SCD and will provide inputs back to the TYCOM by recommending the Index values associated with the AFOM Benefit Structure Rating Scales discussed earlier. The TYCOM will review inputs and enter the final Index value in NDE. NDE will aggregate TYCOM inputs and automatically calculate or recalculate the AFOM based on the algorithm which reflects the weights described. This process is replicated in each of the first three phases (Preliminary Analysis, Concept Design, Design Development) to support the three decision points. An overall AFOM score and a breakout of AFOM by Capability, Suitability, QOS **or** QOL and each of the four

Naval Power 21 Capabilities (Sea Base, Sea Strike, Sea Shield, ForceNet) will be included on the RCP.

36.4.8 Combining of Phases. Guidelines for combining of Phases II and III:

- a. If the Scope is Internal Equipment Modification, all of the following criteria must be met:
 - (1) The change can be accomplished without changing an interface external to the equipment or system.
 - (2) The change is made within the equipment or system.
 - (3) The change does not negatively impact Strike Force Interoperability.
 - (4) The change does not impact shipboard distributive systems (i.e., water, ventilation, electrical, power, etc.), Ship Selected Records or interfacing equipment or systems, compartmental arrangement records or Damage Control records.
- b. If the scope is Ship Modification, all of the following criteria must be met:
 - (1) The change does not negatively impact Strike Force Interoperability.
 - (2) The change does not impact ship's stability records (weight & moment).
 - (3) The change does not impact or alter the 3-dimensional footprint of the equipment being replaced.
 - (4) The change does not impact shipboard distributive systems (i.e., water, ventilation, electrical, power, etc.), Ship Selected Records or interfacing equipment or systems, compartmental arrangement records, or Damage Control records.
 - (5) The change does not impact manning levels.
- c. If all of the guidelines listed are met, the technical assessment team may recommend Phases II and III be combined.
- d. If the Phase I O-6 Board determines Phases II and III can be combined, then both Phases II and III of the SCD must be completed before going to the Decision Point 3 O-6 Board.
- e. Duration of Alteration is designated as a Non-Permanent Installation (Previously termed Temporary Alteration). **These changes will include prototypes, proof-ins and current TEMPALTS.** This type of change will adhere to the following guidance:
 - (1) A non-permanent install will start in Phase I and must be approved at Decision Point 1. After Decision Point 1, the change will proceed to SCD Phase II for concept design.
 - (2) During concept design a Ship Change Data Package, including Plan of Action and Milestones, will be prepared and the proposal sent through the review process to Decision Point 2 for approval to install.

- (3) Approval at Decision Point 2 constitutes approval to install the non-permanent installation. At the completion of the authorized install period the change will either be:
 - (a) Removed and all documentation forwarded to the review teams and Decision Point 3 to inform all parties of the results.
 - (b) Make install permanent by forwarding results and Phase III SCD reflecting the need to make the change permanent and to install on other platforms.
- (4) Installation will be onboard for pre-specified amount of time not to exceed one deployment cycle or one (1) year.
- (5) Sponsoring Activity may utilize internal process to complete preliminary engineering and provide a draft Phase III SCD to the SPM Change Manager, or the SPM may task the Planning Yard to develop a Phase III SCD.
- (6) Sponsoring Activity **must** provide required documentation (e.g., ICDs) to support completion of the Phase III SCD.
- (7) Plan of Action and Milestones required for equipment development.
- f. If all of the guidelines listed are met, the technical assessment team may recommend Phases II and III be combined.
- g. If the Phase I O-6 Board determines Phases II and III can be combined, Phases II and IIa of the SCD must be completed before going to the Decision Point 3 O-6 Board.

36.5 VOTING RULES.

36.5.1 Voting Database Rules. The principal document in the voting process is the RCP. The RCP is prepared electronically in NDE, and presents information from the Technical Assessment, AFOM, and CBA. While the RCP provides summary information, the capability exists to drill down to view more detail from the Technical Assessment, AFOM **and** CBA. The three Decision Boards mentioned in paragraph 36.6 of this chapter will be in place to approve RCPs and authorize SCDs to proceed to the next phase of the process. NDE will be the single authoritative database for Ship Modernization and will support the entire process, from alteration inception through installation of the alteration. NDE will include an electronic voting capability (eVote) to enable Decision Boards to convene virtually and on a continuous basis.

36.5.2 Initiate Ship Change Document Business Rules. The SCD will initially capture the basic idea, associated cost and mission capability information, but will be updated with more detailed information as the change matures through the process. The initiator of the change will prepare the SCD and forward to the organization, in their chain of command, authorized to submit the SCD into NDE (e.g., TYCOMs, OPNAV, PEO, PARM **and** Life Cycle Managers). The appropriate technical authority will be assigned at NAVSEA and will be responsible for providing updated data in the SCD to support the process through final disposition of the change.

36.6 DECISION BOARDS.

36.6.1 Decision Board Process. The three decision points in the process (i.e., Authorize and Fund Preliminary Engineering, Design Development and Procurement **or** Installation) are

accomplished through the three Decision Boards (O-6, 1 or 2 Star, 3 Star). These decisions feed the POM or Budget process to create and sustain a fully funded ship Modernization Plan (MP). A positive decision at Decision Point 1 constitutes Resource Sponsor commitment to fund the alteration through development and final installation. Appendix F reflects the Decision Point Flowchart. For each alteration the Technical Assessment, AFOM Assignment and Cost Benefit Analysis are completed prior to each decision, and aggregated in a RCP to be considered by the voting boards. The RCP will be available on a read only basis in NDE for review by SPM, PM and PARM personnel prior to consideration by the boards. NDE will provide for electronic workflow such that SCD processing up to and including voting by board members can be done virtually. While the boards will operate in a hierarchical mode where decisions made at a lower level board will be validated by the senior board, the following thresholds are established for approval authority:

- a. O-6 Board < \$50M Total Cost
- b. 1 or 2 Star Board \$50-200M Total Cost
- c. 3 Star Board > \$200M Total Cost

36.6.2 Board Specific Rules. The following specific rules apply to each Board:

- a. O-6 Review Board
 - (1) **Must** meet continuously on a virtual basis and consider all RCPs. For items that are outside their fiscal threshold (\$50M total program value) they make recommendations to higher boards.
 - (2) All members have the opportunity to vote on all RCPs.
 - (3) Concur or non-concur with recommendation to expedite.
 - (4) Concur or non-concur with recommendation to go to Phase IIA.
 - (5) Voting process will be achieved within the following timelines:
 - (a) 5 working days to vote.
 - (b) 5 working days to adjudicate funding issues (associated with Funding Concurrence-resource identification). If resource sponsor fails to provide acceptable trade-off, the board has the authority to approve per SCD.
- b. 1-2 Star Review Board
 - (1) Will meet monthly to review Modernization Plan and to consider forwarded RCPs that fall within their monetary threshold (>\$50M and <\$200M total program cost).
 - (2) Concur or non-concur with recommendation to expedite.
 - (3) Concur or non-concur with recommendation to go to Phase IIA.
 - (4) Voting process will be achieved within the following timelines:
 - (a) 20 working days to vote.

- (b) 5 working days to adjudicate funding issues (associated with Funding Concurrence-resource identification). If resource sponsor fails to provide acceptable trade-offs, the board has the authority to approve **per** SCD.
- c. 3 Star Review Board
 - (1) Will meet quarterly to review Modernization Plan and to consider forwarded RCPs that fall within their monetary threshold (above \$200M total program costs).
 - (a) Approve **or** disapprove 1-2 Star Board recommendations.
 - (b) Voting process will be achieved within following timelines:
 - 1 60 days to vote.
 - 2 5 days to adjudicate funding issues (associated with Funding Concurrence-resource identification). If resource sponsor fails to provide acceptable trade-offs, the Board has the authority to approve **per** SCD.
 - (2) Submits annual Modernization Plan to OPNAV N7.

36.7 APPROVAL FOR FLEET ALTERATIONS. Approval for Fleet Alterations **must** be via official TYCOM Letter of Authorization **following** the milestone listed in Volume II, Part II, Chapter 2, Appendix D of this manual and entered into NDE. Alterations **must** not be authorized for installation unless included in NDE. The TYCOM **must** establish Fleet Alteration funding policies for each fiscal year by defining a “fleet modernization control” (i.e., a specified percent of the maintenance budget set aside for Fleet Alteration modernization). Resource sponsor (OPNAV N43) approval to fund alterations that result in exceeding the fleet modernization control will require offsets to be identified to keep the fleet modernization control at the specified level **or** percentage. If offsets cannot be identified, it will be the responsibility of the TYCOM to increase the fleet modernization control within the constraints of the maintenance budget (i.e., increases to the fleet modernization control will be offset by decreasing the amount of the maintenance budget allotted for maintenance).

36.8 EXECUTION YEAR CHANGES TO MODERNIZATION PLANS. It is expected this process will minimize changes during the execution year. Operational priorities may require some changes after the approved Modernization Plan has been submitted with the annual President’s budget submission to Congress. Execution year changes to the approved Modernization Plan will be limited and only as approved by the Voting Boards **following** fiscal statutes and regulations.

36.9 METRICS.

36.9.1 Ship Modernization Program Goal. A goal of the Ship Modernization Program is to instill discipline in the process, ensuring stability from alteration inception through final installation, minimizing deficiencies. To support this stability a number of business rules have been established within this chapter. The metrics established are used by all levels of the chain of command to measure the process, determine what barriers exist in the entitled process and to predict downstream milestone attainment. Metrics are not to be used to measure performance of

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individuals. Any methods employed to circumvent collection of valid metrics are counterproductive, mask real process improvement, and often create more work for Maintenance Team members. From a process improvement standpoint, it is far preferable to miss a metric milestone based on good business decisions rather than to work around the process measures to avoid the “hit”. Examples of undesirable actions:

- a. Cancellation of an aged, unscreened job with subsequent production of a new identical job for the sole purpose of avoiding a high cycle time.
- b. Having the ship re-upline a Maintenance and Material Management Maintenance Action Form (2-Kilo) with desired changes, knowing it will over write the shore file, rather than taking the First Pass Yield (FPY) hit and changing the original 2-Kilo.
- c. Not making needed changes to a 2-Kilo before screening it to a planning activity just to avoid an FPY hit.
- d. Utilizing the date the 2-Kilo is written and uplined as the “when discovered date” vice the date the deficiency was actually discovered in order to avoid a high ship to shore cycle time.

36.9.2 Evaluation. The five selected metrics will be used to evaluate the Ship Modernization Program processes. Regional Maintenance Center (RMC) Commanders will report metric measurements to Commander, Navy Regional Maintenance Center monthly. This reporting requirement allows process efficiency and effectiveness collaboration between SEA04 and Commander, Navy Regional Maintenance Center where required, impacting process preplanning and execution during Maintenance and Modernization overlap.

36.9.2.1 Process Effectiveness. For all alteration installation completions, determine if it was accomplished in the same fiscal year as called for in the Modernization Plan developed during the most recent POM cycle. (Example: The Modernization Plan used as the baseline for this metric will be set by POM06 for Fiscal Year (FY)06 and FY07 and set by POM08 for FY08 and FY09.) Metric data will be collected and analyzed monthly with Fleet and Program alterations plotted separately. This same data will be tallied by SYSCOM on an annual basis.

CALCULATION:

1. Total # of Fleet Alterations completed as per the Modernization Plan schedule
Total # of Fleet Alterations completed
 2. Total # of Program Alterations completed as per the Modernization Plan schedule
Total # of Program Alterations completed
- a. Source Data and Reporting Frequency for Measurement. All data used for this metric **must** come from Navy Data Environment-Navy Modernization (NDE-NM). A separate monthly tally of Fleet and Program alterations installed **following** the Modernization Plan will be plotted to provide a trend on the “effectiveness” of the process.
 - b. Basis for Baseline: Since this metric is based solely on the entitled process, the baseline will be established after 12 months of data collection.
 - c. Required NDE Fields:

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- (1) Alteration Identifier.
- (2) Alteration Type (Fleet or Program).
- (3) Installation FY from most recent POM cycle.
- (4) Actual completion FY.

36.9.2.2 Process Efficiency. The process efficiency is the percentage of planned installation dollars that were actually expensed. Comparison of the planned installation dollars to the actual cost of installations performed. For all alteration installation completions, determine if it was accomplished for the estimated cost as provided in the Modernization Plan developed during the most recent POM cycle. (Example: The Modernization Plan used as the baseline for this metric will be set by POM06 for FY06 and FY07 and set by POM08 for FY08 and FY09.) Metric data will be collected and analyzed monthly with Fleet and Program alterations plotted separately.

CALCULATION:

1. Total estimated cost of Fleet Alterations completed as per the Modernization Plan schedule
Total actual cost of completed Fleet Alterations
2. Total estimated cost of Program Alterations completed per the Modernization Plan schedule
Total actual cost of completed Program Alterations
 - a. Source Data and Reporting Frequency for Measurement. All data used for this metric **must** come from NDE-NM. A separate monthly tally of Fleet and Program alterations installed **following** the Modernization Plan will be plotted to provide a trend.
Source Data: NDE-NM
 - b. Basis for Baseline. Since this metric is based solely on the entitled process, the baseline will be established after 12 months of data collection.
 - c. Required NDE Fields:
 - (1) Alteration Identifier.
 - (2) Alteration Type (Fleet or Program).
 - (3) Installation cost estimate from most recent POM cycle.
 - (4) Actual installation completion cost.

36.9.2.3 First Pass Yield. For all SCDs, keep a count of how many are being reviewed for the first time at each major decision point and of these how many are “approved”. “Approved” are those that are not “killed” or sent back for rework. Metric data will be collected and analyzed monthly and tallied by SYSCOM on an annual basis.

CALCULATION:

- a. FPY 1 (Decision Point 1 - “Authorize Fund Preliminary Engineering”)

$$\frac{\text{Total \# of SCDs being reviewed for the first time and approved at Decision Point 1}}{\text{Total \# of SCDs being reviewed for the first time at Decision Point 1}}$$

- b. FPY 2 (Decision Point 2 - “Authorize Fund Design Development”)
 - Total # of SCDs being reviewed for the first time and approved at Decision Point 2
 - Total # of SCDs being reviewed for the first time at Decision Point 2
- c. FPY 3 (Decision Point 3 - “Fund Procurement & Installation”)
 - Total # of SCDs being reviewed for the first time and approved at Decision Point 3
 - Total # of SCDs being reviewed for the first time at Decision Point 3
- d. FPY 4 (“Ship Change (SC) Ready to Install”)
 - Total # of SCDs being reviewed for the first time and Ready to Install (Block 270)
 - Total # of SCDs being reviewed for the first time at “SC ready to install”

36.9.2.4 Productivity. For all SCDs, keep a count of how many are approved at each major decision point. Metric data will be collected and analyzed monthly, and tallied by SYSCOM on an annual basis.

CALCULATION:

1. Total number of alterations approved at Decision Point 1 “Authorize Fund Preliminary Engineering”
 2. Total number of alterations approved at Decision Point 2 “Authorize Fund Design Development”
 3. Total number of alterations approved at Decision Point 3 “Fund Procurement & Installation”
 4. Total number of alterations approved at “SC ready to install” point
- a. Source Data and Reporting Frequency for Measurement. All data used for this metric **must** come from NDE-NM. Each SCD is assigned a unique identification number in NDE on submission. A separate monthly tally of alterations approved at each point will be plotted to provide a trend on the “productivity” of the process.
 - b. Basis for Baseline. Since this metric is based solely on the entitled process, the baseline will be established after 12 months of data collection.
 - c. Required NDE Fields:
 - (1) SCD identification number.
 - (2) Approval status of SCD at each of the decision points Status will be blank for a specific decision point if SCD has not yet reached that block in the process.
 - (3) Date that decision at each point was reached. Date will be blank for a specific decision point if the SCDs approval status at that point is blank.

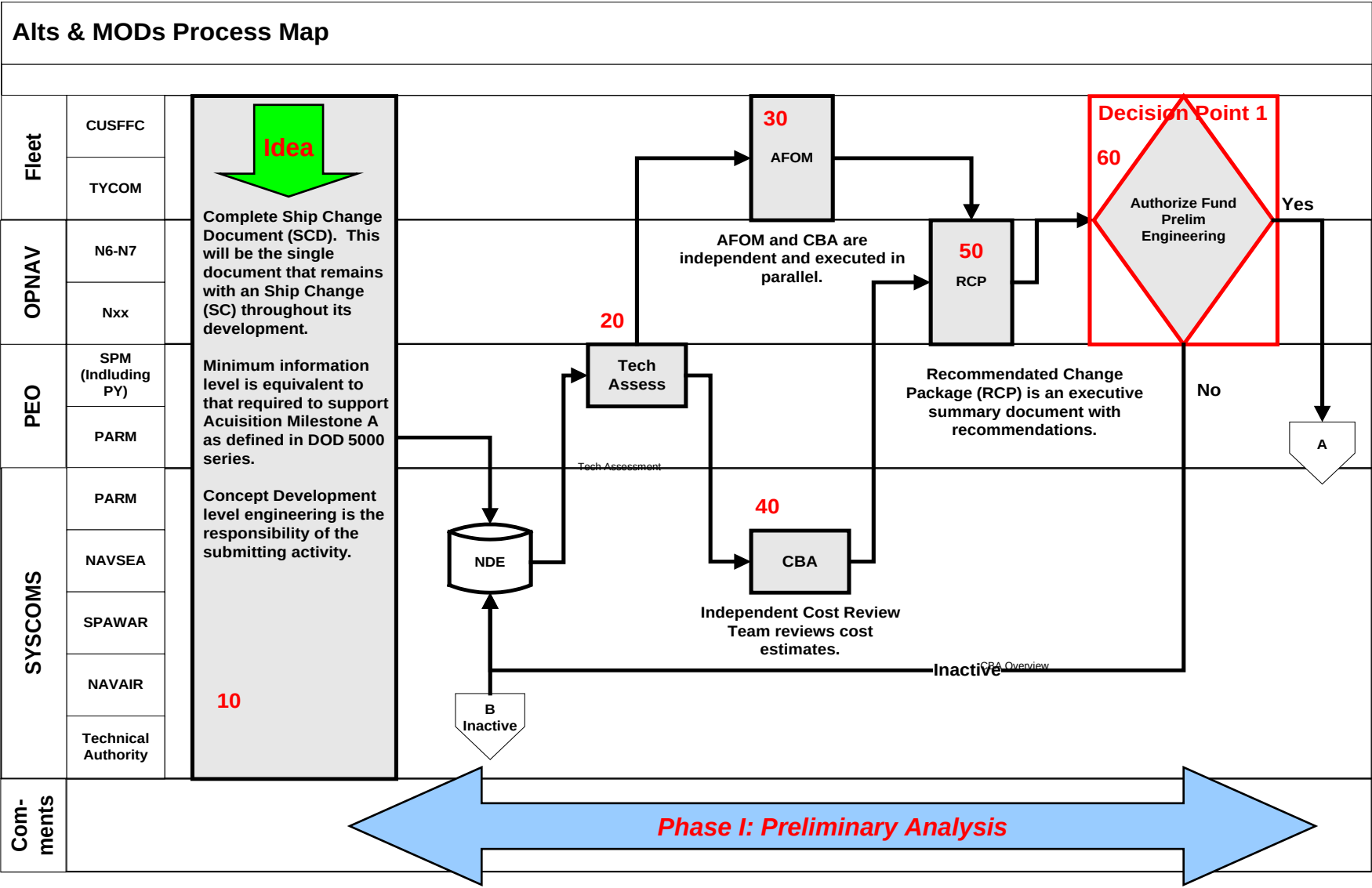
36.9.2.5 Sunk Cost. For all SCDs that are entered into NDE under the entitled process, identify and measure the total resources (dollars) invested in SCDs that are subsequently voted to be “Inactive and Killed” at various process decision points. Metric data will be collected and analyzed monthly, and tallied by type of appropriation on an annual basis.

CALCULATION: For all SCDs that are entered into NDE

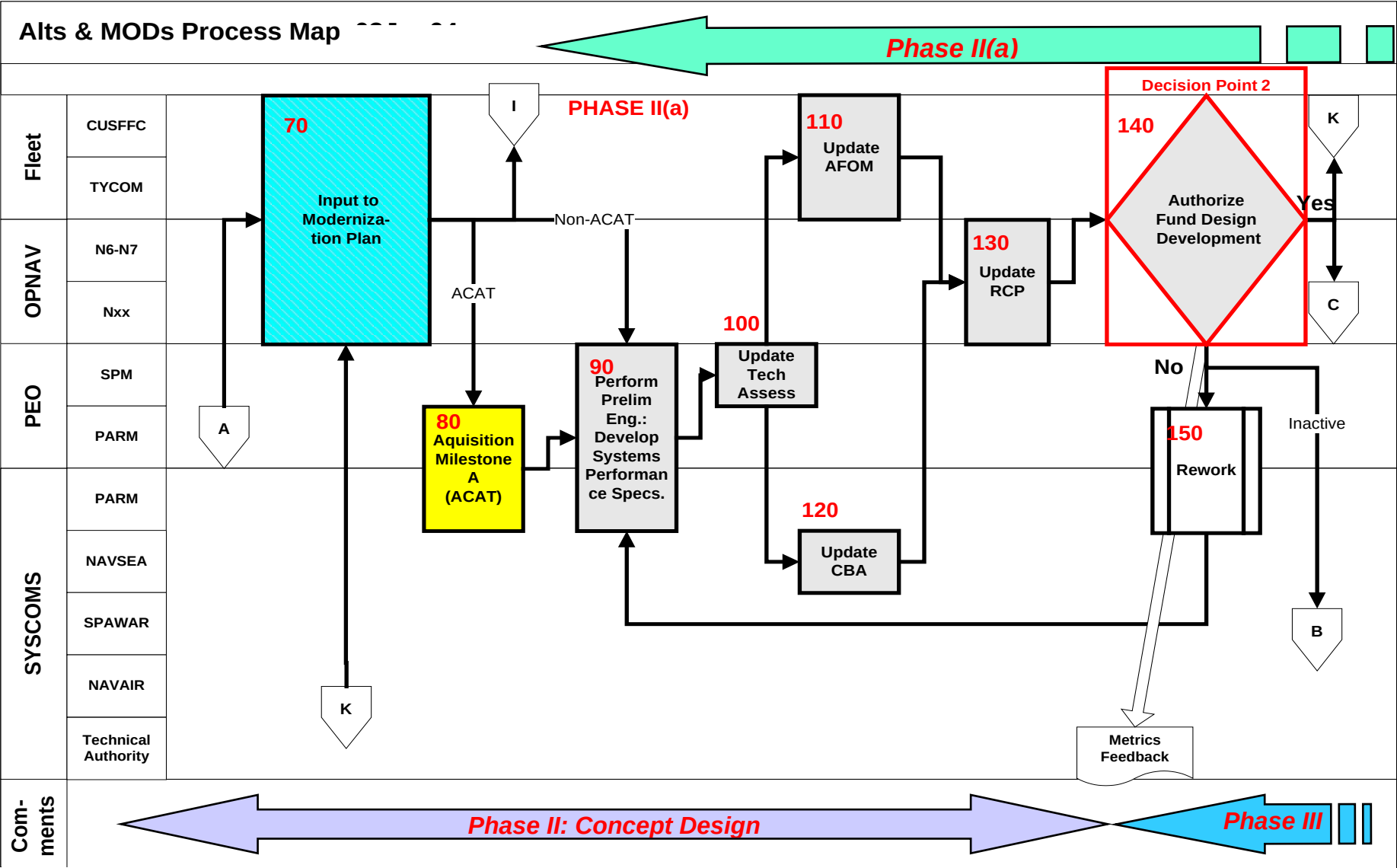
- a. Total of actual dollars expended in all FY for an SCD “killed” at Decision Point 1 (Authorize Preliminary Engineering).
 - (1) Capture actual expenditures as recorded in NDE as part of the CBA prepared for Decision Point 1.
 - (2) Metric may be further refined for phase of development and type appropriation per the cost categories recorded in the CBA as:
 - (a) Infrastructure investment – Appropriation-Preliminary Engineering (APPN-PE)
 - (b) Preliminary Engineering – APPN-PE
- b. Total of actual dollars expended in all FY for an SCD “killed” at Decision Point 2 (Authorize Design Development).
 - (1) Capture actual expenditures as recorded in NDE as part of the CBA prepared for Decision Point 2.
 - (2) Metric may be further refined for phase of development and type appropriation per the cost categories recorded in the CBA as:
 - (a) Infrastructure investment – APPN-PE
 - (b) Preliminary Engineering – APPN-PE
- c. Total of actual dollars expended in all FY for an SCD “killed” at Decision Point 3 (Authorize Procurement and Installation).
 - (1) Capture actual expenditures as recorded in NDE as part of the CBA prepared for Decision Point 3.
 - (2) Metric may be further refined for phase of development and type appropriation per the cost categories recorded in the CBA as:
 - (a) Infrastructure investment – APPN-PE
 - (b) Preliminary Engineering – APPN-PE
 - (c) Design Development – APPN-PE

36.10 MILESTONES. Surface Force Ship Planning Process Milestones are documented in Volume II, Part II, Chapter 2, Appendix D of this manual. Aircraft Carrier Navy Modernization Process Milestones are documented in Volume II, Part II, Chapter 2, Appendix E of this manual.

APPENDIX A
MODERNIZATION PLAN FLOWCHART

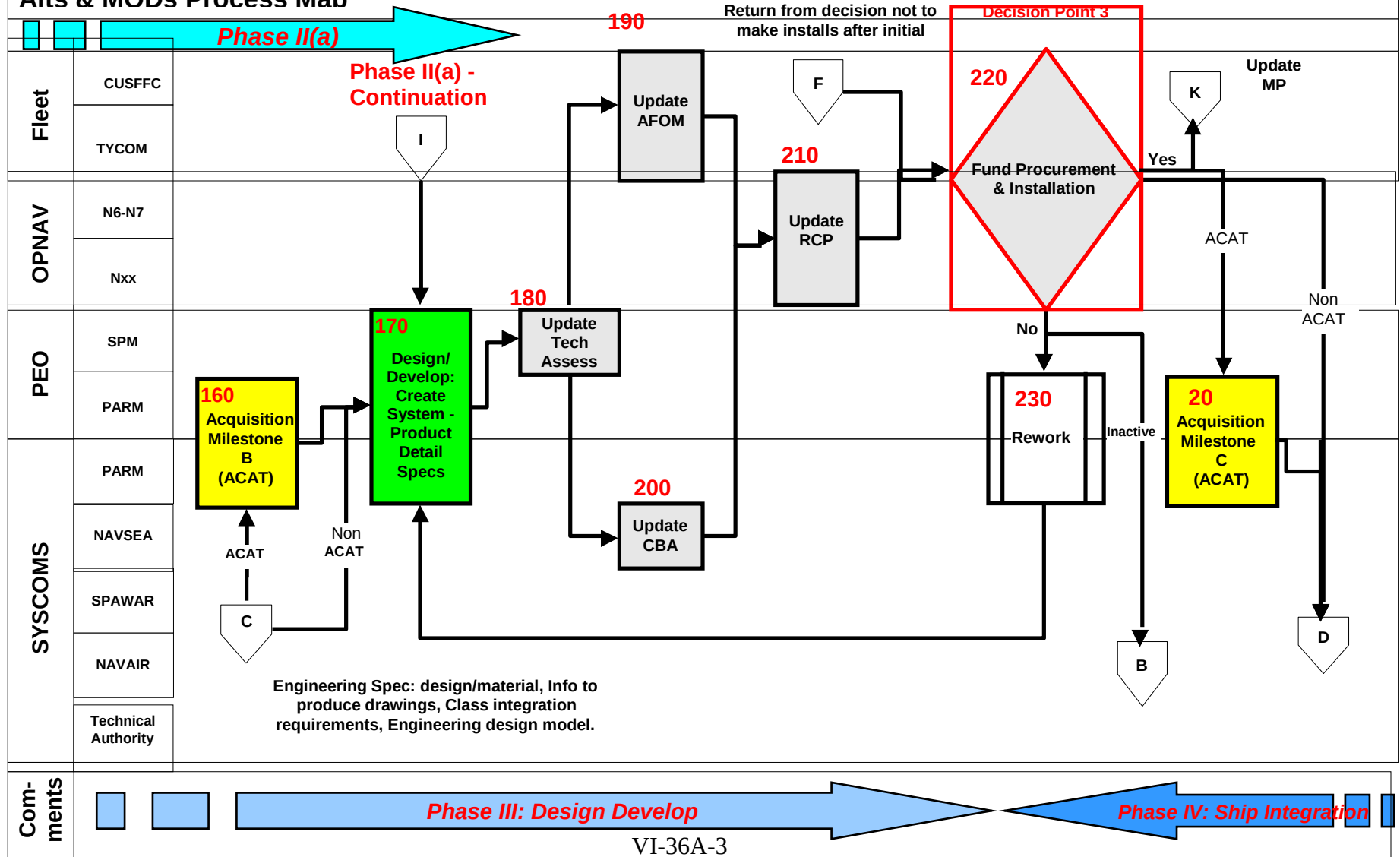


APPENDIX A
MODERNIZATION PLAN FLOWCHART

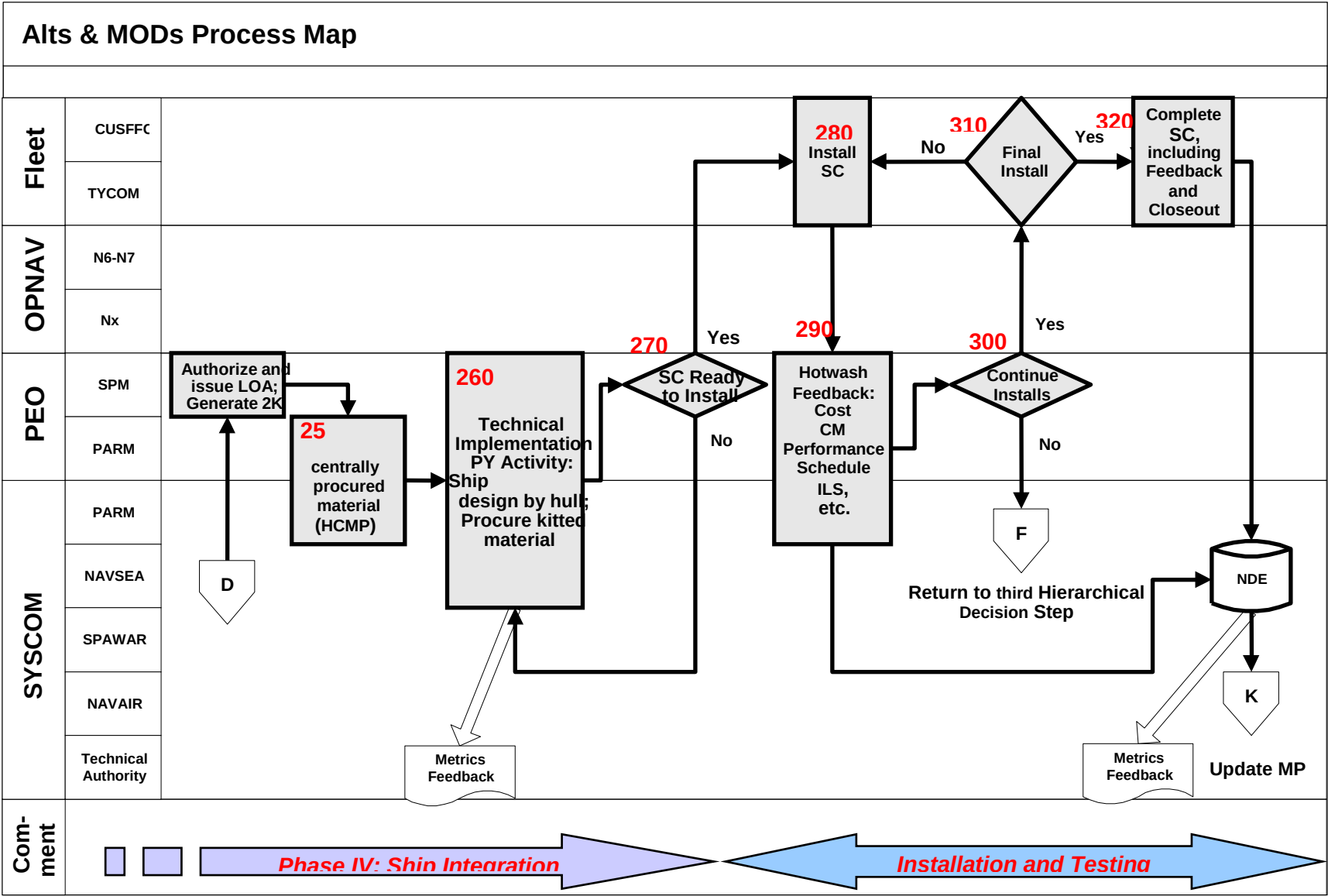


APPENDIX A

Alts & MODs Process Map



APPENDIX A
MODERNIZATION PLAN FLOWCHART



APPENDIX B
SHIP CHANGE DOCUMENT TEMPLATE
PHASE I

CHANGE TRACKING NUMBER_____ **Recommend Expedite** ☐

DATE: _____ **CLASSIFIED OR NOFORN:** YES___ NO___

1. SHIP CHANGE TITLE: _____

2. APPLICABLE SHIP, SHIP CLASS OR SITES (INCLUDES SHORE FACILITIES):

3. RECOMMENDED SCD:

a. Scope: (Check all that apply)

- ☐ Internal Equipment Modification
- ☐ Ship Modification
- ☐ Site Modification

b. Category (Check all that apply)

- ☐ HM&E
- ☐ C4I
- ☐ CS
- ☐ Computer Program or Software

c. Duration

- ☐ Permanent
- ☐ Temporary

d. Funding

- ☐ Program
 - ☐ Joint
- ☐ Fleet
 - ☐ Joint

4. INITIATING POINT OF CONTACT: NAME___ ACTIVITY ___ CODE___
PHONE___ E-MAIL___ DATE___ N/A___

5. SUBMITTING POINT OF CONTACT: NAME___ ACTIVITY and CODE ___
PHONE___ E-MAIL___ DATE___

6. PARM POINT OF CONTACT: NAME___ ACTIVITY and CODE ___ PHONE___
E-MAIL___ TBD___

7. TYCOM POINT OF CONTACT: NAME___ ACTIVITY and CODE ___ PHONE___
E-MAIL___

8. TECHNICAL POINT OF CONTACT: NAME___ ACTIVITY and CODE ___
PHONE___ E-MAIL___

9. DESCRIPTION OF CHANGE: _____

10. IMPACT IF NOT ACCOMPLISHED: _____

11. REQUIREMENTS AND JUSTIFICATION OF CHANGE (CITE DOCUMENT **AND** REQUIREMENTS IN NARRATIVE BOX)

- ☐ Statutory Requirement
- ☐ Legislated Regulatory Requirement
- ☐ Environmental Requirement
- ☐ Proposed Military Improvement
- ☐ Proposed Survivability Improvement
- ☐ Reduction of Total Owner Ship Costs (R-TOC)
- ☐ Strike Force Interoperability (BFI)
- ☐ Safety
- ☐ Mandatory Safety
- ☐ QOL-QOS
- ☐ Restoring Margins
- ☐ Contract Defect
- ☐ Unavailable, Obsolete or Unreliable Equipment
- ☐ Testing and Trial Deficiency
- ☐ Top Management Attention-Top Management Initiative (TMA-TMI)
- ☐ Aviation Capability and Air Wing Compatibility
- ☐ Anti-Terrorism-Force Protection
- ☐ Other

Need **or** Purpose Narrative:

12. DISTRIBUTIVE SYSTEMS **OR** OTHER IMPACTS (Check at least one box)

	Yes	No
AC Plants or /Chilled Water		
Electric Generation and Power Distribution Systems		
Topside Design or Mast Structure		
Fiber Optic Cable Plant		
Firemain		
Weight & Moment Change		
IC Switchboard & Database Multiplex System		
Electrical (400 Hz)		
Potable Water		
Fuel System		
Air Systems		
Networks		
IC Circuits		
HVAC		
Ships Characteristics Document change required		
Ship or Aviation Integration		
Storage Requirements		
Dry Docking Required		

Certification Required		
SUBSAFE		
Space Configuration		
Damage Control		
Software		
Weapons Systems		
Human Systems Integration (HSI)		
Hangar Bay or Flight Deck Encroachment		
Integrated Logistics Support (ILS)		
Prior, Concurrent or Conjunctive Alts		
Ordnance Handling or Storage		
Other (Systems, Equipment or Sites):		

13. AFOM

SEA SHIELD

Force Protection

- ☐ Protect against SOF & Terrorist Threats
- ☐ Mitigate effects of CBRNE

Surface Warfare

- ☐ Provide Self Defense against Surface Threats
- ☐ Conduct Offensive Operations against Surface Threats

Under Sea Warfare

- ☐ Provide Self Defense against Subsurface Threats
- ☐ Neutralize Submarine threats in the Littorals
- ☐ Neutralize open oceans Submarine Treats
- ☐ Counter Minefields from deep to shallow water
- ☐ Breach Minefields, Obstacles, and Barriers from very shallow water to the beach exit zone
- ☐ Conduct Mining Operations

Theater Air and Missile Defense

- ☐ Provide Self Defense against Air and Missile Threats
- ☐ Provide Maritime Air and Missile Defense
- ☐ Provide Overland Air and Missile Defense
- ☐ Conduct Sea-Based Missile Defense

SEA STRIKE

Strike

- ☐ Conduct Strike OPS
 - ☐ Engage Fixed Land Targets
 - ☐ Engage Moving Land Targets
- ☐ Conduct Special OPS
 - ☐ Provide Precision Targeting
 - ☐ Conduct Direct Action
- ☐ Conduct Offensive Information Operations
 - ☐ Jam Potential Threats
 - ☐ Conduct Network Attacks

- ❑ Provide Aircraft Survivability

Naval Fire Support

- ❑ Provide Precision Fires
- ❑ Provide High Volume Fires
- ❑ Provide Extended Range Fires

Maneuver

- ❑ Project or Reposition Forces
- ❑ Assault Centers of Gravity and Critical Vulnerabilities
- ❑ Conduct Concurrent or Follow-on Missions

Strategic Deterrence

- ❑ Conduct Nuclear Strike
- ❑ Provide Assured Survivability

SEA BASING

Close, Assemble, Employ & Reconstitute

- ❑ Close the Force & Maintain Mobility
- ❑ Provide at Sea Arrival & Assembly
- ❑ Allow Selective Offload
- ❑ Reconstitute & Regenerate at Sea

Provide Integrated Joint Logistics

- ❑ Provide Sustainment for Operations at Sea
- ❑ Provide Sustainment for Operations Ashore
- ❑ Provide Focused Logistics
- ❑ Provide Shipboard and Mobile Maintenance
- ❑ Provide Force Medical Services
- ❑ Provide Advance Base Support

Preposition Joint Assets Afloat

- ❑ Integrate and Support Joint Personnel and Equipment
- ❑ Provide Afloat C2 Physical Infrastructure
- ❑ Provide AFSB Capability for Joint Operations

FORCENET

Communications and Data Networks

- ❑ Provide Communication Infrastructure
- ❑ Provide Network Protection
- ❑ Provide Network Synchronization
- ❑ Provide Information Transfer

Intel, Surveillance and Recon

- ❑ Conduct Sensor management and Information Processing
- ❑ Detect and ID Targets
 - Fixed Land Targets
 - Moving Land Targets
 - Air and Missile Targets
 - Surface Targets

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- o Submarine Targets
- o Mines
- Provide Cueing and Targeting Information
- Assess Engagement Results

Common Operational and Tactical Pictures

- Provide Mission Planning
- Provide Battle Management Synchronization
- Provide Common PNT and Environmental Info
- Integrate and Distribute Sensor Info
- Track and Facilitate Engagement of Time Sensitive Targets
- Track and Facilitate Engagement of Non-Time Sensitive Targets

Phase I -- CBA input on SCD													
Investment Costs	Then Year Dollars (TYS) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
System/Equipment Design/Development Cost													
Concept Development													
Preliminary Engineering													
Design Development													
<i>Subtotal System/Equipment Design/Development Cost</i>													
System/Equipment Procurement Cost													
<i>Subtotal System/Equipment Procurement Cost</i>													
Installation/Checkout Cost													
<i>Subtotal Installation/Checkout Cost</i>													
<i>Subtotal (Sum of Major Cost Element Categories By FY)</i>													
Appropriation/Program Element Funding Plan													
Phase I - Preliminary Engineering	Then Year Dollars (TYS) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
Appn/PE (Include all as required)													
Phase II - Design Development													
Appn/PE (Include all as required)													
Phase III - Procurement													
Appn/PE (Include all as required)													
Phase III - Installation													
Appn/PE (Include all as required)													
<i>Subtotal (By FY)</i>													
Projected Savings and Cost Avoidance													
Development Phase	Then Year Dollars (TYS) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
Direct													
Additional TOC Elements													
Total Development Phase													
Production Phase													
Recurring													
Non-recurring													
Additional TOC Elements													
Total Production Phase													
Operating & Support													
O-Level / Mission Personnel													
Unit Level Consumption													
Intermediate Maintenance													
Depot Maintenance													
Contractor Support													
Sustaining Support													
Indirect Support													
Other													
Total Operating and Support													
Labor rates used to calculate O&S savings/cost avoidance													
O Level (\$/man-year) =													
I Level (\$/man-year) =													
MILPERS Workload Reduction (Man-years)													
Organization Level Personnel													
Intermediate Maintenance													
Installation Fielding Plan Data													
Total Production Units	Then Year Dollars (TYS) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
Ship Class Total Installations (Ship Quantity)													
Hull XX													
Hull YY													
Hull ZZ													
Hull YY													

14. CONCEPT DEVELOPMENT COST INFORMATION:

15. APPROVAL RECOMMENDATION:

Recommended Not Recommended Recommend Re-Work

NUCLEAR POWER DIRECTORATE (As Required)

Signature_____ DATE _____

SHIP PROGRAM MANAGER

Signature_____ DATE _____

CHANGE TRACKING NUMBER_____ **Recommend Expedite** ☐

SHIP CHANGE TITLE: _____

TECHNICAL REVIEW COMMENTS:

PHASE II

CHANGE TRACKING NUMBER _____

Expedite Approved ☐

SHIP CHANGE TITLE: _____

DESCRIPTION OF CHANGE: _____

IMPACT IF NOT ACCOMPLISHED: _____

APPLICABLE SHIP, SHIP CLASS OR SITES: _____

DATE: _____

1. LIST APPLICABLE SHIP(s) WITHIN 5-YEAR DECOMMISSIONING WINDOW:

2. DISTRIBUTIVE SYSTEMS IMPACT: (check box that applies)

	Net Increase	Net Decrease	No Net Impact	Unknown
AC Plants or Chilled Water				
Electric Generation and Power Distribution Systems				
Topside Design or Mast Structure				
Fiber Optic Cable Plant				
Firemain				
Weight & Moment Change				
IC Switchboard & Database Multiplex System				

