

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-04
DATE:	01 OCT 2017
CATEGORY:	I

1. SCOPE:

1.1 Title: Quality Management System; provide

2. REFERENCES:

2.1 Standard Items

2.2 ANSI/ISO/ASQ Q9001-2015, Quality Management Systems - Requirements

2.3 ANSI/NCSL Z540-3, Requirements for the Calibration of Measuring and Test Equipment

2.4 ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories

2.5 NAVSEA 04-4734, Navy and Marine Corps Calibration Laboratory Audit/Certification Manual

2.6 SSPC QP1 Application, Instructions, and Program Rules

2.7 NAVSEA OD 45845, Metrology Requirements List (METRL)

3. REQUIREMENTS:

3.1 Establish, document, implement, and maintain a Quality Management System (**QMS**) as a means of ensuring that product conforms to specified requirements.

3.2 A written QMS Manual addressing all elements of 2.2 and supporting documented procedures shall be submitted to the SUPERVISOR for review and acceptance. **Subsequent to SUPERVISOR acceptance, the written QMS Manual is acceptable in each geographic location in which the contractor maintains the same QMS.** The contractor shall have an **accepted** QMS, in accordance with this Standard Item, in place to receive an award of a Job Order. Include the following documented procedures:

3.2.1 Support: Address all areas of Paragraphs 7.1.5, 7.2 and 7.5 of 2.2.

3.2.1.1 Calibration laboratories shall be accredited to either 2.3 or 2.4 by a Commercial Accreditation Activity, or certified by a Navy Certification Activity to 2.5, and the scope of accreditation must cover the appropriate measurement parameters and ranges of the calibrations performed.

3.2.1.2 Calibration intervals assigned to Measuring and Test Equipment used by the contractor for acceptance testing shall meet those recommended in 2.7 unless alternate calibration intervals are established in accordance with 2.3.

3.2.2 Operation: Address all areas of Paragraphs 8.2, 8.4, 8.5, 8.6, 8.7 of 2.2

3.2.2.1 Verification of Purchased Product: Identify, in the purchasing documents, verification arrangements at the subcontractor or vendor location/premises. Purchasing documents shall contain the following statement when the SUPERVISOR requests government inspection: "Government Inspection is required prior to shipment from your plant. Upon receipt of this order, promptly notify and furnish a copy to the Government representative who normally services your plant so that appropriate planning for government inspection can be accomplished. In the event the government representative or office cannot be located, our purchasing agent shall be notified immediately.

3.2.2.2 Unless otherwise specified in a higher tier document, Receipt Inspection of contractor furnished materials shall be based on supplier performance history and one or more of the following: certificate of compliance, vendor material test certification data, manufacturer's mill certificate, or testing using sampling techniques.

3.2.3 Performance evaluation: Address all areas of Paragraphs 9.2 and 9.3 of 2.2

3.2.4 Improvement: Address all areas of Paragraph 10.2 of 2.2.

3.2.5 The documented QMS shall include a matrix listing the correlation between 2.3, 3.3 and the submitted documents. |

3.3 The QMS shall be subject to audits by the SUPERVISOR throughout the contract. Retain documented information to demonstrate the processes are carried out as planned.

3.4 Submit one legible copy, in hard copy or approved transferrable media, of any revisions to the accepted QMS identified in 3.2 to the SUPERVISOR within 7 days of contractor approval. |

3.5 Submittal of procedures and Process Control Procedures (009-09 of 2.1) invoked by NAVSEA Standard Items, MIL-STDs, drawings, technical publications, and specifications, although an integral part of the QMS, shall be submitted to and approved by the SUPERVISOR independent of the QMS a |

minimum of 14 days prior to start of required process for planned |
availabilities, or as otherwise approved by SUPERVISOR.

3.6 The corrective action program shall require that a copy of the written responses to contractor generated corrective actions will be provided to the SUPERVISOR when requested.

3.7 Respond in writing to each SUPERVISOR issued Method B/C/D Corrective Action (CA) within 3 business days unless otherwise specified by the SUPERVISOR. Initial response shall include immediate corrective action taken and a plan of action for CA completion. Final response shall include preventive action for recurrence of identified nonconformance, root cause analysis and Objective Quality Evidence (OQE) for corrective action completed. All follow up responses shall be as specified by the SUPERVISOR.

3.7.1 Inform the SUPERVISOR when corrective actions are complete for each SUPERVISOR issued Method A Corrective Action (CA). Response required within 72 hours unless otherwise specified by the SUPERVISOR. Response shall state that the non-conformance has been corrected.

