CNRMC INSTRUCTION 4700.5A

From: Commander, Navy Regional Maintenance Center (CNRMC)

Subj: GUIDANCE AND POLICY FOR EXPANDED PROCESS CONTROL PROCEDURES (EPCP)

Ref: (a) NAVSEAINST 5400.108, Policy for Quality Management of Work on Non-Nuclear Surface Ship Critical Systems
(b) COMUSFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual (JFMM)
(c) CNRMC ltr 4700 Ser C200/126 of 5 Oct 11, Implementation of Controlled Work Packages (CWP) and Expanded Process Control Procedures (EPCP) on Surface Ships
(d) CNRMCINST 4700.9, Availability Quality Management Plan (QMP) Standard Operating Procedure
(e) CNRMCINST 7570.1, Process for Utilizing Historical Reservation Requirements in Ship Repair Contracts
(f) CNRMC ltr 4700 Ser C200/150 of 30 Nov 11, Technical Matter Expert

Encl: (1) SOP for EPCPs
(2) EPCP Metrics
(3) EPCP Process Map
(4) Ready to Start (RTS) SOP
(5) Surface Ship Critical System Boundary Supplemental Guidance
(6) EPCP Feedback Form

1. Purpose. To provide guidance on the management of Expanded Process Control Procedures (EPCP) for Surface Ship Critical Systems as directed by references (a) through (c).

2. Cancellation. This instruction cancels CNRMCINST 4700.5 and CNRMCINST 4700.8 in their entirety.

3. Background. Recurring problems and persistent failures in critical systems on various ship classes have occurred resulting in elevated repair costs and reduced operational capability and availability. Inadequate work processes, quality management systems, and government oversight contributed to these problems.
In order to reduce failures and recurrence of problems, additional controls are required.

4. Scope. Apart from the general exceptions listed below and specific exclusions of Enclosure (5), this instruction applies to all maintenance and modernization work conducted within the Critical System boundaries defined in reference (a), including work executed inside Chief of Naval Operations Availabilities, Continuous Maintenance Availabilities, Continuous Maintenance (CM) Periods and Emergent Maintenance (EM) Periods.

   a. For any Intermediate level work on systems specified by reference (a), Controlled Work Packages (Volume V of reference (b)) shall be utilized.

   b. This instruction does not apply to work accomplished using Advanced Industrial Management Task Group Instructions.

   c. This instruction does not apply to work accomplished by Ship Repair Facility and Japan Regional Maintenance Center (SRF-JRMC).

   d. This instruction does not apply to decommissioning work except in specific cases where the component is to be reused on an active vessel.

5. Policy

   a. All EPCPs shall be approved by the Naval Supervisory Authority (NSA) Chief Engineer (CHENG) or their designated representative prior to starting work.

   b. EPCPs shall be reused to the maximum extent possible. Only the NSA CHENG can authorize development of new EPCPs.

   c. Alteration Installation Teams (AITs) are responsible for developing EPCPs when work is to be conducted on the Critical Systems specified in reference (a).

   d. An NSA Quality Management Plan shall be developed per reference (d).

   e. Reference (e) time and material reservations are authorized for use on reference (a) identified Critical Systems in certain instances. However, the requirements of this instruction remain applicable.
f. In emergent situations where work on reference (a) designated system is required and the ship's operational commitments do not allow for the normal processing of an EPCP, work may begin prior to formal EPCP document approval if the local NSA Commanding Officer or their designated representative provides authorization. Enclosure (1) provides additional guidance on the Emergent EPCP process.

g. Technical Matter Experts (TME) shall be designated and assigned to represent the NSA CHENG on technical matters related to all EPCPs. The TME does not have to be a member of the Engineering Code however, does have to be knowledgeable on the government inspection point and responsible to the CHENG for its acceptance. Reference (f) provides additional TME roles and responsibilities.

h. All non-conformances shall be resolved quickly to prevent delays in production. All approved non-conformances shall be documented via a Departure From Specification (DFS).

i. All work accomplished using EPCPs, including work completed in accordance with reference (b) for the Emergent process, shall be certified to support availability Key Event schedule.

j. The NSA shall track the EPCP performance data listed in enclosure (2). The data shall be submitted to their Immediate Superior in Charge electronically by the 15th of every month in the format specified in enclosure (2).


a. Planning

(1) For the systems outlined in reference (a), a 100 percent specification review shall occur.

(2) The NSA CHENG or designated representative shall conduct a review of the Type Commander (TYCOM) Availability Work Package, identify all work items that require an EPCP and determine which previously approved EPCPs are to be reused and/or modified for reuse.

(3) The NSA CHENG or designated representative shall review the EPCPs identified for reuse to ensure compliance with the latest requirements. Updates to the EPCP shall be made by
the NSA as required. The NSA shall provide the work items and associated approved EPCPs to the contractor by A-120. Work items added late that require EPCPs will follow guidance as outlined in sub-paragraph (7) below.

(4) Only the NSA CHENG can authorize development of new EPCPs and shall work with the NSA Project Manager (PM) to determine if the EPCP will be written internally or sent out for contractor development. All EPCPs shall be developed per the format requirements of enclosure (1). All new EPCPs shall be written without proprietary information to facilitate reuse.

(5) When new EPCPs are developed by the government, the NSA shall provide the approved EPCP and associated work item to the contractor by A-120.

(6) When new EPCPs are developed by the contractor, the Project Support Engineer (PSE) shall provide a list of Critical System work items requiring EPCPs to the contractor by A-240. The contractor shall submit all new EPCPs to the government for review and approval by A-190.

(7) For any tasking received from the NSA after A-204, the contractor shall submit new EPCPs within 14 days. The NSA shall work with the contractor to ensure that NSA CHENG (or designated representative) approval is received within seven calendar days after contractor submission of the EPCP. This guidance shall be followed for work items added later in the planning process as well.

(8) NSA Engineering (C200), Quality Assurance (C130), and Waterfront Operations (C300) departments shall review all new EPCPs for technical compliance, quality oversight, and compliance with this instruction prior to submittal to the NSA CHENG for final approval. The level of review will be per Appendix A of enclosure (1).

(9) For EPCPs developed by the contractor, the NSA shall conduct a first time review and return the EPCPs to the contractor for correction by A-150. Upon contractor resubmission of the corrected EPCP, the NSA shall conduct a second review. If corrections are again required, the NSA shall meet with the contractor to present the required changes. During this meeting, the contractor shall provide resources to support modification of the electronic EPCP file to allow for immediate incorporation of changes. The product of this meeting
shall be the final EPCP ready for approval signatures. All EPCPs shall be approved by A-120.

(10) If the first review of contractor developed EPCPs are found to have extensive changes based on information provided to the contractor, a Corrective Action Request may be issued. The following must be provided to the contractor in an effort to prevent this action from being taken:

(a) The work item must be identified in detail without changes being made after EPCP development has began.

(b) Sufficient time must be allotted to the contractor to complete the EPCP — guidance is provided in paragraph (7) above.

(c) The contractor must identify all missing data in writing to the government within five days of receiving the work item.

(11) In situations where work is required on reference identified Critical Systems outside of a planned maintenance availability, such as a CM or EM period, where no reuse EPCP is available, and where the NSA tasks a contractor to develop the new EPCP, the contractor shall provide the EPCP to the NSA for review and approval within 14 calendar days of official tasking. The NSA shall work with the contractor to ensure that NSA CHENG (or designated representative) approval is received within seven calendar days after first contractor submission of the EPCP for government approval.

(12) For EPCPs developed by AITs

(a) All EPCPs shall be submitted to the cognizant NSA CHENG (or designated representative) by A-135.

(b) The NSA CHENG or designated representative shall approve AIT submitted EPCPs prior to A-120 to support follow-on planning milestones.

(c) If during Regional Maintenance Modernization and Coordination check-in the AIT does not have an NSA CHENG (or designated representative) approved EPCP, the installation shall be placed on Gatekeeper Hold. The AIT shall not start work without an NSA CHENG (or designated representative) approved EPCP.
(13) The NSA shall notify NAVSEA 05Z of all LPD 17 Class Main Propulsion Diesel Engine (MPDE) work that is added to the availability work package after the 80 percent package lock date (A-120). Notification shall occur within seven days of the addition and may be made to NAVSEA 05Z via phone or email or to the local NAVSEA 05 Engineering Field Representative (EFR) who will notify NAVSEA 05Z.

b. Execution

(1) Prior to starting work, a Ready-to-Start (RTS) review shall be conducted in accordance with enclosure (4).

(2) The original job-specific EPCP shall be at the job site at all times during the performance of work.

(3) Work shall be executed in compliance with the EPCP, including procedure sequence. If problems occur during work execution that prevent compliance with the EPCP (i.e. failure to or inability to comply), work shall stop until the problem is resolved. Enclosure (1) provides instruction on changing EPCPs via pen and ink, addendum, Deficiency Form or formal revision and rework.

(4) For the Critical Systems identified in reference (a), the NSA CHENG or designated representative shall notify the appropriate NAVSEA 05 Technical Warrant Holder (TWH) and Ship Design Manager (SDM) at least seven calendar days prior to the start of work and upon completion of work (to include completion of pier-side testing and completion of at-sea testing). For emergent EPCPs, the NAVSEA 05 TWH and SDM shall be notified immediately upon work tasking. Notification may be made via phone, email or to the local NAVSEA 05 EFR who will notify the NAVSEA 05 TWH and SDM.

(5) The NSA CHENG shall designate TMEs by name in writing.

(a) For AIT installations, the AIT On-Site Installation Coordinator (OSIC) may serve as the TME. TME designation shall be limited to the specific alteration(s)/Ship Change Document(s) (SCD) for which the OSIC is assigned.

(b) In the event that the AIT Manager requests that the NSA provide TME services and the NSA accepts this responsibility, the NSA PM shall ensure that appropriate funding
is transferred to the NSA for accomplishment prior to the AIT starting work.

(6) The NSA PM shall conduct an RTS review prior to starting work.

(7) A TME shall attend 100 percent of the (G) checkpoints contained in the EPCP, found in enclosure (1). Work shall not proceed to the next procedural work step without completion of the (G) checkpoint. The TME shall be cognizant of and support the work schedule so as to not delay production and is responsible to notify the NSA PM immediately if he/she cannot attend a scheduled checkpoint.

(8) The government PSE assigned to the availability shall ensure that all non-conformances are resolved to prevent delays in production and that all approved non-conformances are documented via a DFS.

c. Certification and Close-out

(1) All EPCPs, including those developed during the Emergent process, shall be approved for closeout by the prime contractor and NSA prior to underway or system operation. Some EPCPs may need to remain open until successful completion of Sea Trials due to underway testing requirements. Breaking EPCP work into separate phases, such as production and test phases, will help in these types of situations.

(2) The NSA PM is responsible for EPCP close-out.

(3) The NSA CHENG, assisted by the NSA PM, shall certify all work conducted using EPCPs.

(4) The NSA PM shall ensure that Project Team (PT) members have reviewed the completed EPCPs for completeness and compliance and shall ensure that all problems are resolved prior to submitting the EPCPs to the NSA CHENG for certification. At a minimum, the PSE, TME and Quality Assurance Specialist assigned to the PT shall review the completed EPCPs.

(5) The NSA PM shall ensure that PT review of completed EPCPs supports work certification by providing the NSA CHENG sufficient time to review and meet Key Event schedules.
d. Record Retention, Submission and Feedback

(1) The NSA Engineering Department (Code 200) shall serialize and log each approved EPCP. Enclosure (1) provides additional guidance.

(2) Upon close-out of an EPCP reused from the EPCP library, the TME shall provide all required or recommended changes as feedback to CNRMC. EPCP feedback shall be provided electronically within 30 calendar days of EPCP closeout via use of the EPCP Feedback Form provided in enclosure (6).

(3) All accepted and closed-out EPCPs shall be retained by the local NSA Code 200 as supporting documentation for Availability Work Certification per reference (b).

(4) NSA Code 200 is responsible for electronically submitting all EPCPs to CNRMC.

