









Surface Maintenance Engineering Planning Program (SURFMEPP)





Surface Navy Association

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- > SURFMEPP Overview
- Requirement Oversight and Development
- Programming Impact and Alignment
- Discussion

SURFMEPP has an enduring focus on the maintenance requirements

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SURFMEPP Mission & Vision





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Our Mission

We provide centralized surface ship life cycle maintenance engineering, class maintenance and modernization planning, and management of maintenance strategies.

Our Vision

- We are the nation's team accountable for surface ship life cycle maintenance engineering.
 - We defend surface ship maintenance requirements that are aligned and responsive to OPNAV, Fleet, and NAVSEA priorities.
 - We execute engineered life cycle analysis in support of Navy leadership decisions that impact both readiness and attainment of Expected Service Life (ESL).
 - We ensure validated maintenance requirements are programmed and planned for execution.
 - We will remain the conscience of surface navy maintenance.
 - We will remain a world-class employer of choice that fosters an environment of innovative thinking, collaboration, and work life balance.

Last Modified: 1 JUL 2015



Evolution of SURFMEPP



- 2008 Pre-Surface Ship Life Cycle Management Activity (SSLCM)
 - 14 people for entire surface Navy
 - Surface Navy was not performing all required life cycle maintenance
 - No Technical Foundation Papers (TFPs)
 - No Baseline Availability Work Packages (BAWPs)
 - Ship Sheets at the Class level

SSLCM – May 2009

- 36 total staff
- Class Maintenance Plan (CMP)
- TFP for DDG 51 class only
- BAWP
- Deferral tracking
- Ship Sheets based on deferrals

- > SURFMEPP Nov 2010
 - 83 total staff
- SURFMEPP today
 - 232 total staff
 - CMP strengthening
 - TFP for all major ship classes
 - BAWPs for all CNO availabilities
 - Deferral tracking by hull
 - Ship Sheets for every CNO availability
 - Long Range Maintenance Schedules by hull
 - Corrosion Control (CCIMS, TPRs, LRTPRs)





SURFMEPP Global Footprint





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Achieving Expected Service Life...One Ship at a Time

ified: 5 NOV 2015







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Achieving Expected Service Life...One Ship at a Time



BAWP Fielding Status





USS HUE CITY (CG 66) will be the last pre-FY16 ship to complete an FRP cycle, which occurs in FY24.

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SURFMEPP Programming Impact (RESET included in W)



Programmed & Actual Cost Comparison (CNO + CM)



CLOSING THE PROGRAMMING GAP

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TFP ESL MDYS Increases by Class



Class (Update FY)	ESL (Yrs)	PR 11 Notionals	Change		POM 19 Notionals
		(MDYS)	(MDYS)	(%)	(MDYS)
CG 47 (2014)	35	391,600	119,860	30.6%	511,460
DDG 51 (2014)	40	316,050	117,310	37.1%	433,360
DDG 1000 (2014)	40	572,050	311,950	54.5%	884,000
LCS 1 (2017)	25	347,400	510,053	146.8%	857,453
LCS 2 (2017)	25	329,900	584,052	177.0%	913,952
LHD 1/8 (2015)	45	1,340,900	628,441	46.9%	1,969,341
LPD 17 (2017)	40	795,800	732,632	92.1%	1,528,432
LSD 41/49 (2015)	35	847,500	86,867	10.2%	934,367
MCM 1 (2013)	30	137,000	95,158	69.5%	232,158
PC 1 FDNF (2014)	30	66,900	41,459	62.0%	108,359

Updated 11/01/2016

Life cycle requirements were not properly identified prior to SURFMEPP

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REQUIREMENT OVERSIGHT AND DEVELOPMENT

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Structural Surveys Level 1



11

The scope of all Level 1 surveys shall include all structural members and their welds. These include shell, deck/overhead, and bulkhead plating; longitudinal and transverse framing and stiffeners or stringers; structural stanchions; machinery foundations; and the support structure for deck gratings, walkways, catwalks, and ladders.



DDG BLISS CAP DECKS

- > Ineffective drainage
- Legacy coating was not UHS, coating breakdown lead to structural wastage
- Receives a separate G1N6 survey task every 36 mo
- Full coating remediation using UHS and front-loaded structural repairs

<u>LSD WELL DECK</u>

- Next Due Date strategy modified to A-360
- Compressed from 72 mo to 36 mo periodicity



Split well deck configuration into five structural areas for more granular G1N6 survey results and thorough repair 2-kilos

NSWCPD BWL SURVEY

- Programmed each docking availability FRP cycle
- Conducted before A-540 to identify any major structural requirements early for programming into major docking availability



CRITICAL CORROSION SPACE SURVEYS

- Husbanded in CMP with A1 Level 1 requirements
- All areas surveyed during docking FRP cycles to identify and program structural repairs
- Bilge areas assigned individual tasks

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Structural Surveys Level 2



Conducted in all cases where: cracks, fractures, deformation, fatigue, or other signs of structural or physical damage beyond corrosion are identified; engineering analysis is required to determine the root cause of the damage or to determine if structural integrity will be compromised by the anticipated time of projected repairs; evidence of substrate loss of thickness is observed and UT thickness measurements are required.