3.7.2 Use NMD, or approved Web interface, to perform all CAR functions for contracts managed in NMD.

3.8 Attend fact-finding/investigative meetings when requested by the SUPERVISOR. (See 4.4)

3.9 Develop a Test and Inspection Plan (TIP) incorporating each Work Item in the job order, LOA Chits or Statements of Work (SOW). The initial TIP shall include all inspections and tests required by zero-tier references and first tier references, as well as symbols (I)(V)(Q) test/inspections and (G) government notification identified in the Work Item, and any additional tests and inspections the contractor deems necessary to substantiate product conformance.

3.9.1 Submit one legible copy, in hard copy or approved transferrable media, of initial copy of the TIP to the SUPERVISOR prior to start of productive work for non-CNO availabilities and no later than 5 days prior to the availability start date for CNO availabilities.

3.9.1.1 Submit one legible copy, in hard copy or approved transferrable media that can be sorted (e.g., Excel spreadsheet) of an updated TIP when requested by the SUPERVISOR.

3.9.2 A TIP shall:

3.9.2.1 Be revised prior to the start of productive work and updated as work proceeds on each Work Item. It shall be available upon request by the SUPERVISOR. Supporting data for tests and inspections requiring government notification (G), including accept/reject criteria, shall be available at the location of each test and inspection. Include

provisions for documenting the date, time, and identification of the SUPERVISOR's representative notified and government representative attending each (G)-Point on the TIP. The TIP shall annotate the relationship to a specific key event. The following key events shall be considered at a minimum (as applicable): Undocking, Production Completion Date (PCD), **Command, Control, Communications, Computer, Combat Systems, and Intelligence (C5I) Light-Off (C5ILO)**, Dock Trials (DT), Fast Cruise (FC), Sea Trials (ST), and Availability Completion (AC).

3.9.2.2 Each test and inspection shall be identified by its respective Work Item number and Work Item paragraph number, including Standard Item paragraph number, and shall include inspection symbols (I) (Q) and (V), and the government notification (G) Point symbol where applicable.

3.9.2.3 Provide identification of the item to be inspected by name, number, and location (e.g., number 3 main feed pump, 5-180-0-E).

3.9.2.4 Provide identification of each characteristic of the items to be inspected and provide the criterion for acceptance for each characteristic (e.g., air test; 2 PSIG for 10 minutes; no drop).

3.10 Test and Inspection records shall:

3.10.1 Include the ship's name and hull number, Job Order and Work Item number, **applicable PCP number**, paragraph number, component identification, accept/reject criteria, date, time, and signature of the contractor's authorized representative who witnessed or performed the test or inspection. The signature occurs after the checkpoint is determined to be satisfactory or unsatisfactory and any exceptions are documented.

3.10.2 Be maintained at a contractor location accessible to the site of the work required by the Job Order.

3.10.3 Be documented within one day of accomplishment or prior to the subsequent tests or inspections, whichever is less. The records shall indicate the results of the test and or inspection accomplished. Records shall be incorporated into the TIP within 4 days after completion of each test or inspection.

3.10.3.1 For tests and inspections involving (G)-points, records shall be documented upon acceptance or rejection and a hard copy (or electronic copy as authorized by the SUPERVISOR) provided to the SUPERVISOR at the conclusion of each (G)-Point. For tests and inspections utilizing Coating QA Tool Kit (CQATK) paperless QA program in accordance with 009-32 of 2.1, the data must be downloaded into the computer at the time and location of inspection. (See 4.5)

3.10.4 Required reports resulting from tests or inspections shall include the appropriate design criterion for each attribute or measurement required by the Work Item.

3.11 The SUPERVISOR will consider the Work Item incomplete if the contractor's documentation and records are not complete.

3.12 Accomplish (I), (V) and (Q) tests/inspections that do not have associated (G)-points, with qualified and/or currently certified personnel where required by the technical documents (e.g., NBPI, NACE, nondestructive testing, electrical cableway inspection, etc.) as follows:

3.12.1 (I) inspections require verification and documentation by a separate individual, other than the person who has accomplished the work, who is qualified as an inspector.

3.12.2 (V) inspections require verification and documentation by the qualified tradesperson, trade supervisor, or inspector.

3.12.3 (Q) inspections require verification and documentation by a qualified Technical Representative in accordance with 009-90 of 2.1 and associated PCP requirements.

3.12.4 The authority to accomplish, document, accept and reject (I) and (V) inspections may be delegated to qualified subcontractor personnel, without regards to geographical location, subject to SUPERVISOR approval.