3. OTHER CONSIDERATIONS (IF YES, PROVIDE EXPLANATION):

(i) Topside: **Yes No**

Explanation:

a. Ship Characteristics Document change required: **Yes No**

Explanation:

b. Ship or Aviation Integration Impact: **Yes No**

Explanation:

i. Storage Requirements: **Yes No**

Explanation:

ii. Dry Docking Required: **Yes No**

Explanation:

iii. Certification Required: **Yes No**

Explanation (include responsible activity):

(1) SUBSAFE Impact: **Yes No N/A**

(i) Network Impact: **Yes No**

Explanation:

(ii) Fuel System Impact: **Yes No**

Explanation:

(iii) IC Circuits Impact: **Yes No**

Explanation:

(iv) MCS **or** DCS Impact: **Yes No**

Explanation:

(v) Software Impact: **Yes No**

Explanation:

(vi) Weapons Systems Impact: **Yes No**

Explanation:

Space Configuration: **Yes No**

Explanation:

(vii) Hangar Bay **or** Flight Deck Impact: **Yes No**

Explanation:

Air Systems: **Yes No**

Explanation:

Ordnance Handling **or** Storage: **Yes No**

Explanation:

iv. Other: _____

Explanation:

4. SHOCK, VIBRATION AND EMI REQUIREMENTS:Shock Grade (check one **per** the GSO section 072):**A B C N/A**

Compliant with MIL-STD-167-1 Type 1 Vibration Requirements (check one):

Yes No N/A

Compliant with MIL-STD-461 EMI Requirements (check one):

Yes No N/A

Compliant with MIL-STD-464 EMI Requirements (check one):

Yes No Tailored (specifics appended) N/A

Compliant with OPNAVINST-2400.20 RF Spectrum Management Requirements

Yes No N/A

Compliant with HERO, HERP **OR** HERF (NAVSEA OP 3565) Requirements (check one):

Yes No N/A

1. Remarks: _____

5. INTEGRATED LOGISTICS SUPPORT (ILS) IMPACT (check all that apply)

- ☐ Technical Manuals
- ☐ Provisioning
- ☐ Planned Maintenance System (PMS)
- ☐ Ship's Selected Records (Drawings & Manuals)
- ☐ Operating Sequencing Systems (OSS)
- ☐ Steam Plant Manual (SPM)
- ☐ Test Equipment
- ☐ Software management
Specify software support activity: _____
- ☐ Spares Affected
Specify responsible activity: _____
- ☐ COTS-NDI
- ☐ Facilities
- ☐ Other (Specify): _____

6. HUMAN SYSTEMS INTEGRATION (HSI) IMPACTS:

Manpower **or Workload Impact:** Yes **or** No

Brief Description:

Personnel Impact: Yes **or** No

Brief Description:

Training Impact: Yes **or** No

Brief Description:

Human Factors Engineering (HFE): Yes **or** No

Brief Description:

Habitability: Yes **or** No

Brief Description:

Environment, Safety and Occupational Health (ESOH): Yes **or** No

Brief Description:

Personnel Survivability: Yes **or** No

Brief Description:

7. CRITICAL MATERIAL: _____

**8. PRIOR, CONJUNCTIVE OR CONCURRENT CHANGE ACCOMPLISHMENT
(LIST ANY CHANGE THAT APPLIES):** _____

9. ESWBS _____

10. DETAIL DESIGN CRITERIA: (Check all that apply)

- ☐ Ship Specification
- ☐ Deep Diving General Overhaul Specification

- ☐ General Specifications for Overhaul (GSO)
- ☐ Other (Specify)_____

11. PROTOTYPE REQUIRED:

Yes_____ No_____

Approx Time Required Onboard _____

12. AFOM

13. CBA INFORMATION

Phase II -- CBA input on SCD

Investment Costs	Then Year Dollars (TY\$) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
System/Equipment Design/Development Cost													
Concept Development													
Preliminary Engineering													
Design Development													
Software Development													
Hardware Development													
EDM/Pre-Production Prototype													
Testing													
Program Management													
Subtotal System/Equipment Design/Development Cost													
System/Equipment Procurement Cost													
Hardware Cost													
Installation Material													
Testing (Production/Post Production)													
H.S.I													
Logistics													
Topside Analysis													
Location Evaluation													
Special Evaluation													
EMX Evaluation													
RCS Certification													
Shock Certification													
Hull Evaluation													
Documentation (PTD)													
Certifications													
Distributed Systems Impact													
Interoperability Costs													
Program Management													
Subtotal System/Equipment Procurement Cost													
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	To Complete (Constant Year \$)
Installation/Checkout Cost													
Planning													
Design Services Allocation (DSA)													
SAR Development													
Shipcheck													
SID													
SSR/SRD													
ILS													
Configuration Overhaul Planning (COP)													
COSAL													
TM UPDATE													
CDM/SNAP VALIDATE													
Other ILS													
PROJECT MGMT													
Design Services Allocation (DSA) Non-Ping Yd													
Installation													
Shipyard (NSA)													
Mandays Required for Installation													
AIT													
Incidental Material													
Certification Cost													
TMA/TMI													
Subtotal Installation/Checkout Cost													
Subtotal (Sum of Major Cost Element Categories By FY)													

Appropriation/Program Element Funding Plan	Then Year Dollars (TY\$) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
Phase I - Preliminary Engineering													
Appr/PE (include all as required)													
Phase II - Design Development													
Appr/PE (include all as required)													
Phase III - Procurement													
Appr/PE (include all as required)													
Phase III - Installation													
Appr/PE (include all as required)													
Subtotal (By FY)													

Projected Savings and Cost Avoidance	Then Year Dollars (TY\$) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
Development Phase													
-- Direct													
-- Additional TOC Elements													
Total Development Phase	0	0	0	0	0	0	0	0	0	0	0	0	0
Production Phase													
-- Recurring													
-- Non-recurring													
-- Additional TOC Elements													
Total Production Phase													
Operating & Support													
-- O-Level / Mission Personnel													
-- Unit Level Consumption													
-- Intermediate Maintenance													
-- Depot Maintenance													
-- Contractor Support													
-- Sustaining Support													
-- Indirect Support													
-- Other													
Total Operating and Support													
Labor rates used to calculate O&S savings/cost avoidance													
MILPERS Workload Reduction (Man years)													
Organization Level Personnel													
Intermediate Maintenance													

Installation Fielding Plan Data	Then Year Dollars (TY\$) in Thousands												To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total	
Total Production Units													
Ship Class Total Installations (Ship Quantity)													
Hull XX													
Hull YY													
Hull ZZ													
Hull YY													

14. APPROVAL RECOMMENDATION:

Recommended Not Recommended Recommend Re-Work

NUCLEAR POWER DIRECTORATE (As Required)

Signature _____ DATE _____

SHIP PROGRAM MANAGER

Signature _____ DATE _____

TECHNICAL REVIEW COMMENTS:

PHASE III

CHANGE TRACKING NUMBER _____

Recommend Expedite ☐

SHIP CHANGE TITLE: _____

DESCRIPTION OF CHANGE: _____

IMPACT IF NOT ACCOMPLISHED: _____

APPLICABLE SHIP, SHIP CLASS **OR** SITES: _____

DATE: _____

1. SYSTEM **OR** EQUIPMENT DESIGNATION: _____

2. MODEL NO. _____

3. CAGE CODE _____

4. DETAILED DESCRIPTION OF CHANGE: _____

5. DISTRIBUTIVE SYSTEMS IMPACT:

	Added	Removed
A/C Plants or Chilled Water Dist (Tons A/C)		
(CHW GPM)		
Electrical Generation and Power Dist Sys (kW)		
Topside Design or Mast Structure (Weight in Tons)		
Fiber Optic Cable Plant (Yes or No)		
Firemain (GPM)		
Ship's Stability (Weight in Tons)		
IC SWBD and Database Multiplex Sys (Loads)		

6. ARE THERE REFERENCES **OR** SUPPORTING DOCUMENTATION IN ADDITION TO STANDARD REQUIREMENTS? Yes____ No____

7. ESTIMATED WEIGHT AND MOMENT:

WEIGHT	VCG	LCG	TCG
Stability Statement			

8. CHANGE MATERIAL OR SOFTWARE LIST:

ITEM NO.	DESCRIPTION	UNIT OF ISSUE	QUANTITY	PROCURING ACTIVITY

**9. ARE THERE QUALITY ASSURANCE REQUIREMENTS IN ADDITION TO
STANDARD REQUIREMENTS? Yes___ No___**

If Yes, List Requirements:_____

10. SPECIAL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL:

MATERIAL	DISPOSITION

11. INSTALLATION SUPPORT AND TEST EQUIPMENT:_____

12. SHIPBOARD STOWAGE DETAILS:_____

**13. NAVSEA SHIP INSTALLATION DRAWING (SID) REVIEW REQUIRED: YES___
NO___**

14. SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS:_____

**15. REQUIRED PRIOR, CONJUNCTIVE OR CONCURRENT
CHANGES:_____**

16. OTHER SYSTEMS IMPACTS:_____

17. INSTALLATION DURATION:_____

18. HUMAN SYSTEMS INTEGRATION (HSI):

Manpower-Workload:_____

Personnel:_____

Training:_____

Human Factors Engineering (HFE):_____

Habitability:_____

Environment, Safety and Occupational Health (ESOH):_____

Personnel Survivability:_____

**19. CERTIFICATIONS OR QUALIFICATIONS REQUIRED (CHECK ALL THAT
APPLY):**

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ILS Cert _____ Estimated Completion Date _____
HSI Cert _____ Estimated Completion Date _____
EMI Cert _____ Estimated Completion Date _____
WSESRB _____ Estimated Completion Date _____
Software Cert _____ Estimated Completion Date _____
Shock Qualification _____ Estimated Completion Date _____
SPAWAR PPL-SSIL (IT-21) Cert _____ Estimated Completion Date _____
SEA 62 Interoperability Cert _____ Estimated Completion Date _____
Other Cert (Specify) _____ Estimated Completion Date _____
Other Cert (Specify) _____ Estimated Completion Date _____

20. DETAILED COST STRUCTURE:

Phase III -- CBA input on SCD														
Investment Costs	Then Year Dollars (TY) in Thousands													To Complete (Constant Year \$)
	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	To Complete	Total		
System/Equipment Design/Development Cost														
Concept Development														
Preliminary Engineering														
Design Development														
Software Development														
Hardware Development														
EDM/Pre-Production Prototype														
Testing														
Program Management														
Subtotal System/Equipment Design/Development Cost														
System/Equipment Procurement Cost														
Activation Cost														
Hardware Cost														
Production Engineering														
Installation Material														
INCO														
RINCO														
SPARES														
Testing (Production/Post Production)														
Developmental Testing														
Operational Testing														
HQ														
Training/Training Support														
Schoolhouse modification														
Installation Training														
NTOP Development/Update														
Training Development Costs														
Manpower and Personnel														
Top Down Requirements Analysis (TDRA)														
Other Manpower Workload Analysis														
Logistics														
Special Tools/Test Equipment/MAMS														
Facilities														
Manpower & Personnel														
PHS&I (Special Handling)														
Support Equipment														
Topside Analysis														
Topside Design														
Location Evaluation														
Special Evaluation														
EMX Evaluation														
RC-S Certification														
Shock Certification														
Hull Evaluation														
Documentation (PTD)														
Certifications														
Distributed Systems Impact														
Battle Force Interoperability Studies														
Stability Analysis and Studies														
Program Management														
Stability Analysis and Studies														
Subtotal System/Equipment Procurement Cost														
Installation/Checkout Cost														
Planning														
Certification Cost														
ILS Certification														
H/SI Certification														
Shipcheck														
SID														
SSR/SRD														
ILS														
Configuration Overhaul Planning (COP)														
COSAL														
TM UPDATE														
CTM/NAP VALIDATE														
Other ILS														
PROJECT MGMT														
Design Services Allocation (DSA)														
Mandays Required for Installation														
Shipyards (NSA)														
OSR (On Site Representatives)														
Special Services														
Total Ship Testing														
H/SI Certification														
TMA/TM														
Subtotal Installation/Checkout Cost														
Subtotal (Sum of Major Cost Element Categories By FY)														
Appropriation/Program Element Funding Plan														
Phase I - Preliminary Engineering														
Appr/PPE (Include all as required)														
Phase II - Design Development														
Appr/PPE (Include all as required)														
Phase III - Procurement														
Appr/PPE (Include all as required)														
Phase III - Installation														
Appr/PPE (Include all as required)														
Subtotal (By FY)														
Projected Savings and Cost Avoidance														
Development Phase														
Direct														
Additional TOC Elements														
Total Development Phase														
Production Phase														
Recurring														
Non recurring														
Additional TOC Elements														
Total Production Phase														
Operating & Support														
O-Level / Mission Personnel														
Unit Level Consumables														
Intermediate Maintenance														
Repair Maintenance														
Contractor Support														
Sustaining Support														
Indirect Support														
Other														
Total Operating and Support														
Notes used to calculate O&S savings/cost avoidance														
MILPERS Workload Reduction (Man years)														
Organization Level Personnel														
Intermediate Maintenance														
Installation Fielding Plan Data														
Total Production Units														
Ship Class Total Installations (Ship Quantity)														
Hull XX														
Hull YY														
Hull ZZ														
Hull YY														

21. APPROVAL RECOMMENDATION:

Recommended Not Recommended Recommend Re-Work

NUCLEAR POWER DIRECTORATE (As Required)

Signature _____ **DATE** _____ _____ _____

SHIP PROGRAM MANAGER

Signature _____ **DATE** _____ _____ _____

TECHNICAL EVALUATION COMMENTS:

CHANGE TRACKING NUMBER _____

Recommend Expedite ☐

SHIP CHANGE TITLE: _____

DESCRIPTION OF CHANGE: _____

IMPACT IF NOT ACCOMPLISHED: _____

APPLICABLE SHIP, SHIP CLASS **OR** SITES: _____

DATE: _____

1. LIST APPLICABLE SHIP(s) WITHIN 5-YEAR DECOMMISSIONING WINDOW:

2. SYSTEM **OR EQUIPMENT DESIGNATION:** _____

3. MODEL NO. _____

4. CAGE CODE _____

5. DETAILED DESCRIPTION OF CHANGE: _____

6. ESWBS _____

7. PROTOTYPE REQUIRED:

Yes _____ No _____

Approx Time Required Onboard _____

8. DISTRIBUTIVE SYSTEMS IMPACT: (check box that applies)

	Added	Removed
A/C Plants or Chilled Water Dist (Tons A/C)		
(CHW GPM)		
Electrical Generation and Power Dist Sys (kW)		
Topside Design or Mast Structure (Weight in Tons)		
Fiber Optic Cable Plant (Yes or No)		
Firemain (GPM)		
Ship's Stability (Weight in Tons)		
IC SWBD and Database Multiplex Sys (Loads)		

9. OTHER CONSIDERATIONS (IF YES, PROVIDE EXPLANATION):

(i) Topside: **Yes No**

Explanation:

a. Ship Characteristics Document change required: **Yes No**

Explanation:

b. Ship **or** Aviation Integration Impact: **Yes No**

Explanation:

i. Storage Requirements: **Yes No**

Explanation:

ii. Dry Docking Required: **Yes No**

Explanation:

iii. Certification Required: **Yes No**

Explanation (include responsible activity):

(1) SUBSAFE Impact: **Yes No N/A**

(i) Network Impact: **Yes No**

Explanation:

(ii) Fuel System Impact: **Yes No**

Explanation:

(iii) IC Circuits Impact: **Yes No**

Explanation:

(iv) MCS **or** DCS Impact: **Yes No**

Explanation:

(v) Software Impact: **Yes No**

Explanation:

(vi) Weapons Systems Impact: **Yes No**

Explanation:

Space Configuration: **Yes No**

Explanation:

(vii) Hangar Bay **or** Flight Deck Impact: **Yes No**

Explanation:

Air Systems: **Yes No**

Explanation:

Ordnance Handling **or** Storage: **Yes No**

Explanation:

iv. Other: _____

Explanation:

10. SHOCK, VIBRATION AND EMI REQUIREMENTS:

Shock Grade (check one **per** the GSO section 072):

A B C N/A

Compliant with MIL-STD-167-1 Type 1 Vibration Requirements (check one):

Yes No N/A

Compliant with MIL-STD-461 EMI Requirements (check one):

Yes No N/A

Compliant with MIL-STD-464 EMI Requirements (check one):

Yes No Tailored (specifics appended) N/A

Compliant with OPNAVINST-2400.20 RF Spectrum Management Requirements

Yes No N/A

Compliant with HERO, HERP **or** HERF (NAVSEA OP 3565) Requirements (check one):

Yes No N/A

1. Remarks: _____

11. INTEGRATED LOGISTICS SUPPORT (ILS) IMPACT (check all that apply)

- ☐ Technical Manuals
- ☐ Provisioning
- ☐ Planned Maintenance System (PMS)
- ☐ Ship's Selected Records (Drawings & Manuals)
- ☐ Operating Sequencing Systems (OSS)
- ☐ Steam Plant Manual (SPM)
- ☐ Test Equipment
- ☐ Software management
Specify software support activity: _____
- ☐ Spares Affected
Specify responsible activity: _____
- ☐ COTS-NDI
- ☐ Facilities

Other (Specify): _____

12. DETAIL DESIGN CRITERIA: (Check all that apply)

- ☐ Ship Specification
- ☐ Deep Diving General Overhaul Specification
- ☐ General Specifications for Overhaul (GSO)
- ☐ Other (Specify)_____

13. ARE THERE QUALITY ASSURANCE REQUIREMENTS IN ADDITION TO STANDARD REQUIREMENTS? Yes____ No____

If Yes, List Requirements:_____

14. REFERENCES **OR SUPPORTING DOCUMENTATION:**

15. ESTIMATED WEIGHT AND MOMENT:

WEIGHT	VCG	LCG	TCG
Stability Statement			

16. CHANGE MATERIAL OR SOFTWARE LIST:

ITEM NO.	DESCRIPTION	UNIT OF ISSUE	QUANTITY	PROCURING ACTIVITY

17. SPECIAL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL:

MATERIAL	DISPOSITION

18. INSTALLATION SUPPORT AND TEST EQUIPMENT:_____

19. SHIPBOARD STOWAGE DETAILS:_____

20. NAVSEA SHIP INFORMATION DRAWING (SID) REVIEW REQUIRED: YES____
NO____

21. SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS:_____

22. REQUIRED PRIOR, CONJUNCTIVE OR CONCURRENT CHANGES:_____

23. INSTALLATION DURATION:_____

24. HUMAN SYSTEMS INTEGRATION (HSI):

Manpower-Workload: _____
Personnel: _____
Training: _____
Human Factors Engineering (HFE): _____
Habitability: _____
Environment, Safety and Occupational Health (ESOH): _____
Personnel Survivability: _____

25. CERTIFICATIONS OR QUALIFICATIONS AS REQUIRED:

ILS Cert _____ Target Completion Date _____
HSI Cert _____ Target Completion Date _____
EMI Cert _____ Target Completion Date _____
WSESRB _____ Target Completion Date _____
Software Cert _____ Target Completion Date _____
Shock Qualification _____ Target Completion Date _____
SPAWAR PPL-SSIL (IT-21) Cert _____ Estimated Completion Date _____
SEA 62 Interoperability Cert _____ Estimated Completion Date _____
Other Cert (Specify) _____ Target Completion Date _____
Other Cert (Specify) _____ Target Completion Date _____

26. DETAILED COST STRUCTURE:

	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	Total
System/Equipment Design/Development Cost											
Concept Development											
Preliminary Engineering											
Design Development											
Software Development											
Hardware Development											
EDM/Pre-Production Prototype											
Testing											
Program Management											
<i>Subtotal System/Equipment Design/Development Cost</i>											
System/Equipment Procurement Cost											
Activation Cost											
Hardware Cost											
Installation Material											
Testing (Production/Post Production)											
Developmental Testing											
Operational Testing											
H.S.I.											
Training/Training Support											
Schoolhouse modification											
Installation Training											
NTSP Development/Update											
Training Development Costs											
Manpower and Personnel											
Top Down Requirements Analysis (TDRA)											
Other Manpower Workload Analysis											
Logistics											
Special Tools/Test Equipment											
Facilities											
Manpower & Personnel											
Spares (testing)											
Repair parts											
PHS&T											
Documentation (PTD)											
Certification Cost											
ILS Certification											
H.S.I Certification											
Interoperability Costs											
Program Management											
<i>Subtotal System/Equipment Procurement Cost</i>											
	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	Total
Installation/Checkout Cost											
Planning											
Design Services Allocation (DSA)											
SAR Development											
Shipcheck											
SID											
SSR/SRD											
ILS											
Configuration Overhaul Planning (COP)											
COSAL											
TM UPDATE											
CDM/SNAP VALIDATE											
Other ILS											
PROJECT MGMT											
Design Services Allocation (DSA) Non-Ping Yd											
Installation											
Shipyard (NSA)											
AIT											
Incidental Material											
Certifications											
TMA/TMI											
Topside Analysis											
<i>Subtotal Installation/Checkout Cost</i>											
Subtotal (Sum of Major Cost Element Categories By FY)											
Funding Phasing Plan											
	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	Total
Preliminary Engineering											
Appn/PE (Include all as required)											
Design Development											
Appn/PE (Include all as required)											
Procurement											
Appn/PE (Include all as required)											
Installation											
Appn/PE (Include all as required)											
<i>Subtotal (By FY)</i>											
Projected Savings and Cost Avoidance											
	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	FYXX	Total
Development Phase											
- Direct											
- Additional TOC Elements											
Total Development Phase											
Production Phase											
- Recurring											
- Non-recurring											
- Additional TOC Elements											
Total Production Phase											
Operating & Support											
- O-Level / Mission Personnel											
- Unit Level Consumption											
- Intermediate Maintenance											
- Depot Maintenance											
- Contractor Support											
- Sustaining Support											
- Indirect Support											
- Other											
Total Operating and Support											

27. APPROVAL RECOMMENDATION:

Recommended Not Recommended Recommend Re-Work

NUCLEAR POWER DIRECTORATE (As Required)

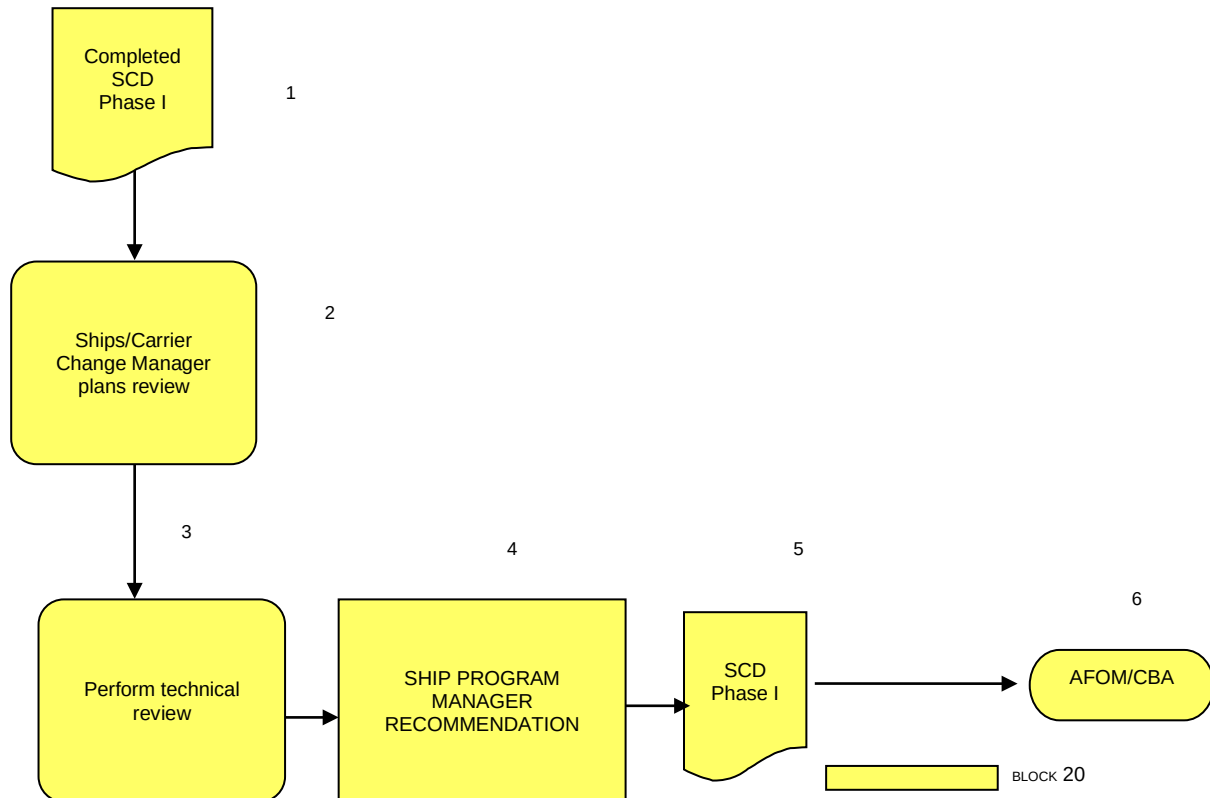
Signature _____ **DATE** _____ _____ _____

SHIP PROGRAM MANAGER

Signature _____ **DATE** _____ _____ _____

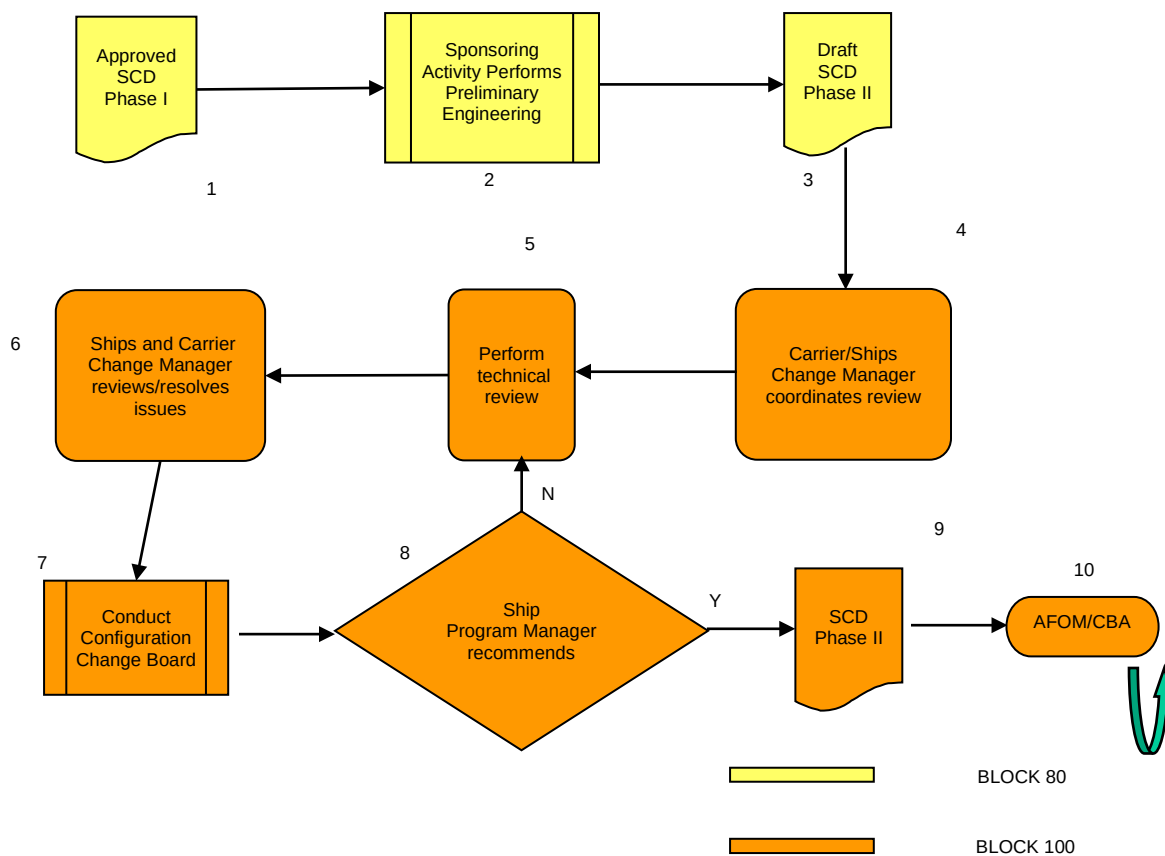
TECHNICAL REVIEW COMMENTS:

APPENDIX C
TECHNICAL ASSESSMENT FLOWCHART



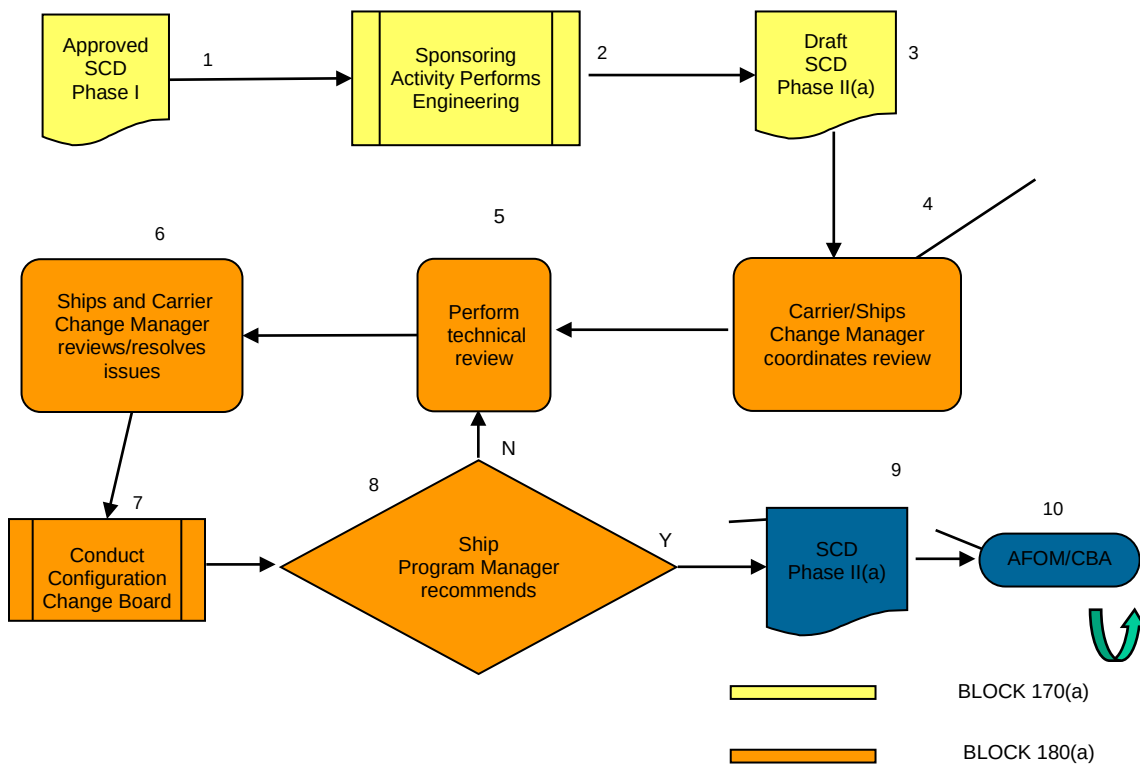
Technical Assessment Phase I

TECHNICAL ASSESSMENT FLOWCHART



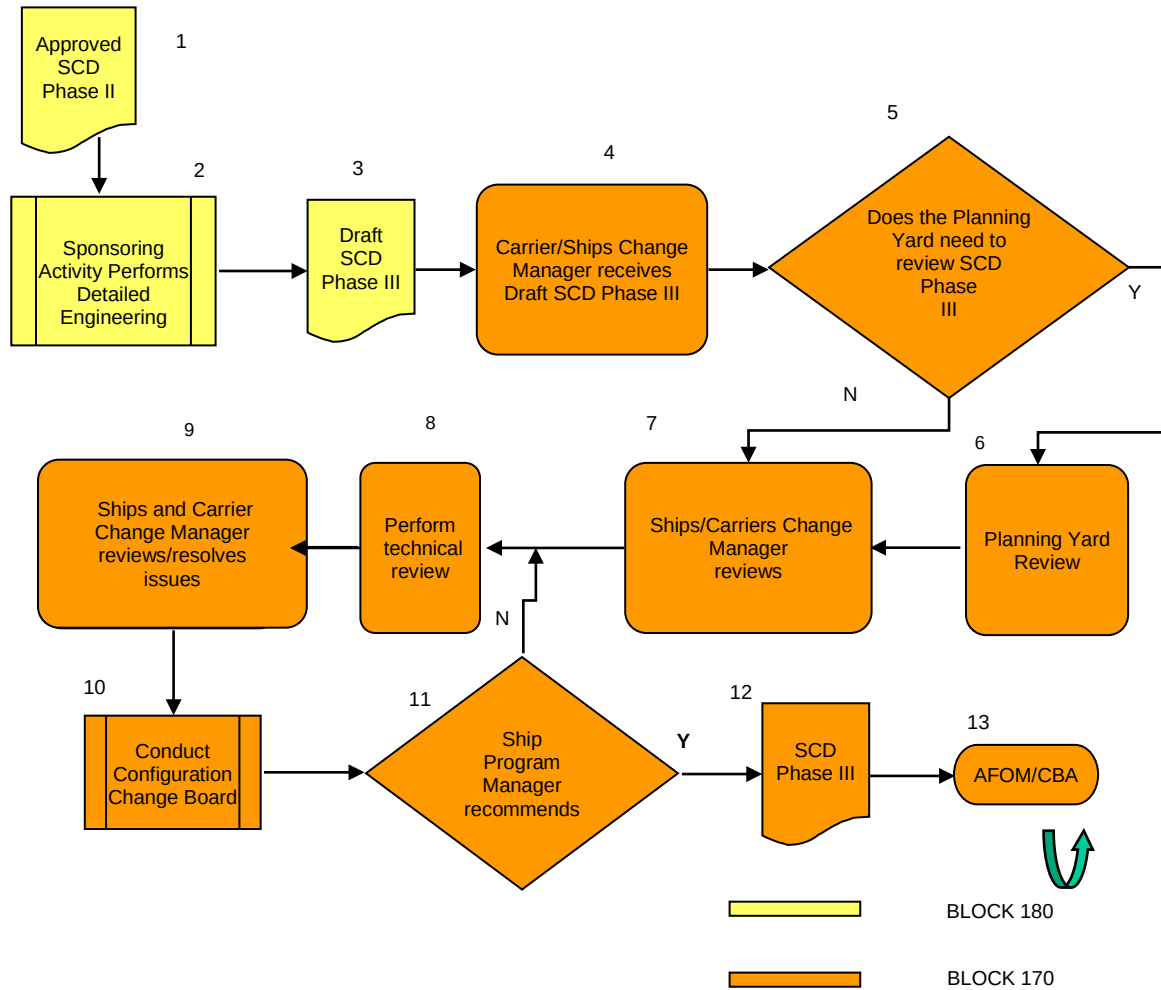
Technical Assessment Phase II

TECHNICAL ASSESSMENT FLOWCHART



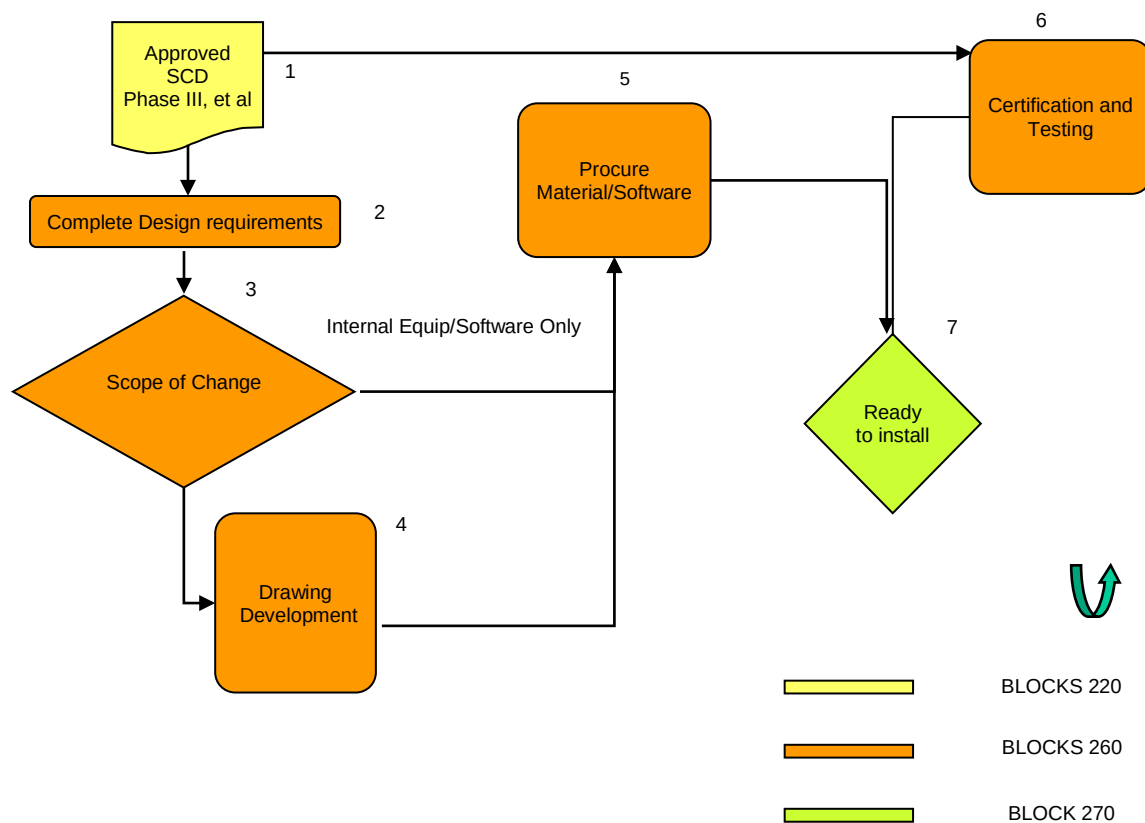
Technical Assessment Phase II(a)