7. Review. This instruction shall be reviewed annually and revised as necessary by CNRMC Code 200.

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CNRMC STANDARD OPERATING PROCEDURE (SOP) FOR EXPANDED PROCESS CONTROL PROCEDURES (EPCP) ON SURFACE SHIPS

Ref:   (a) COMUSFLTFORCOMINST 4790.3 Series, Joint Fleet Maintenance Manual (JFMM)
(b) NAVSEA Standard Items
(c) NAVSEA Technical Publication S9074-AR-GIB-010/278, Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels
(d) MIL-STD-1689, Fabrication, Welding, and Inspection of Ships Structure

Appendices

A - EPCP Template
B - EPCP Record of Change Form
C - EPCP Deficiency Form
D - EPCP Approval Form
E - Local NSA EPCP Log
F - CNRMC EPCP Master Log
G - EPCP Addendum Template
H - EPCP Emergent Work Approval Form

1. **Purpose.** To provide instruction for writing, changing, updating and retaining EPCPs.

2. **Writing New EPCPs**

   a. New EPCPs may be written by the government or a contractor. Contract type (MS/MO, FFP), maintenance availability/period (CNO, CMAV, CM or EM) and schedule (planned availability, emergent or urgent work such as a CASREP) shall be considered when determining who will write new EPCPs.

   b. Work on Surface Ship Critical Systems may be divided into phases to support incremental certification of work. All phases shall be clearly delineated and contained within the EPCP.

   c. **Sequencing Document.** A sequencing document is an EPCP developed per this SOP with the exception that the procedure section is an outline format directing the mechanic to the pertinent step(s) in other referenced EPCPs.
d. **EPCP Format.** EPCPs shall be in the format specified in Appendix A and include the following:

1. **Record of Change Form.** Appendix B of this instruction will be used to document any changes to the approved EPCP. This includes formal revisions and technical changes resulting from direction provided by Deficiency Forms (DF) (Appendix C), issued after initial NSA approval of the EPCP.

2. **List of Effective Pages (LOEP).** The LOEP accounts for every page, including enclosures, that makes up the EPCP. Each time a change adds, modifies, or deletes a page, the LOEP must be revised. Original pages will be marked revision “-.” Subsequent changes shall reflect the latest revision letter. This is necessary to maintain an accurate and auditable trail of all changes to the EPCP.

3. **Precautions.** List precautions for personnel, equipment, and cleanliness that are specific to the job. Examples include, but are not limited to:

   a. **Personnel Safety.** Specific hazards (e.g., toxic or explosive mixtures), stressors (e.g., high noise levels, high heat operations), and protective requirements needed to ensure personnel safety.

   b. **Equipment Safety.** Specific protective equipment and operating restrictions necessary to prevent equipment damage.

   c. **Cleanliness.** Specific precautions to maintain the required level of system cleanliness for the task being performed.

   d. **Electrical Safety.** Ensure all electrical safety requirements are met - specifically if required to work on energized gear.

4. **Prerequisites and Initial Conditions.** This section contains those prerequisites and plant conditions that must be completed prior to commencing the work. List the initial plant/system conditions required to properly and safely accomplish the work, including identification of work boundaries.
(5) Personnel Qualifications. List any unique or special qualifications required for personnel conducting or overseeing work required by the EPCP.

(6) Hazardous Material

(a) Identify and include methodologies to handle hazardous materials (e.g. occupational exposure strategies, Hazardous Substance Control Forms, etc.) as required by Volume VII of reference (a), Standard Item 009-09 of reference (b), and the contract.

(b) Include a note that a current copy of the Material Safety Data Sheets (MSDS) associated with the EPCP shall be at the job site as required by Standard Item 009-01 of reference (b).

(7) List of References

(a) All referenced documents shall be listed in a manner to allow positive identification of the current revision and/or change used at the time of EPCP preparation.

(b) If only a portion of the reference is pertinent to the work, only that applicable portion shall be listed. For example, if a drawing package contains 20 drawings but only two are needed for the EPCP, only list those two drawings; or only list the applicable sections of the tech manual.

(c) Any reference required for the execution of the EPCP (e.g. the technical manual that provides a procedure for the craftsman or mechanic to follow, a schematic that the craftsman or mechanic must follow for completing a step of the EPCP, etc.) shall be annotated as “required”. All applicable portions of each required reference shall be at the location where the work is being performed. Required references shall not be included as enclosures to the EPCP unless it is not available to personnel conducting the work.

(8) Materials Required. This section is used to list all material, spare parts, Foreign Material Exclusion (FME) devices, cleanliness caps/blanks/plugs and special tools required to accomplish the job. Material listed in this section shall be verified on hand, or with a reliable Estimated Delivery Dates (EDD) meeting availability schedule requirements prior to starting work. An automated Job Material List (JML) or Bill of
Material (BoM) generated from the contractor’s procurement system may be attached as a supplement to the Material List provided it clearly ties the material to the work item supported by the EPCP and includes the EDD if the material is not on hand.

(9) **List of Enclosures.** This section is used to list technical documentation that is not readily available to the craftsman and are therefore enclosed within the EPCP. Enclosures are used to provide information, direction or an approved form to document work. Each page of the enclosure shall contain, at a minimum; the work specification number, EPCP log number, enclosure number, and enclosure page number. Enclosures are not required to be listed as references. Some examples of enclosures are:

(a) Appropriate reference (a) QA Forms required for documenting the Objective Quality Evidence (OQE)

(b) Diagrams, sketches, illustrations, etc.

(c) Weld Joint Maps

(d) Maintenance Standards

(e) Contingency repair procedures (predictable event)

(10) **Procedure.** A well written procedure is developed for use by trained personnel possessing a requisite level of knowledge about the work to be performed. The procedure shall:

(a) Include all required steps in the appropriate sequence to accomplish the task.

*Note:* There may be instances where work is allowed to be performed in parallel. A sequencing note shall be included to explicitly state the exact procedural steps that may be worked concurrently. This note shall immediately precede the steps to be worked out of sequence.

*Note:* Breaking the EPCP procedure into phases may be appropriate to support incremental certification of the work. If the EPCP procedure is phased, a statement shall be included after the last step of the phase to require submission of OQE for that section. A (G) checkpoint shall be included to verify that all work in the phase is completed technically correct with
all Objective Quality Evidence (OQE) completed satisfactory. The next work phase shall not start until this (G) checkpoint is completed.

1. The first step in the procedure shall be a (V)(G) sign-off signifying completion of an RTS. The NSA PM shall sign this checkpoint.

(b) Include notes on proven craftsmanship skill level and techniques that significantly aid in first-time quality if the information is not addressed in other reference documents.

(c) Contain a level of detail sufficient to allow for determination of the exact steps completed, the material used, and the tests and inspections accomplished.

(d) Include the necessary inspection, verification and record requirements to sufficiently document that the completed steps meet all technical and quality requirements.

1. Quantitative OQE refers to a type of information based on quantifiable data (objective properties) and is expressed in terms of a unit of measure by assigning a numerical value as a quantity relating to or resulting from measurement. Quantitative OQE is required any time a measured value can be taken/obtained.

2. Qualitative OQE contains descriptions or distinctions based on a quality characteristic rather than on quantity or measured value. Qualitative properties are observed but generally cannot be measured with a numerical value. These typically result in a pass/fail or sat/unsat evaluation (subjective properties) based on engineering judgment. Qualitative OQE is required when a measured value cannot be attained.

3. Certain critical or significant work procedure steps require positive, documented assurance that the step was performed and completed in the prescribed manner.

   a. In-process signatures shall be used to document review and acceptance of Qualitative OQE.

   b. Quantitative OQE may be recorded and approved within the procedural steps of the EPCP or on the
appropriate reference (a) QA Form, whichever is appropriate. All QA Forms shall be completed in accordance with reference (a).

**Note:** The signature block titles/descriptions within the procedural steps of the EPCP or on the QA Forms shall be modified to reflect actual personnel required to make QA and approval signatures.

**Note:** QA Forms 34 and 34A shall not be used. QA Form 17 shall be used for recording torque when record of torque data is required.

4. All required (I), (V), (Q), (D) and (G) signatures in the EPCP shall be captured per reference (b), 009-04.

a. (V) - Designates a step requiring a verification signature as specified in reference (b), 009-04.

b. (I) - Designates a step requiring an inspection signature as specified in reference (b), 009-04.

c. (G) - Indicates that a NSA CHENG designated TME is required to witness and sign the checkpoint. A designated TME must attend 100% of the (G) checkpoints in the EPCP. Work shall not progress until the TME is present to witness the checkpoint and the required signature is obtained.

d. (Q) Designates a step requiring verification and documentation of a qualified technical representative in accordance with reference (b), 009-04 and 009-90.

e. (D) - Indicates that documentation in the form of a required report must be submitted in addition to the data recorded in the EPCP.

f. (V)(G) - Indicates that two signatures are required as specified in reference (b), 009-04.

g. (I)(G) - Indicates that two signatures are required as specified in reference (b), 009-04.

5. Personnel signing QA Forms or other OQE documents shall print their name, sign and date each time a
signature is made. Signatures shall be accompanied by an adjacent statement stating that satisfactory compliance with requirements was achieved (e.g. “all measurements are satisfactory”).

6. Weld joint identification shall be completed in accordance with reference (c). Class P-2 welds, as defined in reference (c), shall also be marked for weld joint identification purposes. A mapping of joints shall be provided as an enclosure to the EPCP. For structural welds other than 5XXX series aluminum welds, weld joint identification and record of accomplishment shall be in accordance with reference (d) with identification of weld joint location.

   (e) Reference the source document(s) which shall be at the work site when used. These documents shall be designated as “required” in the List of References.

   (f) When work is to be conducted per an enclosure, the precise steps to be performed shall be specified if the entire enclosure is not applicable. The applicable portion of an enclosure to be used by the tradesman shall be annotated or highlighted. Portions not used shall be lined out.

   e. Tests and Inspections

   (1) Tests and inspections may be included either as a separate section in the body of the EPCP or as an enclosure. Repair process tests, such as seat leakage tests or joint tightness tests performed in the shop, shall be considered part of in-process work and will be contained within the procedure section of the EPCP.

   (2) Testing to be conducted during an underway period, such as Sea Trials, shall be written either in a designated test phase or a separate enclosure.

       (a) If a designated test phase is used, a (G) checkpoint shall be included as the last step in the preceding phase to verify that all work in the phase was completed technically correct with all OQE satisfactory. The test phase shall not start until this (G) checkpoint is completed.

       (b) If a separate test enclosure is used, a (G) checkpoint shall be included as the last step in the EPCP procedure to verify that all work (with the exception of underway testing) was completed technically correct with all OQE
satisfactory and that testing will be conducted per the test enclosure. The test enclosure shall not start until this (G) checkpoint is completed.

(3) Record of test results is required for OQE and the necessary data forms/reports shall be enclosed in the EPCP.

(4) When testing is to be transferred to another activity or to be scheduled as part of another agenda, such as transferring a required test to Ship’s Force for accomplishment during Sea Trials, the approved document providing the test requirement/criteria and the form(s) to be used for recording the results shall be clearly identified in the EPCP. The Sea Trials agenda or a DFS may be used.

f. System Restoration. Restoration of systems to normal operating status shall be conducted utilizing the pertinent local governing documents (PMS, EOSS, CSOSS, etc.) for the associated equipment.

g. Where appropriate, the EPCP shall include statements (e.g. verify, confirm, ensure, etc.) to bring attention to pertinent Category I and II NAVSEA Standard Item requirements that have a direct impact on the accomplishment of work. Category II NAVSEA Standard Items shall be invoked by the work specification for which the EPCP is required, not by the EPCP.

3. EPCP Review and Approval

a. During the EPCP preparation, Appendix D shall be prepared and included as the cover page for the EPCP. Completion of Appendix D will ensure proper review and approval of the EPCP by the contractor and government has occurred.

b. Upon completion and review of the EPCP by the contractor, the contractor will sign the appropriate block(s) of Appendix D. The contractor shall then submit the EPCP (including Appendix D) to the government for review and approval at least 14 calendar days prior to scheduled start of work. All comments and discrepancies shall be addressed and/or corrected by the contractor to the satisfaction of the SUPERVISOR prior to government approval.

c. For EPCPs developed by the government, enter “NA” in the contractor signature blocks. All other signatures are required.
d. Appendix D shall be used to document approval of the original EPCP and subsequent revisions. Upon approval, each sheet of the EPCP, including enclosures, shall be stamped or otherwise marked “Original” in blue ink.

e. A log of serialized EPCPs shall be maintained using Appendix E. CNRMC will maintain a master log of serialized EPCPs using Appendix F.