3.13 Accomplish (G)-Point (government notification) as follows:

3.13.1 (G) is a symbol inserted in a Work Item to establish a point in the sequence of accomplishment of work at which time the SUPERVISOR shall be notified by the prime contractor in all cases to permit observation of a specific test or inspection (I)(V) by the government. When the symbol (G) precedes tests or inspections in a Work Item which are applicable to more than one action, the symbol (G) shall identify the action required, e.g., (G) "HYDROSTATIC TEST". When more than one unit is involved, the (G) notification requirement applies to each unit. Pre-inspection by the contractor prior to a (G)-Point is neither required nor desired.

3.13.2 Notify the SUPERVISOR's designated representative via FAX, hard copy, or by electronic method, as directed by the SUPERVISOR.

3.13.2.1 Notify the SUPERVISOR during normal day shift working hours, at least 4 hours, but not more than one day, prior to commencing the specific requirements in the paragraph annotated with the symbol (G). Notify the SUPERVISOR to cancel a scheduled test or inspection as soon as known, but no later than 30 minutes prior to the scheduled event.

3.13.2.2 Notify the SUPERVISOR not later than 4 hours before the end of the last preceding day shift when tests or inspections following a (G) Point are scheduled after normal day shift working hours, on a weekend, or on a federal holiday.

3.13.2.3 Notify the SUPERVISOR at least 48 hours, but not more than 72 hours, prior to commencing (G)-Points at contractor's/subcontractor's plants located in excess of 50 miles by the most direct roadway nearest to the place of performance of the contract. Document the date, time, and identification of the SUPERVISOR's representative notified.

3.13.2.4 For (G)-Points scheduled after normal day shift working hours, on a weekend, or a Federal holiday, notify the SUPERVISOR to cancel a scheduled test or inspection as soon as known, but no later than 2 hours prior to the scheduled event.

3.13.3 Proceed with the test or inspection if the SUPERVISOR is not present, provided the required advance notice has been furnished to the SUPERVISOR and the contractor has completed and documented the preceding tests and inspections.

3.13.4 A partial test or inspection requiring (G) notification may be accomplished in the event that all work cannot be completed and work progress would be delayed in waiting for total completion of work. Comply with the requirements of 3.13.2 when the incomplete work is completed and ready for the remainder of the test or inspection. Note partial inspections on the test or inspection form.

3.13.5 Invoke (G) notification requirements for tests or inspections involving a subcontractor in purchase orders such that the requirements of 3.13.2 are met.

3.13.6 A qualified contractor representative shall be present to accomplish, accept or reject and document tests or inspections associated with the symbol (G).

3.13.6.1 The authority to witness or perform, document and accept/reject (I) (G), (Q) (G), and (V) (G) tests and inspections is a prime contractor's responsibility but, subject to SUPERVISOR approval within a 50-mile radius of the contractor's plant nearest to the place of performance of the contract, may be delegated to subcontractors who are MSRA or ABR agreement holders, SSPC QP1 certified, NDT certified, or have a current **QMS** accepted by the SUPERVISOR.

3.13.6.2 The contractor may delegate responsibility to subcontractors to perform, document and accept/reject (I) (G) and (V) (G) tests and inspections performed at plants located outside a 50-mile radius of the contractor's plant nearest to the place of performance of the contract subject to SUPERVISOR prior approval.

3.13.6.3 Associated (G)-Point notification requirements shall not be delegated.

3.14 For work being performed outside a 50-mile radius of the place of contract performance, the prime contractor shall submit one legible copy, in

hard copy or approved transferrable media, of purchase orders to the SUPERVISOR within 2 days or otherwise as directed by the SUPERVISOR, prior to issue of purchase order and shipment of equipment. For contractors who do not utilize purchase orders as a vehicle for accomplishing work within their company, a report identifying the delineation of the specific Work Item requirements, in lieu of the purchase order shall be submitted to the SUPERVISOR.

3.15 Maintain a current list for reference by the SUPERVISOR, designating the contractor's qualified and currently certified inspectors who witness or perform and sign for symbol (I) inspections, indicating the type of tests and inspections for which each inspector is qualified and currently certified. When subcontractors are delegated responsibility, the subcontractor's qualified and currently certified inspectors shall be included on this list.

3.16 Submit one legible copy, in hard copy or approved transferrable media, of the most recent contractor's/subcontractor's SSPC QP-1 audit results to the SUPERVISOR, no later than 10 days after contractor's/subcontractor's receipt of the final audit report.

3.17 Contractor/subcontractor shall notify the SUPERVISOR within one day when aware of any preliminary SSPC audit findings for critical audit items that result in a rating of one (1) (i.e., major CAR or deficiency) as referenced in 2.6. These notifications shall be submitted, as required, in addition to the final SSPC audit report.