TECHNICAL ASSESSMENT FLOWCHART



Technical Assessment Phase III

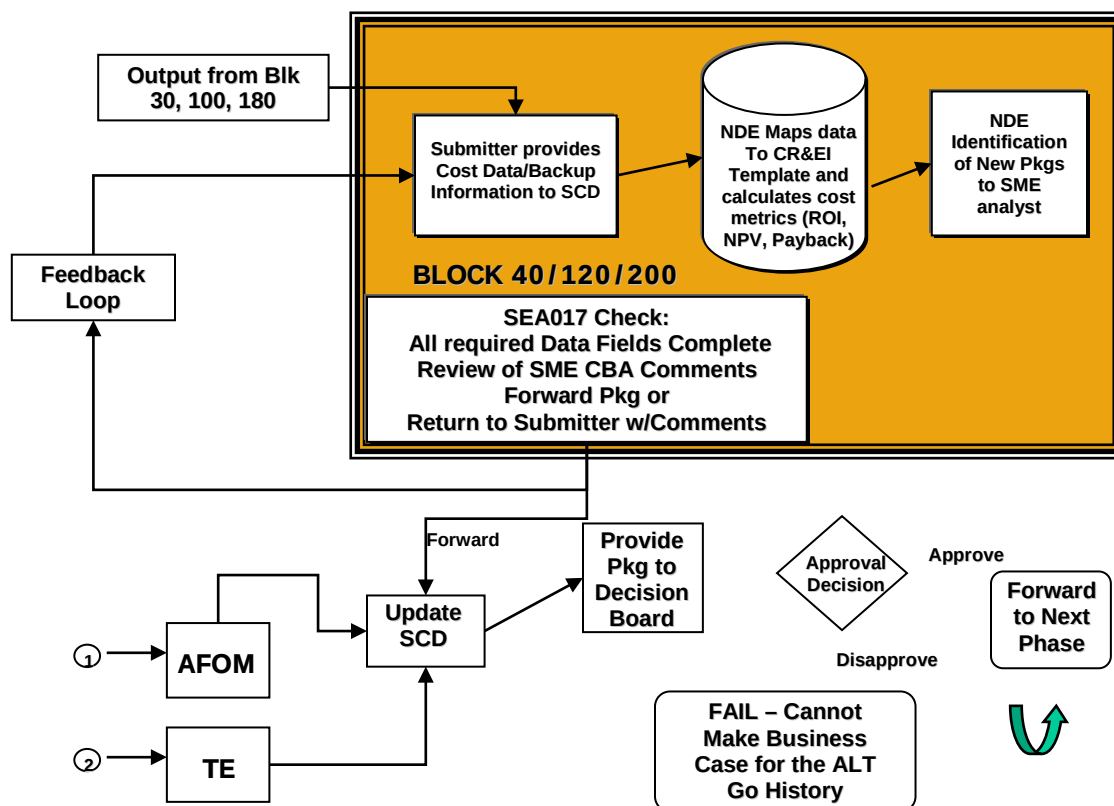
TECHNICAL ASSESSMENT FLOWCHART



Technical Implementation Phase

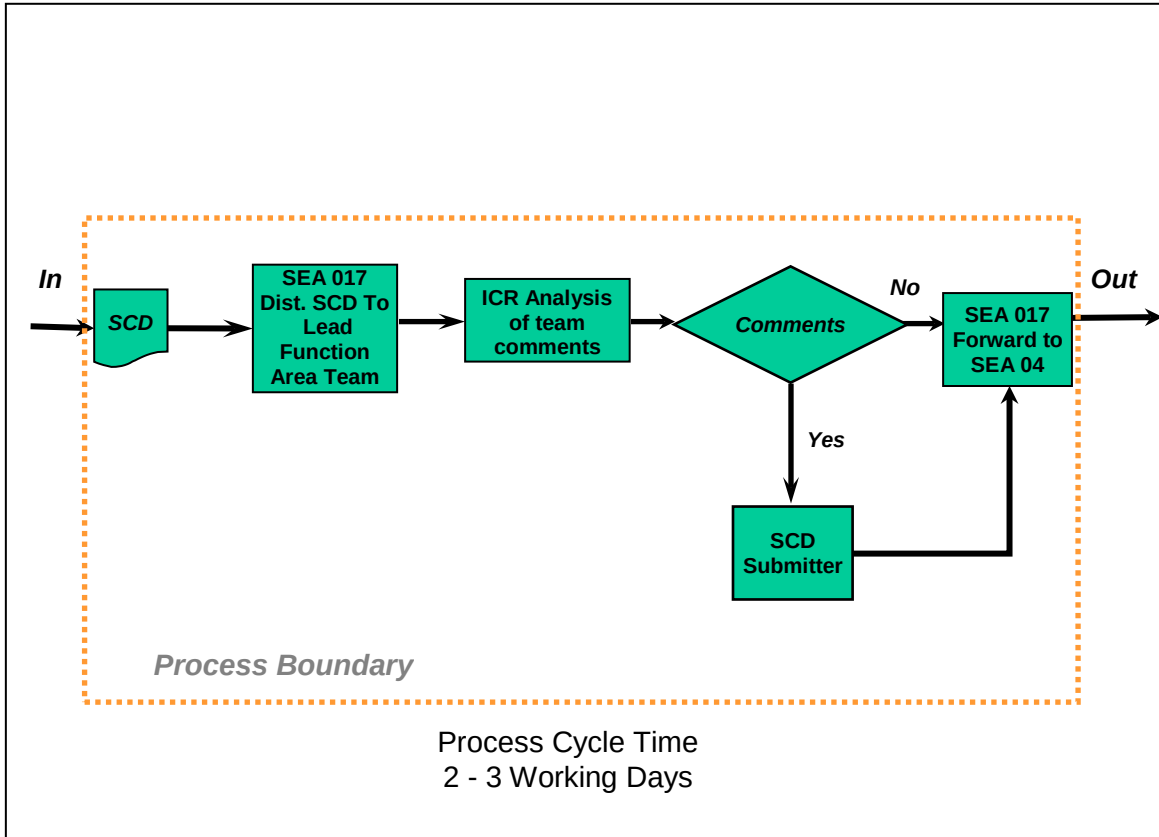
APPENDIX D

COST BENEFIT ANALYSIS FLOWCHART



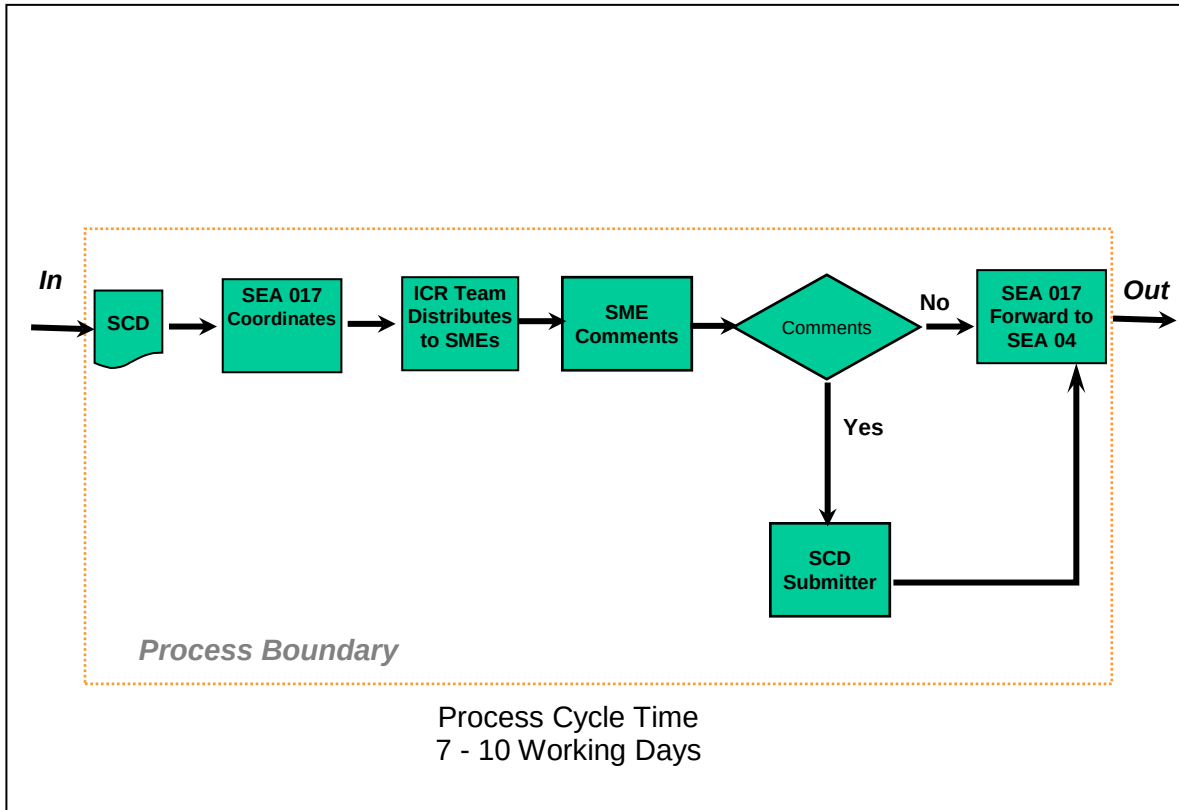
CBA PROCESS FLOW, BLKS 40, 120, 200

COST BENEFIT ANALYSIS FLOWCHART



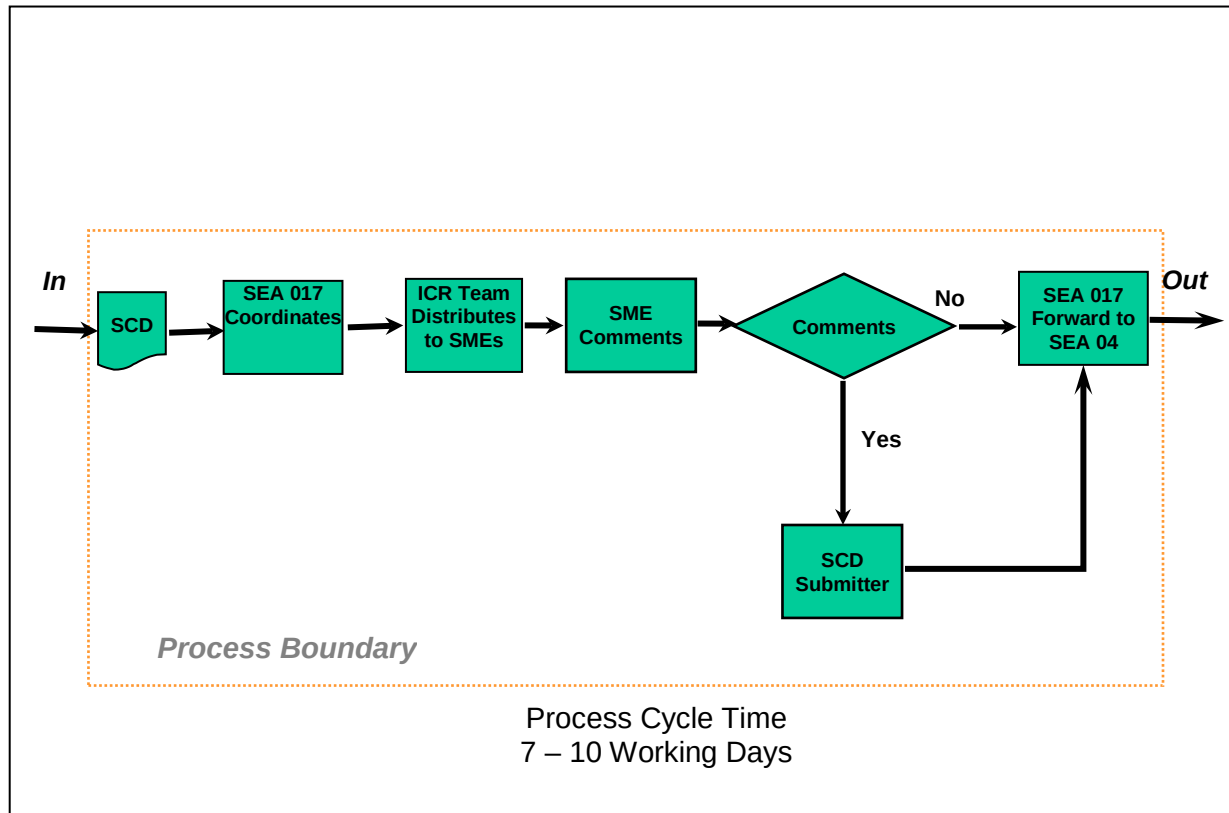
COST BENEFIT ANALYSIS (CBA) BOX #40 - LEVEL 3

COST BENEFIT ANALYSIS FLOWCHART



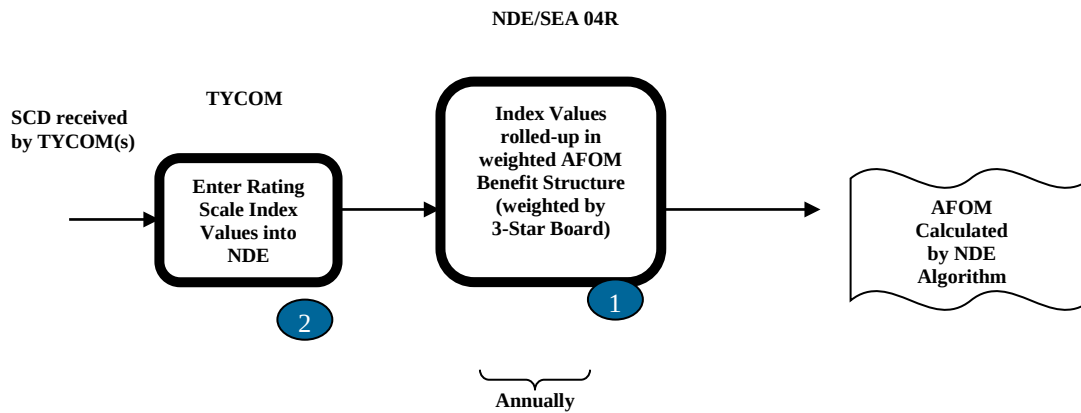
UPDATE COST BENEFIT ANALYSIS (CBA) BOX #120 - LEVEL 3

COST BENEFIT ANALYSIS FLOWCHART



UPDATE COST BENEFIT ANALYSIS (CBA) BOX #200 - LEVEL 3

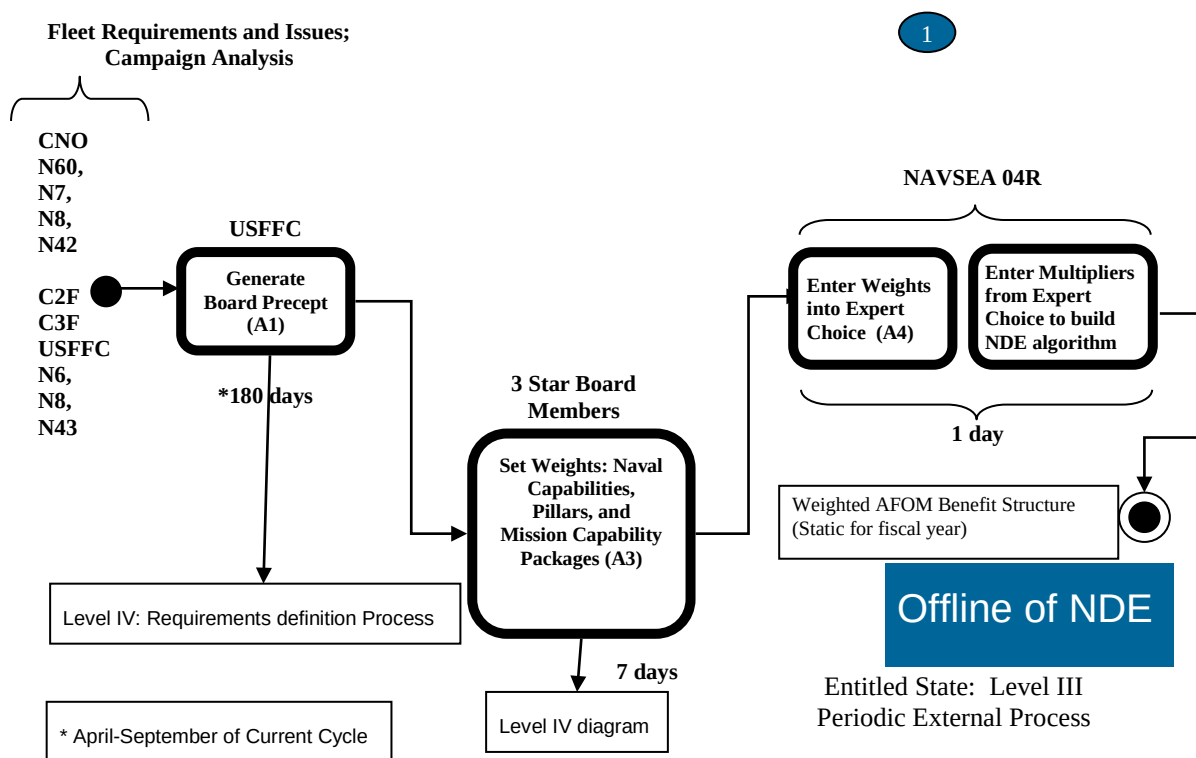
APPENDIX E
ALTERATION FIGURE OF MERIT FLOWCHART



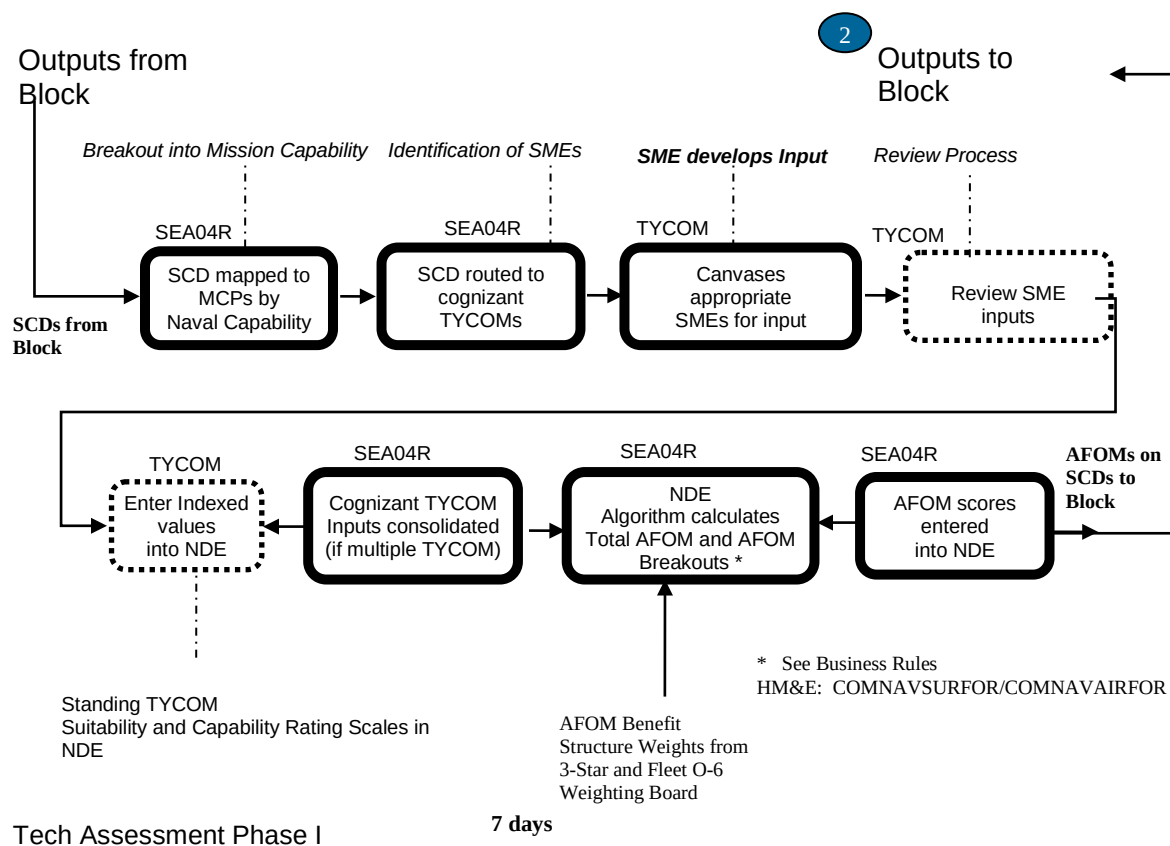
CONTINUOUS SCDs X TYCOM RATINGS X NAVY PRIORITIES (WEIGHTS) = AFOM VALUE

AFOM PROCESS (INITIAL AND UPDATE)

ALTERATION FIGURE OF MERIT FLOWCHART

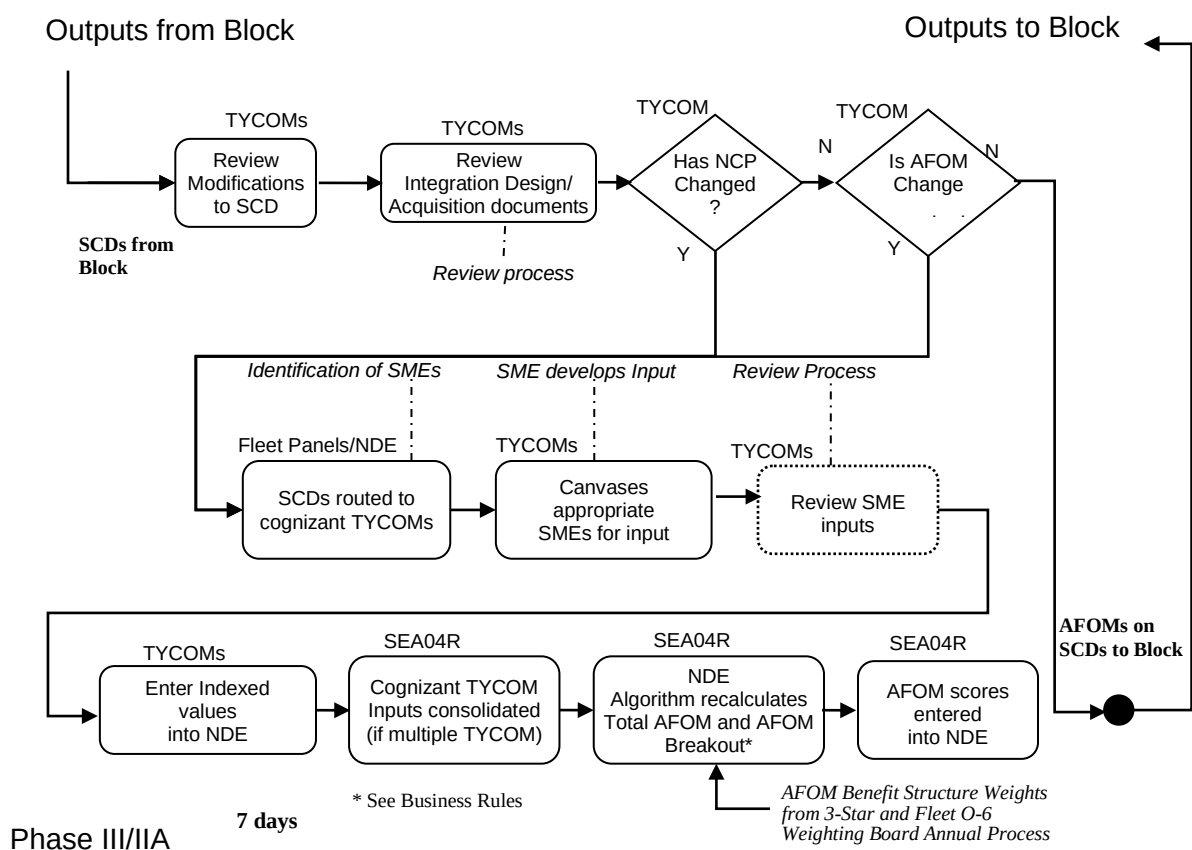


ALTERATION FIGURE OF MERIT FLOWCHART

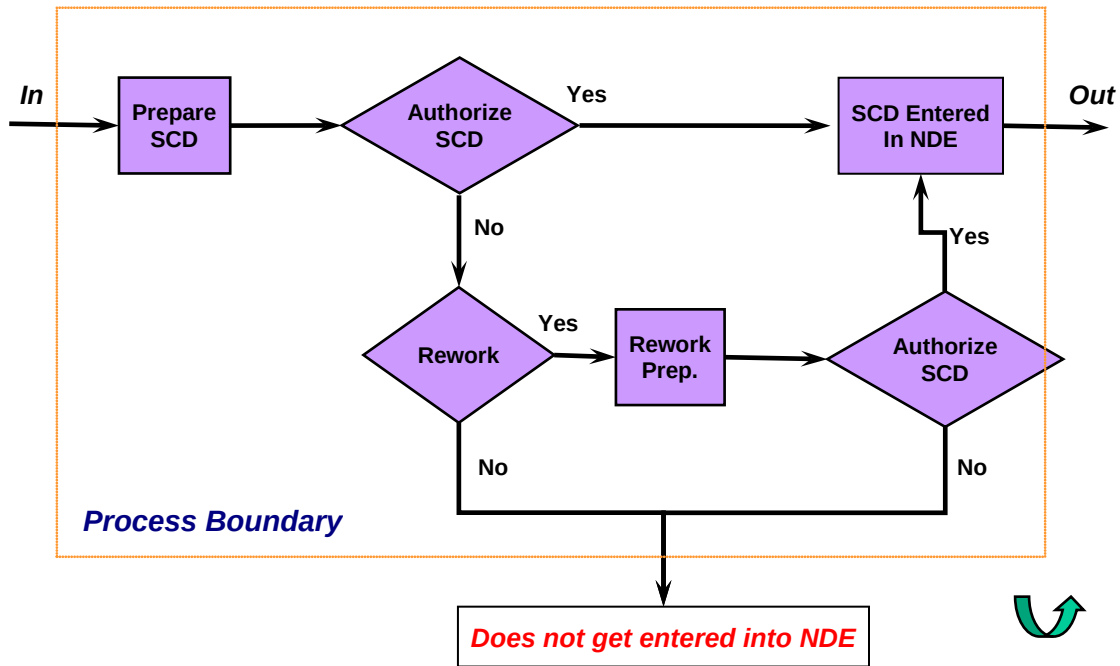


PROCESS FLOW (LEVEL III) - CALCULATE INITIAL AFOM

ALTERATION FIGURE OF MERIT FLOWCHART



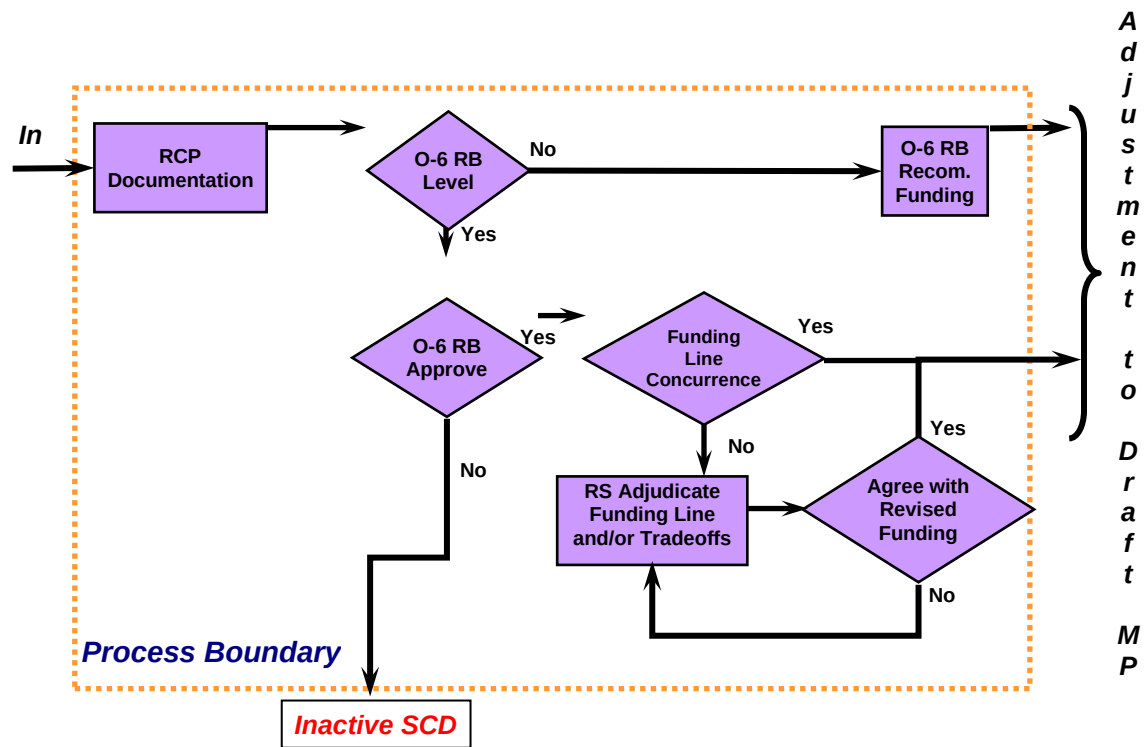
APPENDIX F
VOTING DATABASE FLOWCHART



CREATE SHIP CHANGE DOCUMENT (SCD)
BOX #10 - LEVEL 3

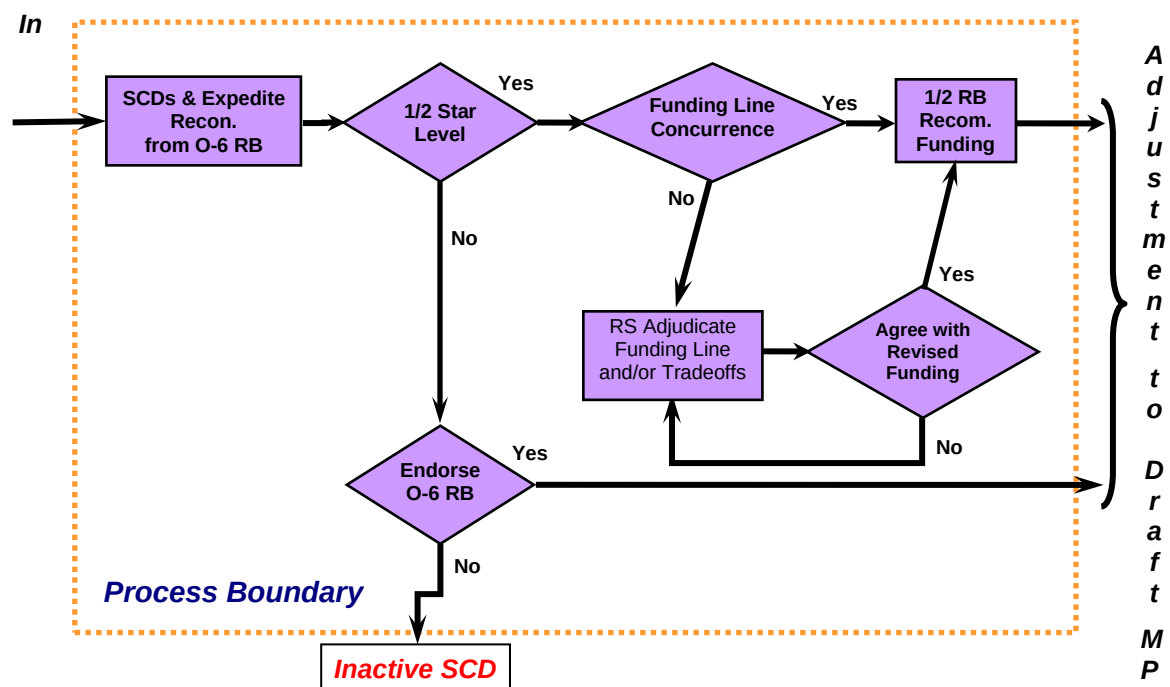
PROCESS FLOW (LEVEL III)
BLOCK - 2ND UPDATE AFOM

VOTING DATABASE FLOWCHART



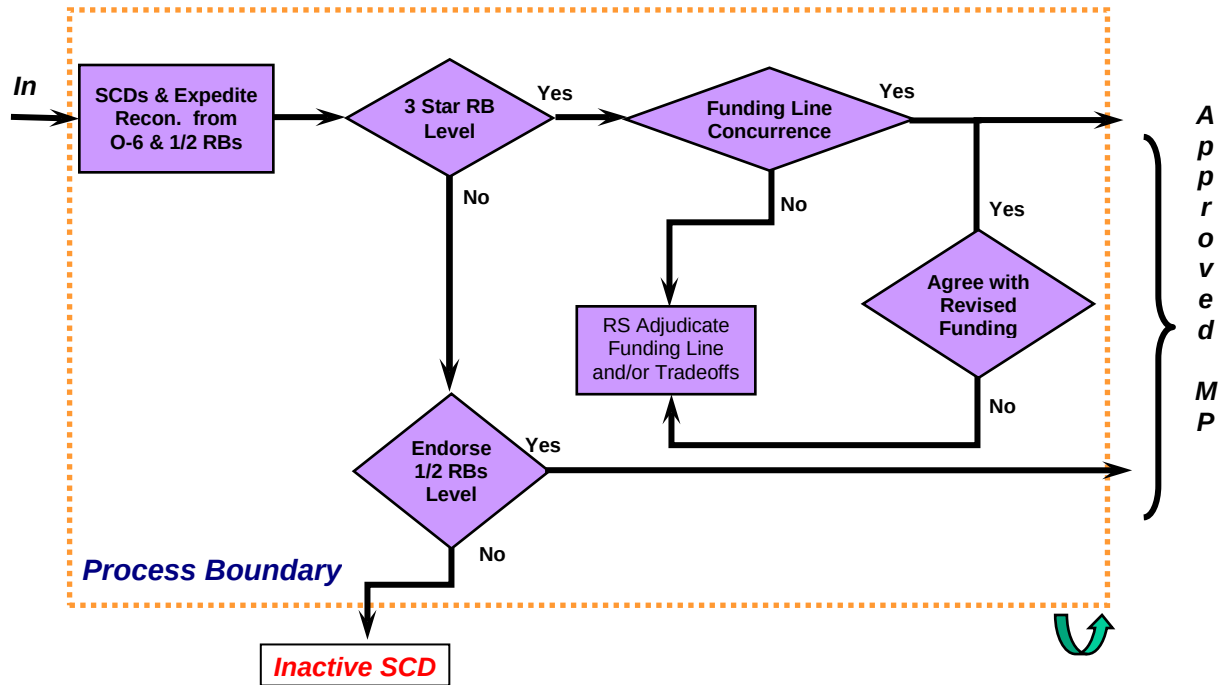
DECISION POINT 1 - O6 REVIEW BOARD
 AUTHORIZE FUNDING FOR PREL. ENGINEERING
 (BOX #60 - LEVEL 3)

VOTING DATABASE FLOWCHART



DECISION POINT 1 - 1/2 STAR REVIEW BOARD
AUTHORIZE FUNDING FOR PREL. ENGINEERING
(BOX #60 - LEVEL 3)

VOTING DATABASE FLOWCHART



DECISION POINT 1 - 3 STAR REVIEW BOARD
 AUTHORIZE FUNDING FOR PREL. ENGINEERING
 (BOX #60 - LEVEL 3)

VOLUME VI**CHAPTER 37****REGIONAL MAINTENANCE CENTER PASSIVE COUNTERMEASURE SYSTEM
SUPPORT REQUIREMENTS****REFERENCES.**

- (a) OPNAVINST 9070.2 - Signature Control Policy for Ships and Craft of the U.S. Navy
- (b) NAVSEA RMC CERT 05P1 - Passive Countermeasure System (PCMS) Waterfront Support Certification Plan
- (c) NAVSEA SE400-DA-MMO-010 - Passive Countermeasure System (PCMS) Technical Manual
- (d) Maintenance Index Page 4721/081 CG/DDG/LPD Passive Countermeasure System (PCMS)
- (e) NAVSEA RIM 05P1 - PCMS Repair and Installation Methods
- (f) NAVSEA ACD 05P1 - PCMS Access, Material Control and Disposal Manual
- (g) Maintenance Index Page 4721/082 – CVN Passive Countermeasure System (PCMS)
- (h) NAVSEA RIM (SLT) 05P1 – PCMS Repair and Installation methods for Type 3R SLT
- (i) NAVSEA ACD/J 05P1 - PCMS Access, Material Control and Disposal Manual (Japan)
- (j) NAVSEA ACD/R 05P1 – PCMS Access, Material Control and Disposal Manual (Rota)
- (k) NAVSEA ACD (CVN) 05P1 – PCMS Access, Material Control and Disposal Manual (CVN)

37.1 **PURPOSE.** Per references (a) through (k), to provide guidance in the execution of a shore based Passive Countermeasure System (PCMS) maintenance program in the U.S. Surface Fleets. Waterfront support for the PCMS is focused through the homeport Regional Maintenance Center (RMC). To support the Fleet PCMS program each RMC **must** be capable of conducting the following core PCMS activities:

- a. PCMS Readiness Improvement Program (RIP).
- b. PCMS Maintainer and Supervisor technical training.
- c. Installation and removal of Motion Measurement System.
- d. AP-1 and AP-2 system assessments. AP-2 is not applicable to CVN.
- e. Technical assists.
- f. Prioritization and quality assurance of all topside PCMS work related to or impacting PCMS resources and procedures. Requirements for these tasks are identified in reference (b). A general system description is provided in reference (c).
- g. Support of a RMC Production Repair Replace Facility. This facility will be outfitted and stocked by the RMC for accomplishment of tiling on ship items which have been removed from or are destined for PCMS ships. The facility **must** include, at minimum, an on-site RMC technician, certified by the NAVSEA Technical Warrant

Holder at Waterfront Level 2 Maintainer Instructor, to act as supervisor and manager of the production shop. The designated Code 900 production shop manager **must** coordinate training and oversight with PCMS SME (Code 200) at the RMC as needed. This capability will be RMC funded stocking of necessary tools, consumables and tiles such that work performed at the shop will not require specific ship provided materials or funding.

37.2 PASSIVE COUNTERMEASURE SYSTEM EVENT DESCRIPTION.

- a. PCMS RIP. RIPs are scheduled by the Type Commander (TYCOM) via the Immediate Superiors In Command (ISIC). ISICs obtain primary and secondary dates, submit via action to TYCOM with information to the local RMC. This weeklong event is designed to provide on board training to the entire ship PCMS team, focused on maintenance and inspection training. Curricula are available for both the PCMS maintenance person and PCMS supervisor personnel. The RIP focuses on one day of classroom training, followed by shipboard training that includes assessment and repairs training to the system (trim, caulk, application of material, etc.). This is the primary method of delivering training and PCMS certification for Ship's Force personnel for CG/DDG/LPD. It also serves the purpose of providing a focused period for accomplishment of a prioritized selection of Ship's Force capable maintenance. Stand-alone onboard technical training (PCMS Supervisor or Maintainer) may be provided to ships CVN/CG/DDG/LPD) if delivering that training via the RIP process is not possible. This form of training can be requested by the ship directly through the local RMC PCMS SME. This training is requested through the RMC by ship submission of a 2K.
- b. Motion Measurement System. **Per** references (d), ships without installed telemetry equipment require installation and removal of Motion Measurement System for radar cross-section testing. This is accomplished by the RMC following ship submission of a 4790/2K request.
- c. AP-1 and AP-2 (CG/DDG/LPD) assessments. These comprise the annual Subject Matter Expert (SME) assessment of the ship system. It utilizes a visual assessment process in order to provide a prioritized maintenance plan for the ship. This complements the ship's measurement. A structured discipline is used for this assessment.
- d. Technical assistance. RMC SMEs are responsible for responding to Forces Afloat requests for PCMS technical assistance. The RMC technician must be certified by the NAVSEA Technical Warrant Holder at a minimum for Level 2 Maintainer Instruction, to directly assist the ship in identifying and organizing a Ship's Force PCMS maintenance project. The technician would provide on-site advice and quality assurance assistance.
- e. Prioritization and Quality Assurance of I and D Level Work. RMC SMEs **must** be utilized by the RMCs to provide technical advice, including work prioritization, and quality assurance of all I and D Level PCMS related or PCMS impacting work executed under the purview of the RMC.

37.3 PASSIVE COUNTERMEASURE SYSTEM PERSONNEL CERTIFICATION.

37.3.1 Passive Countermeasure System In-Service Engineering Activity. The Naval Sea Systems Command (NAVSEA) Topside Signatures Technical Warrant Holder has assigned Naval Surface Warfare Center Port Hueneme Detachment (NSWC PHD) as the PCMS In-Service Engineering Agent (ISEA). The Technical Warrant Holder (NAVSEA 05P1) retains final authority for all PCMS personnel certification.

37.3.2 Support Personnel. **Per** reference (b), PCMS personnel certification is required every three years. Qualifications for PCMS certification are successful completion of NAVSEA sponsored PCMS installation course conducted under the authority of NSWC PHD (S22) and on-the-job-training witnessed by a certified PCMS instructor within the past three years. RMC Subject Matter Expert personnel are also required to retain proficiency through annual accomplishment of at least one AP-1 and one RIP. This certification enables RMCs and shipyards to maintain a cadre of qualified PCMS personnel and with the assistance of the PCMS ISEA, to coordinate further certification or recertification training as required. Specific certification levels are addressed in the relevant PCMS Program NAVSEA manual.

37.3.3 Training Requirements. **Per** reference (c) and (e), NAVSEA 05P1 has established the requirement that all personnel involved in PCMS installation and maintenance, including inspection/assessment, surface preparation, material application, final painting or quality assurance, **must** be U.S. citizens trained in the specifics of PCMS installation procedures prior to any actual tile installation work. As waterfront experience has underscored the absolute importance of limiting PCMS work to properly trained personnel, the certification process is the single most important element of quality assurance for the fleet customer. All personnel assigned PCMS repair duties **must** be trained in the requirements of reference (f).

37.3.4 Regional Maintenance Center Japan, Regional Maintenance Center Rota and Pearl Harbor Naval Shipyard. With the exception of CVN training, Forward Deployed Naval Forces (Regional Maintenance Center Japan, Regional Maintenance Center Rota and Pearl Harbor Naval Shipyard) are authorized to execute training of personnel organic to their production codes for all PCMS maintenance and installation work using the PCMS ISEA provided training guide.

37.3.5 Ship's Force Personnel. **Per** the requirements of reference (c) MRC S-1, fleet personnel conducting PCMS S-1 assessments must be graduates of a PCMS ISEA approved ship supervisor course which includes an assessment/inspection training module. Ship's Force personnel assigned maintainer duties to include all reference (d) MRCs except the S-1 must be graduates of the PCMS ISEA approved PCMS maintainer course. Ship's Force personnel assigned maintenance duties to include all reference (g) MRCs must be graduates of the PCMS ISEA approved CVN specific course.

37.4 PASSIVE COUNTERMEASURE SYSTEM TECHNICAL ASSISTANCE. PCMS technical assistance is available through the local RMC. Distance support is also available, if required.

37.5 RESPONSIBILITIES.

- a. Commander, Naval Sea Systems Command:
 - (1) Certify personnel, facilities, and activities in PCMS handling, Quality Assurance, application, and destruction. Maintain records for each RMC certification.

- (2) Provide Equipment Guide List (EGL) packages for AP-1, AP-2 and S-1 assessments. AP-2/S-1 is not applicable to CVN.
 - (3) Incorporate and distribute ship configuration revisions submitted following AP-1 and AP-2 assessments. AP-2 is not applicable to CVN.
 - (4) Conduct analysis of all measurements and provide Forces Afloat reports of results and recommendations.
 - (5) Adjudicate all PCMS related requests for Departures from Specifications.
 - (6) Designate a PCMS ISEA to function as the first line technical resource for Forces Afloat.
 - (7) Coordinate PCMS in service activities with the broader Surface Maintenance Engineering Planning Program (SURFMEPP) organization and other activities, such as corrosion control programs.
- b. Navy Regional Maintenance Center:
- (1) Ensure that RMCs have adequate PCMS SMEs/technicians to support PCMS core activities defined in paragraph 37.1 of this chapter. Provide stewardship of RMC SMEs to ensure a seamless transition when personnel are scheduled for transfer or retirement. If qualified PCMS Technicians are not available at local RMC, the RMC should contact the following (in order of contact) for assistance:
 - (a) Other RMCs.
 - (b) PCMS ISEA (NSWC PHD). This request **must** include funding for the performance of the activity.
 - (2) Ensure integration of PCMS SME support to all former SUPSHIP planning and execution of shipboard repairs and other upkeep performed under the auspices of the RMC organization.
 - (3) Establish I-Level PCMS tiling support shops at RMCs with PCMS responsibilities.
 - (4) Ensure the integration of PCMS restoration on all RMC conducted repairs and corrosion control projects where PCMS coverage is required. This is to ensure that PCMS restoration requirements generated as interferences to work performed by I and D level activities are not assigned to Ship's Force, but rather are restored as part of the I or D task. Should the Type Commander determine that it is necessary to abbreviate the funded task, he or she **must** direct the ship to submit a Departure from Specifications (DFS) to NAVSEA delineating the specifics of the unfunded PCMS restoration work.
- c. Type Commanders **must**:
- (1) Coordinate with the System Commands in identifying, solving and correcting PCMS deficiencies.
 - (2) Refer all PCMS related Departures from Specifications to NAVSEA for adjudication.

- (3) Prior to promulgation, review and authorize all documents prepared by technical agencies that contain procedures relative to PCMS and the fleet PCMS program.
 - (4) Evaluate comments and recommendations regarding the fleet PCMS program. If necessary, **issue** changes to existing policy and procedures.
 - (5) Fund PCMS RIPS to provide for the additional RMC labor and material required to conduct these events at least bi-annually.
 - (6) Ensure that proper corrosion control procedures are employed in the planning and execution of I and D Level maintenance affecting PCMS areas. References (f) and (h) provides detailed guidance.
 - (7) Coordinate all aspects of scheduling ship measurements.
 - (8) Provide for the restoration of all PCMS materials removed as interferences for other tasks.
- d. Immediate Superiors in the Chain of Command (ISIC) **must**:
- (1) Submit requests to schedule PCMS core activities for each unit to maintain unit currency in trained personnel and ship measurements.
 - (2) Review and take the appropriate action to correct PCMS discrepancies for subordinate units.
- e. RMCs **must**:
- (1) Maintain qualified PCMS personnel and ensure assets are available to perform PCMS activities of paragraph 37.1 of this chapter, **per** reference (b).
 - (2) Budget and provide travel funding to the ISEA for RMC personnel PCMS competency certifications, as required. As an alternative, the RMC person requiring certification can travel to Norfolk or San Diego for certification from the ISEA.
 - (3) Budget for RMC PCMS SME attendance of Annual Waterfront PCMS Standardization Program Reviews required reference (b).
 - (4) Provide Technical Assistance via distance support **or** on site visit as appropriate.
 - (5) Conduct PCMS core activities. Provide the following to NAVSEA PCMS ISEA within four weeks following AP-1 events:
 - (a) Redlined updates to key plans and detailed drawings.
 - (b) Completed EGL inspection checklist, including revised items.
 - (c) Completed digital photo surveys consisting of any new systems and topside changes not previously submitted or not listed in the ship key plans.
 - (6) Ensure that RMC PCMS SMEs are involved in planning of all PCMS equipped ship topside maintenance where PCMS is affected.