4. **EPCP Use**

a. **EPCP Copies**

   (1) The EPCP shall be at the job site at all times during the performance of work.

   (2) For multiple worksites, the original EPCP may be copied; however, all signatures and data shall be recorded on the original EPCP copy. This shall be accomplished by transferring the appropriate portions (QA Forms, procedure steps, in-process signatures, etc.) from the original copy to the working copy, capturing signatures as work occurs at the other worksite(s), and transferring the appropriate portions back to the original copy when complete. These steps provide the contractor a formal, documented process to properly control multiple copies and ensure that all OQE is captured with the original copy. Any signatures that are contained in EPCP working copies shall be clearly annotated in the original EPCP via statement that the signatures are contained in the copy. The ENTIRE copy must be included with the original EPCP on file.

b. **Completing a Step**

   (1) As each step in the EPCP is commenced, the step number shall be circled. Upon completion of the step, an “X” shall be marked through the circle or initialed by the tradesman/craftsman. The first set of initials used by an individual shall also include a printed name for traceability purposes.

   (2) The “circle X” requirement also applies to work steps being accomplished per an EPCP enclosure and on EPCP copies at other worksites.

   (3) When the tradesman/craftsman starts a step directing work to be conducted in accordance with a required reference,
the tradesman/craftsman shall circle the number of the EPCP step. Upon completion of the work specified in the required reference, an “X” shall be marked through the circle as described above. This “circle X” procedure does not apply to procedure steps in required references.

c. If at any time a step, test or inspection cannot or is not executed in compliance with the EPCP (i.e. failure to or inability to comply) the tradesman/craftsman doing the work must stop work immediately and notify his/her supervisor. Contractor supervisory personnel shall immediately notify the government Project Team. The problem shall be resolved by the government Project Support Engineer (PSE) or other designated government Engineering Department representative as designated by the NSA CHENG prior to proceeding.

d. If a contractor supervisor submits a Condition Found Report (CFR) or a Departure From Specifications (DFS), the CFR or DFS number shall be recorded in the EPCP in an area adjacent to the step requiring the CFR or DFS with a statement similar to; “DFS ____ applies,” or “Refer to CFR ____.”

5. Changes to Approved EPCPs

a. Pen and Ink Changes

(1) Pen and Ink changes are minor administrative-type changes that do not affect the maintenance scope or intent of the EPCP. Changes of this nature include typographical/editorial errors, amplifying/additional information to clarify a step, or modifications to the material list that do not alter testing requirements or create a non-conformance.

(a) Pen and ink changes are only permitted when no Request for Contract Change (RCC) is required.

(b) Changes to the technical content, scope and/or intent of the EPCP cannot be made by pen and ink.

(2) Pen and ink changes shall be made by the shop/trade supervisor responsible for the step and shall be initialed by a NSA CHENG designated government representative to signify acceptance.

(3) Pen and ink changes shall be accomplished by drawing a single line through the portion to be changed and entering the
necessary information adjacent to that portion. The person making the change shall print their name, initial and date. The government representative approving the change shall also print their name, initial and date.

b. Deficiency Form (DF) Process for Technical Changes

(1) The following process is permitted only when no RCC is required.

Note: Current NSA processes (e.g. Engineering Service Request (ESR)) may be used for providing quick technical resolution and guidance in support of waterfront efforts.

(2) The DF process shall be utilized when no process exists at the NSA for providing resolution of technical problems. The DF process may also be adopted in part to support improvement to existing NSA processes (e.g. ESR).

(3) A DF is initiated by a member of the Project Team.

(4) Corrective action is provided by the NSA Engineering Department (C200).

(5) The DF is approved by the PSE, TME, or another government representative designated by the NSA CHENG.

(6) All DFs shall be evaluated by the Project Team for impact to the contract. If the DF impacts the contract such that an RCC is required, the EPCP change shall be made by invoking an EPCP Addendum (Appendix G) or via a formal EPCP revision vice completing a DF.

(7) For changes that supersede existing EPCP content, a single line shall be drawn through the portion to be changed and an annotation added referencing the DF (e.g. “See DF-001”). The person making the change shall print their name, initial and date. If different from the person making the change, the authorized government representative approving the change shall also print their name, initial and date.

(8) For changes that supplement existing EPCP content, an annotation referencing the DF (e.g. “See DF-002”) shall be made in the area of the EPCP where the DF content is to be inserted. The person making the change shall print their name, initial and date. If different from the person making the
change, the authorized government representative approving the change shall also print their name, initial and date.

(9) All DFs shall be recorded in the Record of Change Form, Appendix B.

(10) If a DF results in or is a result of an approved non-conformance (DFS), the DFS number shall be recorded in the corrective action block (block 12) of Appendix C and in the remarks/comments block (block 10) of Appendix B.

(11) In cases where rework is required, a DF shall be developed with new QA Forms necessary to capture the OQE related to the re-performed steps. The rework QA Forms shall be clearly annotated as part of the DF to preclude confusion with the originally accomplished work. Annotation shall be made in the area of the EPCP procedure near the rework steps stating the specific steps reworked and the DF documenting the rework (e.g. “Steps 3.4.2 through 3.4.5 required rework as documented on DF-003”). The person making the change and the authorized government representative approving the change (if different) shall each print their name, initial and date next to the note.

c. **Addendums**

(1) During the process of conducting work on Critical Systems, problems may arise that require procedures additional to those included in the EPCP. This additional work is often recognized as predictable growth based on documented experiences from past maintenance on certain systems and equipment (e.g. replacement of sheared fasteners). EPCP addendums may be developed and invoked to address this type of work.

(2) Addendums are isolated portions of work for which directions are easily bound into a separate set of instructions from main body procedure section of the EPCP.

(3) The addendum does not require a LOEP, however, it does require the specific steps necessary to accomplish the work and all QA Forms, in-process signoffs and checkpoints applicable to the work and shall be in the format provided in Appendix G.

(4) The NSA PM shall evaluate CFRs and determine if an addendum is available to resolve the problem and invoke the addendum as appropriate. The TME shall support the PM in evaluating the CFR and potential addendum(s) as necessary.
(5) The NSA PM shall evaluate each invoked addendum for potential RCC requirements and take appropriate action to issue RCCs.

(6) The TME shall add a statement in an area near the EPCP procedure where the addendum work is required to identify the addendum (e.g. “See Addendum 1 for additional work procedures.”). The TME shall each print their name, initial and date next to the note.

(7) The requirement to “circle/X” work procedure steps applies to Addendums as in the original EPCP.

(8) The final step in the addendum shall redirect the work flow back to the procedure section of the EPCP.

d. Formal EPCP Revisions

(1) Formal EPCP revisions are required to change an approved EPCP when the pen and ink, DF and addendum options are not suitable. Possible situations requiring a formal revision to an EPCP include:

   (a) Technical work scope changes (e.g. valve packing replacement changed to machining the valve and installing oversized packing).

   (b) Work boundary changes (e.g. change location or addition of disconnected joints).

   (c) Changes in test requirements unless authorized by a Departure From Specification (DFS).

   (d) Process changes in how the work must be performed.

   (e) Changes in material requirements resulting in a change to testing requirements, unless authorized by a DFS.

(2) The government Project Manager (PM) shall notify the TME and PSE that an EPCP requires formal revision.

(3) Appendix B shall be used to record and track revisions to EPCPs.
(4) All revisions to the EPCP shall include an updated LOEP.

(5) EPCP revisions require formal review and approval using the same process specified for new EPCPs.

(6) A revision is made by page substitution. Revisions shall be lettered consecutively starting with “A” and the revision letter shall be entered on all affected pages of the EPCP. New or replacement sheets may be added by labeling the added sheet with the number of the preceding page and a sub-letter (e.g., Page 5A of 15). Steps listed on the revision page which were completed in the previous version of the EPCP shall be marked with a diagonal line through the completed portion and a notation stating, “Completed in Rev X” and retained in the EPCP. Transfer of (V), (I), (Q), (D), (V)(G) and (I)(G) signatures from superseded to revised pages is prohibited.

(7) If an EPCP revision results in or is a result of an approved deviation from or waiver of technical requirements, the DFS number shall be recorded in the remarks/comments block (block 10) of Appendix B.

(8) The EPCP revision cover sheet (Appendix D) shall be placed on top of any previous cover sheet with the most current cover sheet preceding the EPCP.

6. EPCP Closeout and Certification

a. As required by NAVSEA Standard Items, completed EPCPs shall be submitted for certification no later than 72 hours after completion or a minimum of 48 hours prior to the Key Event to which the Work Item is tied, whichever occurs first. Appendix D shall be used to document completion and certification signatures.

b. Incremental certification. For EPCPs that are broken into phases or those that remain open to support underway testing during Sea Trials, all OQE for work executed up to the next phase or underway testing portion of the EPCP shall be reviewed and certified by the NSA CHENG or designated representative. Follow-on phase shall not be conducted until the previous phase is certified by the CHENG.

c. Upon receipt of completed EPCP with Prime Contractor completion signature, the PM shall ensure that the document is reviewed for technical accuracy and completeness. Signature by
the PM in the Completion and Certification block of Appendix D signifies that the EPCP has been reviewed and is ready for certification.

d. Signature by the NSA CHENG or designate representative in the Completion and Certification block of Appendix D signifies that EPCP is certified and ready for close-out.

e. Closeout review verifies the following attributes are technically complete or have an approved DFS documenting the non-conformance:

   (1) All work was completed as specified in the approved EPCP.

   (2) All required signatures were made with supporting printed names and dates.

   (3) All cleanliness requirements were met.

   (4) The correct materials were used.

   (5) All EPCP changes (pen and inks, DFs, revisions and addendums) are completed, logged, and incorporated into or included with the EPCP as appropriate.

   (6) All required data (OQE) was recorded properly and verified to be within specifications.

   (7) All equipment and systems were restored to normal operating condition and configuration.

   (8) All post-maintenance testing was completed with satisfactory results.

f. Close-out of EPCPs shall complete within three (3) working days of certification.

7. EPCP Retention and Submission

   a. EPCP Log. The local NSA Engineering Department (Code 200) shall maintain a log (Appendix E) of all approved EPCPs. A log for each ship shall be maintained individually and compiled in an EPCP log binder. CNRMC will maintain a master log of all approved EPCPs.
b. **EPCP Retention.** Upon closeout of each EPCP, the original EPCP shall be submitted electronically to CNRMC. The local NSA Engineering Department Code 200 is responsible for the retention of EPCPs.

(1) Upon closeout of each EPCP, the NSA CHENG or designated representative shall ensure that the completed copy is scanned and submitted electronically to CNRMC for upload to the EPCP repository.

(2) Each EPCP shall be scanned into an Adobe Portable Document Format (PDF) with a filename reflecting the local NSA serial number and revision (e.g. SW-005-13A.pdf). The file shall include all QA Forms and all changes made via revision, addendum, DF, and pen and ink.

(3) The latest blank EPCP copy shall be saved in an MS Word (DOC) file with a filename aligned with the associated scanned PDF copy (e.g. SW-005-13A.doc).

(4) Electronic .pdf and .doc copies shall be submitted to CNRMC within 30 calendar days of EPCP closeout.