3.18 Certify to the SUPERVISOR that work is completed technically correct with all required OQE. All supporting documentation shall be submitted in support of the following Key Events: Undocking (if applicable), PCD, C5ILO, |DT, FC, ST, and CA.

3.18.1 As required by 009-60 of 2.1, each Work Item to be accomplished during the availability shall be evaluated and properly tied to the appropriate Key Event in a predecessor/successor methodology and documented in the Integrated Production Schedule (IPS) and tracked via the Event Readiness List. Key Event ties shall also be annotated for each item in the TIP as required by 3.9.2.1.

3.18.2 Notify the SUPERVISOR of the condition and status of each individual Work Item in the availability within 3 days of Work Item completion or a minimum of 5 days prior to the scheduled Key Event to which that item is tied, whichever occurs first, by either of the following methods:

3.18.2.1 Completion and submission of one legible copy of Attachment A, in hard copy or approved transferrable media. Submission of Event Readiness List (ERL) may substitute for Attachment A when authorized by the SUPERVISOR.

3.18.2.2 Signature on a centralized signature sheet or record book maintained by the SUPERVISOR if Work Item is complete. If work is incomplete or complete with discrepancies, supporting rationale and impact

statement with recovery plan shall be provided to the SUPERVISOR via submission of one legible copy of Attachment A, in hard copy or approved transferrable media. Upon completion of work or correction of discrepancies, a revised Attachment A with the updated status shall be submitted to the SUPERVISOR in hard copy or approved transferrable media.

4. NOTES:

4.1 ANSI/ISO/ASQ Q9001:**2015** commercial third party registrar certification is not required.

4.2 The **QMS** submitted in 3.2 requires a one-time submittal/acceptance unless this NAVSEA Standard Item and/or references change or contractor's status changes. |

4.3 A "zero-tier reference" is a specification, standard, drawing, test memo, planning/design memo that is cited in the contract (including its attachments). A "first-tier reference" is either: (1) a specification, standard, or drawing cited in a zero-tier reference, or (2) a specification cited in a first tier drawing. All zero-tier and first tier references are mandatory for use. All lower tier references shall be used for guidance only.

4.4 Contractor-run critiques or fact findings are accomplished in accordance with 009-120 of 2.1.

4.5 A partial (G)-point may be accomplished for a fraction of the work specification components. When elected, the contractor is responsible to account for the inspection status of each component. A final (G)-point is required for the last remaining component(s).

4.6 ISO compliant Quality Management Systems typically follow a 4-tiered hierarchy comprised of:

- a. *The "first-tier" document related to the QMS is the Quality Manual, which is the high-level document that is authored and approved by upper management of the organization and is the guiding organizational document for which all subsequent tiers within the system should be aligned with.*
- b. *The "second-tier" documents are the Quality Procedures making up the center of the documentation system. These procedures span all the required processes and practices within the organization and should include references both upward to the Quality Manual and downward to the Work Instructions associated with each process.*
- c. *The "third-tier" documents are Work Instructions comprised of instructions that describe the specific actions required to achieve a quality product.*

- d. *The "fourth-tier" documents are the Quality Records which capture all the data, information, records, forms and become the objective evidence which will prove the QMS is being executed per procedure.*

Attachment A
Work Completion Certification

SHIP'S NAME :	HULL NO.:																
WORK ITEM NO:	SSP NO.:																
KEY EVENT: <table style="display: inline-table; vertical-align: top; margin-left: 20px;"> <tr><td><input type="checkbox"/></td><td>Undocking (UD)</td></tr> <tr><td><input type="checkbox"/></td><td>Production Completion Date (PCD)</td></tr> <tr><td><input type="checkbox"/></td><td>Dock Trials (DT)</td></tr> <tr><td><input type="checkbox"/></td><td>Fast Cruise (FC)</td></tr> <tr><td><input type="checkbox"/></td><td>Sea Trials (ST)</td></tr> <tr><td><input type="checkbox"/></td><td>Availability Completion (AC)</td></tr> <tr><td><input type="checkbox"/></td><td>Command, Control, Communications, Computer, Combat Systems, and Intelligence Light-Off (C5ILO)</td></tr> <tr><td><input type="checkbox"/></td><td>Other _____</td></tr> </table>		<input type="checkbox"/>	Undocking (UD)	<input type="checkbox"/>	Production Completion Date (PCD)	<input type="checkbox"/>	Dock Trials (DT)	<input type="checkbox"/>	Fast Cruise (FC)	<input type="checkbox"/>	Sea Trials (ST)	<input type="checkbox"/>	Availability Completion (AC)	<input type="checkbox"/>	Command, Control, Communications, Computer, Combat Systems, and Intelligence Light-Off (C5ILO)	<input type="checkbox"/>	Other _____
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<input type="checkbox"/>	Sea Trials (ST)																
<input type="checkbox"/>	Availability Completion (AC)																
<input type="checkbox"/>	Command, Control, Communications, Computer, Combat Systems, and Intelligence Light-Off (C5ILO)																
<input type="checkbox"/>	Other _____																