- (7) Ensure that RMC Quality Assurance personnel, certified by the PCMS ISEA, are actively involved in the Quality Assurance of all I and D level PCMS related repairs and installations.
 - (8) Ensure that contracted or I-Level jobs activities, facilities and personnel selected to conduct PCMS work are certified for the work being conducted.
 - (9) Conduct annual inventory of all locally RMC held PCMS materials and provide results to NAVSEA 05P1.
 - (10) Include in contracted I and D-Level jobs the provision of PCMS tiles for planned PCMS repairs and interference areas. Ships **must** not be tasked to provide tiles or other PCMS Allowance Parts List or Allowance Equipage List items to support work undertaken by other than Ship's Force, except with the specific concurrence of the TYCOM.
 - (11) Maintain repair capability detailed in paragraph 37 .1.1.g of this chapter.
- f. PCMS Ship Commanding Officers **must** ensure:
- (1) Scheduling of PCMS activities within periodicity.
 - (2) Obtaining RMC SME assistance in reviewing work packages to ensure identification of all topside signature related issues.
 - (3) Establishment and maintaining of the following shipboard organization:

NOTE: AS OUTLINED IN CHAPTER 19, APPENDIX C4H OF THIS VOLUME, THE OT02 WORKCENTER IS DESIGNATED AS THE PCMS MAINTENANCE WORKCENTER. CVN DOES NOT LIST A SPECIFIC PCMS WORKCENTER. REFERENCE (B) CONTAINS ALL CVN PCMS MAINTENANCE REQUIREMENTS AND **MUST BE CARRIED UNDER WORKCENTER OS02 (ELECTRONIC WARFARE (EW) OR CRYPTOLOGIC TECHNICIAN, TECHNICAL (CTT)). ADDITIONALLY, THE CVN PCMS SUPERVISOR **MUST** COME FROM THIS WORKCENTER OR CAN BE A MORE SENIOR PERSON WITHIN THE SAME DEPARTMENT.**

- (a) PCMS Department Head: **Per** reference (a), The Commanding Officer **must** appoint a Department Head responsible for coordinating operation and maintenance of PCMS. Their responsibilities include:
 - 1 Providing the Commanding Officer monthly PCMS effectiveness summaries including major PCMS deficiencies, the compliance of the ship with personnel certification requirements, an abbreviated Plan of Action and Milestones for correction of Category 1, 2 **and** 3 deficiencies and corrosion items, and the due date for the next ship measurement.
 - 2 Coordinating shipboard PCMS indoctrination for newly reported personnel.
 - 3 Coordinating ship-wide PCMS preventive and corrective maintenance schedule.

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- 4 Coordinating distribution and update of Planned Maintenance System (PMS) materials, including ship specific PCMS key plan drawings and EGLs required for PMS inspections.
 - 5 Serving as single point of contact for Quality Assurance of PCMS related Current Ship's Maintenance Project entries, review of all topside configuration changes (including program alterations, fleet alterations, field changes, etc.) to ensure Radar Cross Section reduction has been considered.
 - 6 Ensuring PCMS is included in the command PMS spot-check program.
 - 7 Assigning a command PCMS coordinator responsible to the PCMS Department Head for the detailed implementation of PCMS maintenance and operation.
 - 8 Designate in writing the maintenance assignments by all work centers assigned PCMS responsibility, as applicable.
- (b) Command PCMS coordinator: The command PCMS coordinator is the primary assistant to the PCMS Department Head in carrying out his or her responsibilities. Additional responsibilities include:
- 1 Request PCMS RIPs at intervals not to exceed 24 months (non-CVN).
 - a Designate team of minimum 8 people (DDG **and** LPD), (15 people (CG) to attend the RIP. This team must include at least two supervisor level personnel (E5 and above). These team members **must** be committed throughout the entire RIP duration and cannot be substituted once the RIP commences.
 - b Commit this team to the full 5-day period, arranging other individual requirements or commitments around the PCMS RIP. The names, rates and PRD of these personnel **must** be provided to the local RMC SME by e-mail or record message not later than 3 working days prior to the PCMS RIP. The senior ship's force member of this team is responsible as the team's mustering petty officer and **must** exercise military control of the team. Personnel may not be substituted once the RIP has begun.
 - c All PCMS training requested through the RMC will be done by ship submission of a 2K.
 - 2 Maintain personnel certifications, ensuring the required number of trained personnel are onboard. For DDG **and** LPD, a minimum of 8 maintainers and 2 supervisor-trained personnel are required. For CG, a minimum of 15 maintainers and 2

supervisor-trained personnel are required. For CVN, a minimum of 15 personnel are required to be trained in the CVN-specific training, one of which formerly designated as the ship's PCMS Supervisor.

3 During RMC technical assists, ships would be expected to provide a minimum, dedicated team of five Level 1 Maintainer personnel and one Level I Supervisor personnel for such a technical assist. The team would be required to muster at least 80% of its assigned personnel continuously for workdays during the technical assistance period.

- (c) Supply Officer: Maintain Allowance Parts List stocks of PCMS materials and sufficient Allowance Equipage List items to support maintenance requirements. All shipboard stocks must be within shelf life.

VOLUME VI
CHAPTER 38
DEEP SUBMERGENCE SYSTEMS
HULL INTEGRITY PROCEDURES

REFERENCES.

- (a) NAVSEA SS800-AG-MAN-010/P-9290 - System Certification Procedures and Criteria Manual for Deep Submergence Systems

LISTING OF APPENDICES.

- A SUBMEPP DSS HIP Inventory
- B SUBMEPP DSS HIP Schedule
- C Request for DSS HIP Periodicity Extension Format

38.1 PURPOSE. This chapter provides guidance and definition for the requirements, responsibilities and actions for Deep Submergence Systems (DSS) Hull Integrity Procedures (HIP) to continue certification for manned operations. The DSS HIP program is invoked on Dry Deck Shelter (DDS) certified under reference (a).

38.2 HULL INTEGRITY PROCEDURES MAINTENANCE SCHEDULING, PLANNING AND REPORTING.

38.2.1 Maintenance Requirements for Continued Certification. Reference (a) establishes the Maintenance Requirements and identifies the responsibilities and actions required to support continued unrestricted Submarine and DSS manned operations. In conjunction with reference (a), Naval Sea Systems Command (NAVSEA) has issued individual manuals containing required, periodic Scope of Certification (SOC) maintenance actions for each DSS. The DSS HIP procedures identify degradation of the material condition of the hull integrity boundary and of those systems affecting occupant safety. SOC certification indicates that a valid recommendation for continued manned operations can be made. Maintenance of certification is dependent on the positive control of all re-entries into the SOC boundaries per Volume V, Part III, Chapter 5 of this manual, the satisfactory and timely completion of applicable DSS HIP procedures as required by reference (a) and any necessary repairs. Accomplishment of the DSS HIPs specified with this program identify changes within the SOC boundary which result from inadvertent error or from degradation caused by the service environment.

38.2.2 Scheduling and Reporting. To enable the Type Commanders (TYCOM) to carry out their responsibilities in the maintenance of certification of DSSs and to aid in decisions concerning operational restrictions, an auditable system of scheduling the performance and reporting of DSS HIPs has been developed. This system provides visibility to problem areas, facilitates verification and provides a permanent record of DSS HIP accomplishment in the DSS's Maintenance and Material Management (3-M) machinery history maintained at the NAVSEA Logistics Center.

38.2.2.1 Dry Deck Shelter. Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity provides Periodic Maintenance Requirement (PMR) inventories and

schedules are used for scheduling and reporting. Appendices A and B of this chapter show examples of the SUBMEPP DSS HIP inventories and schedules respectively.

38.2.2.2 Submarine Maintenance Engineering, Planning and Procurement Activity Inventories and Schedules. The SUBMEPP inventories and schedules are provided at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm>.

38.2.3 Baseline and Due Dates. The baseline date for determining DSS HIP due dates is the Last Maintenance Action (LMA) date. LMA dates for new requirements will be based on the Change Issue Date of the DSS HIP invoking the new requirement unless otherwise directed from NAVSEA. Due dates are calculated based on LMA dates **per** paragraph 38.2.3.2 of this chapter. It is recognized that upkeep schedules for vehicles that are well into the operating cycle may not permit full compliance with the scheduled due dates. In such cases, a Departure From Specification (DFS) for the DSS HIP will be addressed on a case-by-case basis as specified in Volume V, Part I, Chapter 8 or Volume V, Part III, Chapter 8 of this manual. LMA dates and DSS HIP due dates are determined **in the following paragraphs**.

38.2.3.1 Last Maintenance Action Date. All DSS HIPs have an initial LMA date established at installation to start the operating cycle **following** the applicable DSS HIP manual. During the operating cycle, an adjusted LMA is used for DSS HIP. Calculate the adjusted LMA date as:

- a. If the HIP is accomplished during a period other than a scheduled Availability (e.g., voyage repair periods, at sea, port calls, Fleet Maintenance Activity (FMA) Availability, refit, upkeep, etc.) the adjusted LMA date will be the first of the month following the PMRs completion date.
- b. If the HIP is accomplished during a scheduled availability (e.g., Overhaul or Restricted Availability), the adjusted LMA date will be the first of the month following the scheduled availability's actual completion date.

38.2.3.2 Calculating Due Dates. Next due dates are calculated based on an adjusted LMA date. Due dates are calculated, for scheduling purposes, by taking the adjusted LMA date month (number) and adding the periodicity months (number) to show the month due (i.e., an item with an adjusted LMA date of February 2005 (2/05) with a six-month periodicity would be due in August 2005 (8/05)). The HIP will be accomplished prior to midnight of the last calendar day of the month due.

38.2.4 Periodicity Extensions. When determining the due date for certain DSS HIPs inspections, inactive time may be excluded from the time elapsed since the last inspection.

- a. Inactive Time for HIPs 001, 003, 004 and 005 is defined as days in which a DDS is in a Restricted Availability (RAV), Regular Overhaul (ROH), storage, or other non-operational period. The definition of Inactive Time for HIP 002 is limited to only the time during which a DDS is in an availability (e.g. RAV, ROH). The sustaining activity **must** submit a Minor, Temporary, Non-Precedent setting DFS to the TYCOM, via the ISIC, to request a periodicity extension for the subject DDS HIP based on inactive time alone. This DFS **must** be specific to the HIP items and portions that will exceed the required periodicity, and **must** include supporting OQE (Transfer of custody letters, Dive log records etc.) to account for the inactive time. TYCOM **must** approve this DFS as temporary, with a due date of the requested HIP periodicity extension, and the DFS **must** remain active until the SUBMEPP PMR Inventory for

the HIP is updated. Upon update of the SUBMEPP PMR Inventory for the HIP, the DFS can be cleared.

- b. General Periodicity Extensions: These authorization requests are for HIP periodicity extensions other than an Inactive Time Periodicity Extension of 1-9.d.1., and are generally due to technical or scheduling obstacles that prevent timely completion of a HIP. The sustaining activity **must** submit a Major, Temporary, Non-Precedent setting DFS to NAVSEA, via the ISIC and TYCOM, to request a periodicity change for the subject DSS HIP. This DFS **must** be specific to the HIP items and portions that cannot be or are not completed and **must** include rationale to support the requested change. This may include emergent operational needs, unavailability of material, incomplete integrity inspections, etc. The originator should provide supporting OQE (inspection and test reports accumulated, etc.). The originator will indicate when the HIP will be accomplished, propose any restrictions or limitations, and identify whether or not manned operations will be conducted between now and when the HIP inspection is accomplished. NAVSEA **must** approve this DFS, if appropriate, as temporary, with a due date of the requested HIP periodicity change, and the DFS **must** be active until the SUBMEPP PMR Inventory for the HIP is updated. Upon update of the SUBMEPP PMR Inventory for the HIP, the DFS can be cleared.

38.2.5 Scheduling, Planning and Reporting Hull Integrity Procedure Accomplishment at Sustaining Activity or Fleet Maintenance Activity Level.

38.2.5.1 Scheduling. The TYCOM PMR Scheduling System Inventories and Schedules are located at <https://ebusiness.submepp.navy.mil/eBusiness/index.cfm>. An inventories and schedules is to be provided to each applicable Unit Identification Code (UIC) by the ISIC. As a minimum, ISICs will schedule applicable DSS HIPs 60 days prior to scheduled availabilities.

38.2.5.2 Planning. FMA Planners will requisition materials, obtain plans and drawings, prepare Formal Work Packages or Controlled Work Packages and coordinate the scheduling with the Ship Superintendent, Production Officer and ISIC Material Office. Then the job will be turned over to the applicable Work Center for accomplishment.

38.2.5.3 Reporting. Each DSS HIP contains specific instructions on reporting the completed action and on use of a special feedback code to identify the material condition, or a change in inspection frequency is required. In order to ensure DSS HIPs are correctly accomplished and reported to SUBMEPP, the following actions are to be taken:

- a. Sustaining Activities completing DSS HIPs **must** provide a report of accomplishment to SUBMEPP via the ISIC.
- b. The Sustaining Activity **must** update the local inventory report and verify the completed HIPs are subsequently updated by SUBMEPP.

38.2.6 Scheduling, Planning and Reporting Hull Integrity Procedures Accomplishment During Regular Overhaul (ROH). Each DSS HIP contains specific instructions on reporting the completed action and on use of a special feedback code to identify the material condition, or a change in inspection frequency is required. In order to ensure DSS HIPs are correctly accomplished and reported to SUBMEPP, the following actions are to be taken.

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- a. The Availability Work Package (AWP) prepared by SUBMEPP will reflect all DSS HIPs authorized for accomplishment during the ROH at the AWP Ship Work List Item Number level.
- b. For DSS HIPs assigned to the depot, the ISIC will enter "Assigned to <depot name> by AWP <AWP number>" in the Remarks/Completion block of the DSS HIP Schedule/Inventory and in the local scheduling system.
- c. The Sustaining Activity will verify that all DSS HIPs assigned to the depot were reported and subsequently updated by SUBMEPP.

38.2.7 Scheduling, Planning and Reporting Hull Integrity Procedures Accomplishment During Restricted Availabilities (RAV). Each DSS HIP contains specific instructions on reporting the completed action and on use of a special feedback code to identify the material condition, or a change in inspection frequency is required. In order to ensure DSS HIPs are correctly accomplished and reported to SUBMEPP, the following actions are to be taken.

- a. Prior to each RAV, the Sustaining Activity **must** identify HIPs required to be accomplished during the availability and assign them to the responsible repair activity for accomplishment. Forward this list via formal correspondence to the ISIC.
- b. ISIC **must** review and verify these requests and forward to NAVSEA via the TYCOM.
- c. The Sustaining Activity will verify that all DSS HIPs assigned for completion during the RAV are reported to the ISIC and subsequently updated by SUBMEPP.

38.2.8 Deep Submergence System Hull Integrity Procedures Completion Reporting.

- a. Within 30 days after the completion of an availability or completion of a HIP outside an availability, the Sustaining Activity is required to provide a report of accomplishment to SUBMEPP and the DSS ISIC as well as other technical codes as designated in the DSS HIP. Specific information to be included in the report is identified in the applicable DSS HIP. The accomplishing activity or Sustaining Activity and ISIC **must** retain a legible copy of the most current inspection report until disposal of the DSS.
- b. Prior to Manned Operations, the DSS Sustaining Activity **must** submit a letter to SUBMEPP via the ISIC that certifies all required inspections have been satisfactorily completed.
- c. Upon identifying a material condition that would result in a reduced inspection periodicity if not restored to Category A condition during the availability in which the condition was found, a special report is required to be submitted by the accomplishing activity **following** the applicable DSS HIP and, if applicable, the AWP. This special report **must** be provided immediately to NAVSEA (PMS 399) (SEA 07Q), TYCOM, ISIC and SUBMEPP indicating:
 - (1) Applicable DSS HIP.
 - (2) Equipment component identification.
 - (3) Inspection category.

- (4) The reduced or deferred periodicity of each equipment component that should be inspected at less than its normal periodicity. This reduced periodicity report requirement is in addition to the completion reporting requirements.

38.3 RESPONSIBILITIES.

38.3.1 Type Commander.

- a. Perform periodic audits of the ISICs and FMAs to verify full compliance with the provisions of reference (a), Volume V, Part I, Chapter 9 of this manual and this chapter.
- b. Provide guidance to the ISICs, obtaining NAVSEA concurrence as necessary, when deviations in the scheduling or accomplishment of maintenance or repairs are required by a DFS request and resolution per Volume V, Part I, Chapter 8 and Part III, Chapter 8 of this manual.
- c. Review requests for HIP accomplishment as required per paragraph 38.2.6 of this chapter.

38.3.2 Submarine Maintenance Engineering, Planning and Procurement Activity.

- a. Receive reports of completion of DSS HIPs from all completing activities.
- b. Review completion reports for compliance with the scheduled periodicity requirements and any change in the status category.
- c. Establish an LMA date per paragraph 38.2.3.1 of this chapter.
- d. Revise the periodicity and next due dates in DSS HIP inventories and schedules to reflect any NAVSEA approved periodicity extension changes, or TYCOM approved periodicity extensions due to inactive time as allowed for in the individual DSS HIP and paragraph 38.2.4 for this chapter.
- e. Notify the TYCOM via the on-site SUBMEPP Representative of any DSS HIP beyond periodicity for TYCOM resolution.
- f. Provide updated DSS HIP inventories and schedules **following** the distribution.
- g. Quarterly, provide a list of DSS HIPs that appear overdue in the schedules and a list of DSS HIPs that have been reported complete by the fleet but Objective Quality Evidence has not been received by SUBMEPP.
- h. Receive and review DSS HIP Objective Quality Evidence for technical accuracy and maintain DSS HIP completion history.

38.3.3 Immediate Superior In Command.

- a. Maintain auditable records of DSS HIP accomplishment for each DSS. These records will include the current SUBMEPP Quarterly inventories and schedules, DSS HIPs completed and data report forms **or** reports submitted as a result of last accomplishment and all approved DFSs.
- b. Conduct periodic audits of assigned FMAs and Sustaining Activities to verify full compliance with the provisions of reference (a), Volume V, Part I, Chapter 9 and Part III, Chapter 9 of this manual and this chapter.

- c. In addition to the records of audits, maintain a file, by DSS, of the current DSS HIP inventories and schedules as provided by SUBMEPP. The schedules (Appendix B of this chapter) for each DSS **must** be annotated with the new adjusted LMA date and the next due dates for the completions and any periodicity extensions authorized.
- d. Although the responsibility for the accomplishment of DSS HIPs must rest with the DSS Commanding Officer, the nature and scope of the DSS HIPs dictate that the ISIC coordinate the accomplishment of DSS HIPs **following** the SUBMEPP provided inventories and schedules. Accordingly, the ISIC **must** assist in the preparation of, and approve each DSS HIP performance schedule. In addition, the ISIC **must**:
 - (1) Unless previously notified by SUBMEPP of delays, notify the SUBMEPP Representative and TYCOM of the non-receipt of schedules and reports.
 - (2) Upon printing, review each vehicle's quarterly DSS HIP inventory and schedule against the schedule information on the individual DSS HIP to verify DSS HIP scheduling **or** periodicity is accurate and that any rescheduling data which has been submitted to SUBMEPP has been accurately incorporated. HIPs accomplished during the month preceding the quarterly report may or may not be reflected in the issue received. Similarly, upon receipt of DSS HIP changes, audit the individual DSS HIP procedural and schedule information against each DSS's HIP inventory and schedule to verify that the component **or** equipment and periodicity has not changed and that provided changes do not impact current schedules. Resolve identified deficiencies through the SUBMEPP Representative at TYCOM.
 - (3) Review the enclosures to the HIP procedural inventories and the schedule forwarding letter and advise SUBMEPP of the completion dates and JSNs for DSS HIPs listed. Forward copies of completed Data Report Forms for these and any other DSS HIP completions identified by SUBMEPP as having missing Data Report Forms.
- e. Ensure that all DSS HIP requirements with the appropriate screening (Ship's Force, FMA) are in the CSMP for subsequent development by SUBMEPP of forthcoming availability AWP.
- f. In the event that deviations from required periodicities or full requirements of the DSS HIPs are required, request approval from the Program Manager with Sustaining Certification Authority (SCA) concurrence by submitting a DFS request **per** Volume V, Part III, Chapter 8 of this manual. Such DFS requests will be a Major DFS for DSS HIP program deviations. DFS requests are also to be submitted when repairs arising from the DSS HIP inspections cannot be completely accomplished. Periodicity extension requests for all DSS HIPs **must** be submitted **per** paragraph 38.2.4 of this chapter.
- g. Establish procedures to affect routing of completed DSS HIP transactions. The ISIC should ensure proper documentation has been completed as described in the special reporting procedures of the HIPs. This must include the material condition feedback code as part of the final action, if required. Upon receipt of the report of maintenance action accomplishment from an assigned unit or the FMA, review the report for

completeness, consistency, acceptability of conditions and material trends. Where unsatisfactory conditions are found, direct repairs. Where repairs cannot be made, submit a DFS **per** Volume V, Part I, Chapter 8 and Part III, Chapter 8 of this manual. Ensure SUBMEPP inventories and schedules are updated **per** paragraph 38.3.3.c of this chapter. Clear DSS HIP major DFS upon TYCOM or NAVSEA approval and upon receipt of the SUBMEPP Quarterly PMR inventories and schedules, and ensure they accurately reflect the new due date of the DSS HIP as stated in the approved DFS.

- h. Upon identifying a material condition that would result in a reduced inspection periodicity, ensure the accomplishing activity immediately reports the condition found via official correspondence to NAVSEA (PMS 399), the TYCOM and SUBMEPP **per** paragraph 38.2.7.c of this chapter.
- i. Monitor the timely submission of DSS HIP data report forms and the report of accomplishment for DSS HIPs completed by the FMA, Sustaining Activity or industrial activity, as applicable, to ensure required documentation is submitted **per** paragraph 38.2.7 of this chapter. Ensure data report forms are submitted to report component replacement, repair **or** operation out of specification. Review all Sustaining Activity accomplished DSS HIP data for compliance with the requirements of the DSS HIP Program prior to submittal to SUBMEPP.
- j. Prior to a DSS's underway period, review the vehicle's certification continuity report, if submitted, to ensure the ISIC and DSS's records (including the CSMP) accurately reflect DSS HIP status.
- k. The Parent ISIC of deploying ships will ensure that any DSS HIP due for accomplishment by the ship **or** DSS during its deployment period is identified in the transfer of custody message and that the ship possesses the DSS HIP data report forms (if applicable) for reporting job completion.
- l. Deployed Squadrons will review the DSS HIP status of deployed DSSs upon in-chop. Perform the function of the Parent ISIC in ensuring all DSS HIPs are accomplished and reported within the required periodicity while the DSS is deployed.
- m. Prior to the start of an availability, ISIC DSS HIP coordinators will:
 - (1) Assign Job Control Numbers to DSS HIP items assigned to Forces Afloat in the AWP and screen them prior to the start of the availability **following** the directions in the AWP. Care must be taken to appropriately assign DSS HIP items to the correct accomplishing activity.
 - (2) ISIC DSS HIP coordinators will not assign Job Control Numbers to DSS HIP items assigned to the industrial activity in the AWP. The industrial activity is responsible for performing, auditing and reporting all DSS HIP items assigned by the AWP.
 - (3) DSS HIPs assigned to Forces Afloat by the AWP for accomplishment prior to the start of the depot period, but for some reason were not completed, will be reassigned to a concurrent availability or formally reassigned to the industrial activity via a supplemental work request.

- n. DSS HIPs assigned to the industrial activity by the AWP which are not accomplished during the depot period will be reassigned to another availability by NAVSEA (PMS399) following the depot period provided the DSS HIP does not exceed its due date. The ISIC will be notified of this reassignment by formal correspondence which will include justification and reason why the scheduled and planned requirements were not met.
- o. Prior to availability completion, ISICs will audit DSS HIPs assigned to Forces Afloat by the AWP and ensure all have been satisfactorily completed and documented within the required periodicity. The ISIC audit will also verify that all DSS HIP items coming due within six months of availability completion are complete or assigned to a follow-on fleet availability. Under no circumstances are DSS HIP due dates to be exceeded. ISIC Quality Assurance Officers will not be responsible for auditing DSS HIPs assigned to the depot in the AWP.
- p. Following availability completion, the ISIC DSS HIP coordinator will ensure that all DSS HIPs assigned to the industrial activity were reported and subsequently updated by SUBMEPP.

38.3.4 Deep Submergence System Commanding Officer.

- a. Ensure all DSS HIPs are accomplished within the required periodicity as specified by SUBMEPP.
- b. Maintain auditable records of the accomplishment of DSS HIPs to permit verification of compliance with reference (a), Volume V, Part I, Chapter 10 and Part III, Chapter 10 of this manual and this chapter. These records **must** consist of:
 - (1) Copies of letters of completion and inspection reports for all DSS HIP work accomplished by all activities. The required data forms are located in the individual DSS HIPs. A copy of each completed report **must** be submitted to the ISIC for review a minimum of 24 hours prior to manned operations.
 - (2) One copy each of the current Quarterly DSS HIP inventories and schedules provided by SUBMEPP. Annotate the DSS HIP Inventory Report when accepting completed work requests from the FMA or Ship's Force (LWC 991). It is the DSS responsibility for ensuring that the reports reflect the actual configuration, especially with regards to the equipment identity and the Allowance Parts List.
 - (3) Copy of outstanding DSS HIPs to be accomplished by Ship's Force.
 - (4) One copy of each approved DFS from the requirements of reference (a), Volume V, Part I, Chapter 8 and Part III, Chapter 8 of this manual and this chapter. This authority is based on the following factors and considerations:
 - (a) The completion of all DSS HIPs, or portions thereof, will be reported by the ISIC **per** paragraph 38.2.5.3 of this chapter. Particular care must be exercised to ensure that existing conditions found at the time of inspection or need for repair or replacement of components is recorded in detail as prescribed by the DSS HIP.

- (b) Deviations from DSS HIP requirements or periodicities may result in operational restrictions being placed on a unit. In order to determine whether such restrictions are necessary, the TYCOM must be fully apprised of the number and extent of deviations involved.
- (c) Allow no deviations in the scheduling or accomplishment of required DSS HIP maintenance actions unless formal NAVSEA approval of such deviations has been granted by an approved DFS or as allowed in paragraph 38.2.4 of this chapter. All system disassemblies, repairs, and reassemblies must be conducted **per** Volume V of this manual, including requests for a DFS, if necessary.
- (d) Except in an emergency, refrain from manned operations if all required DSS HIP maintenance actions have not been completed within the specified periodicities unless formal authorization to deviate from these requirements has been granted by NAVSEA. NAVSEA recommendation and TYCOM authority to conduct manned operations are contingent upon the satisfactory completion of these maintenance actions.

APPENDIX A

SUBMEPP DSS HIP INVENTORY

FOR OFFICIAL USE ONLY

PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO/HIP SORTED BY URO/HIP

REPORT DATE: 01 Nov 2005

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

SDVT-2

SHIP'S UIC: 59603

COMPID	LINE ITEM	COMP SERIAL	MJC NO MJFCN	PROC TYPE	MID NO	MRN	R M D L D	LAST WRK CTR JSN URO ITEM	M C C	LMA DATE	DUE DATE	PER	ALT	JSN	REMARKS/COMPLETION INFO DATE
<u>SYSTEM: 1310 PRESSURE HULL</u>															
ITEM-01 596003AP01	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-02 596003AP02	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-03 596003AP03	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-04 596003AP04	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-05 596003AP05	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-06 596003AP06	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-07 596003AP07	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-08 596003AP08	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-09 596003AP09	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-10 596003AP10	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901
ITEM-11 596003AP11	XCONFIGITEM		PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M			1310 270137 L901

FOR OFFICIAL USE ONLY

URO/HIP INVENTORY BY URO/HIP PAGE: 1 DDS 03P

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APPENDIX A

FOR OFFICIAL USE ONLY

PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO/HIP SORTED BY URO/HIP

REPORT DATE: 01 Nov 2005

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

SDVT-2

SHIP'S UIC: 59603

COMPID	LINE ITEM	COMP SERIAL	MJC NO MJFCN	PROC TYPE	MID NO	MRN	R M D L D	LAST WRK CTR JSN URO ITEM	M C C	LMA DATE	DUE DATE	PER	ALT	REMARKS/COMPLETION INFO JSN DATE
SYSTEM: 1310 PRESSURE HULL (Cont'd)														
ITEM-12			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP12	XCONFIGITEM													
ITEM-13			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP13	XCONFIGITEM													
ITEM-14			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP14	XCONFIGITEM													
ITEM-15			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP15	XCONFIGITEM													
ITEM-16			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP16	XCONFIGITEM													
ITEM-17			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP17	XCONFIGITEM													
ITEM-18			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP18	XCONFIGITEM													
ITEM-19			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP19	XCONFIGITEM													
ITEM-20			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP20	XCONFIGITEM													
ITEM-21			PENDING	HIP	001		D		X	Dec 2002	Dec 2009	84M		1310 270137 L901
596003AP21	XCONFIGITEM													

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URO/HIP INVENTORY BY URO/HIP PAGE: 2 DDS 03P

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PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO/HIP SORTED BY URO/HIP

REPORT DATE 01 Nov 2005

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

SDVT-2

SHIP'S UIC: 59603

<u>COMPID</u>	<u>LINE</u> <u>ITEM</u>	<u>COMP</u> <u>SERIAL</u>	<u>MJC NO</u> <u>MJFCN</u>	<u>PROC</u> <u>TYPE</u>	<u>MID</u> <u>NO</u>	<u>MRN</u>	<u>R</u> <u>M D</u> <u>L D</u>	<u>LAST WRK</u> <u>CTR JSN</u>	<u>M</u> <u>C</u> <u>C</u>	<u>LMA</u> <u>DATE</u>	<u>DUE</u> <u>DATE</u>	<u>PER</u>	<u>ALT</u>	<u>JSN</u>	<u>REMARKS/COMPLETION INFO</u> <u>DATE</u>
<u>HSC</u>	<u>RIC</u>							<u>URO ITEM</u>							
<u>SYSTEM: 1110 SUPERSTRUCTURE AND FAIRWATER</u>															
AFTSUPSTRUCT			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1110 270900 L902</u>
596003AM02	XCONFIGITEM														
FWD MOUNT RG			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1110 270900 L902</u>
596003AM04	XCONFIGITEM														
ATTSTUDS&WLD			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1110 270900 L902</u>
596003AM06	XCONFIGITEM														
FRG MEM&WLD			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1110 270900 L902</u>
596003AM10	XCONFIGITEM														
EXT FOUND			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1110 270900 L902</u>
596003AM12	XCONFIGITEM														
<u>SYSTEM: 1310 PRESSURE HULL</u>															
HANGAR CYL			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1310 270163 L902</u>
596003AG02	XCONFIGITEM														
ACC SPHERE			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1310 270163 L902</u>
596003AG04	XCONFIGITEM														
ACC SPH SKRT			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1310 270163 L902</u>
596003AG06	XCONFIGITEM														
HYPER CHAMBR			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1310 270163 L902</u>
596003AG08	XCONFIGITEM														
FR FLANGES			PENDING	HIP	002		D		X	Jan 2003	Jan 2007	48M			<u>1310 270163 L902</u>
596003AJ02	XCONFIGITEM														

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URO/HIP INVENTORY BY URO/HIP PAGE: 3 DDS 03P

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PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO / HIP SORTED BY URO / HIP

REPORT DATE: 01 Nov 2005

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

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SHIP'S UIC. 59603

COMPID	LINE ITEM	COMP SERIAL	MJC NO	PROC TYPE	MID NO	MRN	R M L D	LAST WRK CTR JSN	M C LMA C DATE	DUE DATE	PER	ALT	JSN	REMARKS/COMPLETION INFO DATE
HSC	RIC		MJFCN					URO ITEM						
<u>SYSTEM: 1310 PRESSURE HULL (Cont'd)</u>														
FR WEBS			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1310 270163 L902
596003AJ04	XCONFIGITEM													
ATT RNGS&WLD			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1310 270163 L902
596003AM08	XCONFIGITEM													
INS&PEN EXT			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1310 270163 L902
596003AM16	XCONFIGITEM													
INS&PEN INT			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1310 270163 L902
596003AS04	XCONFIGITEM													
<u>SYSTEM: 1700 WATERTIGHT HATCHES (PRESSURE HULL), TRUNKS AND ENCLOSURES</u>														
EXT HNG DOOR			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1700 270480 L902
596003BG08	312110266Y													
<u>SYSTEM: 1770 INTERNAL STRUCTURAL BULKHEADS</u>														
HYP CHMBR DR			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1770 270540 L902
596003BG04	312110258Y													
INR HNG DOOR			PENDING	HIP	002		D		X Jan 2003	Jan 2007	48M			1770 270540 L902
596003BG06	312110258Y													

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APPENDIX A

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PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO/HIP SORTED BY URO/HIP

REPORT DATE 01 Nov 2005

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

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SHIP'S UIC: 59603

<u>COMPID</u>	<u>LINE</u> <u>ITEM</u>	<u>COMP</u> <u>SERIAL</u>	<u>MJC NO</u> <u>MJFCN</u>	<u>PROC</u> <u>TYPE</u>	<u>MID</u> <u>NO</u>	<u>MRN</u>	<u>R</u> <u>M D</u> <u>L D</u>	<u>LAST WRK</u> <u>CTR JSN</u> <u>URO ITEM</u>	<u>M</u> <u>C</u> <u>C</u>	<u>LMA</u> <u>DATE</u>	<u>DUE</u> <u>DATE</u>	<u>PER</u>	<u>ALT</u>	<u>JSN</u>	<u>REMARKS/COMPLETION INFO</u> <u>DATE</u>
<u>SYSTEM: 5081 FLOOD, VENT & DRAIN</u>															
SHD-001			PENDING	HIP	003		I		X	Dec 2002	Dec 2009	84M/R			5081 444340 L903
5960D3MU10	887306276Y														R=F16Accomplish whenever the valve is removed for other reasons.
SHF-001			PENDING	HIP	003		I		X	Dec 2002	Dec 2009	84M/R			5081 440015 L903
596003MV10	887305590Y														R=F16Accomplish whenever the valve is removed for other reasons.
SHF-002			PENDING	HIP	003		I		X	Dec 2002	Dec 2009	84M/R			5081 440015 L903
596003MV20	887306272Y														R=F16Accomplish whenever the valve is removed for other reasons.
SHA-029			PENDING	HIP	003		I			Dec 2002	Dec 2009	84M/R			5081 440015 L903
596003PU29	887306275Y														R=F16Accomplish whenever the valve is removed for other reasons.

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URO/HIP INVENTORY BY URO/HIP PAGE: 5 DDS 03P

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APPENDIX A

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PERIODIC MAINTENANCE REQUIREMENTS REPORT DATE: 01 Nov 2005
INVENTORY URO/HIP SORTED BY URO/HIP

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

SDVT-2

SHIP'S UIC: 59603

<u>COMPID</u>	<u>LINE</u> <u>ITEM</u>	<u>COMP</u> <u>SERIAL</u>	<u>MJC NO</u> <u>MJFCN</u>	<u>PROC</u> <u>TYPE</u>	<u>MID</u> <u>NO</u>	<u>MRN</u>	<u>R</u> <u>M D</u> <u>L D</u>	<u>LAST WRK</u> <u>CTR JSN</u> <u>URO ITEM</u>	<u>M</u> <u>C</u> <u>C</u>	<u>LMA</u> <u>DATE</u>	<u>DUE</u> <u>DATE</u>	<u>PER</u>	<u>ALT</u>	<u>JSN</u>	<u>REMARKS/COMPLETION INFO</u> <u>DATE</u>
<u>SYSTEM: 0611 AUDITS AND CERTIFICATION</u>															

VITAL EQUIP			PENDING	HIP	004		0			May 2002	May 2006	48M/R			<u>0611 603040 1 904</u>
596003AD02	XCONFIGITEM														R=N97 Accomplish after each ROH, or after installation or other configuration change which adds equipment or significantly changes existing design.

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PERIODIC MAINTENANCE REQUIREMENTS
INVENTORY URO/HIP SORTED BY URO/HIP

01 Nov 2005

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

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SHIP'S UIC: 59603

<u>COMPID</u>	<u>LINE ITEM</u>	<u>COMP SERIAL</u>	<u>MJC NO MJFCN</u>	<u>PROC TYPE</u>	<u>MID NO</u>	<u>MRN</u>	<u>R M D L D</u>	<u>LAST WRK CTR JSN URO ITEM</u>	<u>M C C</u>	<u>LMA DATE</u>	<u>DUE DATE</u>	<u>PER</u>	<u>ALT</u>	<u>JSN</u>	<u>REMARKS/COMPLETION INFO DATE</u>
<u>SYSTEM: 5081 FLOOD, VENT & DRAIN</u>															
SHF-001			PENDING	HIP	005		D		A	Dec 2002	Dec 2009	84M			5081 440015 L905
596003MV10	887305590Y														
SHF-002			PENDING	HIP	005		D		A	Dec 2002	Dec 2009	84M			5081 440015 L905
596003MV20	887306272Y														

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URO/HIP INVENTORY BY URO/HIP PAGE: 7 DDS 03P

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APPENDIX A

APPENDIX B
SUBMEPP DSS HIP SCHEDULE

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PERIODIC MAINTENANCE REQUIREMENTS
SCHEDULED URO/HIP

REPORT DATE: 01 Nov 2005
CUTOFF DATE: 01 Aug 2006

HIP CHANGE: 39 Sep 2005

DRY DECK SHELTER 03P DDS 03P

SDVT-2

SHIP'S UIC: 59603

COMPID	LINE ITEM	COMP SERIAL	MJC NO	PROC TYPE	MID NO	MRN	R M D L D	LAST WRK CTR JSN	M C LMA C DATE	DUE DATE	PER	ALT	JSN	REMARKS/COMPLETION INFO DATE
HSC	RIC		MJFC					URO ITEM						
SYSTEM: 0611 AUDITS AND CERTIFICATION														
VITAL EQUIP			PENDING	HIP	004		0		May 2002	May 2006	48M/R			0611 803040 L904
596003AD02	XCONFIGITEM								R=N97 Accomplish after each ROH, or after installation or other configuration change which adds equipment or significantly changes existing design.					

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URO/HIP SCHEDULE PAGE: 1 DDS 03P

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APPENDIX B

APPENDIX C

REQUEST FOR DSS HIP PERIODICITY EXTENSION FORMAT

4790

Ser

From: Commander, DSS Squadron ____

To: Commanding Officer, Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity

Via: COMNAVSPECWARCOM

Subj: REQUEST FOR EXTENSION OF PERIODICITY FOR DSS HIP (S)_____ON
DSS Vehicle **or** Shelter and Hull No.)

Ref: (a) Applicable DSS HIP

(b) COMUSFLTFORCOMINST 4790.3; Joint Fleet Maintenance Manual, Volume VI, Chapter 38

(c) COMNAVSPECWARCOM ltr 4790 Ser ____ of (previous letter granting extension of periodicity)

1. **Per** references (a) and (b), request extension of DSS HIP periodicity for Deep Submergence System (Vehicle **or** Shelter and Hull No.) as:

DSS HIP	Equipment Guide List Item Number or Component Ident	LMA Date	Current Due Date	Inactive Time		Extension Required	Required Next Due Date
					Inactive Days		
001	All	June 82	Apr 91		100 days	7 months	Nov 91
002	All	June 82	Aug 91		100 days	3 months	Nov 91
003	All	June 82	Aug 91		100 days	3 months	Nov 91
004	All	June 84	Apr 91		100 days	7 months	Nov 91
005	VB-10	June 84	Apr 91		100 days	7 months	Nov 91

2. Inactive time identified for the DSS HIPs listed in paragraph 1 is the actual allowable time accrued to date since DSS HIP was last accomplished **or** previous extension of periodicity was granted by reference (c).

Copy to:

COMNAVSEASYS COM (PMS 399)

Commanding Officer, _____

VOLUME VI**CHAPTER 39****MAINTENANCE AND MODERNIZATION PERFORMANCE REVIEW
AND LESSONS LEARNED CONFERENCE
FOR SURFACE FORCE SHIPS****LISTING OF APPENDICES.**

- A Access to Lessons Learned Conference and MMPR Sites on the ST1 Portal

39.1 PURPOSE.

- a. The Maintenance and Modernization Performance Review (MMPR) is a semi-annual forum for maintenance and modernization professionals to share, identify issues and focus on continuous process improvement opportunities within the Surface Maintenance and Modernization Community. The MMPR provides a path for communication between the individual Project and Ship Lessons Learned Conferences (LLC) and the top-level maintenance and modernization leadership.
- b. The primary purpose of the LLC is to facilitate communication between Project Teams of all Surface Force ship classes across all Regional Maintenance Centers (RMC) and supporting activities at various stages in their availability to assist in improving cost, schedule and performance. The LLCs provide a singled-up approach to evaluate and capture critical lessons learned and barriers brought forward by Project Teams to facilitate process improvements in the Surface Navy.
- c. The LLC process encompasses the established milestones and meetings within the planning and execution of availabilities per Volume II, Part II, Chapter 2 of this manual. Appendix D of Volume II, Part II, Chapter 2 of this manual includes a detailed table of milestones. Meetings that already exist to reinforce process improvements may include the Advance Planning Meeting, Work Package Integration Conference, Work Package Execution Review, Arrival Conference, 50% Conference and Completion Conference. While these events occur at various times, the feedback process exists to continually collect information to improve processes.

39.2 MAINTENANCE AND MODERNIZATION PERFORMANCE REVIEW OVERVIEW.

39.2.1 MMPR Objective. The MMPR topics will be relevant to process improvements for future availabilities and may include ship class or port specific process issues, best practices, success stories, industry feedback, technical issues, Surface Team One (ST1) initiatives and new developments and Fiscal Year Availabilities.