8. **Emergent Work on Critical Systems**

a. Prior to starting work, the local NSA Commanding Officer (CO) shall authorize work to proceed under the emergent process.

b. The NSA PM shall ensure that Appendix H is completed and presented to the contractor and Engineering code for review and signature prior to submitting to the NSA CO for approval. Refer to the RTS SOP for additional guidance.

c. Upon NSA CO authorization to proceed, an RTS review shall be conducted prior to starting work.

d. To the maximum extent possible, an EPCP shall be prepared and approved prior to commencement of work (without delaying the start of work).

e. An NSA Quality Management Plan (QMP) shall be developed for the work being performed or the work shall be included in the Availability QMP.
f. For work not covered by an approved EPCP, the in-process work must be continuously monitored and all actions observed and recorded by:

   (1) Contractor QA personnel
   
   (2) Contractor work center supervisory personnel

Note: This observation and recording requirement applies until the EPCP is approved and includes documentation of all notable precautions taken, any prerequisite requirements, initial conditions and pertinent personnel qualification requirements, a listing of all material (including HAZMAT) and reference documents utilized, a sequential listing of every procedural step taken and all OQE collected.

g. An NSA CHENG designated representative shall be onsite to continuously monitor the work in progress so as to provide necessary oversight and incremental certification. Prior to the start of work, shift assignment shall be provided to the NSA PM and shall include the representative names. This assignment shall be determined in advance and shall be based on contractor provided work schedule (i.e. 3 Shifts / 7 days). In addition, an NSA supervisor lead point of contact shall be identified by name and with telephone number in the event personnel do not report to provide oversight (i.e. illness, family emergency). Work stoppage shall occur if the supervisor continuous monitoring cannot be provided.

h. All tests and inspections must be completed and all required OQE recorded.

i. All OQE and other reports must be reviewed and verified as complete and correct.

j. The local supervisor shall perform all inspections and audits necessary to certify the work.

k. At the completion of the work, all actions taken and all recorded data and signatures shall be incorporated into an EPCP to document the work performed. This emergent EPCP package will serve as the completed EPCP and shall be closed out, certified, logged and retained in accordance with this SOP.
1. PURPOSE/GENERAL INFORMATION

1.1 PURPOSE

1.1.1 The purpose of this EPCP is (Describe general scope and purpose of the work contained in the EPCP).

1.2 GENERAL INFORMATION

1.2.1 This EPCP is required to be physically at the work site whenever work under its direction is performed.

1.2.2 (Describe other general requirements associated with the conduct of the work under the EPCP and administrative use of the EPCP. Use additional paragraphs as required. Where appropriate, the EPCP shall include statements (e.g. verify, confirm, ensure, etc.) to bring attention to pertinent Category I and II NAVSEA Standard Item requirements that have a direct impact on the accomplishment of work. Category II NAVSEA Standard Items shall be invoked by the work specification for which the EPCP is required, not by the EPCP.)

1.3 PRECAUTIONS

1.3.1 (Describe applicable personnel safety precautions or equipment protection precautions for the conduct of work under the EPCP. Include any safety equipment or specialized PPE unique to the work. Include specific precautions to prevent the loss of system or component cleanliness. Include specific precautions to maintain a sanitary environment for the task being performed. Use additional paragraphs as required.)

1.4 PREREQUISITES AND INITIAL CONDITIONS

1.4.1 (Describe the initial conditions that must be set and any prerequisite actions that must be accomplished prior to commencing the EPCP. Include a description of the work boundaries addressed by the EPCP. Examples: Equipment secured, system drained, ship in drydock, equipment tagged out, Work Authorization Form submitted and approved. Use additional paragraphs as required.)
1.5 PERSONNEL QUALIFICATIONS

1.5.1 (List any specific qualifications required for any member of the work team to participate in the maintenance action under the EPCP. Identify personnel by position or title, not by name. Use additional paragraphs as required.)

1.5.2 In addition to the qualification requirements listed in Section 1.5.1 through 1.5.X, all personnel who conduct work under this EPCP must participate in a pre-work briefing to ensure that they are thoroughly familiar with the work direction, applicable safety precautions, documentation requirements and overall guidance provided by the EPCP. This briefing will be repeated as necessary to accommodate new personnel assignment and when dictated by supervisor judgment. Attendance at this briefing will be documented on Enclosure (2.X). (Recording of briefing attendance will include name, date, and identifying employee number.)

1.6 HAZARDOUS MATERIAL

1.6.1 (Option 1) No hazardous material will be utilized in the processes guided by this EPCP.

1.6.2 (Option 2) Hazardous material is required in the performance of this EPCP. Detailed information on material characteristics and considerations in handling can be found in the MSDS.

1.6.3 The following measures will be taken to minimize the volume of hazardous waste generated by this EPCP:

1.6.3.1 (Describe measures in sufficient detail to ensure understanding and compliance.)

1.6.4 Hazardous material produced or utilized in the performance of this EPCP will be disposed of as follows:

1.6.4.1 (Describe measures in sufficient detail to ensure understanding and compliance.)

1.7 REFERENCES

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Enclosure (1)
1.8 MATERIAL

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(All materials, including consumables, spare parts, and special tools required to accomplish the work shall be listed. The table above shall be augmented by a Job Material List, Bill of Materials, or other report generated from the contractor’s procurement system and included as an enclosure to the EPCP.)

2. ENCLOSURES/ADDENDUMS

(Enclosures are any technical documents which are not readily available to the craftsman and are used to provide information, direct or document work, or direct reasonably expected contingency work. This includes OQE data recording forms, technical directive excerpts, tables, and calculation records. Addendums may be used to expand the scope of contractually authorized work, or guide and document rework. Add additional enclosure numbering as appropriate.)

(Record of (V), (I), (Q) and (G) signatures will be captured in the following locations, in order of precedence: 1. On the OQE data recording form associated with the action or in signature blocks incorporated within the body of the EPCP, 2. On a Master Signature Record Form if provided as an enclosure to the EPCP.)

2.1 Record of personnel work brief
2.2 Master Signature Record (If used)
2.3 Disassembly Inspection OQE Records
   2.3.1 Location 1
   2.4.2 Location 2
2.4 Repair OQE Records
   2.4.1 Location 1
   2.4.2 Location 2
2.5 Assembly OQE Records (including in-process testing)
   2.5.1 Location 1
   2.5.2 Location 2
2.6 Final Acceptance / Work Certification Testing OQE Records
2.7 Technical Source Document Excerpts (Maintenance Standards, Process Instructions, Diagrams, etc.)
3. **PROCEDURE**

(This section contains the instructions on how to accomplish the work in proper sequence. It does not describe technically how to do a step unless past experience has shown some of this type of information is required. The procedure shall be used to list the various tasks to be performed and the sequence in which they should be accomplished. Notes on proven craftsmanship skill techniques that significantly aid in first-time quality and are not addressed in other reference documents shall be included. A well-written procedure is designed for use by trained personnel who have a requisite level of knowledge about their specialty and the work to be performed. A procedure must have sufficient detail to allow a determination of exactly what was done, material used, inspections required, and allow re-certification of the system or component.)

(Retyping/scanning extensive step-by-step procedures from source documents into EPCPs is discouraged. The procedure shall reference the specific section and paragraphs of the source document.)

(The steps of the job shall be placed in a logical and proper sequence. In instances where work can be performed in parallel, identify those steps by use of a sequencing note.)

(All inspections and tests directed by the EPCP, including enclosures, shall include clear acceptance and rejection criteria.)

(All (V), (I), (Q) (D) and (G) inspections and checkpoints called out in the applicable Work Item must be incorporated and present in the EPCP.)

(The paragraph arrangement below provides a logical sequence of common repair steps. This will need to be modified or added to as applicable to the specific work being controlled by the EPCP. Section titles may be customized if those listed below do not adequately reflect the work involved.)

3.1 **(I)(G) Start of Procedure.** Accomplish the requirements of NAVSEA Standard Item 009-09 paragraph X.X.

3.2 **Installation of Temporary Systems/Services**

3.2.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.2. Add additional paragraphs as necessary.)

3.3 **Removal, Disassembly and Inspection**

3.3.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.3. Add additional paragraphs as necessary.)

3.4 **Equipment Repair/Modification**

3.4.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.4. Add additional paragraphs as necessary.)

(Component post-repair inspections, bench testing, etc. may be included in this section)
3.5 **Assembly**

3.5.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.5. Add additional paragraphs as necessary.)

(Component post-repair inspections, bench testing, etc. may be included in this section.)

3.6 **Installation**

3.6.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.6. Add additional paragraphs as necessary.)

3.7 **Component Level Installed Testing, prior to Acceptance Test**

3.7.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.7. Add additional paragraphs as necessary.)

4. **ACCEPTANCE AND CERTIFICATION TESTING**

(Acceptance or certification testing are those tests which provide final acceptance of the work conducted by the EPCP. This includes, but is not limited to: final system hydrostatic tests, engine operational tests, system functional testing and integrated multi-system testing.)

(All tests directed by the EPCP, including enclosures, shall include clear acceptance and rejection criteria.)

4.1 **TEST NAME**

4.1.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 4.1. Add additional paragraphs as necessary.)

4.2 **TEST NAME**

4.2.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 4.2. Add additional paragraphs as necessary.)

5. **TRANSFER OF TESTING**

(Certain testing cannot be performed until the ship is underway. Two options exist for this situation: 1. Transfer accountability of the testing to a Departure from Specification (DFS), or 2. Transfer accountability of the testing to the CNO Availability Sea Trials Agenda.)

5.1 **TEST NAME**

5.1.1 (I)(G) “Test Description” will be accomplished during the next ship’s underway period. Accountability for accomplishment of this test has been transferred to DFS Number XXXX-XXXX.

5.1.1 (I)(G) “Test Description” will be accomplished during the next ship’s underway period. Accountability for accomplishment of this test has been transferred to the XXX-XXXX Availability Sea Trials Agenda dated MMM DD YYYY.
6. **SYSTEM RESTORATION**

6.1 (Describe actions necessary to return the system or equipment to a state of normal operability, under ship’s standard operating procedures. Add additional paragraphs as necessary. The Transfer of Testing per Section 5 above does not need to be repeated.)
## Appendix B

**LOCAL NSA EXPANDED PROCESS CONTROL PROCEDURE (EPCP) LOG**

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Enclosure (1)
LOCAL NSA EPCP LOG INSTRUCTIONS

BLOCK 1 - PAGE NUMBER
As each new EPCP log page is started, a QAS will enter the appropriate page number.

BLOCK 2 - SHIP NAME/HULL
Enter the ship's name and hull number.

BLOCK 3 - NSA EPCP SERIAL NUMBER
The format of the EPCP serial numbers will be as follows:
1. Two letters shall designate the NSA (RMC).
   - “NF” for NSSA
   - “SE” for SERMC
   - “SW” for SWRMC
   - “NW” for PSNSY and IMF
   - “HI” for PHNSY and IMF
   - “JP” for Japan
2. Three digit sequential number assigned by the NSA (RMC).
3. Two digits designating year EPCP was initiated.

Example: “SW-005-13” indicates the fifth SWRMC EPCP of 2013.

BLOCK 4 - REVISION
Circle the applicable revision to indicate EPCP revision;
Initial issue is “-“ (dash), first revision “A”, second revision “B”, etc. When the initial EPCP is issued, the dash (-) shall be circled. Subsequent revisions shall be recorded by circling the appropriate letter (A, B, C). Previously circled letter crossed out with an "X". Revisions beyond “G” shall be recorded in the “Remarks” column.

BLOCK 5 - SYSTEM/COMPONENT
Enter name of the system or component that is being worked by the EPCP. (e.g. “NR1 MRG LUBO CLR”).

BLOCK 6 - COMPANY/COMMAND
Enter the name of the company or government command that is responsible for planning/writing the EPCP. Abbreviation is acceptable.

BLOCK 7 - DATE
“APPROVED” – Enter the date that the final EPCP review signature was made.*

“CERTIFIED/CLOSED” – Enter the date that the NSA CHENG signed for certification.*

*As recorded on the EPCP Approval Form, exhibit (1)
BLOCK 8 - REMARKS
Record the work specification number in this column. May also be used to record revisions of the EPCP (if revisions are issued after "G"), associated RCCs (if applicable) and/or to document other pertinent information.
## DEFICIENCY FORM (DF)

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<td>1. SHIP/HULL NO.:</td>
<td>2. SHIP/HULL NAME:</td>
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<td>4a. LOCAL EPCP SER NO.:</td>
<td>4b. REV:</td>
<td>5a. CNRMC EPCP SER NO.:</td>
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<td>6. EPCP TITLE:</td>
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<td>7. COMPONENT/SYSTEM NAME:</td>
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<td>8. WORK SPECIFICATION NO.:</td>
<td>9. EPCP PARAGRAPH NO.:</td>
<td>10. LEAD CONTRACTOR:</td>
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### 11. PROBLEM DESCRIPTION:

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### 12. CORRECTIVE ACTION (REFERENCES, MATERIAL, PROCEDURE, QA CHECKPOINT, IN-PROCESS SIGNATURES, CONCURRENCE SIGNATURES, etc.):

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### 13. ORIGINATOR INFORMATION

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<td>13a. NAME (PRINT): (LAST, FIRST, MI)</td>
<td>13b. NAME (SIGNATURE):</td>
<td>13c. COMPANY / COMMAND:</td>
<td>13d. SHOP OR CODE:</td>
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### 14. NSA APPROVER INFORMATION (PSE, TME OR OTHER NSA CHENG APPROVED GOVERNMENT REP)

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<td>14a. NAME (PRINT): (LAST, FIRST, MI)</td>
<td>14b. ORIGINATOR NAME (SIGNATURE):</td>
<td>14c. COMPANY / COMMAND:</td>
<td>14d. SHOP OR CODE:</td>
</tr>
</tbody>
</table>
DEFICIENCY FORM INSTRUCTIONS

BLOCK 1 – SHIP/HULL NUMBER
Enter the ship hull number for which the DF is assigned. Copy from EPCP Approval Form (Appendix D).