1) All contracted production work (original, new and growth) has been satisfactorily reviewed, accurate and complete. **All non-conformances have been corrected and corrective action request (CAR) are at an acceptable level of completion.**

RESULTS/STATUS:

- Complete
- Complete w/ Discrepancies
- Incomplete

Note: **If work is incomplete or complete with discrepancies, supporting rational and impact statement with recovery plan in the Comments block below.**

Comments: _____

Print and Sign

Name: _____ Date: _____

Position and Responsibility: _____

2) All Tests and Inspections have been completed satisfactorily reviewed, accurate, complete and properly documented in the T&I Plan.

RESULTS/STATUS:

- Complete
- Complete w/ Discrepancies
- Incomplete

Note: *If work is incomplete or complete with discrepancies, supporting rational and impact statement with recovery plan in the Comments block below.*

Comments: _____

Print and Sign

Name: _____ Date: _____

Position and
Responsibility: _____

3) All required reports and all accompanying required data have been submitted, reviewed, accurate, complete and satisfactory.

RESULTS/STATUS:

- Complete
- Complete w/ Discrepancies
- Incomplete

Note: *If work is incomplete or complete with discrepancies, supporting rational and impact statement with recovery plan in the Comments block below.*

Comments: _____

Print and Sign

Name: _____ Date: _____

Position and
Responsibility: _____

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-09
DATE: 01 OCT 2017
CATEGORY: II

1. SCOPE:

1.1 Title: Process Control Procedure (PCP); provide and accomplish

2. REFERENCES:

2.1 None.

3. REQUIREMENTS:

3.1 Submit one legible copy of each PCP, in approved transferrable media, to the SUPERVISOR for approval. For planned availabilities, submission shall be no later than 14 days prior to start of the required process, or as otherwise approved by the SUPERVISOR. Attachment A **shall be used for** PCP development; ensure each element is contained within its respective section.

3.2 Submit updated or changed procedures to the SUPERVISOR at least 3 days prior to implementation.

3.3 Participate in a joint Ship's Force and SUPERVISOR personnel safety brief, prior to start of PCP.

3.3.1 For SI 009-88 PCP's, the safety brief shall include a hand-over-hand inspection and verification of the tagged-out piping/mechanical/electrical system.

(V) (G) "START OF PROCEDURE"

3.4 Provide notification to the SUPERVISOR when ready to start the PCP.

3.4.1 Verify the PCP is approved.

3.4.2 Verify necessary parts and equipment are on hand to start work.

3.4.3 Attend/verify job briefing conducted prior to start of work.

3.5 Accomplish the requirements of the approved PCP.

3.6 Make pen-and-ink editorial changes to the PCP when required after work commences. Editorial changes are limited to those correcting typographical errors and do not create a technical change as defined in 3.7.

3.6.1 Submit one legible copy, in approved transferrable media, of any editorial change made to the PCP to the SUPERVISOR within one day of making the change.

3.7 Submit one legible copy, in approved transferrable media, of a report to the SUPERVISOR identifying any technical changes required after work has commenced and prior to proceeding with the affected procedural steps. Technical changes include any change to work scope, work location, work sequence, testing, technical parameters (torque, test pressure, flow rate, etc.), material, inspections, repair processes, references, or change which otherwise alters any technical aspect of the work.

3.7.1 Make technical changes to the PCP and proceed when approved by the SUPERVISOR.

3.8 Ensure completed process control documentation provides a record of the data required to control and determine the satisfactory completion of the process.

3.8.1 Submit one legible copy, in hard copy or approved transferrable media, of the completed documentation to the SUPERVISOR ***within 3 days of completion or a minimum of 5 days prior to the scheduled Key Event to which the PCP is tied, whichever occurs first.***

4. NOTES:

4.1 None.

ATTACHMENT A
Process Control Procedure (PCP) **Requirements**

Section One - Identification

- Include the Process Title and Procedure Number with revision **on each page.**
- List the Ship's name, Work Item and paragraph that the PCP fulfills.
- Include contractor/subcontractor's name and address.
- Include space for the Approval Signature and title of the contractor's representative. Include spaces for the Date Developed, Date of Submission **and scheduled start date.**
- If submitting a previously approved PCP, include the previous Government approval letter (if appropriate) and attach a letter of intent to use the PCP with the updated information required by this section. A revision of Section 1 of the previously approved PCP is not required. A previously approved PCP is defined as one that has been approved by the SUPERVISOR for a like system or component.