39.2.2 MMPR Key Membership.

- a. Commander, Naval Surface Forces Atlantic N43 is the Process Master and responsible for managing and coordinating the MMPR.
- b. Nearly all commands linked to the Surface Ship Maintenance and Modernization Community participate in the MMPR. These commands include Commander, Navy Regional Maintenance Center, RMCs, Naval Sea Systems Command (NAVSEA) 21,

16 Oct 2019

Type Commanders (TYCOM), Surface Maintenance Engineering Planning Program (SURFMEPP), Planning Yards, Private Sector Industrial Activity Contracting Partners, Ship's Force (Commanding Officers through Department Heads), Fleet, SEA04, SEA05, Space and Naval Warfare Systems Command, Program Executive Officer Integrated Work Schedule and Office of the Chief of Naval Operations N43. At a minimum, the following organizations will be invited to attend all MMPRs:

- (1) Commander, Navy Regional Maintenance Center.
 - (2) RMCs Southeast Regional Maintenance Center (SERMC), Southwest Regional Maintenance Center (SWRMC), Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF), Northwest Regional Maintenance Center (NWRMC), Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY & IMF), Hawaii Regional Maintenance Center (HRMC), Mid-Atlantic Regional Maintenance Center (MARMC), Forward Deployed Regional Maintenance Center (FDRMC), Ship Repair Facility (SRF)-Japan).
 - (3) Commander, Naval Surface Forces Atlantic.
 - (4) Commander, Naval Surface Forces Pacific.
 - (5) NAVSEA21.
 - (6) SURFMEPP.
 - (7) Ship's Force.
 - (8) United States Fleet Forces Command.
 - (9) Commander, U.S. Pacific Fleet.
 - (10) Industry Partners.
 - (11) Space and Naval Warfare Systems Command.
 - (12) Naval Surface Warfare Center (Philadelphia, Port Hueneme, Corona).
 - (13) NAVSEA04.
 - (14) NAVSEA05.
 - (15) Program Executive Officer Integrated Work Schedule.
- c. **MMPR Planning Team.** The MMPR Planning Team will be chaired by the ST1 Executive Steering Committee (ESC). MMPR planning meetings will be conducted on a monthly basis preceding a scheduled MMPR. The objective of these meetings is to develop the agenda and ensure any information from ST1 priority topics is included.

39.2.3 **MMPR Action Items.** All action items resulting from an MMPR meeting will be tracked by ST1 and documented and tracked on the ST1 Portal with Lessons Learned Conference Action Items and barriers. Documents from the MMPR will be posted to the MMPR site under the ST1 Portal. Instructions on gaining access to the ST1 Portal are located in Appendix A.

39.2.4 **Further Guidance.** Further guidance regarding the MMPR process is outlined in the MMPR Business Rules.

39.3 LESSONS LEARNED CONFERENCE OVERVIEW.

39.3.1 Lessons Learned Conference Concept. The LLC is not a program review, an evaluation of the Maintenance Team (government or contractor) or a forum to acknowledge heroism or place blame. It is a process review, an evaluation of the execution of the availability from the advance planning to the completion of the availability. It is also a place to identify process issues that can further improve overall end-to-end maintenance and modernization process.

39.3.2 Lessons Learned Conference Objective. The objective of the LLC is to increase in-depth cross-Project Team discussions of common issues and to include risk mitigation strategies and best practices. Feedback will be shared locally and globally in the surface force ship community and will ultimately be embedded into the maintenance and modernization processes.

39.3.3 Lessons Learned Conference Key Membership.

- a. Process Owner. Commander, Naval Surface Forces Atlantic N43 and Commander, Naval Surface Forces Pacific N43 are the overall LLC process owners. As such, Commander, Naval Surface Forces Atlantic N43 and Commander, Naval Surface Forces Pacific N43 are responsible for the general management of implementing the LLC process to ensure process effectiveness. While the TYCOMs are the LLC Process Owners, the LLCs are part of the ST1 structure as a “Knowledge Sharing Network”. Each Knowledge Sharing Network under ST1 is assigned a Process Master; the LLC Process Master will be identified by the Process Owners.
- b. RMC LLC Analysis Team. Each RMC must have a designated LLC Analysis Team Coordinator and a designated LLC Analysis Team Waterfront Operations Representative on the Analysis Team. Some RMCs may choose to have the Coordinator and Waterfront Operations Representative to be one and the same due to the time requirements demanded of an Analysis Team Member.
 - (1) The LLC Analysis Team Coordinator is responsible for the coordination and facilitation of their local RMC’s scheduled LLCs. This person serves as the liaison between the Project Teams and the global LLC Community. Further guidance regarding the RMC LLC Coordinator’s responsibilities are outlined in the LLC Analysis Team Business Rules.
 - (2) The LLC Analysis Team RMC Waterfront Operations Representative is responsible for providing the Waterfront expertise and knowledge for their local RMC to the Analysis Team. This person serves as the liaison between his or her RMC’s waterfront and the global LLC Community. Further guidance for the roles and responsibilities of the local RMC LLC Analysis Team Member in completing the LLC Waterfront Perspectives Questionnaire is contained in the LLC Analysis Team Business Rules.

NOTE: WHILE THE LLC ANALYSIS TEAM MEMBER POSSESSES MANY RESPONSIBILITIES AS THE LLC MEETING FACILITATOR, HE OR SHE SHOULD EXPECT TO RECEIVE ASSISTANCE FROM ALL STAKEHOLDERS.

- c. RMC Availability Project Manager (PM). The RMC PM is responsible for preparing and briefing their ship’s Chief of Naval Operations Availability based on the

Waterfront Perspectives Questionnaire they provided answers **and** comments on. The RMC PM will capture all lessons learned, action items and barriers deemed necessary to be communicated to the Surface Maintenance and Modernization Community.

- d. Maintenance Community. Other maintenance activities involved with ship availabilities (in addition to those highlighted in preceding paragraphs) will participate in the LLC. These representatives are active members of the LLC Community and are responsible for maintaining awareness of availability issues and participating in the topic specific LLCs. The following participants are mandatory:
 - (1) TYCOM N43 Type Desk Office.
 - (2) TYCOM Project Engineer.
 - (3) Immediate Superior In Command.
 - (4) Ship's Force Representative.
 - (5) Private Sector Industrial Activity **or** Firm Fixed Price Contractor.
 - (6) SURFMEPP Detachment Representative.
 - (7) **Government Availability Planning Manager (GAPM).**
- e. Modernization Community. Representatives of any Alteration Installation Team or other non-repair activity involved with availabilities will participate in the availability LLC meetings as appropriate:
 - (1) NAVSEA 21.
 - (2) Field Activities.
 - (3) Space and Naval Warfare Systems Command.
 - (4) Program Manager Representative.
 - (5) Planning Yard Representative.

39.4 PREPARING FOR THE LESSONS LEARNED CONFERENCE.

39.4.1 Preparation. To adequately prepare for an LLC, Project Teams should review any lessons learned and barriers that they feel will be beneficial to other Project Teams throughout their Planning and Execution phases regarding the topic of the LLC. All Project Teams will be first introduced to the LLC Process during their first scheduled Integrated Project Team Development Event **following** the milestones listed in Volume II, Part II, Chapter 2, Appendix D of this manual by their local RMC LLC Analysis Team Coordinator **or** Waterfront Operations Representative.

39.4.2 Lessons Learned Conference Presentation Overview. The LLC Availability Overview Presentation serves as the format for the Project Teams to articulate key lessons learned and barriers encountered during their Availability Cycle. The LLC Waterfront Perspective Questionnaire template is available through the RMC Analysis Team Member. However, it will be tailored to each LLC Topic. Throughout the planning stages and execution of the availability, Maintenance Team members, **other RMC personnel including the GAPM**, Ship's Force, contractor, Alteration Installation Teams and other key availability stakeholders **must** assist the RMC PM in submission of the LLC presentation. Input should also be gathered from:

- a. Ship's Commanding Officer's Weekly Situation Reports.
- b. Standard metrics identifying top cost drivers.
- c. Late add alteration risk assessment messages (including comparison of expected versus actual impact to the availability).
- d. Late add alteration risk acceptance.
- e. Waivers for work added after the late add impact assessment as dictated by the milestones listed in Volume II, Part II, Chapter 2, Appendix D of this manual (including impact to availability).
- f. Cost variance forms provided by contractor.
- g. A review of contract changes to the base work package.

39.5 CONDUCTING A LESSONS LEARNED CONFERENCE.

39.5.1 Lessons Learned Conference Schedule. LLCs are scheduled as topics are identified for inclusion in the LLC process. Required LLC Project Teams are determined based on their applicability to the selected topic.

39.5.2 Agenda. The primary focus of the meeting is to discuss lessons learned, best practices and barriers pertaining to the specific topic. An agenda for all scheduled LLCs will be forwarded to all participants by the ST1 LLC Process Master, RMC LLC Analysis Team Coordinator. The agenda will also be available on the LLC site on the ST1 Portal: <https://usff.navy.deps.mil/sites/surflant/st1/default.aspx..>

39.5.3 Lessons Learned Conference Focus Areas. Surface Force Ships are required to participate in LLCs to promote synergy toward the identification and resolution of common availability issues. Topics of a LLC can be identified by any member of the Surface Ship Maintenance and Modernization Team. The topic specific LLC will bring together people from around the enterprise to share lessons learned on issues that are affecting the ability of project teams to complete availabilities on time or are constant drivers of growth and new work.

39.5.4 Invitees. Key membership and project team personnel involved with the availability, including the TYCOM, will be notified of the LLC meeting by the ST1 LLC Process Master, the RMC LLC Analysis Team Coordinator or the Class Team Leader. Key stakeholders involved with future availabilities will also be invited to attend the meeting.

39.5.5 Invites and Announcement. The RMC LLC Analysis Team Coordinator will review the scheduled LLCs on no less than a monthly basis. The schedule will include an agenda of upcoming LLCs based on topic relevance. The RMC Analysis Team Coordinators will recommend and designate the specific ship Project Teams to present at upcoming LLCs.

39.5.6 Lessons Learned Conference Documents. All LLC documentation will follow the LLC Analysis Team Communications Plan. Requirements for documents will also be discussed during the weekly LLC Telecoms.

39.5.7 Lessons Learned Conference Minutes. All participants, action items and barriers will be documented in minutes (KMail), following each LLC. The KMail will be forwarded no later than five business days to all invitees, ST1 ESC and RMC Commanders. The minutes will also be posted on the LLC site on the ST1 Portal.

39.5.8 Lessons Learned Conference Web Site. LLC process meeting documents and information **must** be posted on the LLC site on the ST1 Portal. This site tracks all scheduled LLCs throughout the calendar year, all meeting preparation materials to include necessary read-ahead material for participants, Project Team Point of Contact Lists and approved KMail. The site should be used to aid in planning work packages and preparing for availabilities to ensure that any barriers and lessons learned identified by previous LLC Project Teams are applied to future availabilities. The site is located at <https://usff.navy.deps.mil/sites/surflant/st1/default.aspx>. See Appendix A for instructions on obtaining access.

39.6 INTERACTION AMONG FEEDBACK PROCESSES.

39.6.1 Relationships. The LLC meeting is sensitive to the contractor-government relationship and the legal procedures that accompany it. The Department of the Navy Acquisition Reform strategy includes a goal to “build a continuous dialogue with industry to identify mutually beneficial opportunities and practices”. While the Department of the Navy encourages open communication between the contractor and the government, many legal issues arise from such information sharing. It is critical that the LLC meetings and general processes maintain awareness of the following legal procedures: Federal Advisory Committee Act, Procurement Integrity Act, Trade Secrets Act and Organizational Conflicts of Interest. Additionally, the LLC process is mindful of other feedback **and** review processes, such as the Award Fee Board and Contractor Performance Assessment Report.

39.6.2 Consistency. These business rules recognize the need for consistency between other feedback processes and the need for all to exist. As the LLCs will most likely occur prior to the Award Fee Board and the Contractor Performance Assessment Reports issuance, sensitive issues may arise. The LLCs intend to remain focused on process improvement, lessons learned and barrier identification. The LLC will allow for sensitive issues to remain in closed sessions or within the scope of their existing feedback and review processes.

39.7 LESSONS LEARNED CONFERENCE APPLICATION AND KNOWLEDGE SHARING. Lessons Learned, Barriers and Action Items and their associated resolutions are only useful when they are communicated between maintenance and modernization professionals. The following are the required methods for sharing information in a timely manner, but are not the only means to share this information:

- a. Maintenance and Modernization Performance Review. Status of LLC Action Items and Barriers will be provided during each Maintenance and Modernization Performance Review.
- b. Surface Team One Executive Steering Committee Meetings. When requested, the LLC Process Master will brief the ST1 ESC. As a minimum, each ESC meeting will include a status brief of all open action items and barriers. When barriers are briefed to the ESC, the barrier will be assigned to the correct point of contact for action and closure.
- c. Surface Team One Monthly Process Master Meetings. Monthly meetings will be conducted with each Knowledge Sharing Network Process Master and designated support personal. These meetings will serve as a venue to provide a critical review of assigned action items from each LLC.

ACCESS TO LESSONS LEARNED CONFERENCE AND MMPR SITES ON THE ST1 PORTAL

1. Go to: <https://inavy.accessrequest.portal.navy.mil>
2. Fill in the information requested and submit.
3. Your command approvers will create the account, usually within 48 hours.
4. If **an individual** already has an account for a different site within iNavy, **they** will see the User Registration Dashboard that will indicate your status.

WELCOME

iNAVY is the Navy-wide portal for all Commands to collaborate and manage their information and data.

Your Name

There is **no record of registration** for you in our system. Continued access to iNavy requires user registration. To start, provide your work information then click the next button.

Association: CTR - Contractor Business Phone: United States of America 443

UIC: N Activity/Command:

NEXT

Search:

VOLUME VI
CHAPTER 40
SUBMARINE MESSAGE REPORTING

REFERENCES.

- (a) SECNAVINST 5510.36 - Department of the Navy Information Security Program Regulation, Chapter 6
- (b) NAVSEAINST 4720.14 - Temporary Alterations to Active Fleet Submarines, Control of
- (c) NAVSEA SL720-AA-MAN-030 - Navy Modernization Process Management and Operations Manual (NMP-MOM)

LISTING OF APPENDICES.

- A Sample (SUBS) Initial Message
- B Sample (SUBS) Update Message
- C Sample (SUBS) Final/Closeout Message
- D Sample (SUBS) Shipalt/Tempalt Installation Message
- E Sample (SUBS) Shipalt/Tempalt Removal Message

40.1 PURPOSE. This chapter provides policy and guidance regarding the utilization of (SUBS) messages. Reactor Plant and Strategic Weapons Systems material issues are not governed by this document and **must** not be reported via (SUBS) message format. (SUBS) message requirements for New Construction, Chief of Naval Operations, (CNO) and Type Commander (TYCOM) depot availabilities are addressed in Volume II, Part I, Chapters 3 and 4 of this manual and will not be addressed in this chapter. This chapter supercedes all other policy, procedures or guidance previously **issued** regarding (SUBS) messages.

40.2 BACKGROUND. Submarine material and equipment problems or requests for technical assistance reported via message have experienced delays receiving the required resolutions for identified problems. Delays were associated with insufficient data and or improper message addressing.

40.3 SCOPE. To establish protocol for the reporting of submarine equipment, systems and material issues that affect ship's mission or ship **or** personnel safety. To establish a reporting procedure that will ensure all necessary commands and technical authorities are contacted without delay. To ensure the correct action is identified and provided to the ship using the most rapid means.

40.4 POLICY.

- a. The parenthetical code word (SUBS) **must** appear as the first word in the subject line before the subject description.
- b. (SUBS) messages **must** identify its status by using the words INITIAL, UPDATE or FINAL at the end of the subject line.

- c. The (SUBS) message **must** not be used as a substitute for any Casualty Report, Situation Report or Incident Report that may be required by higher authority. A (SUBS) message **must** be sent to provide further supplemental information needed to explain the problem, provide troubleshooting support and identify its effect on the ship.
- d. (SUBS) messages are intended for material and technical assistance request issues pertaining to ship's mission or personnel safety and should not be used to report routine administrative items such as visit requests, post tech assist visit reports or any other event not requiring the urgency of a (SUBS) message.
- e. (SUBS) messages originated by submarines will be updated by the submarine at a periodicity not greater than once every 30 days. UPDATES should include equipment status, repair efforts in progress and if known anticipated repair date.
- f. To identify (SUBS) message priority use the following precedence:
 - (1) ROUTINE - REQUEST ANSWER WITHIN 5 WORKING DAYS.
 - (2) PRIORITY - REQUEST ANSWER WITHIN 3 WORKING DAYS.
 - (3) IMMEDIATE - REQUEST ANSWER WITHIN 24 HOURS.
- g. (SUBS) messages **must** be used to identify the installation and removal of Temporary Alterations (TEMPALT) and Ship Alterations (SHIPALT). However, the 30-day UPDATE requirement and precedence identification is waived for these instances.
- h. (SUBS) messages identifying the installation or removal of a TEMPALT or SHIPALT will identify such message by placing the words (TEMPALT) or (SHIPALT) at the end of the subject line.
- i. (SUBS) messages are to be classified appropriately **per** reference (a).
- j. (SUBS) messages **must** be addressed to the controlling Immediate Superior In Command (ISIC) for action and INFO Naval Sea Systems Command (NAVSEA), NAVSEA 08, TYCOMs and Technical Authority as appropriate ensuring parent commands are included as addressees. INFO NAVSURFWARCENDIV PHILADELPHIA PA for all submarine diesel problems. SSBNs and SSGNs will INFO Director, Strategic Systems Programs (DIRSSP).
- k. A FINAL close out (SUBS) message **must** be sent upon correction of the reported material problem or if in the Commanding Officer's judgement, a technical resolution has been reached or no additional response is required from Technical Authorities, NAVSEA, TYCOM or ISIC.
- l. NAVSEA **must** review all (SUBS) messages and provide responses to the ISIC within the precedence time line as identified in paragraph 40.4 f. of this chapter.
- m. (SUBS) messages initiated by NAVSEA requesting information from one or more Commands **must** be tracked by NAVSEA.
- n. (SUBS) messages being initiated for the purpose of gathering technical information from submarines **must** be provided to the TYCOM for action.

- o. Technical Authorities **must** provide all (SUBS) message responses to NAVSEA, TYCOM and ISIC for review and action. For messages addressed to SSBNs or SSGNs, INFO DIRSSP.
- p. (SUBS) messages **must** not be initiated by a Technical Authority unless authorized by NAVSEA, TYCOM or ISIC.

40.5 RESPONSIBILITIES.

40.5.1 Type Commanders.

- a. Review (SUBS) message traffic and when necessary readdress or forward to ensure the proper Technical Authority was identified and aware of the message.
- b. Assist and support the ISIC as required to generate (SUBS) messages.
- c. (SUBS) messages initiated by the TYCOM, requesting information from one or more Commands are to be tracked by the TYCOM department generating the message.
- d. Track all (SUBS) messages generated by submarines under its cognizance.

40.5.2 Immediate Superior In Command.

- a. Review and take for action all (SUBS) messages coordinating with NAVSEA, TYCOM and the Technical Authority to generate and provide message responses as required and within the precedence time line as identified in paragraph 40.4 f. of this chapter.
- b. (SUBS) messages sent to or initiated by a submarine under its cognizance **must** be tracked by the ISIC.
- c. (SUBS) messages initiated by the ISIC requesting information from one or more commands **must** be tracked by the ISIC.

40.5.3 Ship's Commanding Officer.

- a. (SUBS) messages initiated by the ship **must** be tracked by the ship until closeout.
- b. **All technical assistance (SUBS) requests must include the Ship's job sequence number (JSN).**
- c. Responses to technical assistance (SUBS) messages **must** be answered as soon as the troubleshooting efforts have results. If requested troubleshooting efforts are not accomplished due to ship's operations or lack of test equipment, generate a (SUBS) message containing efforts taken, results, effect on ship and any further assistance needed.
- d. When requesting onboard technical assistance, Chapter 2 of this volume, Fleet Technical Assistance, **must** be used as guidance.
- e. Issue a (SUBS) message to identify the installation and removal of TEMPALTs and SHIPALTs.

40.6 MESSAGE REQUIREMENTS.

- a. All (SUBS) messages requesting technical assistance will contain, as a minimum, the following requirements:

- (1) EXECUTIVE SUMMARY - faulted equipment, when the fault occurred, functions lost and equipment effected.
 - (2) BACKGROUND (if any) - previous related equipment problems, when experienced, corrective action taken, last completed system certification.
 - (3) DESCRIPTION OF THE PROBLEM - affected equipment, type of fault, fault indications, system indications.
 - (4) TROUBLESHOOTING EFFORTS - procedures used, documentation held onboard, Ship's Force training and experience with the equipment, troubleshooting limitations, special equipment held, any possible fault identified during Ship's Force troubleshooting.
 - (5) ASSISTANCE DESIRED - repair parts needed, distance support or onboard technical assistance needed, if known identify the technical authority and the next available ship operation where a technician could board the ship. Identify the problem as corrected, no further assistance required and justify it as a FINAL REPORT with no additional action required. When answering an information request (SUBS) message a closeout message is not required and should be identified as such in Paragraph 5 of the message. (i.e., no additional action required by this message)
 - (6) COMMANDING OFFICER'S ASSESSMENT - level of impact assessment of ship's capabilities to complete operational commitments, any additional backup or redundant systems and its operational status.
 - (7) REQUIRED RESPONSE DATE - Specify the calendar date response is due by to support ship operations.
- b. All (SUBS) messages reporting TEMPALT and SHIPALT completion will contain, **per** references (b) and (c), the following requirements:
- (1) ACTIVITIES: Unit and installing activity identified.
 - (2) BACKGROUND: TEMPALT number, TEMPALT name, installation period dates, installation completion date, Ship's Force operational testing completion acceptance date.
 - (3) PROVIDED INFORMATION:
 - (a) Type of installation: New equipment, Upgrade, Design change, etc.
 - (b) TEMPALT number: XXXX K/D.
 - (c) Certifying Statement: "all work was accomplished in full compliance with applicable contractual standards, specifications and installation drawings as outlined in reference ()". System Operation Verification Testing (SOVT) was completed on XX NOV XXXX, results were provided to Ship's Force.
 - (d) TEMPALT installation issues resolved: Ship's Installation Drawings require revision. All Liaison Action Requests submitted to the planning yard were resolved. Ship's Force has been provided copies of

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all Liaison Action Requests and red line drawings. Red line drawing forwarded to planning yard.

- (e) TEMPALT Completion Report completed and forwarded XX Dec XXXX, results provided to Ship's Force.
 - (f) Equipment installed: example AN-BLQ-10 ES SYSTEM.
 - (g) Integrated Logistics Support provided: Tech manuals, Maintenance Requirement Cards library data, On Board Repair Parts.
 - (h) Training Provided: identify by name all personnel trained.
 - (i) Summary: installation schedule issues, delays, support required, etc.
 - (j) Anticipated TEMPALT removal date.
 - (4) POC: Point of Contact (POC) at installing activity.
 - (5) COMMANDING OFFICER COMMENTS: Describe any issues of concern, provide positive and negative comments and identify any other pertinent information.
- c. All (SUBS) messages reporting TEMPALT removal will contain, **per** reference (b), the following requirements:
- (1) ACTIVITIES: Ship's name and Hull number.
 - (2) BACKGROUND: TEMPALT Number and Title.
 - (3) PROVIDED INFORMATION:
 - (a) Date of removal.
 - (b) Certifying statement the ship was restored to original configuration.
 - (c) Removal Issues; any outstanding item preventing restoration.
 - (4) POC: Removal Activity POC.
- d. To ensure the appropriate Technical Agencies are informed of the material problems or request for technical assistance the addressee guidance provided for Casualty Reporting located at <https://mfom.nola.navy.smil.mil/mfom> (SIPR access required) should be used for (SUBS) messages.
- e. Appendices A through E provide samples of the message format to be used for (SUBS) messages.

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APPENDIX A

SAMPLE (SUBS) INITIAL MESSAGE

OATUZYUW RUCORGP0054 2282105-UUUU--RUCBKMC.
ZNR UUUUU ZUI RUCOMCB4998 2290310
O 1730XXZ AUG XX
FM USS XXXXXXXXXXXX
TO COMSUBRON XXXXX//
INFO COMSUBLANT NORFOLK VA//
COMNAVSEASYS COM WASHINGTON DC//
COMSUBGRU XXX//
NAVSHIPYD NORFOLK VA//
XXXXX RMC XXXXX XX
SUBMEPP PORTSMOUTH NH
DIRSSP WASHINGTON DC// (FOR SSBN/SSGN)
BT
UNCLAS
MSGID/GENADMIN/XXXXXXXXXX/0054/AUG//
SUBJ/(SUBS) EPM CIRCUIT BREAKER OVERCURRENT TRIPS **INITIAL**//
REF/A/DOC/NAVSEA/14MAR1995//
AMPN/REF A IS NAVSEA 0942-LP-005-2020/(C) MAIN PROPULSION GEARS WITH
CH-1.//
JSN:Vxxxxx-WCxx-XXXX
POC/XXXXX./ENGINEER/USS XXXXXXXXXXXX/LOC:AT SEA
/E-MAIL:ENG(AT) XXXXXXXXXXXX.NAVY.SMIL.MIL//
RMKS/1. **EXECUTIVE SUMMARY:** EMERGENCY PROPULSION MOTOR (EPM)
CIRCUIT
BREAKER AT EPM CONTROL PANEL (EPMCP) TRIPS ON OVERCURRENT WHEN
TAKING THE EPM ABOVE 18 SHAFT RPM IN THE AHEAD DIRECTION. CONTROL OF
EPM
MOTOR ARMATURE CURRENT BETWEEN SPEEDS OF 13 AND 18 SRPM IS
SENSITIVE,
WITH MOTOR ARMATURE CURRENT SPIKING AS MOTOR SPEED IS
INCREMENTALLY
RAISED. THE EPM REMAINS OPERATIONAL AT SPEEDS LESS THAN 15 SRPM
AHEAD. OPERATION ASTERN IS NORMAL.
2. **BACKGROUND:** SHIP IS CURRENTLY CONDUCTING POST-SRA SEA TRIALS.
SHIPALT 3461K (EPM HIGH TORQUE CLUTCH) WAS INSTALLED DURING SRA. EPM
OPERATION WAS TESTED SATISFACTORILY PIERSIDE ON XXAUGXX TO A
MAXIMUM
SPEED OF 15 SRPM AHEAD AND ASTERN WITH NO ABNORMALITIES NOTED.
3. **DESCRIPTION OF PROBLEM:**
A. WHILE SLOWLY BRINGING THE EPM FROM 13 TO 18 SRPM AHEAD BY
INCREMENTALLY TURNING THE HANDWHEEL (LESS THAN 1/64TH TURN)
CLOCKWISE THE MOTOR ARMATURE CURRENT SPIKES TO APPROXIMATELY
800 TO 1100 AMPS DC THEN RETURNS TO NORMAL STEADY RUNNING CURRENT

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(APPROX 250 AMPS DC). THE MAGNITUDE OF THE SPIKE IS DIRECTLY PROPORTIONAL TO THE MOTOR SPEED/HANDWHEEL POSITION. MOTOR FIELD CURRENT BEHAVES NORMALLY, RUNNING FROM 7-9 AMPS DC.

B. AS SPEED IS RAISED ABOVE 18 SRPM, AN ARMATURE CURRENT SPIKE OF 1800 AMPS DC IS INDICATED AS THE EPM BREAKER TRIPS. THE MOST LIKELY CAUSE OF THE BREAKER TRIP IS OVERCURRENT (RATED INSTANTANEOUS TRIP POINT IS 2800 AMPS DC), BUT THE AMMETER RESPONSE IS TOO SLOW TO REGISTER FULL DEFLECTION.

4. TROUBLESHOOTING EFFORTS:

A. PERFORMED CLEAN AND INSPECT OF EPM CONTROL PANEL AND CONTROLLER

PER EL-26 A-5 AND A-2 SATISFACTORILY.

B. TESTED OPERATION OF EPMCP PER EL-26 R-2M SATISFACTORILY.

C. INSPECTED EPM CIRCUIT BREAKER SATISFACTORILY.

5. ASSISTANCE DESIRED: REQUEST FURTHER TROUBLESHOOTING GUIDANCE VIA

MESSAGE BY XXAUGXX.

6. CO ASSESSMENT AND REPAIR DESIRES: ORIG IS CONTINUING WITH POST-SRA SEA

TRIALS, LIMITING EPM TO 15 SRPM AHEAD. ADDITIONAL TROUBLESHOOTING WILL BE

PERFORMED UPON SURFACING.//

BT

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NOTE: ENSURE MESSAGES ARE **FOLLOWING** CURRENT MESSAGE FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.

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APPENDIX B**SAMPLE (SUBS) UPDATE MESSAGE**

OATUZYUW RUCORGP0054 2282105-UUUU--RUCBKMC.
ZNR UUUUU ZUI RUCOMCB4998 2290310
O 1730XXZ AUG XX
FM USS XXXXXXXXXX
TO COMSUBRON XXXXX//
INFO COMSUBLANT NORFOLK VA//
COMNAVSEASYS COM WASHINGTON DC//
COMSUBGRU XXX//
NAVSHIPYD NORFOLK VA//
XXXXX RMC XXXXX XX
SUBMEPP PORTSMOUTH NH
DIRSSP WASHINGTON DC// (FOR SSBN/SSGN)
BT
UNCLAS
MSGID/GENADMIN/XXXXXXXXXX/0054/AUG//
SUBJ/(SUBS) EPM CIRCUIT BREAKER OVERCURRENT TRIPS **UPDATE**//
REF/A/DOC/NAVSEA/14MAR1995//
AMPN/REF A IS NAVSEA 0942-LP-005-2020/(C) MAIN PROPULSION GEARS WITH
CH-1.//
POC/XXXXX./ENGINEER/USS XXXXXXXXXXXX/LOC:AT SEA
/E-MAIL:ENG(AT) XXXXXXXXXXXX.NAVY.SMIL.MIL//
RMKS/**1. EXECUTIVE SUMMARY:** EMERGENCY PROPULSION MOTOR (EPM)
CIRCUIT
BREAKER AT EPM CONTROL PANEL (EPMCP) IS STILL EXPERIENCING TRIPS ON
OVERCURRENT WHEN TAKING THE EPM ABOVE 18 SHAFT RPM IN THE AHEAD
DIRECTION. CONTROL OF EPM MOTOR ARMATURE CURRENT BETWEEN SPEEDS
OF
13 AND 18 SRPM IS SENSITIVE, WITH MOTOR ARMATURE CURRENT SPIKING AS
MOTOR
SPEED IS INCREMENTALLY RAISED. THE EPM REMAINS OPERATIONAL AT
SPEEDS LESS
THAN 15 SRPM AHEAD. OPERATION ASTERN IS NORMAL.
2. BACKGROUND: SHIP IS CURRENTLY CONDUCTING POST-SRA SEA TRIALS.
SHIPALT 3461K (EPM HIGH TORQUE CLUTCH) WAS INSTALLED DURING SRA. EPM
OPERATION WAS TESTED SATISFACTORILY PIERSIDE ON XXAUGXX TO A
MAXIMUM
SPEED OF 15 SRPM AHEAD AND ASTERN WITH NO ABNORMALITIES NOTED.
3. DESCRIPTION OF PROBLEM:
A. WHILE SLOWLY BRINGING THE EPM FROM 13 TO 18 SRPM AHEAD BY
INCREMENTALLY TURNING THE HANDWHEEL (LESS THAN 1/64TH TURN)
CLOCKWISE THE MOTOR ARMATURE CURRENT SPIKES TO APPROXIMATELY
800 TO 1100 AMPS DC THEN RETURNS TO NORMAL STEADY RUNNING CURRENT

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(APPROX 250 AMPS DC). THE MAGNITUDE OF THE SPIKE IS DIRECTLY PROPORTIONAL TO THE MOTOR SPEED/HANDWHEEL POSITION. MOTOR FIELD CURRENT BEHAVES NORMALLY, RUNNING FROM 7-9 AMPS DC.

B. AS SPEED IS RAISED ABOVE 18 SRPM, AN ARMATURE CURRENT SPIKE OF 1800 AMPS DC IS INDICATED AS THE EPM BREAKER TRIPS. THE MOST LIKELY CAUSE OF THE BREAKER TRIP IS OVERCURRENT (RATED INSTANTANEOUS TRIP POINT IS 2800 AMPS DC), BUT THE AMMETER RESPONSE IS TOO SLOW TO REGISTER FULL DEFLECTION.

4. TROUBLESHOOTING EFFORTS:

A. PERFORMED CLEAN AND INSPECT OF EPM CONTROL PANEL AND CONTROLLER

PER EL-26 A-5 AND A-2 SATISFACTORILY.

B. TESTED OPERATION OF EPMCP PER EL-26 R-2M SATISFACTORILY.

C. INSPECTED EPM CIRCUIT BREAKER SATISFACTORILY.

D. MEASURED RESISTANCE OF FIELD RHEOSTAT THROUGH ITS ENTIRE RANGE OF MOTION. INITIALLY DISCOVERED SEVERAL REGIONS OF HIGH RESISTANCE CONTACT. CLEANED RHEOSTAT TO LESS THAN 0.1 OHM THROUGHOUT RANGE OF

MOTION, WITH NO RESULTANT CHANGE IN OPERATING BEHAVIOR.

5. ASSISTANCE DESIRED: REQUEST FURTHER TROUBLESHOOTING GUIDANCE BY XXAUGXX.

6. CO ASSESSMENT AND REPAIR DESIRES: ORIG IS CONTINUING WITH POST-SRA SEA TRIALS, LIMITING EPM TO 15 SRPM AHEAD. ADDITIONAL TROUBLESHOOTING WILL BE PERFORMED UPON SURFACING. PER REF A VOL 2 TAB V-A TABLE 4-3, SHIP'S FORCE WILL INSPECT FIELD RESISTOR FOR A POSSIBLE OPEN CIRCUIT.//

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NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAD IS UTILIZED.

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APPENDIX C**SAMPLE (SUBS) FINAL/CLOSEOUT MESSAGE**

OATUZYUW RUCORGP0054 2282105-UUUU--RUCBKMC.

ZNR UUUUU ZUI RUCOMCB4998 2290310

O 1730XXZ AUG XX

FM USS XXXXXXXXXX

TO COMSUBRON XXXXX//

INFO COMSUBLANT NORFOLK VA//

COMNAVSEASYS COM WASHINGTON DC//

COMSUBGRU XXX//

NAVSHIPYD NORFOLK VA//

XXXXX RMC XXXXX XX

SUBMEPP PORTSMOUTH NH

DIRSSP WASHINGTON DC//(FOR SSBN/SSGN)

BT

UNCLAS

MSGID/GENADMIN/XXXXXXXXXX/0054/AUG//

SUBJ/(SUBS) EPM CIRCUIT BREAKER OVERCURRENT TRIPS **FINAL**//

REF/A/DOC/NAVSEA/14MAR1995//

AMPN/REF A IS NAVSEA 0942-LP-005-2020/(C) MAIN PROPULSION GEARS WITH CH-1.//

JSN:Vxxxxx-WCxx-XXXX

POC/XXXXX./ENGINEER/USS XXXXXXXXXXXX/LOC:AT SEA

/E-MAIL:ENG(AT) XXXXXXXXXXXX.NAVY.SMIL.MIL//

RMKS/1. **EXECUTIVE SUMMARY:** THE MATERIAL ISSUE OF OVERCURRENT TRIPS OF

THE EMERGENCY PROPULSION MOTOR (EPM) CIRCUIT BREAKER HAS BEEN CORRECTED.

2. **BACKGROUND:** SHIP WAS CONDUCTING POST-SRA SEA TRIALS. SHIPALT 3461K

(EPM HIGH TORQUE CLUTCH) HAD BEEN INSTALLED DURING SRA. EPM OPERATION WAS TESTED SATISFACTORILY PIERSIDE ON XXAUGXX TO A MAXIMUM

SPEED OF 15 SRPM AHEAD AND ASTERN WITH NO ABNORMALITIES NOTED.

3. DESCRIPTION OF PROBLEM:

A. WHILE SLOWLY BRINGING THE EPM FROM 13 TO 18 SRPM AHEAD BY INCREMENTALLY TURNING THE HANDWHEEL (LESS THAN 1/64TH TURN) CLOCKWISE THE MOTOR ARMATURE CURRENT SPIKES TO APPROXIMATELY 800 TO 1100 AMPS DC THEN RETURNS TO NORMAL STEADY RUNNING CURRENT (APPROX 250 AMPS DC). THE MAGNITUDE OF THE SPIKE IS DIRECTLY PROPORTIONAL TO THE MOTOR SPEED/HANDWHEEL POSITION. MOTOR FIELD CURRENT BEHAVED NORMALLY, RUNNING FROM 7-9 AMPS DC.

B. AS SPEED WAS RAISED ABOVE 18 SRPM, AN ARMATURE CURRENT SPIKE OF 1800 AMPS DC WAS EXPERIENCED AND THE EPM BREAKER TRIPPED.

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4. TROUBLESHOOTING EFFORTS:

A. PERFORMED TROUBLESHOOTING AS IDENTIFIED IN PROVIDED TECHNICAL ASSIST MESSAGES.

B. PROBLEM WAS FOUND TO BE THE FIELD RESISTOR WAS EXPERIENCING AN OPEN CIRCUIT DUE TO A LOOSE CONNECTOR LUG CAUSING A HIGH RESISTANCE CONNECTION. THIS PROBLEM WAS IDENTIFIED DURING THE INSPECTION OF EPM CONTROL PANEL AS DESCRIBED IN THE PROVIDED TECH ASSIST MESSAGE.

5. ASSISTANCE DESIRED: PROBLEM CORRECTED, NO FURTHER ASSISTANCE REQUIRED. THIS IS THE FINAL REPORT NO ADDITIONAL ACTION REQUIRED.

6. CO ASSESSMENT AND REPAIR DESIRES: EPM RESTORED TO FULL SERVICE. // BT

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NOTE: ENSURE MESSAGES ARE **FOLLOWING** CURRENT MESSAGE FORMAT AND CURRENT PLAD IS UTILIZED.

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APPENDIX D**SAMPLE (SUBS) SHIPALT/TEMPALT INSTALLATION MESSAGE**

RATUZYUW RHBPHVA0098 0441139-UUUU--RUCBKMC.

ZNR UUUUU ZUI RUCOMCB0075 0472222

R 13XXXXZ FEB XX

FM USS XXXXXX//

TO COMSUBLANT NORFOLK VA//

INFO CNO WASHINGTON DC//

CNO WASHINGTON DC//

COMLANTFLT NORFOLK VA//

COMSUBGRU TWO//

COMSUBRON EIGHT//

NAVSUBSCOL GROTON CT//

NIWC ATLANTIC CHARLESTON SC//

NIWC PACIFIC SAN DIEGO CA//

CBTDIRSYSACT DAM NECK VA//

NAVSURFWARCEN CARDEROCKDIV BETHESDA MD//

NAVSURFWARCENDIV CRANE IN//

SUPSHIP GROTON CT//

SUPSHIP NEWPORT NEWS VA//

NAVSHIPYD NORFOLK VA//

BT

UNCLAS

MSGID/GENADMIN/UNIT NAME/FEB//

**SUBJ/(SUBS)COMPLETION OF TEMPALT XXXXK FIRE FIGHTING STATION
UPGRADE****INSTALLATION (TEMPALT)//**

REF/A/MSG/CSL/XXXXXXJUN05//

REF/B/DOC/NAVSEA/MARXXXX//

NARR/REF A IS COMSUBLANT MESSAGE AUTHORIZING INSTALLATION OF
TEMPALT XXXXK FIRE FIGHTING STATION UPGRADE ON **USS XXXXX**.

REF B IS NAVSEA TECHNICAL SPECIFICATION XXXXXXXXXXXX SHIP

ALTERATION ACCOMPLISHMENT BY INSTALL TEAMS.//

POC/JOHN SMITH/INSTALLATION MGR/NUWC DIV NEWPORT/-

/TEL:XXX-XXX-XXXX//

RMKS/1. ACTIVITIES: THIS IS A JOINT USS XXXXX NUWC DIV NEWPORT
MESSAGE.**2. BACKGROUND:** TEMPALT 000K FIRE FIGHTING STATION UPGRADE
WAS INSTALLED DURING PERIOD XXAUGXXXX THROUGH XXSEPXXXX. SOVT
WAS COMPLETED XXNOVXXXX AND THE FIRE FIGHTING STATION WAS
ACCEPTED

AS OPERATIONAL.

3. PROVIDED INFORMATION:

A. TYPE INSTALLATION: FIRE FIGHTING STATION UPGRADE.

B. ALTERATION NUMBER: XXXXK.

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C. CERTIFYING STATEMENT: ALL WORK WAS ACCOMPLISHED IN FULL COMPLIANCE WITH APPLICABLE CONTRACTUAL STANDARDS, SPECIFICATIONS AND INSTALLATION DRAWINGS. AS OUTLINED IN REF (A) SYSTEM OPERATION VERIFICATION TESTING (SOVT) WAS COMPLETED ON XXNOVXXXX. RESULTS WERE PROVIDED TO SHIP'S FORCE.

D. INSTALLATION ISSUES: SHIP'S INSTALLATION DRAWINGS (SID) REQUIRE REVISION. ALL LIAISON ACTION REQUESTS (LAR) SUBMITTED TO THE PLANNING YARD WERE RESOLVED. SHIP'S FORCE HAS BEEN PROVIDED COPIES OF ALL LARS. RED LINE SHIPALT DRAWINGS WERE PROVIDED TO THE SHIP AND WILL BE PROVIDED TO PLANNING YARD.

E. ALTERATION COMPLETION REPORT COMPLETED AND FORWARDED XXDECXXXX.

F. EQUIPMENT INSTALLED: FIRE FIGHTING PRESSURE ENHANCER.

G. ILS PROVIDED: TECHNICAL MANUALS ITEM (CD), MIP# 0000/000-00 AND MRC CARDS, FIRE FIGHTING STATION LIBRARY DATA (CLASSIFIED), SSN-XXX COP, (CDMD-OA WORK FILE). THE ON BOARD REPAIR PARTS (OBRP). WILL BE PROVIDED BY NAVICP WHEN THEY ARE PRODUCED BY SHIP'S FORCE.

H. TRAINING PROVIDED: MM1 JONES RECEIVED TWO HOURS OF OPERATIONAL TRAINING.

I. SUMMARY: THE INSTALLATION PROGRESSED ON SCHEDULE WITH NO MAJOR DELAYS. THE SUPPORT PROVIDED BY SHIP'S FORCE WAS EXCELLENT.