BLOCK 2 – SHIP/HULL NAME
Enter the ship and hull name for which the DF is assigned. Copy from EPCP Approval Form (Appendix D).

BLOCK 3 – DF NUMBER
Enter sequential Deficiency Form (DF) number starting with “DF-001” for each corresponding EPCP.

BLOCK 4a – LOCAL EPCP SERIAL NUMBER
Enter the local NSA/RMC EPCP serial number. Copy from EPCP Approval Form (Appendix D).

BLOCK 4b – REVISION
Enter alpha-character starting with “-“, “A”, “B”, etc. to annotate the EPCP revision.

BLOCK 5a – CNRMC EPCP SERIAL NUMBER
Enter the CNRMC EPCP serial number.

BLOCK 5b – REVISION
Enter alpha-character starting with “-“, “A”, “B”, etc. to annotate the EPCP revision.

BLOCK 6 – EPCP TITLE
Copy from EPCP Approval Form (Appendix D).

BLOCK 7 – COMPONENT NAME
Enter name of the system or component being worked by the EPCP. Use same name as listed in Appendix D.

BLOCK 8 – WORK SPECIFICATION NUMBER
Copy from EPCP Approval Form (Appendix D).

BLOCK 9 – EPCP PARAGRAPH NUMBER
Enter the paragraph number(s) in the EPCP that is/are change by the DF. In instance where the DF adds new information or requirements, the preceding EPCP paragraph number shall be entered.

BLOCK 10 – LEAD CONTRACTOR
Copy from EPCP Approval Form (Appendix D).

BLOCK 11 – PROBLEM DESCRIPTION
Provide a clear description of the deficiency and recommended resolution if possible. Include recommended material when applicable and sketch if appropriate to facilitate understanding.

**BLOCK 12 – CORRECTIVE ACTION**
- Enter corrective action required to clear/correct the deficiency.
- Include all required material, special instructions, precautions, references, etc.
- All in-process signature requirements and checkpoints shall be included.
- When concurrence from other NSA departments is required (e.g. C106, C130, etc.), concurrence signatures shall be included.
- Include sketches as appropriate to provide clarification and facilitate understanding of the instructions.
- If additional QA forms are required to support the DF, the appropriate form(s) shall be attached to the DF.

**BLOCK 13a – ORIGINATOR NAME (PRINT)**
Print legibly the name (Last, First, MI) of the person originating the DF.

**BLOCK 13b – ORIGINATOR NAME (SIGNATURE)**
The person originating the DF shall sign in this block.

**BLOCK 13c – ORIGINATOR COMPANY/COMMAND**
Print legibly the company or command for which the DF originator works. Abbreviations are acceptable.

**BLOCK 13d – ORIGINATOR SHOP OR CODE**
Print legibly the shop or code to which the DF originator is assigned.

**BLOCK 13e – DATE**
Print legibly the date (MM/DD/YYYY) that DF is prepared and signed by the originator.

**BLOCK 14a – NSA APPROVER NAME (PRINT)**
Print legibly the name (Last, First, MI) of the NSA PSE, TME or CHENG approved representative that is approving the DF.

**BLOCK 14b – NSA APPROVER NAME (SIGNATURE)**
The person approving the DF shall sign this block.

**BLOCK 14c – NSA APPROVER COMPANY/COMMAND**
Print legibly the NSA for which the NSA Approver works. Abbreviations are acceptable.

**BLOCK 14d – NSA APPROVER SHOP OR CODE**
Print legibly the NSA for which the NSA Approver is assigned.

**BLOCK 14e – DATE**
Print legibly the date (MM/DD/YYYY) that DF is approved and signed by the NSA PSE, TME or CHENG approved representative.
EXPANDED PROCESS CONTROL PROCEDURE (EPCP) APPROVAL FORM

<table>
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<tr>
<th>Ship/Hull Name:</th>
<th>Ship/Hull Number:</th>
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**EPCP Title:**

<table>
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<tr>
<th>Local EPCP Serial No.:</th>
<th>Revision:</th>
<th>Reused EPCP? (Y/N):</th>
<th>CNRMC EPCP Serial No.:</th>
<th>Revision:</th>
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<th>Work Spec No.:</th>
<th>Contract Number:</th>
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**Originator (Name):**

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<th>Company/Command:</th>
<th>Shop/Code:</th>
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**Reviewed By:** (Print and Sign)

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<th>Contractor Shop/Supervisor: (Optional)</th>
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<th>Contractor QA Manager:</th>
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<th>Quality Assurance Specialist (C130): (Optional)</th>
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<th>Project Manager (C300): (Optional)</th>
<th>Date:</th>
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<th>Engineering Tech Code (C200): (Required)</th>
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<th>Cheng (or Designated Representative)- Approval Signature:</th>
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**Revision/Change Summary:**

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**Completion and Certification:** (Signature Required)

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<th>Prime Contractor:</th>
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<tr>
<th>Cheng (or Designated Representative)- Certification Signature:</th>
<th>Date:</th>
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</table>
EPCP APPROVAL FORM INSTRUCTIONS

SHIP/HULL NAME
Enter the ship's name.

SHIP/HULL NUMBER
Enter the ship's hull number.

EPCP TITLE
Enter a descriptive title for the EPCP. Include system or equipment being worked and nature of the work (e.g. “NO. 1 MRG LUBO Cooler Tube Bundle, Repair”).

LOCAL EPCP SERIAL NUMBER
Enter the local RMC EPCP serial number. See Appendix (B) for format information.

LOCAL EPCP REVISION
Enter the EPCP revision number. Initial issue is "-" (dash). First revision “A”, second revision “B”, etc.

EPCP REUSED?
Enter “Y” if the EPCP is a reused EPCP. Enter “N” if new.

CNRMC EPCP SERIAL NUMBER
If the EPCP is a reuse EPCP, enter the CNRMC Serial Number of the reused EPCP. If the EPCP is a new EPCP, enter “NA”.

CNRMC EPCP Revision
If the EPCP is a reuse EPCP, enter the revision of the reused EPCP. If the EPCP is a new EPCP, enter “NA”.

WORK SPECIFICATION NUMBER
Enter the Work Specification number under which the EPCP is required.

CONTRACT NUMBER
Enter the contract number under which the EPCP is required.

ORIGINATOR (NAME)
Enter the name of the planner or engineer writing the EPCP.

COMPANY/COMMAND
Enter the name of the company or government command for which the planner writing the EPCP works.

SHOP/CODE
Enter the shop or code number of the planner writing the EPCP.

REVIEWED BY
CONTRACTOR SHOP/SUPERVISOR: (Optional)
The contractor shop representative shall sign to signify that:

1. All technical and quality requirements in the EPCP are understood,
2. The contractor is capable to execute the EPCP as written.

CONTRACTOR QA MANAGER:
The contractor Quality Assurance Manager shall sign to signify that:

1. The contractor performing the work has a valid and current QMS,
2. Personnel conducting the EPCP work are competent and meet all qualification requirements defined in the EPCP.

QUALITY ASSURANCE SPECIALIST: (Optional)
The RMC QAS shall sign to signify that:

1. The EPCP contains the appropriate use of qualitative OQE in-process sign-offs,
2. The EPCP contains the appropriate use of quantitative OQE record requirements including the proper JFMM QA Forms,
3. The availability QMP provides adequate coverage of work contained in the EPCP,
4. The EPCP identifies all personnel qualification requirements
5. That the Prime Contractor has an approved, current QMS and the system has been audited with satisfactory results within the last five years

PROJECT MANANGER: (Optional)
The RMC PM shall sign to signify that:

1. The EPCP addresses the work scope of the job listed in the AWP,
2. All pertinent administrative requirements are adequately noted in the EPCP,
3. That the EPCP effectively uses addendums in order to mitigate schedule delays,
4. The any transfer of testing is understood and planned

ENGINEERING TECH CODE: (Required)
The RMC C200 representative shall sign to signify that:

1. A thorough of the EPCP was conducted and that the technical content, including references, material, procedures, boundaries, testing, etc., is accurate and current,
2. The contents of the EPCP adequately address the work scope of the job listed in the AWP,
3. The appropriate level of quality checkpoints are included,

RMC CHENG (or Designated Representative) – Approval Signature:
This signature constitutes approval of the EPCP thereby authorizing it for use.
REVISION/CHANGE SUMMARY
This signature confirms that the EPCP revision was rerouted through the Project Team (PT) for C130, C200, C300 and C400 review. The RMC PM shall sign for the collective PT for each revision that this review was conducted.

COMPLETION AND CERTIFICATION

PRIME CONTRACTOR:
The Prime Contractor Representative shall sign to certify that all work was conducted in compliance with the EPCP and that all OQE records complete, accurate and are included.

RMC PM:
The RMC PM shall sign to concur that the contractor conducted all work in compliance with the EPCP, that all OQE records complete, accurate and are included and that the EPCP is ready for certification and close-out.

RMC CHENG (or Designated Representative) – Certification Signature:
The RMC CHENG or his/her designated representative shall sign to certify that work specified in the EPCP is complete, that work was executed and tested in accordance with correct technical requirements, and that any non-conformances associated with the EPCP have been adjudicated and properly documented.
## Appendix E

**LOCAL EXPANDED PROCESS CONTROL PROCEDURE (EPCP) LOG**

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<th>1. PAGE NO.:</th>
<th>2. SHIP NAME/HULL:</th>
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<th>4. REVISION</th>
<th>5. SYSTEM/COMPONENT</th>
<th>6. COMPANY/COMMAND</th>
<th>7. DATE</th>
<th>8. REMARKS</th>
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Enclosure (1)
LOCAL EPCP LOG INSTRUCTIONS

BLOCK 1 - PAGE NO.
As each new EPCP log page is started, a QAS will enter the appropriate page number.

BLOCK 2 - SHIP NAME/HULL
Enter the ship's name and hull number.

BLOCK 3 - NSA EPCP SERIAL NUMBER
The format of the EPCP serial numbers will be as follows:
1. Two letters shall designate the NSA (RMC).
   - "NF" for NSSA
   - "SE" for SERMC
   - "SW" for SWRMC
   - "NW" for PSNSY and IMF
   - "HI" for PHNSY and IMF
   - "JP" for Japan
2. Three digit sequential number assigned by the NSA (RMC).
3. Two digits designating year EPCP was initiated.

Example: "SW-005-13" indicates the fifth SWRMC EPCP of 2013.

BLOCK 4 - REVISION
Circle the applicable revision to indicate EPCP revision;
Initial issue is "-" (dash), first revision "A", second revision "B", etc. When the initial EPCP is issued, the dash (-) shall be circled. Subsequent revisions shall be recorded by circling the appropriate letter (A, B, C). Previously circled letter crossed out with an "X". Revisions beyond "G" shall be recorded in the "Remarks" column.

BLOCK 5 - SYSTEM/COMPONENT
Enter name of the system or component that is being worked by the EPCP. (e.g. “NR1 MRG LUBO CLR”).

BLOCK 6 - COMPANY/COMMAND
Enter the name of the company or government command that is responsible for planning/writing the EPCP. Abbreviation is acceptable.

BLOCK 7 - DATE
“APPROVED” - Enter the date that the final EPCP review signature was made.

“CERTIFIED/CLOSED” - Enter the date that the RMC CHENG signed for certification.
As recorded on the EPCP Approval Form, Appendix D (Encl 1)

**BLOCK 8 - REMARKS**
Record the work specification number in this column. May also be used to record revisions of the EPCP (if revisions are issued after "G"), associated RCCs (if applicable) and/or to document other pertinent information.
Appendix F

CNRMC EXPANDED PROCESS CONTROL PROCEDURE (EPCP) LOG

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CNRMC EPCP LOG INSTRUCTIONS

**BLOCK 1 - CNRMC EPCP Serial Number**

A sequential serial number will be assigned by CNRMC after the EPCP has been provided by the applicable RMC. The format of the CNRMC EPCP serial numbers will be as follows:
1. Four digit sequential number assigned by CNRMC.
2. Two digits designating year EPCP was initiated.