Section 2 - Personnel Qualifications

- List the qualifications of the personnel performing the work.
- Include a statement that a briefing will be conducted prior to beginning work to ensure personnel have direct knowledge of the requirements of the procedure and the safety requirements of the job.

Section 3 - Process Description

- **Method utilized to control the procedure.**
- List any specialized or critical equipment needed to perform the work.
- List any specialized or critical personnel safety equipment.
- State that Government Notification (V) (G) will be made at the start of the process as applicable.
- Describe the process as related to the sequence of work, **including each critical factor which has a direct bearing on the process quality and safety.**
- Provide inspections required for the process, to include (V), (I), and (G) symbols invoked by the Work Item applicable to the process.
- Provide inspection and documentation forms applicable to the process.
- List the acceptance and rejection criteria used for determining satisfactory process completion.
- Include a statement that a copy of the PCP will be provided at the work site during the performance of the work.

Section 4 - Hazardous Material

- State if no hazardous material/waste will be used or generated.
- Identify any hazardous material/waste used or generated during the performance of work.
- Describe the methodology to limit the quantity that will require control.

- Describe the methods of the disposal of hazardous material or hazardous waste.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-12

DATE: **01 OCT 2017**

CATEGORY: II

1. SCOPE:

1.1 Title: Weld, Fabricate, and Inspect; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 MIL-STD-1689, Fabrication, Welding, and Inspection of Ships
Structure

2.3 American Bureau of Shipping (ABS) Rules for Building and Classing
Steel Vessels

2.4 0900-LP-060-4010, Fabrication, Welding, and Inspection of Metal Boat
and Craft Hulls

2.5 S9074-AQ-GIB-010/248, Requirements for Welding and Brazing Procedure
and Performance Qualification

2.6 0900-LP-001-7000, Fabrication and Inspection of Brazed Piping
Systems

2.7 S9074-AR-GIB-010/278, Requirements for Fabrication Welding and
Inspection, and Casting Inspection and Repair for Machinery, Piping,
and Pressure Vessels

2.8 MIL-STD-22, Welded Joint Design

2.9 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.10 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing
Methods

2.11 DOD-STD-2185, Requirements for Repair and Straightening of Bronze
Naval Ship Propellers

2.12 S9221-C1-GTP-010/020, Main Propulsion Boilers; Repair and Overhaul

2.13 S9AAO-AB-GOS-010, General Specifications for Overhaul of Surface
Ships (GSO)

- 2.14 MIL-STD-2191, Repair, Welding, Weld Cladding, Straightening, and Cold Rolling of Main Propulsion Shafting
- 2.15 S9FFG-AG-SRM-010, Superstructure Cracking Repair; FFG7 Class, Ship Repair Manual
- 2.16 DM 10-612, SERMC, FFG7 Class Aluminum Deckhouse Critical Welds and Critical Weld Regions
- 2.17 S9CGO-BP-SRM-010/CG-47CL, Technical Manual for CG-47 Class, Superstructure Cracking Repair
- 2.18 DM 10-623, SERMC, Quality Assurance Requirements for Welding 5XXX Series Aluminum Structures for CG-47 Class

3. REQUIREMENTS:

3.1 Utilize specific requirements of 2.2 through 2.12 listed in Tables One, 2, 3, and 4 of this item for determining the welder and brazer qualifications, electrodes, weld design, welding requirements, brazing requirements, welding procedures, brazing procedures, welding parameters and controls, inspection standards, and acceptance criteria.

3.1.1 Maintain a Welding Workmanship Program in accordance with 2.2 and Welding Training Program in accordance with 2.5.

3.1.2 Maintain a Welding Surveillance Inspection Program in accordance with 2.2.

3.1.3 Maintain a Brazing Process Inspection in accordance with 2.6.

3.2 Weld bell-end fittings in accordance with Section 505c8 of 2.13. Nondestructive testing inspection shall comply with Class P-2 piping systems as defined by 2.7.

3.3 Ground welding machines, for purposes of providing a return path for welding current, using a grounding bar or lead which shall be connected directly from the machine ground return connection to the ship's hull, sized on the basis of 1,000,000 Circular Mils per 1,000 amps per 100 feet, but in no event using less than a Number One cable (85,037 Circular Mils).