DDG FLIGHT DECK CRACKING

- Misaligned chocks at bulkhead FR 389 have caused cracking
- CMP task to inspect for chock mis-alignment at the transverse plating at frame 389 and unsnipped angle bar at main deck beneath the helicopter control station window IAW CLAD 01-2016
- Any mis-alignment or flange angle bar discrepancies shall be documented with a repair 2-kilo

CG SUPERSTRUCTURE

- Accomplished NLT A-540 in O-FRP maintenance cycle.
- Allows for early identification and determination of follow on testing and repair requirements



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DDG FRAME 106

Structural analysis indicates cracking is due to hull bending in a seaway and a high stress concentration in the longitudinal girder at FR 106







Requires surveys for specific hull stress areas that will be incorporated into the CMP



Directive Assessments



13

BLUF/Problem

- Current assessment packages may not identify all discrepancies, leading to late discovery and Growth and/or New Work during depot availabilities
- Risk of duration overruns/LOD if late discovery repairs require Long Lead Time Materials
- Equipment may not have a codified assessment procedure or be scheduled incorrectly in the FRP

Specific Examples

> USS Kearsarge emergent rudder bearing repair



Root Causes

- Operational commitments may prevent the accomplishment of assessments
- Equipment may require assessments not previously identified, due to increased age, changes in operating requirements, or emergent safety concerns
- Assessment execution may vary, based on homeport, assessor expertise, or ineffective assessment procedures

Way Forward

- Mandatory assessments have validated procedures, scheduled at the appropriate time during the FRP. Continuous review. Recent completions:
 - Rudderstock Bump Test
 - Stern Tube and Strut Bearings
 - Silicone Aluminum Bronze Fasteners
 - Steam plant operational assessments
 - LPD17 SWAN
 - Below the Waterline Assessment
 - MCM MRG Pre-avail Assessment

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SURFMEPP



Directive Maintenance



<u>TANKS</u>

- The largest cost, integration and availability schedule driver
- Periodic surveys aligned with frontloaded mandatory CMP repair tasks
- Matches avail type to tank location
- CSWT directs repair and preservation work at integrated engineered intervals





ADJACENT TANKS

- Based on projected maintenance
- Incorporated adjacent tank requirements into TFP LRMS/ Ship Sheet
- Specific CMP tasks for inclusion into the BAWP C+115 Corrosion Planning process

BASE METAL BUILD UP

CMP tasks front-load clad welding for the following services: Compensated Fuel, Fuel Storage, and Service, Potable Water, Ballast, Contaminated Oil/Oily Waste/Waste Water, CHT, and VCHT

Front-loads with preservation tasks are implemented during the C+115 planning process



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- Identified common sources of growth RCCs and included in CSWTs
- Intended to account for average growth and new work
- Front-loads direct a contractor to accomplish a defined quantity of a specific task
- Identifies number of mandays and material dollars to be used to address RCCs during execution



Advance Planning (cont) Directive Maintenance Strategies



15

USS BARRY DDC-52 NOVEMBER 2015

DDG STRUTS

- Significant pitting on struts
- Consistent area of growth work during docking availabilities
- Front-loaded CSWT developed with clad weld and weld seam repairs during every docking availability

LPD 17 BULWARKS

- Installed deck drain location and insufficient coating application
- Structural failures led to running rust on ship exterior and water intrusion into adjacent compartments
- CSWT developed with front-loaded repairs and preserve with UHS coating every docking availability





FLIGHT DECK NON-SKID

- CMP tasks created
- Refurbishment occurs during each CNO availability
- CSWTs incorporate latest non-skid 009-32 requirements

RAST TRACK TROUGH

- Difficult to clean out leading to trapped salt and accelerated corrosion – routinely requires maintenance every availability
- Extensive disassembly required for surveys and results in increased probability of broken components
- Aligned survey requirement with directive flight deck maintenance in CNO availability (36 mo)
- CSWT in development with front-loaded repairs and UHS coatings every availability





Tank Strategies



16

Reducing "Unknown" Tanks

- One of the biggest risks to growth in availabilities is tanks with a condition that is not known or data that is unreliable when entering the CNO availability.
- In FY11 only approx. 60% of the tanks in the Fleet had reliable data in the Corrosion Control Information Management System. Through aggressive and disciplined execution of surveys and repairs the Fleet has increased the known conditions of tanks to 98%.
- Corrosion goal is to maintain the population of tanks across the Fleet at less than 2% unknown.



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DECREASING FLEET UNKNOWN TANKS



Time Directive Tank Maintenance Strategy Impact

- Incorporates the cost to prep the tank with both the premaintenance survey and projected repairs...cost efficiency gains in planning and execution
- Improves planning and integration...packages are more stable and predictable
- Executes coating remediation when coating condition is approaching Condition P3, limiting major structural degradation occurrences from coatings reaching P4
- Reduces growth and new work with CSWT reservations on structural repair requirements...CLAD welding and T-Bar
- Plans the correct tanks into the correct avails minimizing the impacts to sequencing...inner-bottoms to dockings...waterborne to PMA/SRA...Executable Plan



Future Focus Areas



LSD 04 AND ABOVE DECKING



 Crane foundations and thinning of decks topside are primary concern

Analysis is in progress to determine if periodic survey CMP task needs to be changed from 72 to 36 months

Determining if programmed decking replacement or UT readings on a periodic basis are required.



LPD VENTILATION PLENUMS

- Airlift design and transition to shell with large troughs result in water accumulation
- Airlifts are constructed of CRES and welded to an EH-36 coaming
- New strategy will be a zone phased remediation strategy with UHS and front-loaded structural repairs



CPS FAN ROOMS

- Significant salt build-up and corrosion from intake louvers into dirty side of CPS fan rooms
- Analysis is in progress to determine if a directive maintenance strategy is a more cost and duration effective approach



- **BILGES**
- Engaged with ISEA on bilge strengthening special project
- Recommending strategy to include CBM directed UT of known corrosion areas and single coat UHS with front-loaded structure



17

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