Example: “0005-13” indicates the fifth EPCP submitted to CNRMC in 2013.

**BLOCK 2 - NSA EPCP Serial Number**

Enter the EPCP serial number assigned by the local RMC. See enclosure (2) for more information.

**BLOCK 3 – SHIP CLASS**

Enter the class of ship (i.e. DDG, CG, LPD, etc).

**BLOCK 4 - SYSTEM/COMPONENT**

Enter name of the system or component that is being worked by the EPCP. See enclosure (2) for more information.

**BLOCK 5 – Date**

Enter the date that the local RMC CHENG certified the EPCP via signature. If the EPCP on file is not yet certified, enter the date the RMC C200 Engineering Technical code provided final review signature. In this instance, a note shall be recorded in the “Remarks” column to indicate that the EPCP on file is pending execution and certification (e.g. “EPCP pending execution/certification”). Upon receipt of the certified copy of the EPCP, the date shall be updated to reflect the certification date. The “Remarks” column shall also be corrected as appropriate.

**BLOCK 6 - Remarks**

Enter any pertinent information associated with the EPCP, including that discussed in block 5 instructions above.
Appendix G

EPCP ADDENDUM TEMPLATE

1. **Purpose.** The purpose of this EPCP Addendum is *(Describe general scope and purpose of the work to be performed within the scope of the original EPCP – this work is generally “growth work” within the scope of original EPCP).*

2. All headings listed below fall under the original EPCP Change/Additions shall be denoted under each specific heading:

   **2.1 GENERAL INFORMATION** *(List any additional general information)*

   **2.2 PRECAUTIONS** *(List any additional precautions)*

   **2.3 PREREQUISITES AND INITIAL CONDITIONS** *(List any additional prerequisites and initial conditions)*

   **2.4 PERSONNEL QUALIFICATIONS** *(List any additional personal qualifications required)*

   **2.5 HAZARDOUS MATERIAL** *(List any additional HAZMAT required)*

   **2.6 REFERENCES** *(List any additional references as required)*

<table>
<thead>
<tr>
<th>REF. NO.</th>
<th>REF REQ'D (Y/N)</th>
<th>DOCUMENT/DRAWING NUMBER</th>
<th>DOCUMENT/DRAWING TITLE</th>
<th>REV</th>
<th>CHG NO.</th>
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</table>

   **2.7 MATERIAL** *(List any additional material required to complete work)*

<table>
<thead>
<tr>
<th>PIECE NO.</th>
<th>DRAWING NUMBER</th>
<th>NOMENCLATURE</th>
<th>NSN</th>
<th>PART NO.</th>
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</table>

Enclosure (1)
*Note: Additional material is listed in Enclosure (X.X.X).

3. **Enclosures**

(Enclosures are any technical documents which are not readily available to the craftsman and are used to provide information, direct or document work, or direct reasonably expected contingency work. This includes OQE data recording forms, technical directive excerpts, tables, and calculation records. Add additional enclosure numbering as appropriate).

(Record of (V), (I), (Q) and (G) signatures will be captured in the following locations, in order of precedence: 1. On the OQE data recording form associated with the action or in signature blocks incorporated within the body of the EPCP, 2. On a Master Signature Record Form if provided as an enclosure to the EPCP).

3.1 Record of personnel work brief (As Required)
3.2 Master Signature Record (If used)
3.3 Disassembly Inspection OQE Records
   3.3.1 Location 1
   3.3.2 Location 2
3.4 Repair OQE Records
   3.4.1 Location 1
   3.4.2 Location 2
3.5 Assembly OQE Records (including in-process testing)
   3.5.1 Location 1
   3.5.2 Location 2
3.6 Final Acceptance / Work Certification Testing OQE Records
3.7 Technical Source Document Excerpts (Maintenance Standards, Process Instructions, Diagrams, etc.)

4. **PROCEDURE**

(This section contains the instructions on how to accomplish the work in proper sequence. It does not describe technically how to do a step unless past experience has shown some of this type of information is required. The procedure shall be used to list the various tasks to be performed and the sequence in which they should be accomplished. Notes on proven craftsmanship skill techniques that significantly aid in first-time quality and are not addressed in other reference documents shall be included. A well-written procedure is designed for use by trained personnel who have a requisite level of knowledge about their specialty and the work to
be performed. A procedure must have sufficient detail to allow a
determination of exactly what was done, material used, inspections
required, and allow re-certification of the system or component).

(Retyping/scanning extensive step-by-step procedures from source
documents into EPCPs or EPCP Addendums is discouraged. The
procedure shall reference the specific section and paragraphs of the
source document.)

(The steps of the job shall be placed in a logical and proper
sequence. In instances where work can be performed in parallel,
identify those steps by use of a sequencing note).

(All inspections and tests directed by the EPCP Addendum, including
enclosures, shall include clear acceptance and rejection criteria).

(All (V), (I), (Q) (D) and (G) inspections and checkpoints called
out in the applicable Work Item must be incorporated and present in
the EPCP Addendum).

(The paragraph arrangement below provides a logical sequence of
common repair steps. This will need to be modified or added to as
applicable to the specific work being controlled by the EPCP
Addendum. Section titles may be customized if those listed below do
not adequately reflect the work involved).

4.1 (I)(G) Start of Procedure. Accomplish the requirements of
NAVSEA Standard Item 009-09 paragraph X.X.
4.2 Installation of Temporary Systems/Services
   4.2.1 (Specifically describe and provide sequencing of the
necessary actions to accomplish 3.2. Add additional
paragraphs as necessary.)
4.3 Removal, Disassembly and Inspection
   4.3.1 (Specifically describe and provide sequencing of the
necessary actions to accomplish 3.3. Add additional
paragraphs as necessary.)
4.4 Equipment Repair/Modification
   4.4.1 (Specifically describe and provide sequencing of the
necessary actions to accomplish 3.4. Add additional
paragraphs as necessary.)
   (Component post-repair inspections, bench testing, etc. may
be included in this section)
4.5 Assembly
4.5.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.5. Add additional paragraphs as necessary.)

(Component post-repair inspections, bench testing, etc. may be included in this section.)

4.6 **Installation**

4.6.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.6. Add additional paragraphs as necessary.)

4.7 **Component Level Installed Testing, prior to Acceptance Test**

3.7.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 3.7. Add additional paragraphs as necessary.)

5. **ACCEPTANCE AND CERTIFICATION TESTING**

(Acceptance or certification testing are those tests which provide final acceptance of the work conducted by the original EPCP. This includes, but is not limited to: final system hydrostatic tests, engine operational tests, system functional testing and integrated multi-system testing).

(All tests directed by the original EPCP, including enclosures, shall include clear acceptance and rejection criteria).

5.1 **TEST NAME**

5.1.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 4.1. Add additional paragraphs as necessary.)

5.2 **TEST NAME**

5.2.1 (Specifically describe and provide sequencing of the necessary actions to accomplish 4.2. Add additional paragraphs as necessary.)

6. **TRANSFER OF TESTING.** (Certain testing cannot be performed until the ship is underway. Two options exist for this situation: 1. Transfer accountability of the testing to a Departure from Specification (DFS), or 2. Transfer accountability of the testing to the CNO Availability Sea Trials Agenda).
6.1 TEST NAME

6.1.1 (I)(G) “Test Description” will be accomplished during the next ship’s underway period. Accountability for accomplishment of this test has been transferred to DFS Number XXXX-XXXX.

6.1.2 (I)(G) “Test Description” will be accomplished during the next ship’s underway period. Accountability for accomplishment of this test has been transferred to the XXX-XXXX Availability Sea Trials Agenda dated MMM DD YYYY.

7. SYSTEM RESTORATION. This step will be covered under the original EPCP – the restoration process covered under the original EPCP will include restoration from this Addendum.
Appendix H

**EPCP EMERGENT WORK APPROVAL FORM**

<table>
<thead>
<tr>
<th>SHIP/HULL NAME:</th>
<th>SHIP/HULL NUMBER:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EPCP TITLE:</th>
<th>LOCAL EPCP SERIAL NO.:</th>
<th>REUSED EPCP? (Y/N):</th>
<th>CNRMC EPCP SERIAL NO.:</th>
<th>REV:</th>
</tr>
</thead>
</table>

**EPCP EMERGENT WORK REQUIREMENTS:**

1) RTS review is required.
2) QMP is required per CNRMCINST 4700.9.
3) Continuous contractor QA and NSA oversight is required.

**DESCRIPTION OF WORK:**

**REVIEWED BY:** (Print and Sign)

<table>
<thead>
<tr>
<th>CONTRACTOR SHOP/SUPERVISOR:</th>
<th>DATE:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NSA PROJECT MANAGER (C300):</th>
<th>DATE:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NSA ENGINEERING TECH CODE (C200):</th>
<th>DATE:</th>
</tr>
</thead>
</table>

**AUTHORIZATION TO PROCEED/START:** (Sign)

<table>
<thead>
<tr>
<th>NSA COMMANDING OFFICER:</th>
<th>DATE:</th>
</tr>
</thead>
</table>

**PRE-START CHECKS:**

<table>
<thead>
<tr>
<th>RTS REVIEW CONDUCTED?:</th>
<th>DATE CONDUCTED:</th>
<th>SIGNATURE (PM/SBS):</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>QMP DEVELOPED?:</th>
<th>SIGNATURE (PM/QAS):</th>
<th>DATE:</th>
</tr>
</thead>
</table>

**COMPLETION AND CERTIFICATION:** (Signature Required)

<table>
<thead>
<tr>
<th>PRIME CONTRACTOR:</th>
<th>DATE:</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>NSA QAS:</th>
<th>DATE:</th>
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<table>
<thead>
<tr>
<th>NSA PM:</th>
<th>DATE:</th>
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<table>
<thead>
<tr>
<th>NSA CHENG:</th>
<th>DATE:</th>
</tr>
</thead>
</table>

Enclosure (1)
EPCP EMERGENT WORK APPROVAL FORM INSTRUCTIONS

SHIP/HULL NAME:
Enter the ship's name.

SHIP/HULL NUMBER:
Enter the ship's hull number.

EPCP TITLE:
Enter a descriptive title for the EPCP. Include system or equipment being worked and nature of the work (e.g. “NO. 1 MRG LUBO Cooler Tube Bundle, Repair”).

WORK ITEM NUMBER:
Enter the Work Item Number under which the emergent work is required.

LOCAL EPCP SERIAL NUMBER:
Enter the local NSA EPCP serial number for the EPCP to be developed for this work.

REUSED EPCP?:
Enter “Y” if all or part of a previously approved EPCP will be used to accomplish any portion of this emergent work. Enter “N” if new.

CNRMC EPCP SERIAL NUMBER:
If the EPCP is a reuse EPCP, enter the CNRMC Serial Number of the reused EPCP. If the EPCP is a new EPCP, enter “NA”.

CNRMC EPCP REV:
If the EPCP is a reuse EPCP, enter the revision of the reused EPCP. If the EPCP is a new EPCP, enter “NA”.

EPCP EMERGENT WORK REQUIREMENTS:
The following statements shall be included on all emergent work approval forms:

- RTS is required.
- QMP is required per CNRMCINST 4700.9.
- Continuous contractor QA and NSA oversight is required.

Additional requirement statements may be added as appropriate.

DESCRIPTION OF WORK:
Provide a clear description of the work to be conducted. As appropriate, include pertinent precautions, prerequisites, initial conditions and personnel qualification requirements.

REVIEWED BY:
The following individuals (or designated representatives) shall legibly print their name (Last, First, MI), sign and date this form to document that the form was completed in accordance with this instruction and that the information contained on the form is valid. These required signatures shall not be made until after all of the above information has been recorded on the form. Additionally, these three review signature shall be completed prior to submitting the form to the NSA CO for an “authorization to proceed” signature.

- Contractor or shop supervisor
- NSA Project Manager
- NSA Engineering Tech Code

AUTHORIZATION TO PROCEED/START:
The NSA Commanding Officer (CO) shall, via signature and date, provide authorization for work to proceed under the EPCP emergent work process. This signature shall be made after securing all three required signatures.

PRE-START CHECKS:
The RTS and QMP requirements of this instruction shall be complied with and documented prior to starting work.