3.3.1 Welding machines used for welding on machinery, pressure vessels, or piping, rotating ordnance, electronic, or fire control equipment shall have the ground return connection in the immediate vicinity of the work to ensure that current does not flow through bearings, pipe hangers, or other areas where arcing or high resistance paths exist. For ships constructed of non-magnetic materials, the ground return cables shall be connected directly to the component being welded - as close to the weld zone as feasible.

3.3.2 Shipboard power distribution system shall not be used as the power source for welding equipment. External power source shall be used.

3.4 Accomplishment of a Process Control Procedure (PCP) for the specific welding, brazing, and inspection operations in 3.4.1 through 3.4.9 shall be in accordance with NAVSEA Standard Items (See Note 4.1) and the following:

3.4.1 Class A-F, A-1, A-2, A-3, A-LT, P-1, P-LT, M-1, and T-1 welding, as defined by 2.7. These procedures shall include, as a minimum, the information required by Paragraph 4.1.3 of 2.7 and supporting data such as a sketch of the weld repair areas and associated ship components. Joint numbers shall not be duplicated on ship during the availability.

3.4.2 Class P-3a special category silver brazing, as defined by 2.6. The procedure shall include, as a minimum, the information required by Sections 4, 5, 6, 7, 8, and 9 of 2.6.

3.4.2.1 All brazing of steam piping shall conform to 2.6, Class P-3a special category, including ultrasonic inspection, regardless of pipe size, including any (existing) copper to (new) copper-nickel transition joints.

3.4.2.2 In steam systems, where brazed piping and fittings are to be reused, or piping has to be sized to achieve proper fit-up, the option for a 5X visual inspection for cracks listed in Sections 5.5.3, 5.10.1, and 5.10.2 of 2.6 shall not be used; liquid penetrant inspection shall be required.

3.4.3 For bronze propellers, using 2.11 for guidance.

3.4.4 For propellers other than bronze, using 2.7 for guidance.

3.4.5 For propulsion shafting and rudder stocks, using 2.14 for guidance.

3.4.6 For titanium-based materials, using 2.7 for guidance.

3.4.7 Accomplish aluminum welding and nondestructive testing for FFG-7 Class ships in accordance with 2.15 and 2.16.

3.4.8 Accomplish aluminum welding and nondestructive testing for **superstructure of CG-47 Class ships in accordance with 2.17 and 5XXX series aluminum structures for CG-47 class ships in accordance with 2.18.**

3.4.9 The use of a permanent backing strap in accordance with Section 11, Paragraph 11.1 of 2.2 is prohibited unless detailed in the original weld joint design or when authorized by the SUPERVISOR.

(I) or (I) (G) "NONDESTRUCTIVE TESTING"

3.5 Accomplish nondestructive testing in accordance with the following:

3.5.1 Manufacture, installation, and repair (welding, brazing, machining, or lapping) of Level I fittings or components:

3.5.1.1 Nondestructive Testing Visual Inspection - (I)

3.5.1.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I) (G)

3.5.1.3 Nondestructive Testing Radiographic - (I)

3.5.2 Welding/brazing of P-1, P-LT, P-3a piping systems or Class A-F, A-1, A-2, A-3, A-LT, M-1, T-1 welding, and P-2 steam service:

3.5.2.1 Nondestructive Testing Visual Inspection - (I)

3.5.2.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I) (G)

3.5.2.3 Nondestructive Testing Radiographic - (I)

3.5.2.4 Nondestructive Testing Visual Inspection (I) (G) materials S-51, S-52, S-53.

3.5.3 Welding on ship/craft listed in Attachment A hull or structure when required by the fabrication document:

3.5.3.1 Nondestructive Testing Visual Inspection - (I)

3.5.3.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I) (G)

3.5.3.3 Nondestructive Testing Radiographic - (I)

3.5.4 Weight handling equipment manufacture and repair:

3.5.4.1 Nondestructive Testing Visual Inspection - (I)

3.5.4.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant - (I) (G)

3.5.4.3 Ultrasonic Testing (Final Only) - (I) (G)

3.5.4.4 Nondestructive Testing Radiographic - (I)

3.5.5 Corrective maintenance within the certified boundaries of cranes (as defined in NSTM 589):

3.5.5.1 Nondestructive Testing Visual Inspection - (I)

3.5.5.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant - (I) (G)

3.5.5.3 Ultrasonic Testing (Final Only) - (I) (G)

3.5.5.4 Nondestructive Testing Radiographic - (I)

3.5.6 Maintenance on aircraft launch and recovery equipment:

3.5.6.1 Nondestructive Testing Visual Inspection - (I)

3.5.6.2 Nondestructive Testing Magnetic Particle, Liquid Penetrant and Ultrasonic Testing (Final Only) - (I) (G)

3.5.6.3 Nondestructive Testing Radiographic - (I)

(I) (G) "EVALUATION OF RT FILMS"

3.6 Accomplish RT film interpretation.

3.6.1 Provide the cognizant Government representative designated by the SUPERVISOR the evaluated radiographs and records within 2 days of the (G) point.