J. ANTICIPATED REMOVAL DATE. XXMARXXXX.

4. POC: NUWC DIV NEWPORT POC MR. JOHN SMITH (XXX)XXX-XXXX, E-MAIL SMITH (AT)NPT.NUWC.NAVY.MIL.

5. COMMANDING OFFICERS COMMENTS: NONE//

BT

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NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAD IS UTILIZED.

16 Oct 2019

APPENDIX E**SAMPLE (SUBS) SHIPALT/TEMPALT REMOVAL MESSAGE**

RATUZYUW RHBPHVA0098 0441139-UUUU--RUCBKMC.
ZNR UUUUU ZUI RUCOMCB0075 0472222
R 13XXXXXZ FEB XX
FM USS XXXXXX//
TO COMSUBLANT NORFOLK VA//
INFO CNO WASHINGTON DC//
CNO WASHINGTON DC//
COMLANTFLT NORFOLK VA//
COMSUBGRU TWO//
COMSUBRON EIGHT//
NAVSUBSCOL GROTON CT//
NIWC ATLANTIC CHARLESTON SC//
NIWC PACIFIC SAN DIEGO CA//
CBTDIRSYSACT DAM NECK VA//
NAVSURFWARCEN CARDEROCKDIV BETHESDA MD//
NAVSURFWARCENDIV CRANE IN//
SUPSHIP GROTON CT//
SUPSHIP NEWPORT NEWS VA//
NAVSHIPYD NORFOLK VA//
BT
UNCLAS
MSGID/GENADMIN/UNIT NAME/FEB//
**SUBJ/(SUBS) COMPLETED REMOVAL OF TEMPALT XXXXK FIRE FIGHTING
STATION UPGRADE
(TEMPALT)//**
REF/A/MSG/CSL/XXXXXXJUN05//
REF/B/DOC/NAVSEA/MARXXXX//
NARR/REF AIS COMSUBLANT MESSAGE AUTHORIZING REMOVAL OF
TEMPALT XXXXK FIRE FIGHTING STATION UPGRADE ON **USS XXXXX**.
REF B IS NAVSEA TECHNICAL SPECIFICATION XXXXXXXXXXXX SHIP
ALTERATION ACCOMPLISHMENT BY INSTALL TEAMS.//
POC/JOHN SMITH/INSTALLATION MGR/NUWC DIV NEWPORT/-
/TEL:XXX-XXX-XXXX//
RMKS/1. ACTIVITIES: THIS IS A JOINT USS XXXXX NUWC DIV NEWPORT
MESSAGE.
2. BACKGROUND: TEMPALT 000K FIRE FIGHTING STATION UPGRADE
WAS INSTALLED DURING PERIOD XXAUGXXXX THROUGH XXSEPXXXX. SOVT
WAS COMPLETED XXNOVXXXX AND THE FIRE FIGHTING STATION WAS
ACCEPTED
AS OPERATIONAL.
3. PROVIDED INFORMATION:
A. REMOVAL DATE: XXJUNXXXX

16 Oct 2019

B. CERTIFYING STATEMENT: SHIP RESTORED TO ORIGINAL CONFIGURATION.

C. REMOVAL ISSUES: ANY OUTSTANDING ISSUE PREVENTING FULL RESTORATION.

4. **POC:** NUWC DIV NEWPORT POC MR. JOHN SMITH (XXX)XXX-XXXX, E-MAIL SMITH(AT)NPT.NUWC.NAVY.MIL.

5. **COMMANDING OFFICERS COMMENTS:** NONE//

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NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAD IS UTILIZED.

VOLUME VI
CHAPTER 41
MAINTENANCE AND PROJECT TEAM

REFERENCES.

- (a) NAVSEA SL720-AA-MAN-030 - Navy Modernization Process Management and Operations Manual (NMP-MOM)

41.1 PURPOSE. The purpose of this chapter is to define and establish the membership and responsibilities of the Maintenance Team and Project Team (PT) and those supplemental members of both that support the maintenance and modernization process. The Maintenance Team, PT and those that supplement under the Planning Process are integral members of a complex evolution that requires communication, coordination and collaboration in order to accomplish availability planning, execution and close out efficiently and effectively. The contents of this chapter complement Volume II, Part II, Chapter 1, Volume VI, Chapter 31, Volume VI, Chapter 33, and Volume VII, Chapter 7 of this manual.

41.2 MAINTENANCE TEAM. Each ship **must** have a formally structured Maintenance Team. The team is led by the Ashore Ship Maintenance Manager and consists of representatives from the ship and the supporting shore maintenance infrastructure. The responsibility of the Maintenance Team is to manage the advanced planning and planning of maintenance, the routine maintenance of the ship and modernization **following** the maintenance policies, directives and business rules of the Fleet Commander, Type Commander (TYCOM) and the Naval Supervisory Authority (NSA).

41.2.1 Crew Swap. When a crew swap occurs that rotates a different crew to a hull, the non-crew members of the Maintenance Team **must** remain with the hull and provide continuity in planning and execution.

41.2.2 Maintenance Team Members. While there are many who contribute to the planning of ship maintenance and modernization, some key personnel have a continuing involvement in and responsibility for management of the overall advanced planning and planning of the ship's maintenance and modernization. The Maintenance Team forms the core of the PT. The Maintenance Team **must** be permanently assigned to the ship and **must** consist of the following members:

- a. Ashore Ship Maintenance Manager. Validates, screens and brokers all maintenance and modernization, including assessments, requiring off ship assistance. Ensures the Project Manager (PM) has visibility of all assigned work. For all combat systems related maintenance and modernization the Ashore Ship's Maintenance Manager will coordinate with the Combat Systems Port Engineer. Assignments are:
- | | | |
|-----|-----------------|-----------------------------------|
| (1) | Surface Force | Port Engineer |
| (2) | Naval Air Force | TYCOM Maintenance Program Manager |
| (3) | Submarine Force | Maintenance Coordinator |

- b. Ship's Commanding Officer. Primary representative for the ship. (The Commanding Officer may delegate to a representative.)
- c. I-Level Ship Superintendent. Manages Regional Maintenance Center (RMC) **or** Fleet Maintenance Activity (FMA) Government production work for Continuous Maintenance (CM), Continuous Maintenance Availability (CMAV) and Chief of Naval Operations (CNO) availabilities. Manages I-Level production work planning, integration, execution and close out, reporting progress **and** status to the Project Manager and Ashore Ship's Maintenance Manager.
- d. Project Manager. NSA support to the Ashore Ship's Maintenance Manager in the advanced planning and close out phases of the maintenance availability (not applicable for Submarine Fleet Availabilities).
- e. Ship Material Maintenance Officer. Coordinates Maintenance Team activities with Ship's Force personnel. Assignments are:
 - (1) Surface Force Ship Material Maintenance Officer
 - (2) Naval Air Force Ship Maintenance Manager*
 - (3) Submarine Force 3M Coordinator

* The Reactor Maintenance Officer fills this role for Nuclear Propulsion issues.
- f. Contractor Program Manager (when required). Manages authorized contractor **or** company work. Assignments are:
 - (1) Surface Force Prime Contractor Program Manager
 - (2) Naval Air Force Prime Contractor for RMC contracted (non-Naval Shipyard (NSY)) work
 - (3) Submarine Force Prime Contractor for RMC contracted (non-NSY) work
- g. Maintenance Support Team (LCS class ships only).
- h. Combat Systems Ashore Ship's Maintenance Manager. Coordinates with the Ashore Ship's Maintenance Manager to ensure that combat systems-related maintenance and modernization are scheduled and completed (for Surface Ships only).

41.2.3 The Principal Roles of the Maintenance Team.

- a. Management of Ship Maintenance. The Maintenance Team ensures the ship's Current Ship's Maintenance Project (CSMP) and Availability Work Package (AWP) are validated and accurately reflect the ship's material condition and current maintenance status. The Maintenance Team ensures there is an initial cost estimate in man-days and material dollars for all work candidates, including assessments and technical assistance. The estimates **must** be developed by the Ashore Ship's Maintenance Manager during initial review of the work candidates to be as accurate as possible, based on available information such as return costs from similar jobs, Ashore Ship Maintenance Manager experience, NSA and other government prepared or approved estimates. These estimates **must** be updated within the CSMP, as they are refined in order to provide the Maintenance Team with adequate data to plan maintenance

actions. For Aircraft Carriers, these estimates will be entered in the Proposed AWP and finalized in the Authorized AWP. The Maintenance Team coordinates inspections, certifications, assessments and assist visits in support of the class maintenance plan. Additionally, the Maintenance Team may provide on-scene assessment of equipment condition to develop valid and accurate work candidates.

- b. **Budgeting for Ship Maintenance.** The Ashore Ship's Maintenance Manager is responsible for the ship's Maintenance and Modernization Business Plan (MMBP). The Maintenance Team develops the budget recommendation for funding maintenance requirements for the fiscal year. The Maintenance Team assesses the ship's anticipated material condition for budget consideration including the validated CSMP, Class Maintenance Plan, planned fleet alterations, outstanding Departures From Specification (DFS), Temporary Standing Orders and Casualty Reports. This MMBP **must** address the funding required for execution year maintenance. Ashore Ship's Maintenance Manager and the Maintenance Team members will maintain their ship within the fiscal guidance defined by the approved MMBP. Chapter 33 of this volume describes the development and maintenance of the MMBP.
- c. **Logistics and Technical Expertise.** The Maintenance Team members maintain a current, valid CSMP and AWP that serve as the authoritative source for all information on maintenance requirements. All technical guidance and advice provided by the members of the Maintenance Team must be in compliance with Systems Command approved technical guidance and policy. In instances where action by a Technical Authority is needed, the Project Manager **must** ensure this authorization is obtained. The effective logistics support for maintenance depends on the accuracy of the ship's configuration records. The Maintenance Team oversees prompt submission of change documentation pursuant to maintenance or modernization, validates change entries and ensures configuration records (e.g., Configuration Data Managers Database - Open Architecture) are updated.
- d. **Availability Coordination.** The Ashore Ship's Maintenance Manager works for the TYCOM to develop, plan and coordinate scheduled availabilities, CM opportunities and emergent repairs of assigned ships within the resources provided. The Ashore Ship's Maintenance Manager **must** enter CNO availabilities, assessments, associated routine tasks and authorized Fleet and Programmed Alterations into the appropriate Maintenance Automated Information System **following** standard availability planning milestones. The Maintenance Team serves as the point of contact for the NSA **or** Lead Maintenance Activity (LMA) in coordinating maintenance and planning activities. The Maintenance Team facilitates the orderly conduct of work candidate identification, validation, screening and brokering.

NOTE: RESPONSIBILITIES FOR EACH MEMBER HAVE BEEN BROKEN DOWN INTO TWO CATEGORIES, ACCOUNTABLE AND RESPONSIBLE.

- e. **Accountable:** Owns the work, the person who makes the final decision on a task and has the ultimate ownership over that task.
- f. **Responsible:** A contributor, this will be the person or people assigned to do the work.

41.2.4 Specific Duties of Maintenance Team Members.

41.2.4.1 Ashore Ship's Maintenance Manager.

- a. For Aircraft Carriers, receives the Baseline Availability Work Package (BAWP) from the Carrier Planning Activity. Builds and refines the Proposed and Authorized AWP's.
- b. Accountable:
 - (1) Leads the Maintenance Team and maintains frequent contact with the Commanding Officer and conducts personal observations of shipboard conditions. Establishes and maintains an effective communications plan with the ship during deployment. More information can be located in Volume II, Part II, Chapter 1, paragraph 1.2.2 of this manual.
 - (2) Maintains the CSMP shore file accuracy and provides recommended changes for the shipboard CSMP to the Ship Material Maintenance Officer and 3M Coordinator. (See Volume II, Part II, Chapter 1, paragraph 1.3.1 of this manual.)
 - (3) Validates all off ship maintenance for assigned ship(s), including off-ship assessments. (See Volume II, Part II, Chapter 1, paragraphs 1.3.2, 1.3.4 and 1.3.5 of this manual.)
 - (4) Develops initial planning estimates based on information such as return costs from similar jobs and Government prepared or approved estimates. (See Chapter 31, paragraph 31.4.2 of this volume.)
 - (5) Screens or schedules work candidates to the right time period and maintenance availability based on the MMBP, operational schedule, material readiness requirements and cost benefit analysis. (See Volume II, Part II, Chapter 1, paragraphs 1.4.1 and 1.4.4 of this manual.)
 - (6) Brokering as discussed in Volume II, Part II, Chapter 1, paragraph 1.4.2 of this manual.
 - (7) Schedules, and assists the ship's Commanding Officer in conducting the Planning Board for Maintenance meetings, including agenda development. (See Volume II, Part I, Chapter 4, paragraph 4.2.5 of this manual.)
 - (8) Coordinates all off-ship maintenance and modernization requirements.
 - (9) Screens Automated Work Requests in support of 100%, 80% and 50% package lock, including CSMP, Class Maintenance Plan (CMP) and TYCOM routines.
 - (10) Initiates work candidates (OPNAV 4790/2K) for "service" work.
 - (11) Develops Business Case Analysis and generates applicable Engineering Services Request, provides advice and serves as the ship's point of contact for access to technical expertise for all ship maintenance and modernization requirements, including the development of Ship Changes.
- c. Responsibilities:
 - (1) Communicates, coordinates and tracks ship and applicable class problems.
 - (2) Ensures configuration change requests are promptly submitted.

- (3) Ensures completion work candidates (OPNAV 4790/2K) are entered into the CSMP and the appropriate IT system. (See Chapter 2, paragraph 2.6.2 of this volume.)
- (4) Executes the approved MMBP to best utilize windows of opportunity. (See Volume II, Part II, Chapter 2, paragraph 2.1.2 of this manual.)
- (5) Makes recommendations to the ship's Commanding Officer and management on any deferred work items. (See Volume II, Part II, Chapter 1, paragraph 1.4.5 of this manual.)
- (6) Coordinates maintenance availability scheduling and execution. (See Volume II, Part II, Chapter 2, paragraph 2.6.5 of this manual.)
- (7) (Surface Force only) Supports the RMC in planning assigned ship maintenance and modernization availabilities. (See Volume VII, Chapter 1, paragraph 1.3.8 of this manual.)
 - (a) Develops and schedules work packages. Recommends resolutions to CNO scheduling issues.
 - (b) Recommends CM opportunities to the ship's Commanding Officer and the NSA management. Creates CM availabilities.
 - (c) Screens work candidates (OPNAV 4790/2K) to appropriate level of maintenance (Organizational, Intermediate, Depot (O, I, D)). Reviews assessment results for inclusion in work packages.
 - (d) Assists Project Manager with work package analysis for Private Sector Industrial Activity (PSIA) contracts.
 - (e) Provides availability evaluation input documentation during availabilities supporting Contractors Performance Appraisal Reporting System (CPARS).
- (8) Supports Fast Cruise, Dock Trials, Sea Trials, Propulsion Plant Light Off Assessment (LOA) and Production Completion Date (PCD), Combat Systems or AEGIS Light Off and TYCOM validation of PCD.
- (9) Attends Integrated Project Team Development (IPTD), Work Package Integration Conference (WPIC), Work Package Execution Review (WPER), Lessons Learned Conference (LLC) Life Cycle Planning, Docking, Arrival, 25%, 50% and 75% reviews, Undocking, and Departure conferences,
- (10) Plans, coordinates and executes mid-deployment shipcheck.
- (11) Supports Ship's Force for AWP collection and management of Objective Quality Evidence (OQE).
- (12) Performs AWP risk assessments and verifies deliverables to contractor (O, I, D work items and Alteration Installation Team (AIT) schedule requirements).
- (13) Assists the NSA with technical close out and availability work certification. Assists ship in achieving maintenance phase exit criteria.

- (14) Supports the 100% Package Lock Letter.
- (15) Validates growth and new work, assists with the Regional Calibration Center process.
- (16) Supports and participates in work specification review.
- (17) Provides incremental funds for ordering Long Lead Time Material (LLTM) for both repair and alteration **or** modification work to meet required dates.
- (18) Submits change deferral request to appropriate platform planning activity.

41.2.4.2 Ship's Commanding Officer. Primary representative for the ship. Works with the Ashore Ship's Maintenance Manager on the development and prioritization of the ship's maintenance and modernization including the MMBP.

a. Accountable:

- (1) Reports progress weekly to the TYCOM. Recommends urgent and compelling decisions to the TYCOM.
- (2) Works with the Ashore Ship's Maintenance Manager to develop the final work package submission for the ship.
- (3) Directs efforts to identify all shipboard maintenance requirements and ensures accurate and timely entry into the CSMP. Reviews, plans and monitors accomplishment of organizational level work.
- (4) Initiates requests for technical assistance, including distance support.
- (5) Determines the effect of material deficiencies on mission capability and releases Casualty Reports.
- (6) Integrates maintenance planning in the ship's operational schedule.
- (7) Ensures the ship is prepared for and ready to conduct propulsion plant PCD **and** LOA events (and Command, Control Communications, Computer, Combat Systems, Intelligence Light Off (C5ILO) event for Surface Ships).
- (8) Chairs the Planning Board for Maintenance meeting.

b. Responsibilities:

- (1) Verifies technical assistance final resolution satisfies ship's maintenance issue.
- (2) Ensures Ship's Force assists with the management and oversight of work execution by maintenance activities and AITs.
- (3) Executes shipboard DFS process.
- (4) Ensures ship properly supports 25%, 50% **and** 75% reviews; Arrival, Docking, Undocking, Fast Cruise, Dock Trials, Sea Trials, Departure, and Completion key events and conferences; IPTD, WPIC, WPER events; and CSMP, DFS, BAWP Mid-Cycle reviews.
- (5) Ensures Integrated Logistics Support (ILS) is provided.
- (6) Assists in scheduling and execution of mid-deployment shipcheck.

- (7) Collaborates in the authorization of growth **or** new work.
- (8) Supports the Integrated Test Plan execution and work certification.
- (9) Assists in achieving maintenance phase exit criteria. Ensures proper space turnover, Ship's Force AWP collection and management of OQE, and availability technical closeout.

41.2.4.3 I-Level Ship Superintendent.

a. Accountable:

- (1) Manages the collection of I-Level OQE.
- (2) Manages RMC **or** FMA work planning, scheduling, integration, and work execution. Resolves conflicts with other Executing Activities. Ship checks work candidates (2K) as applicable and provides estimates on all I-Level work candidates. Recommends cancellation of invalid work candidates, if applicable.
- (3) Represents the RMC **or** FMA to Ship's Force for RMC **or** FMA production maintenance work. Coordinates the performance of I-Level work including all scheduling and availability coordination, ensuring the I-Level work package is fully accepted **following the** milestones.

b. Responsibilities:

- (1) Ensures completion of I-Level production work supporting LOA, propulsion plant PCD, AEGIS and Combat Systems Light Off, Docking, Undocking, Fast Cruise, Dock Trials, Sea Trials, and Availability Completion.
- (2) Assists ship in achieving maintenance phase exit criteria. Ensures I-Level work is complete in support of availability certification, completion, and technical close out.
- (3) Attends availability production meetings; Arrival, Docking, Undocking, Departure, WPIC and WPER conferences.
- (4) Coordinates work planned and performed by RMC production department. FMA repair division, submits I-Level schedule to NSA **or** LMA for integration, coordination of I-Level open and inspects, coordination of oversight for I-Level work (Product Verification Inspection (PVI), Procedure Evaluation (PE), Procedure Review (PR)).
- (5) Provides recommendations regarding assignment of work candidates to RMC production department **or** FMA repair division based on the capabilities and capacities of the RMC **or** FMA. Works closely with the Ashore Ship's Maintenance Manager on the validation and screening of all work candidates to the I-Level.
- (6) Ensures completed maintenance action (OPNAV 4790/2K) for completed work.

41.2.4.4 Project Manager.

a. Accountable:

- (1) Supports the Ashore Ship's Maintenance Manager in the performance of maintenance and modernization.
- (2) Accepts or rejects work candidates to scheduled availability periods and performing activities **per** guidance in Volume II, Part II, Chapter 1 of this manual. Integrates work candidates to form optimized work packages.
- (3) Establishes the availability in the appropriate maintenance execution IT system.
- (4) Ensures LLTM for Firm Fixed Price and PSIA contracts is ordered to support availabilities.
- (5) Conducts Work Specifications Review with Ashore Ship's Maintenance Manager.
- (6) Serves as the advanced planning manager for contracted maintenance during CNO availabilities and scheduled CMAVs conducted at contractor or Government depots. Coordinates the continuous cost estimate review process.
- (7) Provides timely financial accounting information during the execution of maintenance to customers.

b. Responsibilities:

- (1) Supports CSMP, DFS **and** BAWP mid-cycle review.
- (2) Attends IPTD events, scoping conferences (see Volume VII, Chapter 2, paragraph 2.12.1 of this manual), WPIC and WPER.
- (3) Assists in coordinating mid-deployment shipchecks.
- (4) Provides incremental funds for ordering LLTM for both repair and alteration **or** modification work to meet required dates.

41.2.4.5 Ship's Material Maintenance Officer. (The Reactor Maintenance Officer fills this role for Nuclear Propulsion issues.) Coordinates Maintenance Team activities with Ship's Force personnel.

a. Accountable:

- (1) Provides the Ship's Force work package to the Project Manager and executing activity. Assists in coordinating the integration of Ship's Force work for CNO or CMAV availabilities. Provides shipboard schedule inputs (see Volume II, Part II, Chapter 1, paragraph 1.2.2 of this manual). Interfaces with the Project Manager and the executing activity to resolve maintenance issues.
- (2) Commanding Officer's principal assistant for management of ship maintenance. Prepares the ship input to the Planning Board for Maintenance agenda in support of the Ashore Ship's Maintenance Manager. Works with the Maintenance and Material Management Coordinator to maintain an accurate shipboard CSMP. Approves, validates and ensures submittal of accurate work candidates (OPNAV 4790/2K).

- (3) Works with the Quality Assurance Officer and department representatives to submit and track DFSs.
- (4) Ensures initiation of work candidates (OPNAV 4790/2K) to request distance support and technical assists. Works with Subject Matter Experts (SME) to coordinate tech assist visits.
- (5) Monitors timely submission of configuration change requests.
- (6) Ensures Ship's Force verification of completed work and returns Completed Maintenance Action (OPNAV 4790/2K) to the Ashore Ship's Maintenance Manager.
- (7) Ensures valid deferred work is incorporated into the CSMP.

b. Responsibilities:

- (1) Ensures repair work candidates are submitted supporting 50%, 80% and 100% D-Level lock milestones.
- (2) Ensures Ship's Force I-Level work package 100% brokered and locked.
- (3) Ensures ship's initial conditions are set for work to begin by outside activities and Work Authorization Forms are properly executed. Ensures systems and equipment are properly tagged out, drained and depressurized.
- (4) Generates any new work requests along with supporting urgency information.
- (5) Ensures Ship's Force has planned and prepared for propulsion plant PCD, LOA, and AEGIS or combat systems PCD and light off, Fast Cruise, Dock Trials and Sea Trials mid-deployment shipchecks.
- (6) Attends the Docking, Arrival, 25%, 50% and /75%, Undocking and Departure conferences, WPIC, WPER, IPTD, LLC events, and CSMP, DFS and BAWP Mid-Cycle review.
- (7) Provides oversight and management to ensure AIT controls are in place, Regional Maintenance and Modernization Coordination Office requirements are met prior to starting work onboard ship, and assignment of SMEs to support AITs.
- (8) Ensures Ship's Force work is complete to support end of availability, space turnover, and availability work certification.
- (9) Supports Ship's Force ILS and consolidates software delivery.
- (10) Coordinates with Ship's Force the execution of the Integrated Test Plan.
- (11) Ensures Ship's Force, RMC, LMA, AWP collection and management of OQE.
- (12) Ensures AWP risk assessments are performed and deliverables to contractor verified.
- (13) Collaborates in the authorization of growth or new work.
- (14) Assists ship in achieving maintenance phase exit criteria.

41.2.4.6 Contractor Program Manager. Manages and supervises authorized contractor work (see Volume II, Part II, Chapter 1, paragraph 1.2.2 of this manual).

a. Accountable:

- (1) Schedules and oversees contractor required open and inspects.
- (2) Provides information and advice to the Government on matters of mutual concern to include contractor cost and time estimates, future work planning, contractor capability and capacity for varied work accomplishment (i.e., port loading), production management, integration of work from multiple activities and production problems for assigned availabilities.
- (3) Establishes and recommends availability milestones. Provides schedule for: Integrated Test Plan (ITP), Universal Process Control Procedure (UPCP), Process Control Procedures (PCP), availability planning and assessments.
- (4) Reviews and submits condition reports, initiates completion reports for authorized work completed.
- (5) Ensures progressing Cost and Schedule Status Reports.

b. Responsibilities:

- (1) Recommends scheduling of work to best take advantage of port work loading conditions, provides recommendations for reduction of premiums in the accomplishment of work.
- (2) Ensures completion of 50%, 80% and 100% D-Level maintenance work package 2Ks are planned and estimated. Publishes work package in the appropriate IT system. Conducts work specification reviews in support of each milestone, final package submission and cost proposal. Ensures work package is Technical Analysis Reported, negotiated and definitized.
- (3) Attends 25%, 50% and 75% reviews; Arrival, Docking, Undocking and Departure conferences; WPIC, WPER and LLC events.
- (4) Ensures completion of the ITP, propulsion plant PCD and LOA, Combat Systems\AEGIS PCD and Light Off, Fast Cruise, Dock Trials, Sea Trials, and Availability work certification.
- (5) Ensures consolidated software delivery and ILS support is provided.
- (6) Supports the PM to ensure the availability business and technical close requirements are met.
- (7) Supports the DFS process.
- (8) Ensures requirements are met to support the UPCP, PCP, cleanliness processes.
- (9) Provides contractor oversight of LMA checkpoint execution (V, G, I points) as well as PVI, PE, PR.
- (10) Provides personnel to coordinate with AIT, Fleet Maintenance Activity and Ship's Force to update production schedule (NSI 009-060).

- (11) Provides Integrated Total Ship Test Plan (NSI 009-067).
- (12) Ensures contractor work is complete to support space turnover.
- (13) Supports the authorization of growth **or** new work.
- (14) Ensures habitability items are complete.
- (15) Provides incremental funds for ordering LLTM for both repair and alteration **or** modification work to meet required dates, ensures delivery of material (LLTM and kitted materials) to executing activity.
- (16) Ensures work and support services are in place to support dock and undock.

41.2.4.7 Combat Systems Port Engineer (for Surface Ships Only)

a. Accountable

- (1) TYCOM's C5I waterfront representative who identifies, validates and prioritizes the C5I requirements.
- (2) Serve as the TYCOM's Technical Expert for ship C5I maintenance, modernization and repair requirements.

b. Responsibilities

- (1) Possess the technical knowledge, skills and ability to interface with Subject Matter Experts (SMEs).
- (2) Serve as the Maintenance Team's C5I Subject Matter Expert (SME).
- (3) Attend and provide C5I maintenance status at PB4M.
- (4) Validate C5I work requirements prior to screening and brokering of Work Notifications (WNs) by Ashore Ship's Maintenance Manager.
- (5) Provide input and priorities for final screening of C5I work.
- (6) Maintain cognizance of assigned ship's C5I CASREPS.
- (7) Perform a C5I interface function with class Planning Yard and PEO representatives.
- (8) Schedule and coordinate C5I planning and ship check inspections with ship's force personnel.
- (9) Coordinate C5I Tech Assists, inspections and grooms with customer's support agencies (SYSCOM, SPAWAR, RMC, OEM, Contractor, etc.).
- (10) Review specifications to ensure accuracy and conformance for authorized C5I work.
- (11) Provide C5I input and priorities for MMBP development for assigned ship(s).
- (12) Validate the C5I ICMP **or** BAWP Program push and pull WNs.
- (13) Coordinate Risk versus Cost Management assessments for C5I systems.
- (14) Concur with proposed C5I growth and new work.

- (15) Get underway on assigned ship(s) for rides of opportunity including, but not limited to INSURVs, Sea Trials and mid-deployment ship checks.

41.3 PROJECT TEAM. (Augmentation to manage RMC-contracted maintenance in availabilities between A-120 and C+60). The PT **must** be assigned to the ship availability and **must** consist of those persons listed **here** and all members of the Maintenance Team. The Project Manager leads the PT and has the responsibility to ensure overall integration, execution and close out of a ship's availability. The PM is responsible for quality, schedule and cost. Some PT members may be assigned responsibilities for more than one ship.

41.3.1 Project Manager.

a. **RMC Project Manager:**

- (1) When a RMC is the NSA, the PM is responsible for integration, execution, and close out of the Work Package. When the NSY is the NSA, the RMC PM is responsible for planning, integrating, coordinating, and executing the PSIA contracted maintenance work items, in support of the NSY Project Manager.
- (2) When a RMC is the NSA and the LMA is a contractor, the RMC PM is the senior NSA representative, leads the NSA PT and has the overall responsibility to plan, integrate and execute availabilities.
- (3) When the NSY is the NSA and the LMA, the NSY Project Manager (Superintendent) is the senior NSA representative, leads the NSA PT and has the overall responsibility to plan, integrate and execute availabilities. In this situation, the RMC PM leads the supporting RMC Contract Management PT and is responsible for planning, integrating, coordinating, and executing the contracted maintenance work items in support of the NSY Project Manager (Superintendent), integrates into the NSA PT at the APS Level and operationally reports to the NSA Project Manager (Superintendent) during the project.

b. **Accountable:**

- (1) Accepts and tracks all assigned maintenance work items through execution. Coordinates planning, cost estimating and design specification preparation and scheduling. Coordinates and manages shipchecks **per** Volume II, Part II, Chapter 2, paragraph 2.6.2.3 of this manual. Reviews specifications to ensure completeness and conformance with authorized work. Ensures all specifications for work are developed using approved technical guidelines ensuring maximum use of current NAVSEA approved Standard Items and Standard Work Item templates (Master Specification Catalogue).
- (2) Analyzes feedback submissions **per** Chapter 39, Section 39.5 of this volume.
- (3) Briefs Ship's Force on the status of all work, by work item (see Volume VII, Chapter 2, paragraph 2.8.8 of this manual).
- (4) Acts as business agent with other activities on availabilities and contracts assigned that includes ensuring that TYCOM funds are utilized properly. Evaluates all Technical Analysis Reports (TAR) and supports the Contracting

Officer in contract negotiations. Acts as assistant funds administrator (when designated in writing from the RMC Commanding Officer) for assigned availabilities and contracts.

- (5) (For Surface Force ships) Documents delay and disruption charges and lessons learned **per** Chapter 31, paragraph 31.5.3 of this volume.
- (6) Manages ship repair and modernization work items, job orders and contracts assigned by progressing and evaluating all work to anticipate, prevent and minimize delays, resolving all problems that affect the end cost, quality, schedule and performance of assigned availability or contract.
- (7) Evaluates and acts on the reports received from other members of the availability management team. Prepares reports on current status of assigned project or contract.
- (8) Maintains liaison with customers, the ships Maintenance Team, Ship's Force Representatives, and financial **or** accounting personnel.
- (9) (RMC PM only) Maintains liaison with RMC functional departments and the contractor.
- (10) Arranges and conducts the arrival conference (see Volume VII, Chapter 7, paragraph 7.7.1 of this manual), weekly progress conferences, weekly commanding officer's brief (see Volume VII, Chapter 7, paragraphs 7.7.2, 7.8.8, 7.12.1, 7.9.4 and Volume II, Part I, Chapter 3, paragraph 3.6.3.1 of this manual), Docking conference, and the Availability Completion conference. Attends weekly management meeting and on-site meetings to provide comprehensive information to all concerned and to remain current in all aspects of the project.
- (11) (RMC PM only) Arranges for RMC representation at all conferences pertaining to assigned availabilities and contracts. Coordinates the on-site work effort in observing the contractor's in process production performance and operational testing events for projects assigned to the team.
- (12) Reviews all work accomplished by assigned Shipbuilding Specialists to ensure compliance with regulations, directives, instructions, and policies as well as to ensure that intended work is practical and necessary.
- (13) (RMC PM only) Reviews contractors work schedules, manning curves, material ordering **or** receipt schedules and special tasking **or** equipment requirements. Evaluates contractors' proposals prior to and during contract execution. Takes corrective actions to eliminate conflicts and prevent work stoppages. Identifies and initiates action to correct, prevent, and minimize delays, resolving all problems that affect quality, schedule and contractor performance.
- (14) Provides written reports (CPARS) to the Contracting Officer for award fee evaluations on CNO availabilities.

- (15) Coordinates required action as a result of post overhaul **or** repair inspections with the NSA Technical Authority and Maintenance Team **per** Volume IV, Chapter 4, paragraph 4.3.2 of this manual.
- (16) Maintains records for the Contracting Officer to include but not limited to the following:
 - (a) Maintains a Significant Event Log (see Volume VII, Chapter 7, paragraphs 7.3.2 and 7.2.4 of this manual). All significant event logs from the shipbuilding specialist.
 - (b) Maintains correspondence files containing copies of all correspondence to the contracts office both internal and external.
 - (c) Obtains work authorizations for growth and new work. Work authorizations may be in the form of naval messages, speed letters, letters, other transmittals or documents. In the case of growth work, the authorization may be verbal, a memo at a meeting or a telephone call. Verbal authorizations should be documented with a memorandum for the record.
 - (d) Maintains a ledger notebook or spreadsheet to assist in funds administration. For each contract modification initiated in the work package, the Project Manager **must** show the title of the item, cite the proper funding authorization and account and show the Government estimate. The ledger **must** show funds committed and obligated for each contract modification and other financial transactions and provide an indication of funds available for future use. When changes occur during the negotiation process, the funds reserved or obligated **must** be changed to reflect the current funding status. Periodically, at least monthly, the Project Manager **must** reconcile ledger accounts with the Contracting Officer and Comptrollers' accounts to ensure that funds are not over obligated or expended.
 - (e) Maintains material requisitions for Government Furnished Material (GFM) with prices.
 - (f) Maintains project orders and economy act orders issued to other Government activities.
 - (g) Maintains completion reports.
 - (h) Maintains departure reports including summary costs of individual work items.
- (17) (RMC PM only) Reviews contractor condition reports (see Volume VII, Chapter 7, paragraphs 7.10.2, 7.12.2 and 7.10.3 of this manual), exceptions list, and contract modifications for approval.
- (18) Maintains contact with the ship through the guarantee period (see Volume VII, Chapter 7, paragraph 7.12.4 of this manual).

- (19) Prepares a “Readiness to Start” report (see Volume VII, Chapter 7, paragraph 7.6.3 of this manual).
- (20) Assists Contracting Officers (see Volume VII, Chapter 2, paragraph 2.7 of this manual), participate in the contract awards phase (see Volume VII, Chapter 7, paragraphs 7.6.1, 7.6.2, and 7.6.7 and Chapter 3, paragraph 3.7.5 of this manual), manages funding for option items per Chapter 31, paragraph 31.5.3 of this volume, participates in the pre-award survey, verifies adequate funding for acceptable berthing and messing and performs contract administration.
- (21) (RMC PM only) Provides appropriate clearance letters to the ship for RMC and contractor personnel (see Volume VII, Chapter 7, paragraph 7.6.9 of this manual).
- (22) Conducts underwater hull inspection and drydock walkthrough (see Volume VII, Chapter 7, paragraph 7.8.9.c of this manual).
- (23) Provides a list of expected prorated items with work numbers assigned (see Volume II, Part II, Chapter 2, paragraph 2.4.6.2 of this manual).
- (24) (RMC PM only) Establishes a Ship Specification Package within Navy Maintenance Database (NMD) Planning for CMAVs and set up availability in NMD to receive Automated Work Requests from the appropriate IT system. (See Volume II, Part II, Chapter 2, paragraph 2.6.2.2 of this manual.)
- (25) (RMC PM only) Reviews and validates Automated Work Requests received in NMD Strategic Systems Programs planning availability daily (see Volume II, Part II, Chapter 2, paragraph 2.6.2.3 of this manual).
- (26) Prepares and schedules the LOA or propulsion plant light off (see Volume II, Part I, Chapter 3, paragraph 3.3.4 of this manual).
- (27) (RMC PM only) Reports costs, schedules and maintains the status of all CNO and CMAV work conducted at contractor and Government facilities.
- (28) Coordinates, schedules and administers advance planning functions. Analyzes work package to maintain available dates and minimize premiums.
- (29) Participates in availability final cost validation.
- (30) Participates in establishing controls to fund all repairs for an availability.
- (31) (RMC PM only) Analyzes work package to level load contractor.
- (32) Assures planning estimates are established for timely receipt of funds, requests funds and distributes relevant availability information.
- (33) (RMC PM only) Coordinates review of both Government and contractor estimates for “reasonableness and fairness”. Recommends alternate contracting vehicles if applicable.
- (34) (RMC PM only) Submits contract work packages to appropriate procurement activity for solicitation and monitors progress of contract award.

- (35) (RMC PM only) Responds to contract bidders' questions during Fleet Fast Pay solicitation.
- (36) Provides inputs for funding requirements and serves as the Maintenance Team funds manager for CNO availability preparation and execution.
- (37) Chairs advance planning meetings, reviews and accepts or modifies recommended availability milestones.
- (38) Updates appropriate product and pricing databases.
- (39) Prepares advance planning status messages, fuel and ammunition offload, readiness to start, pre-availability agreement, monthly availability status messages and completion messages for scheduled CNO or CMAV availabilities.
- (40) Coordinates interface of outside activities during availability execution (i.e., Systems Commander, TYCOM, In-Service Engineering Agent, AITs and other customers).
- (41) Oversees contractor or NSY work during availability execution. Progresses and monitors other integrated availability work.
- (42) Assists with business case analysis preparation.
- (43) Verifies that controls are sufficient to fund all repairs required to support operational commitments.
- (44) Reviews cost reports for cost performance.
- (45) Executes availability planning milestones. Enforces depot availability "lock", planning and estimating dates.
- (46) Prepares the business case analysis for growth and new work recommendations and recommends resolutions to the Ashore Ship's Maintenance Manager. Reviews the authorization and funding, and submits information to the contracting officer for negotiation on growth and new work.
- (47) Coordinates urgent and compelling requests.
- (48) Chairs weekly production progress meetings and provides regular status reports to Ashore Ship's Maintenance Manager.
- (49) Reviews condition reports and evaluates submitted time and cost estimates for accomplishment or deferral in concert with the Ashore Ship's Maintenance Manager's concurrence.
- (50) Oversees an independent Government review of brokered work candidates for obligation of Government funds and execution.
- (51) Ensures work candidate 2K documentation is complete and completion reports are initiated by the executing activity.
- (52) Verifies funds availability and maintains funds tracking reports.
- (53) (RMC PM only) Submits I-Level schedule to contractor for integration.

- (54) Ensures work is complete to support PCD, LOA, combat systems light off, propulsion plant light off, Dock Trials, Fast Cruise, Sea Trials (contractual milestone).
- (55) Provides oversight of AIT management.
- (56) Attends 25%, 50%, 75% reviews; Arrival, Docking, Undocking, Departure, and Completion conferences; IPTD, LLC, WPIC and WPER events.
- (57) Ensures work is complete and closed out to support business close.
- (58) Coordinates condition report responses.
- (59) Coordinates consolidated software delivery and ILS support.
- (60) Ensures work is complete supporting habitability completion.
- (61) Provides oversight of (PVI, PE, PR) and LMA checkpoint execution (V, G, I).
- (62) Ensures LMA coordinates with AIT, Fleet Maintenance Activity and Ship's Force to update production schedule (NSI 009-060).
- (63) Ensures LMA provides Integrated Total Ship Test Plan (NSI 009-067).
- (64) Requests funds for repair and modification work LLTM, orders LLTM Firm Fixed Price **or** PSIA.
- (65) (RMC PM only) Ensures contracted maintenance is complete supporting space turnover.
- (66) (RMC PM only) Performs risk assessments and verify deliverables to contractor (O, I, D work items and AIT schedule requirements).
- (67) Provides funds administration for all depot level funding on assigned ship(s) as designated in writing by the RMC Commanding Officer.

c. Responsibilities:

- (1) Provides supporting information for Business Case Analysis for new work.
- (2) Participates in CSMP, DFS **and** BAWP mid-cycle reviews, coordinates mid-deployment shipchecks, and participates in scoping conference (see Volume VII, Chapter 2, paragraph 2.12.1 of this manual).
- (3) Reviews and provides feedback on Engineering Service Request.
- (4) Ensures LMA and I-Level collection and management of AWP OQE.
- (5) Provides oversight of the Integrated Test Plan Execution.
- (6) (RMC PM only) Ensures contractor coordination of open and inspects with participating activities.
- (7) Progresses Cost **and** Schedule Status Reports.
- (8) Participates in risk letter development and signed out.
- (9) Assists with the authorization of growth and new work.
- (10) Assists ship in achieving maintenance phase exit criteria.

41.3.2 Contract Specialist. The Contract Specialist who acts as the Administering Contracting Officer (ACO) and whose duties parallel the responsibilities of the Contracting Officer. Their authority is limited as specified by the level of their Defense Acquisition Workplace Improvement Act qualifications level of authority, specific limitations of their warrant and specific assignments made by the Contracting Officer. The ACO is assisted by additional warranted, Defense Acquisition Workplace Improvement Act qualified personnel, who are assigned specific responsibilities for processing contractual issues and to assist with the management and administration of a contract. The contract specialist is a contributor and this will be the person or people assigned to do the work. The contract specialist's responsibilities are listed in sub-paragraphs a. through d.

- a. Participates in negotiations. TAR, advance planning funding administration and definitization. Prepares for and participates in the award fee board and CPARS.
- b. Ensures financial and contractual requirements are met for availability completion and business close.
- c. Assists in developing pre business clearance, progressing Cost and Schedule Status Reports and participates in the Regional Calibration Center process.
- d. Provides incremental funds for ordering LLTM for both repair and alteration or modification work to meet required dates.

41.3.3 Quality Assurance Specialist. Supports the administration of the Contract Administration Quality Assurance Program to evaluate the effectiveness of the Contractor's Quality Management System on work being performed both shipboard and in the contractor's or subcontractor's plant.

- a. Accountable:
 - (1) Develops a Quality Management Plan for each CNO availability following Commander, Navy Regional Maintenance Center (CNRMC) Standard Operating Procedure (appropriate local instruction for SRF-JRMC).
 - (2) Reviews contract specification items to determine inspections or tests required, and PCPs for review (PR, PE, Program Quality Assurance).
 - (3) Verifies all critical tests and inspections associated with Level I work, Nondestructive Testing and critical welding such as P-1 piping.
 - (4) Reviews past contractor quality data (Quality Data Evaluation, PVI, Government and contractor generated corrective action reports) to support planned surveillance actions.
 - (5) Reviews submitted list of sub-contractors to be utilized to support identification of Defense Contract Management Agency notification requirements.
 - (6) Issues the Quality Assurance (QA) plan to the PT for use via the Project Manager.
 - (7) Participates in bid specification and work specification review with the PT supporting quality and technical requirements following the invoked

milestones. Provides feedback for incorporation into work specification requirements.