- RTS BRIEF CONDUCTED?: Enter “Y” if RTS brief was conducted. Work shall not commence until an RTS brief is completed.
- DATE CONDUCTED: Enter the date of the RTS brief.
- SIGNATURE (PM/SBS): The NSA PM or SBS shall sign to confirm that a RTS brief was conducted. This signature shall be recorded prior to starting work.
- QMP CONDUCTED?: Enter “Y” if a QMP was developed for this emergent work or if the QMP data for this work was included in the availability QMP. Work shall not commence until a QMP is developed for this work.
- SIGNATURE (PM/QAS): The NSA PM or QAS shall sign to confirm that a QMP was developed for this emergent work or that the QMP data was included in the availability QMP. This signature shall be recorded prior to starting work.
- DATE: Enter the date that the PM or QAS signature was made.

COMPLETION AND CERTIFICATION:
Completion and certification signatures shall be recorded as verification that the requirements of this instruction have been met.
EPCP Process Metrics Data

Reporting periodicity
Monthly (15th of each month)

Required data

1. Local NSA EPCP Serial Number (Enter the local NSA EPCP serial number in the format required by this instruction).

2. EPCP Revision (Enter the revision of the EPCP (i.e. “-“, “A”, “B”, etc.).

3. Reuse EPCP? (Y/N)
   a. Enter “Y” if the EPCP is a reuse EPCP.
   b. Enter “N” if the EPCP is new.

4. Reuse EPCP Changed? (Y/N/NA)
   a. Enter “Y” if the EPCP is a reuse EPCP and if changes were made to the EPCP prior to approving for use.
   b. Enter “N” if the EPCP is a reuse EPCP and if no changes were made to the EPCP prior to approving for use.
   c. Enter “NA” if the EPCP is not a reuse EPCP.

5. CNRMC EPCP Serial Number
   a. If the EPCP is a reuse EPCP, enter the CNRMC Serial Number of the EPCP being used.
   b. If the EPCP is not a reuse EPCP, enter “NA”.

6. Ship Class (Enter the two or three alphabetic character designator of the Class of the ship for which the EPCP is written. (e.g. LPD, DDG, CG, PC, LSD, etc.).

7. Ship Name (Enter the name of the ship for which the EPCP is written).

8. Hull Number (Enter the hull number of the ship for which the EPCP is written.)
9. NSA or Contractor Develop? (NSA/KTR)
   a. Enter “NSA” if the NSA developed the EPCP.
   b. Enter “KTR” if the contractor developed the EPCP.

10. Prime Contractor
   a. If the EPCP is developed by a contractor, enter the abbreviated name of the prime contractor.
   b. If the EPCP is developed by the NSA, enter “NA”.

11. Time to Develop, TTD (Days)
   a. Enter the TTD, in days.
   b. TTD is the development time for new EPCPs or the change time for reuse EPCPs.
   c. TTD starts from the date tasking to develop or change the EPCP occurs.
   d. TTD ends at the date the initial EPCP document is submitted for government review.

12. Time to Review, TTR (Days)
   a. Enter the TTR, in days.
   b. TTR is the NSA review time for new or changed EPCPs.
   c. TTR starts from the date the initial EPCP document is submitted for government review.
   d. TTR ends at the date the NSA approves the EPCP, if no corrections are required, or at the date the NSA returns to contractor for correction.

13. Time to Correct, TTC (Days)
   a. Enter the TTC, in days.
   b. TTC is the correction time for new EPCPs or changed EPCPs.
c. TTC starts from the date the NSA returns the EPCP to the contractor for correction.

d. TTC ends on the date the contractor submits the EPCP document for a second government review.

14. EPCP Approval Date (Enter the date the EPCP was approved by the NSA CHENG).

15. Approved First Time? (Y/N)

   a. If the EPCP was approved after the first review cycle, enter “Y”.

   b. If the EPCP required correction after first review, enter “N”.

16. Cost to Development EPCP ($)

   a. For new EPCPs, enter total cost to develop the EPCP.

   b. For change to reuse EPCPs, enter total cost to change the EPCP.
## Sample EPCP Metrics

<table>
<thead>
<tr>
<th>Sample Entry</th>
<th>Local RMC EPCP Serial No.</th>
<th>EPCP Revision</th>
<th>Reuse EPCP (Y/N)</th>
<th>Reuse EPCP Changed (Y/N/NA)</th>
<th>CNRMC EPCP Serial No.</th>
<th>Ship Class</th>
<th>Ship Name</th>
<th>Hull Number</th>
<th>RMC or Contractor Develop (RMC/KTR)</th>
<th>Prime Contractor</th>
<th>Time to Develop, TTD (Days)</th>
<th>Time to Review, TTR (Days)</th>
<th>Time to Correct, TTC (Days)</th>
<th>EPCP Approval Date</th>
<th>Approved First Time (Y/N)</th>
<th>Cost to Develop EPCP ($)</th>
</tr>
</thead>
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<td>-</td>
<td>Y</td>
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</table>

**Sample Explanation**

1. Reused EPCP requiring no change.
2. Reused EPCP requiring change: Contractor changed and submitted the EPCP. The RMC approved the initial product.
3. Reused EPCP requiring change: Contractor changed and submitted the EPCP. However, the RMC found problems with the initial submission and returned to the contractor for correction.
4. No reuse EPCP available: Contractor tasked with development of new EPCP. Contractor developed and submitted the EPCP. However, the RMC found problems with the initial submission and returned to the contractor for correction.
5. No reuse EPCP available: RMC tasked with development of new EPCP.
6. No reuse EPCP: Contractor tasked with development of new EPCP. Contractor submitted the EPCP and the RMC approved the initial product.
7. Revision to approved EPCP: Contractor tasked with revising EPCP. Contractor submitted revised EPCP and the RMC approved the initial product.
Edits Required?

Yes: Return to KTR for Correction (RMC)

No: Review / Edit (Internal KTR)

Submit to Government (KTR)

Review (C200)

Enclosure (3)

Edits Required?

Yes: Approve (RMC CEN/G TWH)

No: Notify NAVSEA 05 THW and SDM (RMC CEN/G)

Part of Definitized Pkg? (C300)

Yes: RCC Required? (C300)

No: Ready to Start (RTS) Review (For initial start and major revisions as determined by RMC CEN/G)

Issue RCC (C400)

Yes: Call Meeting with KTR (C200)

No: Prepare Final EPCP (KTR)

2

5

6

1
STANDARD OPERATING PROCEDURE (SOP) FOR READY TO START (RTS) REVIEW FOR CRITICAL WORK ON SURFACE SHIPS

Ref:   
(a) NAVSEA Instruction 5400.108, Policy for Quality Management of Work on Non-Nuclear Surface Ship Critical Systems  
(b) COMUSFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual (JFMM)  
(c) CNRMC ltr 4790 Ser C211/163 of 21 Dec 11  
(d) CNRMC ltr 4790 Ser C300/065 of 18 Apr 12

1. Purpose. To establish a Standard Operating Procedure (SOP) for the “Ready to Start” (RTS) review prior to commencing work on non-nuclear Surface Ship Critical Systems using Expanded Process Control Procedures (EPCPs).

2. Ready To Start Review

   a. Prior to starting work on Critical Systems identified in reference (a), the NSA Project Manager (PM) shall conduct an RTS review meeting to ensure that all participants involved in the work are prepared, equipped and ready to begin work. The following personnel shall attend the review meeting:

      (1) NSA Code 130, Quality Assurance Specialist (QAS)  
      (2) NSA Code 200, Project Support Engineer (PSE)  
      (3) NSA Code 200, Technical Matter Expert (TME)  
      (4) Ship’s Commanding Officer (CO) or designated representative.  
      (5) Senior Contractor’s representative  
      (6) CNRMC / Navy Regional Maintenance Office (NRMO) representative (See paragraph 2).  
      (7) NAVSEA 05 Engineering Field Representative (EFR) (See paragraph 3).  
      (8) NSA Code 106, Environmental Safety and Health (As appropriate).

NOTE: An RTS review is also required prior to commencing Emergent EPCP work and for EPCP revisions whenever directed by the NSA Chief Engineer (CHENG).
b. The NSA Project Manager (PM) shall invite the NRMO to all RTS reviews. However, NRMO attendance is not mandatory.

c. The NSA PM should invite the local NAVSEA 05 EFR to attend RTS reviews for the systems designated by an asterisk in enclosure (i) of reference (a). Attendance is not mandatory.

d. The NSA PM shall facilitate the RTS review meeting and verify with all participants that the following requirements have been met:

   (1) All required Technical Work Documents (TWDs), Standard Work Templates (SWTs), Local Work Templates (LWTs), etc. are completed and reviewed and the EPCP is approved by the NSA CHENG.

   (2) The project Quality Management Plan (QMP) supports the requirements of reference (a) and any specific elements of the EPCP that require additional oversight or, if a QMP is not required, the general quality oversight plan covers the Critical Systems work.

   (3) Initial conditions are established or a clearly defined plan of action developed to ensure these conditions will be established to support the work (e.g. systems drained, depressurized, de-energized, tag-out and WAF).

   (4) All required materials, special tooling, and test equipment are on hand as verified by the contractor, or will be on hand to support the work without delay as indicated on paperwork brought to the RTS (i.e. bill of lading, shipping documents showing estimated delivery date, NAVSUP tracer documents showing shipment status of materials, or any other official paperwork which positively accounts for delivery status).

   (5) Contractor personnel assigned to perform the work are knowledgeable, trained, and qualified for the work. The contractor shall give a brief description of the work to be performed in the EPCP. The contractor shall provide the appropriate written documentation to support the qualifications or certifications.

   (6) Per Vol II of ref (b), all Memorandums of Agreement (MOAs) are jointly signed by the Ship's CO, the Naval Supervising Authority (NSA), the Immediate Superior in Command (ISIC) representative (if applicable) and the Fleet Maintenance
Activity (FMA) representative showing agreement between the industrial activity and Ship's Force concerning the responsibilities of each party during the availability. (These deal with a number of areas in which Ship's Force generally provides support to the industrial activity and vice versa).

(7) As required by references (c) and (d), a risk management strategy was developed to continuously identify and measure risk, to develop mitigation options, and to implement and track the mitigations to ensure successful risk reduction. The contractor shall discuss specific risks and mitigating actions taken for the Critical Systems work.

(8) All participants conducting work are fully prepared to execute and certify the work.

NOTE: If any RTS meeting participant does not concur that the RTS requirements listed above have been met, the reason(s) shall be documented in the RTS Review Minutes, Appendix (A). As well as a description of how this objective was resolved.

e. The PM is to complete Appendix (A) as follows:

(1) Ensure the printed names of all meeting participants are included.

(2) List significant problems that impact the requirements listed in this SOP paragraphs 4.(a) through 4.(h). Include a brief description of the problem, name of the person assigned to correct the problem and the estimated date by which the problem will to be corrected.

(3) Sign and provide one copy to all RTS meeting participants within 24 hours of meeting adjournment.

NOTE: The PM’s signature on the RTS review minutes signifies that all requirements to begin work have been met or that there is a clear path to correct problems discovered during the RTS.

(4) Attach signed copy to the approved EPCP.
Appendix A

EXPANDED PROCESS CONTROL PROCEDURE (EPCP)
READY TO START (RTS) REVIEW MINUTES

<table>
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Attendance Sheet *To be filled in by PM

- NSA Code 130 - Quality Assurance Specialist (QAS)
- NSA Code 200 - Project Support Engineer (PSE)
- NSA Code 200 - Technical Matter Expert (TME)
- NSA Code 300 - Project Manager (PM)
- Ship’s Force Representative
- Senior Contractor’s Representative
- CNRMC / NRMO Representative
- NAVSEA 05 Engineering Field Representative (EFR)
- NSA Code 106 (When appropriate)
EXPANDED PROCESS CONTROL PROCEDURE (EPCP)
READY TO START (RTS) REVIEW MINUTES

Comments: (Use continuation sheets as needed)

PM Signature, date/time:
List of Surface Ship Critical Systems and Boundaries

This list applies to the following Ship Classes: CG47, DDG51, FFG7, LCC19, LCS, LHA1, LHA6, LHD1, LHD8, LPD4, LPD17, LSD41, LSD49, MCM1 and PC1.

Critical Systems List

Note: The NAVSEA 05 Technical Warrant Holder (TWH) and Ship Design Manager (SDM) shall be notified prior to starting work and upon completion of work (to include completion of pier-side testing and completion of at-sea testing) for all Critical Systems listed below with the exception of SSDG lube oil systems and generator pedestal bearings.

All Ship Classes

- Main Reduction Gear (MRG) - Includes internal components (coupling, clutches and main thrust bearing). If these components are outside the MRG, they are excluded. OD box removal is excluded.
- MRG Lube Oil (L/O) System - Includes external L/O system that is a part of the machine and the sump. The L/O purification system, storage tanks and filling system are excluded.
- Steering System

LSD41, LSD49 and LPD17 Ship Classes

- Main Propulsion Diesel Engine (MPDE)
- MPDE L/O System
- Ship Service Diesel Generator (SSDG) L/O System and Generator Pedestal Bearings

PC1 and MCM1 Ship Classes

- MPDE
- MPDE L/O System
- Magnetic Minesweeping Gas Turbine Generator (MMGTG) L/O System
- SSDG L/O System and Generator Pedestal Bearings
LHA6 Class and LHD8 Class

- SSDG L/O System and Generator Pedestal Bearings

LPD4, LHA1, LHD1 and LCC19 Classes

- Main Boiler
- High Pressure/Low Pressure (HP/LP) Turbines
- HP/LP Turbine L/O System

LCS Class

- MPDE
- MPDE L/O System
- SSDG L/O System

FFG7 Class

- SSDG L/O System

General Exclusions:

- Computer software associated with critical systems
- Flex hoses
- Instrumentation (pressure gages, thermometers, thermocouples)
- Valve repairs (by-pass regulating, thermostatic control, air start distributor, exhaust, relief valves)
- Attached/detached pump repairs (includes mechanical seals)
- Fuel injectors
- Attached/detached fuel oil pumps
- Strainers
- Cleaning/inspection/testing of coolers
- Resilient mounts
- MRG dehumidifiers
- In-shop work on small items (e.g., fuel pumps, fuel injector pop tests) can be excluded at the discretion of the NSA CHENG.
- Exhaust leak repairs
Critical System Boundaries

CG47

- **MRG**
  - The mechanical boundary begins at the input drive flange and ends at the output shaft.
  - Includes all components within the gear case.
  - Includes the SSS clutches, power turbine brakes, sight flow indicators (SFI), input shaft seals, turning gear, oil distribution (OD) box, attached L/O pump drive gears, attached CRP pump drive gears, foundation bolts, MRG sump.
  - Excludes the CPP pumps, L/O pumps, dehumidifier, turning gear motor, SFI thermometers, and all electrical components beyond the first electrical connection (cannon plug) outside of the gear case.

- **MRG L/O System**
  - Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, power unit and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, trickwheel box, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

DDG51

- **MRG**
  - The mechanical boundary begins at the input drive flange and ends at the output shaft.
  - Includes all components within the gear case.
  - Includes the SSS clutches, sight flow indicators (SFI), input shaft seals, turning gear, oil distribution (OD) box, attached L/O pump drive gears, foundation bolts, and MRG sump.
- Excludes the power turbine brake, CPP pumps, dehumidifier, SFI thermometers, and all electrical components beyond the first electrical connection (cannon plug) outside of the gear case.

- **MRG L/O System**
  - Includes the L/O strainer, L/O temperature regulating valves (1-RLO-V-32, 2-RLO-V-32), L/O cooler (oil side), and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pumps, attached L/O pump, L/O cooler (seawater side), gages and gage tubing from the gage back to the last mechanical connection before the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, power unit and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, trickwheel box, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

- **FFG7**

- **MRG**
  - The mechanical boundary begins at the input drive flange and ends at the output shaft.
  - Includes all components within the gear case.
  - Includes the SSS clutches, sight flow indicators (SFI), input shaft seals, turning gear, shaft brake, oil distribution (OD) box, attached CPP pump drive gears, foundation bolts, and MRG sump.
  - Excludes the power turbine brake, attached CPP pump, electric CPP pump, dehumidifier, SFI thermometers, and all electrical components beyond the first electrical connection (cannon plug) outside of the gear case.

- **MRG L/O System**
  - Includes the L/O strainer, L/O unloader (RLO-V8), L/O temperature regulating valve (RLO-V4) and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pumps, L/O coast-down pump, L/O cooler, gages and gage tubing from the gage back to the
last mechanical connection before the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, rotary hydraulic power unit and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, trickwheel box, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

  **LCC19**

- **Boilers**
  - Includes anything subject to ASME Boiler and Pressure Vessel Code requirements and ASME Power Piping requirements, or NAVSEA S9074-AR-GIB-010/278.
  - Includes the mechanical boundary of boiler pressure vessel (headers/drums) and pressure vessel piping from the feed inlet of the economizer to the main (superheater) and auxiliary (desuperheater) steam outlets, HP and LP drains and vents.

- **MRG and Couplings**
  - Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.

- **MRG Main L/O System**
  - Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG

- **HP and LP Steam Turbines**
  - Mechanical boundary stops at and includes the flexible coupling at the turbine drive flange.

- **HP and LP Steam Turbine L/O System**
  - The mechanical boundary begins at the L/O sump suction piping connection and ends at the inlet flange connection to the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic
power unit (HPU) and all associated hydraulic piping used to operate the rudder.
- The controls boundary ends at but includes the actuator.
- Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
- Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

LCS

- MPDEs
  - Mechanical boundary includes, but stops at, the engine coupling.
  - Foundation includes, but stops at, the engine chocks.
  - Air intake boundary includes, but stops at, the shutdown valve (flapper valve)
  - Air exhaust boundary includes, but stops at, the turbochargers.
  - Intercooler boundary includes both the air side and water side of the intercooler.
  - Controls boundary includes, but stops at, the governor.
- Steering System
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.
  - Water-jet steering boundaries include the hydraulic system piping and hoses outboard to and including the hydraulic cylinders. Included is the feedback mechanism used to indicate cylinder position.

LHA1

- Boilers
  - Includes anything subject to ASME Boiler and Pressure Vessel Code requirements and ASME Power Piping requirements, or NAVSEA S9074-AR-GIB-010/278.
  - Includes the mechanical boundary of boiler pressure vessel (headers/drums) and pressure vessel piping from the feed inlet of the economizer to the main
(superheater) and auxiliary (desuperheater) steam outlets, HP and LP drains and vents.

- **MRG and Couplings**
  - Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.

- **MRG Main L/O System**
  - Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG.

- **HP and LP Steam Turbines**
  - Mechanical boundary stops at and includes the flexible coupling at the turbine drive flange.

- **HP and LP Steam Turbine L/O System**
  - The mechanical boundary begins at the L/O sump suction piping connection and ends at the inlet flange connection to the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

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LHD1

- **Boilers**
  - Includes anything subject to ASME Boiler and Pressure Vessel Code requirements and ASME Power Piping requirements, or NAVSEA S9074-AR-GIB-010/278.
  - Includes the mechanical boundary of boiler pressure vessel (headers/drums) and pressure vessel piping from the feed inlet of the economizer to the main (superheater) and auxiliary (desuperheater) steam outlets, HP and LP drains and vents.

- **MRG and Couplings**
  - Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.
second reduction gear.

- **MRG Main L/O System**
  - Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG.

- **HP and LP Steam Turbines**
  - Mechanical boundary stops at and includes the flexible coupling at the turbine drive flange.

- **HP and LP Steam Turbine L/O System**
  - The mechanical boundary begins at the L/O sump suction piping connection and ends at the inlet flange connection to the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

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**LPD4**

- **Boilers**
  - Includes anything subject to ASME Boiler and Pressure Vessel Code requirements and ASME Power Piping requirements, or NAVSEA S9074-AR-GIB-010/278.
  - Includes the mechanical boundary of boiler pressure vessel (headers/drums) and pressure vessel piping from the feed inlet of the economizer to the main (superheater) and auxiliary (desuperheater) steam outlets, HP and LP drains and vents.

- **MRG and Couplings**
  - Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.

- **MRG Main L/O System**
  - Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and
filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG

- **HP and LP Steam Turbines**
  - Mechanical boundary stops at and includes the flexible coupling at the turbine drive flange.

- **HP and LP Steam Turbine L/O System**
  - The mechanical boundary begins at the L/O sump suction piping connection and ends at the inlet flange connection to the MRG.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

**LPD17**

- **MPDE**
  - Mechanical boundary includes but stops at the Gieslingier Coupling.
  - Foundation boundary includes but stops at the engine chocks.
  - Air intake boundary includes but stops at the shutdown valve (flapper valve)
  - Air exhaust boundary includes but stops at the turbochargers.
  - Intercooler boundary includes both the air side and water side of the intercooler.
  - Controls boundary includes but stops at the machinery control interface (commonly known as the "blue box").

- **MPDE L/O System**
  - Includes external L/O system that is a part of the machine. The L/O purification system, storage tanks and filling system are excluded.

- **MRG and Couplings**
  - Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.

- **MRG Main L/O System**
Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.

Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG.

**Steering System**
- The mechanical boundary includes the rudder ram and tiller (including the pins).
- The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
- The controls boundary ends at but includes the actuator.
- Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
- Excludes the main pump motor, hydraulic oil cooler, HPU mechanical seal, tiller linkage bearings, thermometers, pressure switches, transducers and gages.

**LSD41**

**MPDE**
- Mechanical boundary includes but stops at the Gieslinger Coupling.
- Foundation boundary includes but stops at the engine chocks.
- Air intake boundary includes but stops at the shutdown valve (flapper valve)
- Air exhaust boundary includes but stops at the turbochargers.
- Intercooler boundary includes both the air side and water side of the intercooler.
- Controls boundary includes but stops at the governor.

**MPDE L/O System**
- Includes external L/O system that is a part of the machine. The L/O purification system, storage tanks and filling system are excluded.

**MRG and Couplings**
- Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.

**MRG Main L/O System**
- Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
- Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG.
pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

**LSD49**

- **MPDE**
  - Mechanical boundary includes but stops at the Gieslinger Coupling.
  - Foundation boundary includes but stops at the engine chocks.
  - Air intake boundary includes but stops at the shutdown valve (flapper valve)
  - Air exhaust boundary includes but stops at the turbochargers.
  - Intercooler boundary includes both the air side and water side of the intercooler.
  - Controls boundary includes but stops at the governor.

- **MPDE L/O System**
  - Includes external L/O system that is a part of the machine. The L/O purification system, storage tanks and filling system are excluded.

- **MRG and Couplings**
  - Mechanical boundary begins at input to the flexible coupling drive flange and ends at the output shaft of the second reduction gear.

- **MRG Main L/O System**
  - Includes the L/O strainer, L/O unloader and the external L/O system that is a part of the machine.
  - Excludes the L/O purification system, storage tanks and filling systems, L/O pump mechanical seals, attached L/O pump, L/O cooler, gages and gage tubing from the gage back to the last mechanical connection before the MRG

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.

The controls boundary ends at but includes the actuator.

Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.

Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

### MCM1

- **MPDE**
  - Mechanical boundary includes, but stops at, the flywheel.
  - Foundation boundary includes and stops at the engine rail.
  - Air intake boundary includes but stops at the air filter.
  - Air exhaust boundary includes but stops at the turbochargers.
  - Controls boundary includes but stops at the governor actuator.

- **MPDE L/O System**
  - Includes external L/O system that is a part of the machine. The L/O purification system, storage tanks and filling system are excluded.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.

### PC1

- **MPDE**
  - Mechanical boundary includes but stops at the flywheel.
  - Foundation boundary includes and stops at the engine rail.
  - Air intake boundary includes but stops at the air filter.
  - Air exhaust boundary includes but stops at the turbochargers.
  - Controls boundary includes but stops at the governor
actuator.

- **MPDE L/O System**
  - Includes external L/O system that is a part of the machine. The L/O purification system, storage tanks and filling system are excluded.

- **Steering System**
  - The mechanical boundary includes the rudder ram and tiller (including the pins).
  - The hydraulic boundaries include the pump, hydraulic power unit (HPU) and all associated hydraulic piping used to operate the rudder.
  - The controls boundary ends at but includes the actuator.
  - Includes the steering pumps, feedback linkages, hoses, rudder stock and rudder seal.
  - Excludes the main pump motor, hydraulic oil cooler, thermometers, pressure switches, transducers and gages.
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