- (8) Attends scheduled meetings, assesses contractor capabilities, monitors contract performance, provides technical support to the ACO, and participates in claims avoidance.
- (9) Maintains a Significant Events Log. Provide a copy of the log to the contracting officer and PM at the completion of the availability.
- (10) Completes Past Performance Information Surveys within 14 days of completing each availability and provides written reports to Contracts Department in support of Award Fee Evaluations and CPARS. Conducts Procedure Reviews for PCPs submitted by contractors.
- (11) Maintains a copy of all Corrective Action Requests (CAR) generated by the Government, as well as those written by the contractor (when requested by the Government **per** NSI 009-04). Maintains a status of all CARs generated by the Government and updates the Project Manager.
- (12) Informs Project Managers of quality problems that are, or have the potential to, affect their ship.
- (13) Accomplishes Ship's Force QA Interface training prior to each CNO availability.
- (14) Assists Shipbuilding Specialist, as functional responsibilities permit, in the coverage of G-Points.
- (15) If, in the course of evaluating the prime contractor, AIT non-conformities are discovered, they are to be addressed to the Project Manager. If it is determined that the non-conformity warrants the issuance of a Government CAR, and the AIT manager **or** On-Site Installation Coordinator does not issue the CAR to the AIT, the RMC QA department **must** notify NAVSEA 04XQ detailing the Government sponsor information.
- (16) Performs 100% final preservation record review to support work certification at the end of the availability.
- (17) Accomplishes in-process reviews of contractor's test and inspection plan to ensure compliance with NAVSEA Standard Item requirements.
- (18) Reviews and oversight of PCP, UPCP.

b. Responsibilities:

- (1) Provides quality assurance, quality control support of AEGIS Light Off, combat systems light off, propulsion plant light off, production completion date, Fast Cruise, Dock Trials and Sea Trials.
- (2) Provides quality oversight of AIT and AIT management
- (3) Provides quality oversight and input of business close, technical close.
- (4) Provides quality oversight, review, and condition report submission.

- (5) Provides quality review of services request.
- (6) Provides quality oversight of AWP, LMA, I-Level collection and management of OQE.
- (7) Provides quality oversight of the Integrated Test Plan Execution.
- (8) Provides quality oversight of LMA Checkpoint Execution (V, G, I), and (PVI, PE, PR).
- (9) Provides quality control oversight of work certification.
- (10) Provides quality oversight of all work specifications Face-to-Face reviews.

41.3.4 NSA Logistical Representative. Responsible for supporting the configuration management of a ship and validating configuration of the ship following modernization efforts.

- a. Monitors the configuration management process.
- b. Ensures timely action on submittal of configuration change requests and follows up to update configuration records and associated logistics support.

41.3.5 SEA 21 Hull, Mechanical and Electrical and AEGIS Combat Systems On-Site Logistician (Surface Force Ships only). Accountable to ensure that all equipment has proper logistics support completed and available for delivery at the time of installation.

- a. Researches, documents and coordinates delivery of all ILS in support of combat system material readiness to the ship.
- b. Arranges storage and transportation of parts and equipment. Performs inventory audits of installation kits. Assists in the expediting of parts throughout the availability.
- c. Provides applicable logistics data to project engineer's end of availability report.
- d. Provides assessment data, near real time, into ship's CSMP.

41.3.6 Project Support Engineer. The Project Support Engineer is a critical part of availability certification and will work closely with the Project Manager and Chief Engineer to help certify the availability.

- a. Accountable: Provides engineering and technical services during availability planning. The services include:
 - (1) Reviews of contractor work specifications ensuring the requirements of tasking documents are met, naval standards are invoked, and final acceptance testing will validate work performed.
 - (2) Attends all pre-availability planning meetings, assuming a leading role in addressing technical issues and coordinating resolution of technical authority issues.
 - (3) Maintains a records system of tasking documents, 2-Kilos, temporary DFS, a listing of specifications reviewed and documented comments forwarded for correction.

- (4) Coordinates resolution of technical issues during availability execution (i.e., DFS, Condition Reports, Liaison Action Requests).
- b. Provides engineering **and** technical services in support of ongoing waterfront production work at private contractor facilities. Serves as the principal point of contact for all engineering related technical issues between the Fleet Technical Support Divisions, the PT and other outside commands. These services include:
 - (1) Provides oversight of the contractor's technical performance of shipboard work for compliance to contract specifications.
 - (2) Provides oversight of contractor's quality assurance management program for technical documents and data.
 - (3) Provides oversight of contracted Original Equipment Manufacturer technical representatives.
 - (4) Provides technical evaluation and recommendations for contractor change proposals, growth and new work.
 - (5) Serves as the PT's technical authority point of contact. Assigned to resolve all technical issues, adjudicate non-conformances, DFS, waivers and deviations and provides for technical responses to contractor condition reports.
 - (6) Provides oversight of assigned planning yard on-site field personnel responsiveness and technical adequacy.
 - (7) Reviews and approves or disapproves contractor prepared PCP used to provide contractor mechanics guidance for accomplishment of critical repair processes.
 - (8) Initiates Liaison Action Request to document changes or questions to NAVSEA installation drawings.
 - (9) Technical point of contact for analyses during final acceptance testing, certifications and technical inspections.
 - (10) Attends all production meetings to assist and advise the PT in all matters concerning the repair and modernization of shipboard systems and equipment.
 - (11) Provides coordination for the ship availability technical closeout documents to ensure all technical related documents have been properly answered or adjudicated.
- c. Participates as a member of the Maintenance Control Team.

41.3.7 Integrated Test Engineer. The Integrated Test Engineer is a critical part of availability certification and will work closely with the Project Manager and Chief Engineer to help certify the availability.

- a. Approves and provides oversight of the contractor's development and management of the ITP. Ensures the ITP is functionally linked to the Integrated Production Schedule. Ensures the ITP is responsive to changes in production schedule such that when production items completion dates change, their associated test dates change as well. Ensures the ITP includes all testing for all maintenance activities.

- b. Reviews work specification to ensure appropriate work to test relationships have been developed.
- c. Reviews AWP to identify testing key events and milestones that may be required in addition to production key events and milestones (i.e., Aviation Certification and Combat Systems Command, Control, Communications and Computer Readiness Assessment).
- d. Coordinates with Project Manager to ensure the ITP accurately reflects the AWP and the integrated production schedule.
- e. Coordinates with the Program Executive Office, CSPE and Test Coordinator (if assigned) to provide information and status as required.
- f. Acts as the Governments primary point of contact to collect scheduling and testing information from all non-LMA maintenance activities including AITs, Fleet Maintenance Activity, In Service Engineering Agent (ISEA) and NSY. Provides this information as Government Furnished Information to LMA for inclusion into the Integrated Schedule and ITP.
- g. Acts as Government point of contact to coordinate Ship's Force testing schedule and major training evolution schedule information. Provides this information as Government Furnished Information to LMA for inclusion into the Integrated Schedule and ITP.
- h. Evaluates Test Sequence Networks provided by each maintenance activity prior to submitting to the LMA. Evaluates Integrated Test Sequence Networks provided by LMA.
- i. Ensures the Integrated Testing Schedule is updated at least weekly or as milestones and growth work changes dictate.
- j. Receives OQE for completed test procedures from all maintenance activities and evaluates results for completeness and accuracy. Ensures non-conformances are documented and action is taken to resolve or technically adjudicate.
- k. Serves as Government representative on Total Ship Testing Task Group as outlined in NAVSEA Standard Item 009-67.
- l. Provides a final report at the completion of the availability showing completion of all testing, or tests that remain unexecuted with exception reasons and plan for completion.
- m. Ensures the availability of special instrumentation, recording devices, support services, test ranges and data collection requirements to support Sea Trials events. Approves the LMA input to the Sea Trials agenda for submission to Ship's Force, ensuring all test procedures with underway requirements are properly scheduled.
- n. Participates as a member of the Maintenance Control Team.

41.3.8 Assessment Director. Leader of assessment execution. Provides management of military personnel, Government engineers and technicians, contractors, data entry personnel and logisticians in support of assessment program visits and events. Plans, schedules, organizes,

directs and manages the execution of Total Ships Readiness Assessment visits and CMP assessment events.

- a. Accountable:
 - (1) Attends the AWP turnover with SURFMEPP and TYCOM managers to ensure visibility, resource allocation and scheduling of all CMP assessment tasks.
 - (2) Augments **and** assists the PT in CMP assessment accomplishment.
 - (3) Updates the PT on progress in meeting established milestones and deadlines for completion of assignments, projects and tasks, and ensures all team members are aware of and participate in planning for achievement of team goals and objectives.
 - (4) Manages dedicated Visit Support Team performing logistics validation, data entry and data collection support functions.
 - (5) Utilizes data provided by the Fleet Technical Assist (typically RMC Code 200) personnel to assist the Maintenance Team in documenting, completing and closing CMP assessment requirements.
 - (6) Assists Ship in achieving Maintenance Phase Exit Criteria through execution of Assessments.
- b. Responsibilities: Participates in CSMP, DFS **and** BAWP mid-cycle review and life cycle planning conference. Provides open and inspect oversight for screening potential repair.

41.3.9 Technical Matter Expert. The Technical Matter Expert is the Maintenance Control Team leader and acts as the principle assistant to the NSA for non-nuclear propulsion plant work. Accountable as owner of the work and the person who makes the final decision on a task and has the ultimate ownership over that task.

- a. Provides technical guidance in the execution of Controlled Work Packages.
- b. Reviews any revisions for technical adequacy. Verifies and provides recommendations in support of administrative changes. Represents the Government during selective checkpoints, to include testing, and acts as the RMC Chief Engineer's representative.
- c. Participates as a member of the Maintenance Control Team.

41.3.10 Shipbuilding Specialist. Shipbuilding Specialists are individuals that possess a primary trade background but effectively perform across trade lines in two or more trade skill disciplines. Team assignments are made to balance trade expertise appropriately with the type of work in the project. A wide variety of comprehensive duties and responsibilities are assigned to these individuals who are expected to act as decision makers with comprehensive knowledge of each work item assigned. Typical assignments include the following duties and responsibilities (as with Project Managers, this may vary depending on the supporting organization):

- a. Accountable:
 - (1) Provides current information relating to assigned work items to the Project Manager (see Volume VII, Chapter 7, paragraph 7.3.4a. of this manual).

- (2) Attends meetings, resolves production problems, develops scope of work requirements, assists in the development of Government TARs and negotiation positions, assesses contractor capabilities, work progress and performance, provides technical support to the ACO, and participates in claims avoidance and provides other technical support as required (see Volume VII, Chapter 7, paragraph 7.3.4b. of this manual).
- (3) Interfaces with members of the Ship's Force to provide current project information, notifies responsible personnel of scheduled evolutions and solicits required or desirable Ship's Force (see Volume VII, Chapter 7, paragraph 7.3.4c. of this manual).
- (4) Receives and investigates contractor reports, assists with the development of the Government's technical response, requests engineering support, prepares necessary contract modifications, develops the Government cost estimates, estimates the delay and disruption that may occur because of a contract modification, assists with negotiation preparation relative to TARs and contract modifications (as authorized by the ACO), provides the ACO support in negotiations and maintains records of actions taken (see Volume VII, Chapter 7, paragraph 7.3.4d. of this manual).
- (5) Performs and witnesses Government "G" notification points, identified in the work specifications, when the contractor calls them out. Accomplishes random PVIs utilizing checklists or an attribute system to determine contractor compliance with the quality and technical requirements of the work specifications **or** contract. Writes a Corrective Action Request when nonconformities are detected **per** Chapter 11 of this volume (see Volume VII, Chapter 7, paragraph 7.3.4e. of this manual).
- (6) Determines the physical progress, as a percentage of work completed, of each work item and each contract modification assigned. Updates this information weekly in a comprehensive progress report that is used in calculating the contractor's entitlement to progress payments as well as in evaluating the contractor's schedule performance (see Volume VII, Chapter 7, paragraph 7.3.4g. of this manual).
- (7) Monitors the GFM and Contractor Furnished Material report to anticipate actions that may be necessary to preclude schedule impact by unsatisfactory material delivery dates. Initiates material orders to replace unsatisfactory GFM or to provide items with unique Government control and confirms the necessity for the contractor to make cash purchases from the Naval Supply system when it is in the best interest of the Government (see Volume VII, Chapter 7, paragraph 7.3.4h. of this manual).
- (8) Monitors the contract guarantee period to help determine whether failure of equipment or systems covered by the guarantee clause is the responsibility of the Government or the contractor, ensures that the work determined by the ACO to be the responsibility of the contractor, whether it is covered by guarantee or was an exception to the completion of the contract, is repaired

following the specification requirements and provides cost estimates for incomplete work so that the ACO can ensure that appropriate contract funds are retained in the event that the work must be deleted from the contract requirements or be procured from another contractor (see Volume VII, Chapter 7, paragraph 7.3.4i. of this manual).

- (9) Provides positive lessons learned along with feedback related to deficient or inefficient work specifications or work authorizations to the appropriate planning group for use in improving future procurements (see Volume VII, Chapter 7, paragraph 7.3.4j. of this manual).
- (10) Conducts oversight coordination and inspection of work-related environmental issues associated with Ship's Force and contractor's operations. This effort includes but is not limited to Hazardous Material and Hazardous Waste handling, removal, storage, transportation and disposal (see Volume VII, Chapter 7, paragraph 7.3.4k. of this manual).
- (11) Provides input to the Project Manager to support Award Fee Evaluations and CPARS (see Volume VII, Chapter 7, paragraph 7.3.4n. of this manual).
- (12) Maintains the following records: (see Volume VII, Chapter 7, paragraph 7.3.4o. of this manual)
 - (a) Significant Events Log.
 - (b) Work item specifications, references and estimates for the work package, updated to reflect all modifications.
 - (c) Contractor condition reports including Government replies.
 - (d) New work identified and not authorized.
 - (e) GFM delivery status.
 - (f) Records relating to the contractor's capabilities and capacity.
 - (g) Contractor performance evaluations.
 - (h) Supports LMA collection and management of AWP OQE.
- (13) In the course of evaluating the prime contractor, report any AIT non-conformities to the Project Manager.

b. Responsibilities:

- (1) Provides quality oversight to support propulsion plant, AEGIS and combat systems light off.
- (2) Provides quality oversight of availability completion.
- (3) Provides support of Business Case Analysis for new work.
- (4) Reviews condition report submissions and responses.
- (5) Coordinates consolidated software delivery.

- (6) Provides quality oversight supporting Fast Cruise, Dock Trials, Sea Trials Docking and Undocking.
- (7) Reviews Engineering Services Request.
- (8) Provides quality oversight of Integrated Test Plan execution.
- (9) Participates in quality checkpoints supporting oversight of contracted work, PVI, PE and PR.
- (10) Provides quality oversight of open and inspects.
- (11) Provides quality oversight of the Regional Calibration Center process.
- (12) Participates in work certification.
- (13) Conducts work specification review.

41.3.11 AIT On-Site Installation Coordinator. The AIT On-Site Installation Coordinator is the Government or military employee designated by, and acting with, the authority of the AIT Manager on-site.

- a. Provides the ship with: (see Chapter 3, paragraph 3.3.2 of this volume)
 - (1) All ILS equipment (including on-board spares) and documentation.
 - (2) Ship's Selected Records documentation.
 - (3) A complete set of installation drawings redlined to indicate all variances.
 - (4) Hard copy Coordinated Shipboard Allowance List pages.
 - (5) A copy of the completion message.
- b. Performs additional duties as required by Appendix H of reference (a).

41.3.12 AIT Manager. The AIT Manager is the Government activity, ISEA, military person or Government civilian tasked and funded by the AIT Sponsor to initiate, fund, plan, coordinate, schedule, manage and oversee the successful accomplishment of the alteration or ship change.

- a. Coordinates with the NSA to ensure satisfactory completion of alterations. (See Volume II, Part I, Chapter 2, paragraph 2.1.1 of this manual.)
- b. Identifies support, schedule, and impact requirements according to required milestones. (See Volume II, Part II, Chapter 2, Appendix D of this manual.)
- c. Tasks and funds SID Development according to milestones. (See Volume II, Part II, Chapter 2, Appendix D of this manual.)
- d. Develops and submits the Memorandum of Agreement. (See Volume II, Part II, Chapter 2, Appendix D of this manual.)
- e. Performs additional duties as required by Appendix H of reference (a).

41.3.13 Combat Systems Project Engineer (Surface Force Ships only). These specialists monitor the contractor's performance of work and testing in the combat systems work package. The CSPE provides expert advice in the anticipation, identification and resolution of problems that may occur during the maintenance, repair and alteration installation phases, as well as during the grooming and complex systems level testing phases. The CSPE takes a more active role by

accomplishing duties similar to those of production controllers, ship surveyors and shipbuilding specialists in addition to those of electronics engineers or technicians for Combat Systems work items during an availability or project.

- a. Provides current information relating to assigned work items to the Project Manager. This may also include reports to the ship's assigned Port Engineer for Combat Systems (see Volume VII, Chapter 7, paragraph 7.5.4a. of this manual).
- b. Attends meetings to resolve production problems, develops scope of work requirements, assists in the development of TARs to support the Government negotiation positions, assesses contractor capabilities, work progress and performance, provides technical support to the ACO, participates in claims avoidance and provides other technical support as required.
- c. Interfaces with members of the Ship's Force to provide current project information, notifies cognizant personnel of scheduled evolutions, solicits required or desirable Ship's Force participation and provides technical advice.
- d. Receives and investigates contractor reports, writes and receives answers to Liaison Action Requests, provides interim answers to Test Problem Reports, assists in developing the Government's technical response to contractor requests, assists the TAR writer by providing engineering support and in developing the Government cost estimates, assists in preparing necessary contract modifications, estimates the delay and disruption that may occur because of a contract modification, and provides the ACO support in negotiations and maintains records of actions taken.
- e. Observes "G" POINTS for electronic systems and equipment identified in the work specifications when they are presented by the contractor, witnesses required equipment or system tests and accomplishes random in-process inspections (PVIs) at the work sites to determine contractor compliance with the requirements of the specification. Documents the contractor's failure to satisfy contractual responsibilities.
- f. Determines the physical progress, as a percentage of work completed, of each work item and each contract modification assigned. Updates this information weekly in a comprehensive progress report that is used in calculating the contractor's entitlement to progress payments as well as in evaluating the contractor's schedule performance.
- g. Monitors the GFM and Contractor Furnished Material report to anticipate actions that may be necessary to preclude schedule impact by unsatisfactory material delivery dates. Assist the Fleet and Industrial Supply Center or RMC Material Department in visually identifying and verifying receipt of GFM. Initiates material orders to replace unsatisfactory GFM or to provide items with unique Government control and authorizes the contractor to make cash purchases from the Naval Supply system when it is in the best interest of the Government.
- h. Monitors the contract guarantee period to help determine whether failure of equipment or systems covered by the guarantee clause is the responsibility of the Government or the contractor. Ensures that the work determined by the ACO to be the responsibility of the contractor, whether it is covered by guarantee or was an exception to the completion of the contract, is repaired following the specification requirements.

Provides cost estimates for incomplete work so that the ACO can ensure that appropriate contract funds are retained in the event that the work must be deleted from the contract requirements or be re-procured.

- i. Provides lessons learned and feedback related to deficient or inefficient work specifications or work authorizations to the appropriate planning group for use in improving future procurements.
- j. Maintains a Significant Events Log.
- k. Coordinates the efforts of the Master Ship Repair Agreement, Agreement for Boat Repair and each combat systems related AIT.
- l. Participates in the Lessons Learned Conference as appropriate.
- m. Provides written reports to support Award Fee Evaluations and CPARS.
- n. Manages Combat System alteration package and AIT work and facilitates integration with the NSA.
- o. Submits work candidates (2K-MAF) for industrial assistance required for AIT efforts.
- p. Submits work candidates (2K-MAF) for Attack Weapons Systems Element Assessment CMP task accomplishment and uncovered deficiencies.
- q. Ensures that lessons learned identified during availability LLCs are applied across the ship class.
- r. Provides Combat System and Command, Control, Communications, Computers and Intelligence (C4I) test requirements and schedules.
- s. Coordinates C4I schedules and installations, and manages the AIT execution activities.
- t. Provides Combat Systems and C4I reach back to Participating Acquisition Resource Managers and ISEAs.

41.3.14 SEA 21 Hull Manager (Surface Force Ships only). Primary SEA-21 waterfront Surface Combatant Modernization and Integration Representative for execution, engineering, logistic and programmatic support. Primary interface between PT and program office funded activities for all program alterations.

- a. Accountable:
 - (1) Coordinates with ISEA and Participating Acquisition Resource Manager to identify, document and resolve issues of possible concern to the program office as they relate to Navy Modernization Process alteration development or installation.
 - (2) Delivers material (LLTM and Kitted Materials) to Executing Activity.
- b. Responsibilities:
 - (1) Participates in CSMP, DFS and BAWP mid-cycle review.
 - (2) Ensures work supports availability completion.

- (3) Ensures consolidated software delivery and ILS support.
- (4) Attends IPTD, Docking, Arrival, Undocking, Departure and 25%/, 50% and 75% review events or conferences.
- (5) Participates in work certification.
- (6) Participates in work specification review.
- (7) Performs risk assessments and verifies deliverables to contractor (O, I, D work items and AIT Schedule Requirements).

41.3.15 SURFMEPP Waterfront Engineer (Surface Force Ships only)

- a. Accountable
 - (1) Integral member of the Project Teams, assists in the CNO availability Planning, Execution and Closeout Phases.
 - (2) Located at the waterfront to ensure the accomplishment of mandatory technical requirements.
- b. Responsibilities
 - (1) Communicates the technical requirements identified in the Class Maintenance Plan (CMP).
 - (2) Project Team's advocate for resolution of CMP issues or concerns.
 - (3) Maintain relationships and communications with the RMC, TYCOM, Fleet and numbered Fleet Commander's staff.

41.3.16 Government Availability Planning Manager (GAPM). (Surface Force Ships only)

- a. Accountable:
 - (1) Coordinates with PM, Planning Floor, Contracts, Engineering, and Quality Assurance Departments to oversee, monitor and develop executable depot level Work Packages.
 - (2) Monitors performance of the Planning Floor.
- b. Responsibilities:
 - (1) Provides coordination and oversight of planning, estimating, and work specification development.
 - (2) Ensures depot level Work Package development adheres to current business rules; maintenance, modernization and contracting strategies; incorporates lessons learned; and meets planning milestones to support on-time contract solicitation.
 - (3) Monitors and coordinates advance planning of maintenance and modernization activities to ensure availability planning milestones are met.
 - (4) Reviews authorized Work Notifications and advises the Maintenance Team of deficiencies.
 - (5) Coordinates the development of grouping strategy for authorized work.

- (6) Coordinates ship checks per Volume II, Part I, Chapter 2 of this manual.
- (7) Reviews Work Specifications to ensure completeness and conformance with authorized work.
- (8) Reviews Work Specifications and depot level Work Package development processes to ensure compliance with regulations, directives, instructions, and policies.
- (9) Ensures Work Specifications are developed using NAVSEA Standard Items and Master Specification Catalog templates per Volume II, Part II, Chapter 2 of this manual.
- (10) Continuous liaison with customers, Project Team, and Ship's Force Representatives.
- (11) Coordinates with PM to submit depot level Work Packages to the procurement activity for solicitation.
- (12) Monitors and supports contract award.
- (13) Participates in advance planning meetings to include but not limited to: C+21, Life Cycle Planning Conference, mid-cycle reviews, IPTD events and scoping conferences.
- (14) Reviews and provides recommendations concerning availability planning milestones.
- (15) Monitors availability planning milestones and verifies documentation within NMD.
- (16) Monitors, assigns and reviews adjudication of Planning Contractor Furnished Report (CFR).
- (17) Monitors technical adjudication and incorporation of Engineering Service Requests.
- (18) Monitors the identification and ordering of GFM (LLTM, Push, Kitted) for maintenance and modernization.
- (19) Assists in availability risk assessment.
- (20) Assists with the planning of new work.
- (21) Incorporates Lessons Learned with feedback to the Planning Floors and Maintenance Teams related to depot level Work Specifications and planning processes.
- (22) Assists Contracting Officer's Representative by serving as a Technical Point of Contact (TPOC).

41.4 PLANNING PROCESS SUPPORT (Augmentation outside of maintenance availabilities). Supplements both the Maintenance and PTs in the planning and execution of engineered maintenance (CMP, Planned Maintenance System), modernization (Letter of Authorization) and corrective maintenance (CSMP) from advanced planning through close out. Consists of the following members and others as needed:

- a. TYCOM representatives.
- b. Program Executive Officer representatives.
- c. CNRMC representatives.
- d. Systems Command representatives.
- e. SUPSHIP representatives.
- f. Planning Yard representatives.
- g. Carrier Planning Activity representatives.
- h. Submarine Maintenance Engineering, Planning and Procurement representatives (SUBMEPP).
- i. SURFMEPP representatives.
- j. RMC Technical and Logistical SMEs.
- k. RMC Class Team Leaders.

41.5 PLANNING BOARD FOR MAINTENANCE. A regularly scheduled meeting between the ship's Maintenance Team members and stakeholders (e.g., TYCOM, Immediate Superior In Command, planning activity, Ship's Program Manager, etc.) to discuss ship-wide maintenance issues. This forum provides a routine and regularly scheduled management review of current planned off-ship and organizational maintenance, CSMP and AWP quality and accuracy, future maintenance and modernization planning, work prioritization, work integration and fiscal concerns. The objective is to ensure clarity of intent for both the ship's efforts and the shore infrastructure with respect to total ship maintenance, operational schedules and other concerns affecting ship material readiness. While the frequency of Planning Board for Maintenance meetings may vary due to a ship's schedule, a minimum of one meeting per quarter is expected. The Planning Board for Maintenance is the forum for discussing all maintenance issues, including metrics that are currently used to measure the maintenance effectiveness of the ship and the performance of the ship's assigned Maintenance Team. Each maintenance team will incorporate the following business rules.

- a. Ashore Ship's Maintenance Manager will be responsible for all Planning Board for Maintenance decisions.
- b. The frequency of the Planning Board for Maintenance meetings may vary due to a ship's schedule; a minimum of one meeting per quarter is expected.
- c. The meeting will be chaired by the Commanding Officer.
- d. The core Maintenance Team **must** participate in the Planning Board for Maintenance. Other attendees may participate as required.
- e. The Ashore Ship Maintenance Manager will prepare the agenda and provide it to the Commanding Officer and core team members 48 hours in advance.
- f. The agenda provides a list of topic areas to be reviewed during the Planning Board for Maintenance. It does not require an exhaustive examination of each topic during the meeting. Rather the meeting can be used to report the results of detailed reviews,

updates, problem investigations and analyses conducted by assigned teams outside of the Planning Board for Maintenance meeting.

41.6 WORKFORCE DEVELOPMENT PROGRAM (RMC ONLY).

- a. The Work Force Development (WFD) Program is designed as a vehicle for professionalizing the Surface Force Ship workforce. That objective is accomplished through a formal training and certification process that is robust, standardized and repeatable at each RMC. The intent is to support the professional growth of RMC maintenance community personnel and promote career progression opportunities that enhance the long-term prospects for individual work force members, while maximizing overall effectiveness of the maintenance community as a whole. The net result of the WFD Program is a capability that maintenance and modernization work performed at one RMC is both repeatable and standardized with identical maintenance and modernization work performed at any other RMC.
- b. CNRMC serves as the WFD Program sponsor. CNRMC also serves as the Curriculum Control Authority for all WFD training courses and curricula. Each WFD course is delivered via a training team and WFD training covers the vital skills necessary to execute quality Surface Force Ship maintenance and modernization work.
- c. The WFD Program is a requirement for the Surface Force ship contracted maintenance management workforce (except at SRF-JRMC).
- d. All WFD Program courses include comprehensive classroom training, position-specific case studies and practical exercises, and a detailed Job Qualification Requirement (JQR). While JQRs for a given position may be accomplished outside of the associated formal WFD course (i.e., either before or after completing the course), final certification of each course graduate is not granted by CNRMC until each JQR task is completed.

41.7 INTEGRATED PROJECT TEAM DEVELOPMENT (Surface Force Ships only).

41.7.1 Project Team. The PT develops a shared understanding of the assigned project and processes and works to build the rapport and trust required to meet their goals. New members, as well as experienced members, benefit from learning activities which focus on team building and teamwork.

- a. The IPTD curriculum focuses on development and integration of the PT; development of availability expectations and success criteria; advance planning; development, reviewing, refining, validating and communicating key strategies; aligning all members of the integrated PT; process improvement; availability execution processes; and knowledge sharing.
- b. In developing, executing and aligning training, there are many methods and curricula available, at both the corporate level and the individual organization level, to increase team member effectiveness. The IPTD staff works with the PT leadership to identify needs and offer solutions to schedule and logistic questions, topic selection, speaker selection and best learning techniques for each IPTD. From facilitation of arranged topics to customized training programs, the IPTD Staff will continually meet the needs of the PT.

41.7.2 Program Events. The IPTD program is notionally conducted in five events prior to the availability start date and one mid-availability. IPTD events are:

- a. Planning Event. Transition ownership and responsibility for the final development of the AWP from the Advanced Planning Phase (SEA 21 - Surface Maintenance Engineering Planning Program (SURFMEPP) responsibility), to the Planning Phase (CNRMC - NSA **or** RMC responsibility). Review, update and identify risks.
- b. 50% P&E COST **and** 50% 2-Kilo Lock for Firm Fixed Price Event. This event will be scheduled based on the Joint Fleet Maintenance Manual tailored milestone determined at the Planning event. The event focuses on work package development, project strategies and reviewing, updating and identifying risks.
- c. 80% P&E, WPIC COST **and** WPIC Firm Fixed Price Event. This event will be scheduled based on the Joint Fleet Maintenance Manual tailored milestone determined at the Planning Event. The primary purpose of this event is to conduct the WPIC.
- d. WPER. The primary purpose of this event is to conduct the WPER meeting.
- e. Availability Completion Conference (**per** Volume II, Part II, Chapter 2, Appendix D of this Manual). The primary purpose of this conference is to conduct a detailed review of the work package executed during the CNO Availability, and identify Lessons Learned that can be utilized for revising work items and class standard work templates for future maintenance availabilities. Additionally, this conference will serve as the transition (CNRMC - NSA **or** RMC) back to Advanced Planning (SEA 21 - SURFMEPP) to commence the next cycle in the Fleet Response Plan.
- f. 50% Review – Regroup.
 - (1) Midlife Avails: 50% Conference
 - (2) Std Avails: 50% Conference **or** TBD by PT
 - (3) 1-day duration
 - (4) Focus: Regroup, Refocus & Realign

VOLUME VI**CHAPTER 42****MATERIAL READINESS ASSESSMENT****REFERENCES.**

- (a) NAVSEA S9081-AB-GIB-010 - Reliability Centered Maintenance Handbook
- (b) CSL/CSPINST 9010.5 - Total Ship Readiness Assessment (TSRA)
- (c) CNRMCINST 4790.2 - Submarine Regional Maintenance Center (RMC) Fleet Technical Support (FTS) Roles and Responsibilities
- (d) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (e) COMNAVSURFPACINST 4700.1A/COMNAVSURFLANTINST 4700.1/CNRMCINST 4700.7 - Total Ship Readiness Assessment (TSRA)

LISTING OF APPENDICES.

- A Assessment Process
- B Prerequisites and Test Requirements Message (Example)
- C Readiness to Commence Message (Example)
- D Completion Quicklook Message (Example)
- E Job Originator Identification Table

42.1 **PURPOSE.** To maintain units in a material condition that supports the required degree of operational readiness and the ability to accomplish assigned missions using a process designed to assess the right things at the right time with the right people using the right standards at the right cost. This process applies to all activities (e.g., Type Commanders (TYCOM), Regional Maintenance Centers (RMC), shipyards, System Commands, etc.) executing periodic material assessments (scheduled event) and focused system assessments (not a scheduled event) of key systems, equipment and programs that follow an established framework and methodology. When evaluating material condition, either partially or in its entirety, the material assessment Common Assessment Procedures or approved technical documentation, **must** be used and the results properly documented **per** this chapter via Automated Work Notifications (2-Kilo) to include material assessment tasks, (e.g., Condition-Directed Maintenance Tasks from the Class Maintenance Plan) and any discrepancies. The desired outcome of the assessment process is identification and documentation of required work to maintain adequate material condition. Appendix A provides an outline of the Assessment Process. In addition, this process applies and **must** be followed for the material evaluation piece of inspections, certifications, and visits (e.g., Board of Inspection and Survey (INSURV), Afloat Training Group, Safety Center, etc.) as defined **here**:

- a. **Assessment:** A material assessment is part of the ship's Reliability Centered Maintenance (RCM) plan conducted by Unit personnel or by an external agent (e.g., Command, Control, Communications, Computers and Combat Systems Readiness Assessment (C5RA) **and** Total Ship Readiness Assessment (TSRA)). Depending on the context, material assessments may be individual "tasks" or "events" that group together numerous individual material assessment tasks for accomplishment during a

period of time in the ship's operational schedule. Discrepancy documentation will be **per** this chapter.

- b. **Certification:** A certification is regulatory and is required at some periodicity to authorize operation of equipment or systems (e.g., Flight Deck Certification, Aircraft Launch and Recovery, Magazine Certification). Often, continued certification requires that some material assessments be accomplished or have been accomplished prior to certification. Results of a certification and their distribution will be **following** the associated certification's instruction.
- c. **Inspection:** An inspection is an evaluation conducted by an internal or external activity with regards to the performance of equipment, systems, programs or functions to a recognized standard (e.g., Diesel, Boiler, INSURV, 3-M). Depending on the evaluation plan, this may involve judging the material condition of equipment or systems. Results of an inspection and their distribution will be **following** the associated inspection's instruction. Generally, results of the inspection will be provided to the unit's superior or higher authority.
- d. **Visit:** A visit is the response to a request to provide technical assistance (e.g., NAVSAFECEN Visit). The technical assistance visit may or may not involve performing a material assessment. Required reports and their distribution from visits will be **following** the technical representative's organization's standard operating procedures.
- e. **Reliability Centered Maintenance:** A methodology to develop or revise a maintenance approach with the objective of maintaining the inherent reliability of the system or equipment, recognizing that changes in inherent reliability may be achieved only through design changes.
- f. **Common Assessment Procedures:** Common assessment procedures are assessments that, to the maximum extent possible, are common across platforms and serve all users for assessments, inspections and certifications. Common assessment procedures are RCM applicable and effective maintenance procedures that can be properly and consistently executed. They deliver accurate assessment and measurement of, determine and document discrepancies to, and specify repairs required to restore satisfactory material condition. Common assessment procedures satisfy the needs of work definition, inspections and certifications in a common document used both across ship classes and by all activities. The two types of commonality invoked are common across functional use and common across platforms with similar systems and equipment.

42.2 APPLICABILITY. This policy applies to all material condition assessments conducted on surface force ships, submarines, aircraft carriers, service craft and afloat **or** ashore activities under the cognizance of United States Fleet Forces Command and Commander, Pacific Fleet (e.g., Pre-Availability Testing, Point of Entry Testing, Common Assessment Procedures, TSRA, C5RA, Boiler Inspection, Diesel Inspection, etc.). This policy does not apply to the following special categories:

- a. Reactor and Primary support systems under Naval Sea Systems Command 08 cognizance.

- b. Fleet Ballistic Missile systems under the cognizance of Director, Strategic Systems Program.
- c. Naval aircraft and avionics equipment.
- d. Post repair testing (e.g., hydrostatic test, Non-Destructive Testing, etc.).
- e. Operational examinations (e.g., Tactical Readiness Examination, Pre-Overseas Movement certification, etc.).

42.3 OBJECTIVES. The principal objectives are:

- a. Identify and document system **or** equipment deficiencies.
- b. Improve unit's material readiness at the equipment **or** systems level.
- c. Identify and define work for upcoming maintenance availabilities.
- d. Standardize how the fleet conducts material assessments.
 - (1) Certifications, inspections and visits tasks **must** use common assessment procedure standards and criteria in judging material condition.
 - (2) Assessments use standardized detailed procedures to determine material condition.
- e. Identify material assessment training deficiencies and document any deficiencies using a Work Notification (2-Kilo). Conduct over-the-shoulder training for unit personnel.
- f. Identify deficiencies with the Class Maintenance Plan (CMP) and document deficiencies using a Work Notification (2-Kilo).
- g. Identify deficiencies with configuration or configuration data using Maintenance Figure Of Merit (MFOM) **or** Mission Readiness Assessment System.

42.4 PRINCIPLES. The critical success factors for a single integrated, effective material assessment process are:

- a. Assessment procedures produced using a common assessment procedure development process based on RCM principles as discussed in reference (a).
- b. Assessment procedures standardized to the maximum extent possible and identified in the CMP.
- c. A standardized assessment tool set used to plan, execute and report assessments.
- d. Assessment results recorded in a common shared data warehouse.
- e. Accomplished using a common material assessment process, as defined **in paragraph 42.5.2 of this chapter**.
- f. Assessment process has an effective method of feedback for periodic reviews and analysis for improvements.

42.5 MATERIAL ASSESSMENT PROCESS.

42.5.1 Discussion. The primary focus of the material assessment process is to coordinate and integrate the various Navy material assessment processes into a single, integrated, effective process designed to evaluate, measure and report individual unit's material condition. This

information will be used to improve fleet readiness, ship design, maintenance and modernization identification, as well as the self-assessment capabilities of fleet units. Activities performing assessments are encouraged to communicate with each other to avoid duplicate work.

Additionally, the assessment process will provide data to help determine a unit's ability to reach its expected hull life, measure the effectiveness of the CMP and identify potential crew training deficiencies. (Submarines only) References (b) and (c) are applicable to all performing submarine material and maintainability readiness assessments.

42.5.2 Material Assessments. Units will undergo assessments per the CMP and as scheduled by the TYCOM. Systems and equipment are selected for assessment based upon:

- a. The CMPs.
- b. Ship Class trends.
- c. Unit requests.
- d. Review of the Current Ship's Maintenance Project (CSMP).
- e. Maintenance Team inputs.
- f. Integrated Condition Assessment Systems (ICAS)
- g. Integrated Performance Assessment Reports
- h. Corrosion Control Information Management Systems
- i. Master Assessment Index

42.5.2.1 Submarine TSRA Material Assessments. Reference (b) is applicable to TYCOM managed activities with responsibility to perform submarine material and maintainability readiness assessments. Reference (c) is applicable to Commander, Navy RMC managed activities with responsibility to perform submarine material and maintainability readiness assessments.

42.5.2.2 Surface Force TSRA Material Assessments. TSRA visits are nominally two weeks in duration. However, at the discretion of the TYCOM, TSRA events may be scheduled for more or less than two weeks in order to avoid conflicting with operational schedules. When the TSRA event is scheduled for less than two weeks, the focus of the TSRA will be identification and documentation of systems deficiencies.

42.5.3 Assessment Authorizing. The Platform Program Manager develops the CMP requirements as outlined in reference (d), and provides the requirements to the Platform TYCOM, who develop the assessment work packages and initiate assessments via "go assess work notifications" (GA2-K). Many factors determine what items will be selected for assessment, including the level of risk, funding constraints, ship's availability and ongoing maintenance and modernization. RMCs are tasked by Commander, Naval Sea Systems Command to support surface ships under the cognizance of Commander, Naval Surface Force Atlantic and Commander, Naval Surface Force Pacific to plan and execute TSRA's.

- a. The CMP contains two types of assessment notifications that may influence the agenda:
 - (1) Scheduled assessments.

- (2) Unscheduled “As needed” or “pulled assessments” (“Go Assess” maintenance notification). The Go Assess maintenance notification (GA2-K) identifies the equipment and the associated assessment procedure which **must** be used.
- b. Individual material assessments (not more than five assessment procedures) may be scheduled outside of a scheduled assessment event or availability if they can be planned and coordinated on a not to interfere basis with the unit’s combined schedule (operational and maintenance). A larger number of assessments or assessment events require additional planning, integrated scheduling and project management (e.g., C5RA, TSRA, Carrier Material Assessment Team, etc.). In this case, a maintenance availability should be used or added to the ship’s schedule. These assessment notifications are screened and brokered to the appropriate executing activity.
- c. All material assessments are scheduled **per** the CMP and should not be repeated or duplicated by multiple activities. Assessment results **must** be shared and used by multiple activities.
- d. Surface Force TSRA’s will include comprehensive assessments of ship’s Hull, Mechanical and Electrical, combat systems, Command, Control, Communications, Computers and Intelligence systems, support equipment and logistics condition per reference (e). TSRA’s are tailored material assessment packages scheduled to occur at specific times during a ship’s schedule to improve maintenance availability planning, CSMP management, equipment repair, Ship’s Force technician proficiency and operational availability. The Master Assessment Index process is used by Surface TYCOM as a risk prioritization model to assist in the development of the TSRA agenda.

42.5.4 Assessment Planning. For scheduled material assessments or events, the Executing Activity identifies a Team Leader and develops the execution plan. The plan contains all of the necessary information required to complete the assigned tasks and should be integrated with the unit’s schedule. Conduct assessments using the applicable pieces of the standard assessment tool set. To facilitate planning and scheduling and avoid redundancy, assessments may be consolidated into a material inspection. Deficiencies identified during other major ship inspections and assessments such as C5RA’s **must** be incorporated into the final INSURV inspection report if the assessment was conducted within 60 days of the scheduled material inspection or as negotiated between INSURV and the TYCOM. Although deficiencies generated during the assessment will become part of the final INSURV report, these deficiencies will be annotated as “corrected”, where applicable. The TYCOM will document this linked event by message request to INSURV, cognizant RMCs and the affected unit nominally four months prior to the scheduled material inspection. INSURV will evaluate the request and determine the scope and applicability of the linkage.

42.5.5 Assessment Execution.

- a. Work with the unit’s personnel to assess, analyze and document the material condition **following** standard procedures. Maintain good communications with all levels of unit personnel. Train unit personnel in assessment procedures and techniques.
- b. The assessment includes validation of equipment configuration, evaluation of the maintenance periodicity and effectiveness, evaluation of the assessment periodicity.

- c. Documentation of assessment results by the equipment Subject Matter Expert (SME) will include all required data. A maintenance ready work notification (2-Kilo) that is sufficiently defined, contains correct and complete information, provides an accurate diagnosis, and provides an applicable, effective and feasible recommended resolution. A properly validated maintenance ready work notification (2-Kilo) should allow the planning and executing activities the ability to understand the requirement and not to expend additional manpower or time obtaining needed information for any deferred maintenance, and completion of the assessment maintenance notification. All Unclassified Non-Nuclear Naval Propulsion Information **or** Naval Nuclear Propulsion Information assessment results and data will be handled **following** current regulations and standing guidance from NAVSEA 08.
- d. During Surface Force TYCOM TSRA assessments, repairs will be accomplished based on priority, availability of parts, Ship's Force support, SME availability or time remaining in the TSRA.
- e. Conduct assessments using the Automated Work Notification software contained in Afloat Toolbox for Maintenance. This software is located in the MFOM Suite. All collected data is stored in the MFOM data warehouse.
- f. Certifications, inspections and visits **must** document material deficiencies on an Automated Work Notification (2-Kilo) that at a minimum identifies the configuration item and adequately describes the symptoms or conditions that are below standards. For example, the 2-Kilo may identify that a specific component does not function properly and requests assistance to troubleshoot **or** diagnose system discrepancy. If the deficiency is clearly understood, the assessor is required to record what they know or understand the deficiency to be.

42.5.6 Assessment Reporting.

- a. The Executing Activity conducting the assessment should analyze assessment results and notify the Commanding Officer or his designated representative of any findings that could result in a Casualty Report, underway limiting or Repair Before Operate condition. The System Command (NAVSEA 05, SPAWAR 05 or NAVAIR) **must** identify material improvement recommendations for new construction, future alterations or further analysis by the technical community.
- b. For Surface Force Ships, RMC **must** send a Prerequisite and Test Requirements message per reference (e) at least three weeks prior to the start of the event.
- c. For Surface Force Ships, the ship **must** send a Readiness to Commence message per reference (e) no later than five days prior to the scheduled event.
- d. Report assessment results using the standard assessment tool set:
 - (1) To include whether an assigned assessment procedure was completed, partially completed or not accomplished.
 - (2) To produce a maintenance ready work notifications (2-Kilo) for each discrepancy identified during the assessment. Determine with unit personnel their repair capability **or** capacity when recommending level of effort, (i.e., Organizational, Intermediate or Depot repair).

- e. To identify Integrated Logistic Support deficiencies and pass to TYCOM **or** Global Navy Distant Support to research and resolve, reporting any configuration discrepancies.
- f. To provide any procedure discrepancies, validation and periodicity feedback.
- g. To document man-hours and costs.
- h. For Surface Force Ships, RMC **must** send a TSRA Completion message per reference (e) no later than five business days after TSRA completion.

42.5.7 Standard Assessment Tool Kit.

- a. The standard assessment tool kit consists of:
 - (1) The catalog of approved assessments outlined in the ship's CMP. The procedure should be written in a format appropriate to the activity and experience of the personnel assessing (i.e., Maintenance Requirement Card for Unit personnel, Task Group Instruction for Naval shipyards, standard item for private shipyards, etc.).
 - (2) If an equipment or system assessment does not exist, one must be developed **following** the assessment technical guide and identified in the CMP.
 - (3) All assessments **must** be planned, executed and reported using the Fleet approved assessment computer application(s) and the results recorded in the Fleet designated data warehouse.

42.5.8 Assessment Personnel.

- a. When assessments are conducted by the unit's personnel, they should be from a rating associated with the equipment being assessed (operationally knowledgeable) and should be experienced in conducting assessments.
- b. Outside activity personnel should be technically knowledgeable in the area they will be assessing and considered SMEs. Additionally, they should be trained on the assessment process, how to document the material condition of the equipment or system and basic RCM principles as discussed in reference (a).

42.6 RESPONSIBILITIES.

42.6.1 Fleet Commander. Fleet Commander **must**:

- a. Maintain a common material assessment process and policy. Conduct periodic reviews of processes and procedures as recommended by TYCOMs and technical warrant holders.
- b. Be the Fleet's advocate and single point of contact for all material assessment issues to include:
 - (1) Policy.
 - (2) Training, assessment criteria.
 - (3) Procedures.
- c. Provide and support a standard material assessment tool set.

- d. Review the personnel and monetary resources required for the operation, improvement and support of the material assessment process and provide for these requirements in the budget effort.
- e. Establish minimum standards of continuous program improvements for the TYCOMs.

42.6.2 Type Commander. TYCOMs **or** Immediate Superior In Command **must**:

- a. Schedule and authorize material assessments.
- b. Define the scope of material assessment.
- c. Provide funding for execution and support when not part of the mission funded executing activities Capabilities Plan.
- d. Conduct periodic reviews of the material assessment process.
- e. Establish standards of effectiveness to ensure continuous program improvement.
- f. Evaluate units ability to self-assess and report training deficiencies to the appropriate activity.

42.6.3 Material Assessment Executing Activity. The Material Assessment Executing Activity **must**:

- a. For RMC managed assessments, the RMC will send a Prerequisites and Test Requirements Message as directed by the TYCOM. Appendix B provides a sample message template. When requesting SMEs from another RMC for Assessment Events (TSRA, C5RA), the requesting RMC will fund travel and per diem expenses for government and military SMEs. For Surface Force Ships, use reference (e) sample message template and supplemental guidance for all TSRA events.
- b. Conduct unit pre-visit brief in order to affect maximum support for the visit.
- c. Assist the Assessment Team with access to the base and unit.
- d. Review documented system deficiencies. Determine system material condition using established test procedures and unit's input. Unit personnel **must** be included in this process as a training effort.
- e. Task the Team Leader to provide daily progress reviews to unit assessment event coordinator.
- f. Determine, in concert with Unit personnel, the correct maintenance level (Operational, Intermediate, Depot) to correct deficiencies.
- g. Document man-hours expended and assessment results using the standard assessment tool set and record the results of the "Go Assess" maintenance notification (GA2-K).
- h. Document assessment deficiencies via maintenance notification. Document follow-on repair or technical assist 2-Kilos by always starting the Block 35 narrative with the words "Per Job Control Number (JCN)", where '(JCN)' is the Assessment JCN that generated the repair or technical assist 2-Kilo followed by the characters "XX" (e.g., "Per YYYYYEM01ZA56XX", where "YYYYY" is the ship's Unit Identification Code and "XX" signifies a break between the JCN and the beginning of the 2-Kilo's

text description). This methodology allows maintenance personnel to connect each follow-on repair or technical assist 2-Kilo to its initiating assessment.

- i. Establish configuration baseline (sight validation) of selected systems to upgrade logistics support documentation. Initiate configuration changes for direct input into the ship's maintenance management system.
- j. Assist unit personnel in repair and groom, as required, and as dictated by time **or** resource constraints and operational necessity.
- k. Assist unit personnel in identifying material requirements to effect repairs.
- l. Provide an out brief to the unit's Commanding Officer (or his representative), describing significant findings. Additionally, ensure all maintenance work notifications are loaded into the unit's CSMP and shore files complete and intact.
- m. For Surface Force Ships, RMC **must** send a TSRA Completion message per reference (e) no later than five business days after TSRA completion.
- n. Support assessments as requested by the TYCOM.
- o. Initiate change recommendations for program improvement.
- p. Ensure all assigned personnel are experienced, knowledgeable and qualified as required.

42.6.4 Commanding Officer. Commanding Officers, as directed by the TYCOM, for scheduled assessments should:

- a. Prepare for assessments events **following** this instruction.
- b. Designate a senior management representative as the unit's assessment event coordinator.
- c. Send, as directed by the TYCOM, a Readiness to Commence assessment message no later than five working days prior to the scheduled start of the assessment event. Appendix C provides a sample message template. Reference (e) provides a sample message template for all TSRA events. Include contact information for the ship's coordinator and key unit personnel.
- d. Provide support for assessment team (e.g., ICAS data, access to specific spaces, electrical power and cooling water requirements, man aloft equipment tag-out and Radio Frequency radiation requirements, a secure space, Shipboard Nontactical Automated Data Processing Program **or** Legacy Organizational Maintenance Management System – Next Generation, Internet access and e-mail accounts).
- e. Prepare systems **or** equipment, tag outs, Work Authorization Form, request support services and generate Quality Assurance packages as required.
- f. Ensure there are no conflicting evolutions, training, drills, field days, major system overhauls or other events that would detract from the timely and efficient completion of the assessment event that have been planned or scheduled.
- g. Reschedule the preventive maintenance requirements that will be accomplished during the assessment event to eliminate redundant accomplishment if the assessment is

scheduled to occur so that no greater than one-half (1/2) of the scheduled periodicity is exceeded.

- h. Host assessment event briefings.
- i. Ensure the 3-M Coordinator, Functional Area Supervisors and the Supply Officer (or representative) are available as needed during the Assessment.
- j. Ensure divisional personnel are assigned to work closely with the Assessment Team SMEs during testing and repair to maximize On the Job Training and awareness of identified equipment problems.
- k. Remove key maintenance personnel from the watch bill during normal working hours in order to improve efficiency of the assessment event.
- l. Correct material discrepancies as time permits.
- m. Send, as directed by the TYCOM, a Quicklook completion message within five working days following the completion of the assessment event. Appendix D provides a sample message template. Additionally, include in the Quicklook report feedback and recommendations to the TYCOM to support continuous improvement of the assessment event process.

NOTE: INDIVIDUAL MAINTENANCE ASSESSMENTS (NOT MORE THAN FIVE ASSESSMENT PROCEDURES) MAY BE SCHEDULED OUTSIDE OF A SCHEDULED ASSESSMENT EVENT OR AVAILABILITY. HOWEVER, THEY STILL NEED TO BE COORDINATED WITH THE SHIP'S SCHEDULE AND SHOULD NOT INTERFERE WITH OPERATIONAL REQUIREMENTS.

APPENDIX A

ASSESSMENT PROCESS

1. Assessment Background, Scope, and Organizational Responsibilities.

- a. The Fleet Material Assessment Process provides comprehensive testing of equipment or system(s) to determine their current state of material readiness. The resultant data assists maintenance efforts to attain a high state of overall material readiness.
- b. This document provides supplemental information to assist in the execution of a material condition assessment. This material assessment process does supersede or supplant other instructions or notices covering material assessment.
- c. An SME may elect to conduct a material assessment procedure for the purposes of troubleshooting equipment or system(s) as part of a Fleet Technical Assistance.
- d. Job Sequence Numbers will be assigned **per** Appendix E.
- e. Only material assessment procedures currently identified in the CMP **must** be used. If a material assessment is not in the CMP, the executing activity must process a Departure From Specification through the appropriate TYCOM and technical authority before it can be scheduled and performed.
- f. A material assessment is part of the ship's RCM plan conducted by Unit personnel or by an external agent (e.g., C5RA **or** TSRA). Depending on the context, material assessments may be individual "tasks" or "events" that group together numerous individual material assessment tasks for accomplishment during a period of time in the ship's operational schedule.

2. Individual Material Assessment.

- a. Scheduling and Preparing for an Individual Material Assessment.
 - (1) The term "Unit" applies to Ship's Force and shore personnel being assessed.
 - (2) Due to the simple nature of this type of assessment, requests will normally be accomplished through a Go Assess Maintenance Notification (GA2-K). The assessment may be requested by a unit's TYCOM, unit's Immediate Superior in Command (ISIC), Maintenance Team or by the unit itself.
 - (3) Once the assessment is scheduled, the SME assigned should ensure there will be proper support for performing the material assessment (e.g., tag-out, equipment operation, initial system conditions, material history, properly calibrated test equipment).
 - (4) If an assessment was scheduled more than two weeks in advance, the SME should make a courtesy phone call or send an e-mail message as appropriate to ensure schedule changes have not occurred.
- b. Conducting the Individual Material Assessment.
 - (1) Each Individual Material Assessment will have an in brief with the Commanding Officer or his designee. The in brief will include an agenda of the assessment, what procedures will be used to assess the equipment **or**

system(s) and unit specific safety policies. Daily briefs will occur, as appropriate.

- (2) Upon the completion of the in brief, the SME(s) will team with the unit's point of contact to begin the assessment. Benefits of this teaming arrangement include training of personnel and meeting all safety requirements. Training is part of the material assessment and unit personnel should be present during the assessment.
- (3) In the event the assessment discloses significant equipment **or** system failure(s) that prevents completion of the assessment, the SME **must** notify the Commanding Officer or his designee and coordinate repairs if appropriate.

c. Completing the Individual Material Assessment.

- (1) All material discrepancies will be documented on a maintenance notification (2-Kilo) and uploaded to the CSMP. The goal is to provide an uploadable file of all final discrepancies upon completion of the assessment but no later than five working days.
- (2) The SME **must** provide the Commanding Officer or his designee with an out brief. If requested by the unit, a formal final report of the assessment will be provided no more than 30 days after the conclusion of the individual assessment.

3. Assessment Availabilities.

- a. Five or more concurrently scheduled assessments require additional planning, integrated scheduling and project management.
- b. Preparing the assessment.
 - (1) The size and complexity of an assessment availability generally requires that it be scheduled as part of a maintenance availability or an individual event. All material discrepancies will be documented on a maintenance notification (2-Kilo) and uploaded to the CSMP. The goal is to provide an uploadable file of all final discrepancies upon completion of the assessment but no later than five working days.
 - (2) The unit should prepare and release the Readiness to Commence message no later than five working days prior to commencement of the assessment, if required by the TYCOM. Appendix C provides a sample format.
 - (3) The person designated to manage the Assessment Availability is referred to as the Team Leader or Assessment Director and his duties are:
 - (a) Prepare and release the Prerequisites and Test Requirements message four weeks prior to the start of the assessment. Appendix B provides a sample format.
 - (b) Arrange for adequate workspace and computer **or** network support.
 - (c) Ensure all members of the team are on the unit's access list.

- (d) Work with the unit's maintenance team to ensure that the maximum benefit may be realized for the scheduled material assessments.
- (4) Extend an invitation to the material assessment out brief to the appropriate TYCOM **or** ISIC and maintenance team.
- c. Conducting the Assessment.
 - (1) The Team Leader **or** Assessment Director will:
 - (a) Perform the task listed in paragraph 2.a.(2) of this appendix.
 - (b) Conduct an in brief to ensure all assessment team members and unit personnel are given the latest guidance for the event.
 - (c) Verify the Standard Assessment tool kit is operational, that the proper configuration data is loaded and that the unit has provided the necessary computer network access (i.e., logins, passwords, accounts, etc.).
 - (d) Distribute appropriate technical documentation to conduct the assessment.
 - (e) Liaison daily or as required with the assessment team members to check on progress with their portion of the assessment.
 - (f) Conduct a daily brief of progress and report significant problem status with the Commanding Officer or designated staff.
- d. Completing the Assessment.
 - (1) The Team Leader **or** Assessment Director will:
 - (a) Specify the time for final submission of assessment results.
 - (b) Provide major findings that pose a threat to personnel safety or equipment (e.g., inoperative alarms or safety devices; readings exceeding the limits of the assessment that are deemed unsafe or excessive fuel **or** oil leaks).
 - (c) Provide minor findings which are defined as any finding not considered to be a major finding and poses no threat to personnel.
 - (d) Findings for material history which do not impact on equipment system operation.
 - (e) Any repairs performed.
 - (f) Any over-the-shoulder training in support of conducting the assessment.
 - (2) The out brief will include:
 - (a) Report major discrepancies.
 - (b) Report the system(s) **or** equipment for which testing was not attempted, testing not completed and configuration changes were needed.

- (c) Results of logistics discrepancies.
- (d) Discrepancies assigned for follow-on technical assistance.
- (3) Provide the ship with the draft Quicklook message within five working days of the completion of the assessment. A Quicklook message sample outline is provided as Appendix C.
- (4) All material discrepancies will be documented on a maintenance notification (2-Kilo) and uploaded to the CSMP. The goal is to provide an uploadable file of all final discrepancies upon completion of the assessment but no later than five working days.
- (5) The Team Leader **must** provide the Commanding Officer or his designee with an out brief. If requested by the unit, a formal final report of the assessment will be provided no more than 30 days after the conclusion of the individual assessment.
- (6) When requested, provide special report(s) or brief(s) to the TYCOM, ISIC, maintenance team or designated representative(s) to facilitate repair of specific deficiencies.

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APPENDIX B**PREREQUISITES AND TEST REQUIREMENTS MESSAGE (EXAMPLE)**

FM (RMC)
TO USS (SHIP/SUB/CARRIER)
(ISIC)
(ADDITIONAL ADDRESSEES AS APPROPRIATE)
INFO (APPROPRIATE TO SHIP/SUB/CARRIER)
(ADDITIONAL ADDRESSEES AS APPROPRIATE)
(TYCOMS ADDRESSEES AS APPROPRIATE)
BT
MSGID/GENADMIN/(RMC)//
SUBJ/ASSESSMENT TASKING FOR USS (SHIP/SUB/CARRIER)//
REF/A/RMG/(ASSESSMENT)/(REFERENCE)//
REF/B/DOC/ASSESSMENT GUIDEBOOK/(DATE)//
REF/C/DOC/(TEST PLAN PROVIDER IF APPLICABLE)/(DATE)//
REF/D/CON/(SCHEDULING AUTHORITY)/(DATE)//
NARR/REF A IS (ASSESSMENT REFERENCE). REF B IS ASSESSMENT GUIDEBOOK.
REF C IS SHIP'S TEST PACKAGE, IF APPLICABLE, FOR USS (SHIP/SUB/CARRIER).
REF D IS (SCHEDULING AUTHORITY).//
POC/(LIST INFO AS APPROPRIATE)//
RMKS/1. IAW REFS A THRU D, ASSESSMENT WILL BE CONDUCTED ONBOARD USS
(SHIP/SUB/CARRIER) STARTDATE-ENDDATE YYYY.
2. ASSESSMENT WILL PROVIDE THE FOLLOWING:
A. READINESS ASSESSMENT OF SYSTEMS MATERIAL CONDITION.
B. OVER-THE-SHOULDER MAINTENANCE TRAINING FOR SHIPBOARD
PERSONNEL AS THEY PERFORM REQUIRED MAINTENANCE/CORRECTIVE ACTION.
C. ENTRY OF MAINTENANCE READY 2-KILOS INTO THE CSMP AND A CSMP
VALIDATION FOR SYSTEMS ASSESSED.
D. (IF APPLICABLE) ASSESSMENT OF SHIP'S ELECTROMAGNETIC
COMPATIBILITY POSTURE.
E. (IF APPLICABLE) CONFIGURATION REVIEW OF COSAL/SNAP DATABASE
AND INVENTORY OF TECHNICAL MANUALS FOR SYSTEMS/EQUIPMENT
(ELECTRONICS ORDNANCE) BEING ASSESSED.
F. (IF APPLICABLE) A SMALL ARMS READINESS REVIEW (SARR) IS OPTIONAL
AND WILL BE CONDUCTED ONLY IF REQUESTED BY THE SHIP. THE SARR WILL
HELP SHIP'S FORCE TO IDENTIFY POTENTIAL PROBLEM AREAS AND ENSURE
QUALITY SMALL ARMS ARE ONBOARD FOR DEPLOYMENT.
3. BRIEFS AND CLEARANCE DATA:
A. PRE-BRIEF WILL BE CONDUCTED TO DISCUSS GUIDELINES, ESTABLISH
REQUIRED SUPPORT, DISCUSS ANY TEST PLAN ISSUES AND REVIEW POSSIBLE
CONFLICTING EVOLUTIONS. RECOMMEND ATTENDANCE BY CO, XO, DEPT
HEADS, PRINCIPAL ASSISTANTS AND 3-M COORDINATOR.
B. RECOMMEND KICK-OFF BRIEF BE HELD ON THE FIRST MORNING OF
THE EVENT.

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C. ASSESSMENT DIRECTOR WILL PROVIDE DAILY PROGRESS UPDATES TO CO OR DESIGNATED REP.

D. AN OUTBRIEF WILL BE CONDUCTED AT THE CONCLUSION OF THE EVENT.

E. CLEARANCE DATA WILL BE PROVIDED BY SEPCOR.

4. USS (SHIP/SUB/CARRIER):

A. (IF APPLICABLE) RMC LOG REP WILL CONTACT SHIP FOR LOG DATA REQUIREMENTS PRIOR TO START OF ASSESSMENT.

B. TRAINING IN MAINTENANCE PROCEDURES AND PRACTICAL APPLICATION OF ONBOARD TEST EQUIPMENT AND TOOLS FOR INSTALLED SYSTEMS IS CONDUCTED. (IF APPROPRIATE) FOR MAXIMUM BENEFIT, REQ ALL TECHS, SUPPLY SUPPORT PERSONNEL AND 3-M COORDINATOR BE AVAILABLE FOR DURATION OF EVENT.

C. (IF APPLICABLE) TO FACILITATE CRYPTO VOICE/DATA CKT TESTING, REQ LOAD ALL APPLICABLE CRYPTO PRIOR TO EVENT START.

D. (IF APPLICABLE) DUE TO LARGE NUMBER OF PERSONNEL BOARDING EACH DAY, REQ PROCESS BE ESTABLISHED TO EXPEDITE BOARDING ACCESS.

E. THIS ASSESSMENT IS NOT AN INSPECTION AND NO PRE-EVENT TESTING IS REQUIRED. CONTINUE NORMAL PMS SCHEDULE.

F. IAW REF B, REQ TRANSMIT "READINESS TO COMMENCE" MESSAGE NLT ONE WEEK PRIOR TO START OF THE EVENT.

G. (IF APPLICABLE) RMC 2-M FLEET COORDINATOR WILL REVIEW SHIP'S 2-M PROGRAM. REQ SHIP'S 2-M COORDINATOR PROVIDE MODULE TEST AND REPAIR TRACKING SYSTEM (MTRTS) DATA FOR THE LAST TWO QTRS.

H. REQ ADVISE EARLIEST OF ANY SCHEDULE EVOLUTIONS WHICH COULD IMPACT THE CONDUCT OF THIS EVENT.

5. (ISIC): REQ ADVISE ALCON NAME AND TELEPHONE NUMBER OF STAFF MEMBER DESIGNATED AS ISIC REP.

6. REQ ALL SUPPORT ACTIVITIES ADVISE ALCON NAME/CLNC LEVEL OF REP(S) PROVIDING SUPPORT.

(LIST AS APPLICABLE TO THE ASSESSMENT)

7. REQ ALL TEAM MEMBERS REPORT ONBOARD NLT (TIME), DD MMM YY TO MEET WITH THE ASSESSMENT DIRECTOR (AND AS APPROPRIATE) TO OBTAIN TEST PLANS AND CONTROL SHEETS.

8. FOR FURTHER INFO CONTACT (LIST POC E-MAIL ADDRESS). (RMC) STANDS READY TO SUPPORT ALL FLEET UNITS 24/7 THROUGH **THE** COMMAND DUTY OFFICER: COMM (###) ###-####, DSN ###-####, UNCLASSIFIED E-MAIL (INSERT ADDRESS), CLASSIFIED E-MAIL (INSERT ADDRESS), AND BATTLE-CHAT SERVER (INSERT ADDRESS).//

BT

NOTE: ENSURE MESSAGES ARE **FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.**

APPENDIX C
READINESS TO COMMENCE MESSAGE (EXAMPLE)

FM USS (XXX)
TO (ISIC)
INFO (AS APPROPRIATE TO ACTIVITY)
BT
UNCLAS
MSGID/GENADMIN/USS XXX/-/OCT//
SUBJ/READINESS TO COMMENCE (ASSESSMENT)//
REF/A/DOC/TYCOM/YMD:2003XXXX//
AMPN/XXX INSTRUCTION 9093.1J PROVIDED INSTRUCTIONS TO CONDUCT XXX//
POC/XXX/LCDR/CMD/LOC:NORFOLK VA/TEL:XXX-XXX-XXXX//
RMKS/FOLLOWING IS SUBMITTED IAW REF A:
1. XXX ASSESSMENT SCHEDULED FOR: XXOCTOBERXX THRU XXOCTOBERXX.
2. ASSESSMENT TEST PLAN NEGOTIATED DURING PRE-BRIEF ON XXOCTXX.
COMMAND PREPARED TO SUPPORT ASSESSMENT EXCEPT FOR THE FOLLOWING
CONFLICTING EVOLUTIONS:
XXX INSPECTION XX-XX OCT XX
FORCE PROTECTION/DIET DRILLS WITH DUTY SECTIONS-DAILY
ALL HANDS TRAINING CONDUCTED WEEKLY.
3. TEST EQUIPMENT: FOLLOWING TEST EQUIPMENT AT CAL OR REPAIR
FACILITY. TEST EQUIPMENT SCHEDULED TO BE TURNED IN TO RMC
PRODUCTION DEPT FOR CAL DURING WEEK OF XXOCTXX. EDD BASED ON
SHOP LOADING:
(LIST ALL APPLICABLE EQUIPMENT)
4. PERSONNEL SHORTAGES/CRITICAL NEC
RATE NEC NMP ONBRD REMARKS
(LIST APPLICABLE BILLETS)
5. THE FOLLOWING SYSTEMS HAVE HAD MAJOR AITS/UPGRADES WITHIN
LAST 90 DAYS:
SYSTEM TYPE OF WORK DATE COMPLETED
(LIST ALL APPLICABLE EQUIPMENT)
6. THE STATUS OF THE FOLLOWING:
A. CURRENT ASI TAPES LOADED-823.
B. CURRENT CRYPTO LOADED DAILY AT 0001Z.
C. CURRENT SOFTWARE TAPES AVAILABLE IN ADP AND CS OFFICE.
D. MESSAGES TO SUPPORT RADAR RADIATION, SONAR AND COMMS
TRANSMISSIONS ARE IN PROGRESS. WILL COORDINATE WITH ASSESSMENT
TEAM TO DETERMINE ACTUAL RADIATION REQUIREMENTS.
E. KEYS FOR ORDNANCE ARE AVAILABLE.
F. TEST EQUIPMENT (253) AND GAUGES (112) ARE IN CALIBRATION;
WEIGHT TESTS AND CERTIFICATIONS ARE UP TO DATE FOR ORDNANCE
HANDLING EQUIPMENT, STAR GAUGES, ETC.
G. ULM-4 COMPLETED ON 10SEP07.
H. TACAN HAS BEEN FAA CERTIFIED.

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- I. OCSOT COMPLETED ON 30SEP07.
- 7. LIST OF WORK CENTER 1ST/2ND POCS FOR SYSTEMS WILL BE PROVIDED AT 0900 IN-BRIEF ON 22OCT07 ON BOARD IWO JIMA.
- 8. UNCLAS NETWORK ACCESS AND OUTSIDE PHONE LINE WILL BE PROVIDED IN CSMC.
- 9. ALL PRE-ASSESSMENT PMS CHECKS HAVE BEEN COMPLETED.
- 10. USS XXX IS READY TO COMMENCE ASSESSMENT ON XXOCTOBERXX.//
BT

NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAD IS UTILIZED.

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APPENDIX D**COMPLETION QUICKLOOK MESSAGE (EXAMPLE)**

FM (ASSESSMENT ACTIVITY OR USS)

TO (ISIC)

INFO (AS APPROPRIATE TO THE ACTIVITY)

BT

MSGID/GENADMIN/ASSESSMENT ACTIVITY OR USS/-/MAR//

SUBJ/QUICKLOOK REPORT FOR USS XXX MATERIAL INSPECTION (MI)//

REF/A/MSG/ASSESSMENT ACTIVITY/161402ZXXX04//

AMPN/REF A DOCUMENTS//

RMKS/1. AN ASSESSMENT WAS CONDUCTED ON USS XXX AT NAS NORTH ISLAND, CA DURING THE PERIOD XX-XX MAR 200X. CERTAIN DEFICIENCIES EXIST WHICH DEAL WITH THE XXX DEPARTMENT. THESE DEFICIENCIES ARE NOTED IN REF A.

2. SENIOR MEMBER COMMENTS:

A. THE SHIP WAS CLEAN AND WELL PREPARED FOR THE INSPECTION.

B. THE SHIP REPORTED A HISTORY OF XXX(SYSTEM AND DISCREPANCY).

C. THE RELIABILITY OF THE XXX SYSTEM IS SUSPECT. DURING THE COURSE OF THE INSPECTION, XXX WERE INOP DUE TO A NUMBER OF MATERIAL DEFICIENCIES AND XXX WERE INOP DURING THE DTE. THE SHIP HAS A MATERIAL HISTORY FILE THAT INDICATES A RECORD OF POOR RELIABILITY WITH XX CASUALTIES, INCLUDING XX CASREPS, DOCUMENTED OVER A PERIOD OF XXX DAYS. MANY OF THE CASREPS ARE RELATED TO PARTS NOT IN STOCK OR NOT CARRIED.

D. THE CONDITION OF THE DISTRIBUTED ELECTRICAL SYSTEM OUTSIDE OF THE XXX SPACES IS OF CONCERN. NUMEROUS UNLABELED/MISLABELED CIRCUITS, OVERSIZED/UNDERSIZED PROTECTIVE DEVICES, AND OTHER SAFETY DEFICIENCIES WERE NOTED.

E. TOPSIDE CORROSION, ESPECIALLY ALONG THE CATWALKS AND UNDER SPONSONS, WAS NOTED. THE SERIOUSLY DETERIORATED MAIN SPACE INTAKE PLENUMS SHOULD BE ADDRESSED IMMEDIATELY.

F. THE SHIP HAS NEVER HAD A COMPLETE OIL POLLUTION ABATEMENT SYSTEM (SPECIFICALLY AN OILY WATER SEPARATOR AND OIL CONTENT MONITOR) INSTALLED AND CONSEQUENTLY CANNOT COMPLY WITH EXISTING ENVIRONMENTAL PROTECTION LAWS. THE SHIP HAS ROUTINELY USED SPACE EDUCTORS TO REMOVE BILGE WATER WHILE AT SEA.

G. MINIMUM ACCEPTABLE EQUIPMENT FOR UNDERWAY OPERATIONS WAS ACHIEVED AT 1100 ON DAY TWO OF INSPECTION.

H. THE SHIP'S SELF-ASSESSMENT CAPABILITY WAS EVALUATED AS SATISFACTORY.

I. THE SHIP'S ABILITY TO RESOLVE SIGNIFICANT MATERIAL ISSUES DURING THE INSPECTION WAS EVALUATED AS SATISFACTORY.

3. THE FOLLOWING CASREPS WERE ACTIVE PRIOR TO THE MI:

NUMBER	NOMENCLATURE	CATEGORY
04XXX	XXXX	2

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04XXX XXXX 2

04XXX XXXX 2

4. DEMONSTRATION RESULTS: SAT (0.80 - 1.00)/DEGRADED (0.60 - 0.79)/UNSAT (0.00 - 0.59):

- THE SELF-DEFENSE DTE WAS UNSAT (SCORE: 0.58) BECAUSE OF REDUCED DETECTION RANGES ON THE XXX SYSTEM, 3 OF 6 XXX WERE INOP OR DEGRADED, AND XXX FAILED TO CYCLE ROUNDS.
- THE XXX DEMONSTRATION WAS SAT (SCORE: 0.80).
- THE FULL POWER DEMONSTRATION WAS SAT (SCORE: 0.91). SEE REF A.
- THE QUICK REVERSAL AHEAD WAS SAT (SCORE: 0.98).
- THE QUICK REVERSAL ASTERN WAS UNSAT (SCORE: 0.50). SEE REF A.
- THE STEERING DEMONSTRATION WAS DEGRADED (SCORE: 0.63) BECAUSE THE RUDDER SWING RATES WERE OUT-OF-SPEC SLOW AND IMBALANCED.
- THE ANCHOR DROP DEMONSTRATION WAS SAT (SCORE: 0.89).

5. SIGNIFICANT MATERIAL DEFICIENCIES AND EQUIPMENT OPERATIONAL CAPABILITY (EOC) INCLUDE:

A. PROPULSION: 0.88. REF A DOCUMENTS DEFICIENCIES AND OBSERVATIONS NOTED IN THE XXX DEPARTMENT.

B. AUXILIARIES: 0.74.

- THE XXX WAS EXCESSIVELY WORN.
- 5 OF 8 XXX INDICATORS WERE INOP (CORRECTED).
- 10 OF 10 XXX HAD INOP OR OUT-OF-SPEC SAFETY SWITCHES (5 CORRECTED).
- 5 OF 5 XXX WERE INOP (3 CORRECTED).
- 17 OF 23 XXX HAD SIGNIFICANT DEFICIENCIES OR WERE INOP (13 CORRECTED).
- THE ACCOM LADDER UPPER PLATFORM WAS MISSING A THIRD LIFELINE.

C. COMBAT SYSTEMS: 0.83.

- 5 OF 6 XXX WERE INOP (2 CORRECTED).
- 2 OF 10 XXX WERE UNSAFE TO OPERATE (CORRECTED).
- 8 OF 10 XXX WERE UNSAFE TO OPERATE (CORRECTED).
- 25 OF 25 XXXX DID NOT HAVE REQUIRED FLOATATION AND HOLSTER SAFETY MODIFICATIONS INSTALLED.
- THE XXX WARNING BELL WAS INOP (CORRECTED).
- THE XXX WAS INOP (CORRECTED).
- THE CONDITION OF ELECTRONIC MATTING IN MANY XXX SPACES WAS NOT INSTALLED IAW NSTM CH 634 AND COVERED SIGNIFICANTLY CORRODED DECKS.
- THERE WERE SEVERAL SIGNIFICANT TOPSIDE AND MAST INSPECTION DISCREPANCIES INCLUDING VARIOUS CORRODED FERROUS FASTENERS AND ASSOCIATED HARDWARE, MISSING OR IMPROPERLY INSTALLED CLIMBER SAFETY RAIL PINS, AND MISSING ANTENNA SAFETY CUTOUT SWITCH RF HAZARD LABELS.
- THE CLIMBER SAFETY RAILS LOCATED ON THE XXX, NAVIGATION POLE, AND FANTAIL WERE NOT INSTALLED IAW THE NAVSEA STANDARD DRAWING.
- THE XXX WATER CIRCULATING PUMP WAS INOP (CORRECTED).

D. QUALITY OF SHIPBOARD LIFE: 0.83.

- THE FLAG PANTRY GARBAGE DISPOSAL HAD EXPOSED ELECTRICAL WIRES IN THE CABINET BENEATH THE SINK (CORRECTED).

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PAGE 08 RUCOMFB8675 UNCLAS.

- THERE WERE NO DEEP FAT FRYER EMERGENCY DISCONNECT SWITCHES INSTALLED IN 5 OF 7 GALLEYS/PANTRIES.
- 17 OF 44 NEWLY INSTALLED GAYLORD HOOD FAIL-SAFE SWITCHES WERE INOP (CORRECTED).

E. NAVOSH: 0.84.

- 38 OF 41 XXX SAFETY NETS HAD DISCREPANCIES.
- IMMUNIZATION SUPPLIES WERE NOT STORED IN A BIOLOGICAL REFRIGERATOR THAT HAD HIGH/LOW TEMPERATURE AND LOSS OF POWER ALARMS INSTALLED (CORRECTED).
- 1 OF 5 BIOLOGICAL REFRIGERATORS WAS INOP.
- THE XXX CALL BUTTON SYSTEM AND XXX HEADS WAS INOP.
- 1 OF 3 MEDICAL/DENTAL STERILIZERS WAS INOP (CORRECTED).

6. VADM XXX, (CMD), RADM XXX, (CMD), AND RADM XXX, (CMD), WERE PRESENT FOR THE INSPECTION. CAPT XXX WAS THE SENIOR INSPECTOR.

7. PRESIDENT, BOARD OF INSPECTION AND SURVEY, CONCURS WITH THE FINDINGS.//

BT

NOTE: ENSURE MESSAGES ARE FOLLOWING CURRENT MESSAGE FORMAT AND CURRENT PLAD IS UTILIZED.

APPENDIX E

JOB ORIGINATOR IDENTIFICATION TABLE

Code	Short Description
A	HM&E RA (SUB/AIR)
B	C5RA (AIR) - Local TYCOM
C	C5RA (National)
D	C5RA (AIR) - Local TYCOM
G	RMC Inputs (AIR) - Local TYCOM
H	RMC Inputs (AIR) - Local TYCOM
J	ICAS (National)
K	C5RA (SURF) - Local TYCOM
P	PMT OSAR (SUB) - Local TYCOM
Q	Created by RMAIS (National)
R	INSURV (National)
S	Sail Deficiencies (SUB) - Local TYCOM
W	Class Maintenance Plans (AIR, SUB, SURFACE)
X	Class Maintenance Plans (AIR, SUB)
Y	MST (SURF) Class Maintenance Plans (AIR) - Local TYCOM
Z	MST (SURF), CMP (National) - Z-alpha (National), Z-numeric (MST)

References to “National” values indicate that, **per** SHIPMAIN direction, an Information Technology product has been identified as the only authorized tool that will create 4790-2-Kilos containing the respective Job Originator code.

VOLUME VI**CHAPTER 43****GUIDANCE FOR ENHANCED MODERNIZATION AND ALTERATION
INSTALLATION TEAM INTEGRATION DURING AVAILABILITIES****REFERENCES.**

- (a) NAVSEA SL720-AA-MAN-030 - Navy Modernization Process Management and Operations Manual

43.1 CONCEPT.

- a. Scope. This policy applies to all modernization work (Ship's Force, shipyard, Intermediate Maintenance Activity and Alteration Installation Team) conducted during all types of Availabilities (Chief of Naval Operations, Continuous Maintenance Availability, Fleet Maintenance Availability, etc.) on all platforms. This chapter compliments the support policy of the Fleet Modernization Program as described in Chapter 3 and Chapter 36 of this volume.
- b. Overview. Ship availability duration must be limited to only that required to accomplish planned repairs and alterations. Unnecessary time in depot maintenance periods reduces the time when ships are operationally available to support the Fleet Response Plan. Accordingly, scheduling of production and test activity for all work must be optimized to keep availability schedule duration to a minimum. The key to duration optimization is rigorous, inclusive and detailed integrated planning, which encompasses all anticipated work into a balanced schedule. Once an integrated and executable schedule is established and agreed to by all participating activities, the Naval Supervisory Authority (NSA) **must** be responsible and have the authority to manage the execution of the modernization through its completion.
- c. This chapter provides planning and execution requirements for all modernization activities participating in an availability. Disconnected or diffused planning and execution creates local delays and disruption to the overall availability effort, creates additional coordination challenges for NSAs and Ship's Force, and results in excessive availability durations and higher secondary costs.
- d. Essential to establishing an integrated and executable schedule is a stable and properly funded repair and modernization work package. Type Commanders and Program Managers must structure, plan and program repairs and installations with an understanding that they will be executed not in isolation, but as part of a larger, integrated effort with competing constraints and requirements. Accordingly, repair candidates and alterations not authorized at the Work Package Integration Conference (WPIC) will not be included in the integrated schedule, and will only be authorized after the WPIC when the NSA has advised the customer of the cost and schedule impact associated with a proposed late work addition.

**NOTE: FOR SURFACE FORCE SHIPS SUSTAINMENT, TYPE 1 AND 2
ALTERATIONS (TERMED "INTERNAL EQUIPMENT ALTERATIONS")**

MAY BE INCORPORATED INTO THE PACKAGE UP TO THE 100 PERCENT LOCK.

43.2 AVAILABILITY PLANNING BUSINESS RULES.

- a. The NSA **or** Lead Maintenance Activity (LMA) has overall responsibility for the availability and possesses the authority to organize, structure and coordinate availability execution matters. All other participants **must** support the NSA **or** LMA in this regard. Accordingly, it is paramount that the NSA **or** LMA balance the needs of all participants and customers in the availability.
- b. All participating activities **must** provide all availability requirements (specifications, Automated Work Requests, major Planned Maintenance System and Ship's Force projects, approved installation drawings, schedule needs, system and compartment release dates, industrial support requirements, etc.) to the NSA **or** LMA as specified by other applicable milestones in this manual. Technical Points of Contact (TPOC) for each repair or installation activity **must** also be provided to the NSA **or** LMA to assist with integrated planning questions. These TPOCs **must** also be present during the execution of the availability and have authority to represent their organization's interest in matters relating to their repair or installation. For Aegis ships, all Combat System upgrade packages **must** be assembled, scheduled and integrated by the Aegis Combat System Project Engineer and submitted to the NSA **or** LMA as a package via the SEA21 Hull Manager.
 - (1) Alteration Installation Teams **must** provide requirements **per** reference (a).
 - (2) The LMA **must** develop an inclusive, detailed, integrated and resource-loaded schedule of all participating activities. All participants **must** meet and review the proposed plan and make necessary adjustments to render a balanced and optimized integrated schedule. This formal schedule review **must** occur after the WPIC, but no later than the Work Package Execution Review. The NSA **or** LMA **must** serve as the final arbiter of conflicts. By the Work Package Execution Review, all integrated schedule conflicts **must** be resolved by the NSA **or** LMA.
 - (3) The LMA **must** be specifically tasked to accomplish integrated availability planning and execution. For Regional Maintenance Centers, the following related set of specifications achieving end-to-end integration **must** be invoked in the availability Contract Line Item Number at a lead-time commensurate with the complexity of the work package:
 - (a) "Availability Program Management Alteration Installation Team Integration" Standard Work Template 897-04 (Appendix ____).
 - (b) Combat Systems Light-off **or** AEGIS Light-off Compartment Release Schedule, SWT 813-01 (Appendix ____), as applicable.
 - (c) Propulsion Plant Light-off Assessment Standard Item(s), as applicable.
 - (d) Aegis Light-off NAVSEA Standard Item(s), as applicable.

NOTE: TASKING **MUST ENSURE THE NSA **OR** LMA CAN PROVIDE INITIAL “SCHEDULE CONFLICT AWARENESS” AT THE WPIC.**

- c. Costs for this integration effort **must** be prorated amongst the participating customers using existing, standardized proration conventions.

43.3 AVAILABILITY EXECUTION BUSINESS RULES.

- a. During availability execution, the LMA **must** manage and coordinate the project and recommend resolutions to conflicting issues. The NSA will exercise final arbiter for conflict resolution.
- b. The LMA **must** host weekly production progress and work review meetings. All activity participants **must** ensure their TPOC is present to assist in coordination and conflict resolution.
- c. LMAs also conduct daily production coordination meetings. It is recommended that all activity participants and TPOCs attend these on an as-needed basis to assist (in real-time) with coordination and conflict resolution.
- d. In all availability meetings, communications and forums, a forward-looking, anticipatory focus should be applied by all parties to intercept potential problems and resolve them as soon as possible and with least cost and schedule impact.