3.7 Provide and maintain a Welding Consumable Control System in accordance with 2.2, 2.3, 2.4, 2.6, 2.7, 2.11, 2.12, 2.14, and 2.18 which covers the control and issuance of filler materials. The system shall be described in a written procedure that shall be submitted to the SUPERVISOR for review and approval prior to the initiation of production work. This procedure only requires a one-time submittal/approval unless the Standard Items change and/or references change or are updated. The Welding Consumable Control System shall be subject to periodic conformity audits by the SUPERVISOR throughout the contract period.

3.8 Do not deposit ferritic welds on welds made with austenitic or non-ferrous electrodes. Where the base material is ferrous and the existing weld is austenitic or non-ferrous, that weld shall be completely removed prior to welding with ferritic electrodes. The welding shall be accomplished in accordance with 2.2.

3.9 Utilize Attachment A to define combatant and non-combatant vessels and applicable table.

3.10 Where requirements in the repair and testing instructions for propulsion boilers conflict, 2.12 shall take precedence.

4. NOTES:

4.1 If a Process Control Procedure (PCP) for all specific welding, brazing, and inspection operations in 3.4.1 through 3.4.9 is required; the

use of Category II Standard Item 009-09 "Process Control Procedure (PCP); provide and accomplish" of 2.1 will be specified in the Work Item.

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

L I N E	COLUMN	A	B	C	D		E
	SITUATION EVOLUTION	CLASS P-1, P-2 AND P-LT PIPING	CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING	HARD FACING VALVE PARTS	CLASS A PRESSURE VESSEL	** PROPULSION BOILERS	*PROPELLERS (BRONZE)
1	WELDER AND BRAZER QUALIFICATION	S9074-AQ-GIB-010/248, PARAGRAPH 5	0900-LP-001-7000, SECTION 4	S9074-AQ-GIB-010/248, PARAGRAPH 5		S9221-C1-GTP-010/020	
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4	NOT APPLICABLE	S9074-AQ-GIB-010/248, PARAGRAPH 4		S9221-C1-GTP-010/020	DOD-STD-2185, PARAGRAPH 4
3	BRAZING PROCEDURE	NOT APPLICABLE	0900-LP-001-7000, SECTION 4	NOT APPLICABLE			
4	WELDING REQUIREMENTS	S9074-AR-GIB-010/278, PARAGRAPH 6	NOT APPLICABLE	S9074-AR-GIB-010/278, PARAGRAPH 6			MIL-STD-2185, PARAGRAPH 5
5	FILLER MATERIAL	S9074-AR-GIB-010/278, PARAGRAPH 5	0900-LP-001-7000, SECTION 5	S9074-AR-GIB-010/278, PARAGRAPH 5		S9221-C1-GTP-010/020	DOD-STD-2185, PARAGRAPH 5
6	JOINT DESIGN	S9074-AR-GIB-010/278, PARAGRAPH 9 MIL-STD-22	0900-LP-001-7000, SECTION 5	NOT APPLICABLE	S9074-AR-GIB- 010/278, PARAGRAPH 9 MIL-STD-22	S9221-C1-GTP-010/020	

* - PARAGRAPH 3.4.4 APPLIES
** - PARAGRAPH 3.10 APPLIES

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

L I N E	COLUMN	A	B	C	D		E
		SITUATION EVOLUTION	CLASS P-1, P-2 AND P-LT PIPING	CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING	HARD FACING VALVE PARTS	CLASS A PRESSURE VESSEL	** PROPULSION BOILERS
7	HEAT TREATMENT	S9074-AR-GIB-010/278, PARAGRAPH 6	0900-LP-001-7000, SECTION 5	S9074-AR-GIB-010/278, PARAGRAPHS 6 AND 11.6	S9074-AR-GIB-010/278, PARAGRAPH 6	S9221-C1-GTP-010/020	S9074-AR-GIB-010/278, PARAGRAPH 6 DOD-STD-2185, PARAGRAPH 5
8	WORKMANSHIP REQUIREMENTS	S9074-AR-GIB-010/278, PARAGRAPH 7	0900-LP-001-7000, SECTION 5	S9074-AR-GIB-010/278, PARAGRAPHS 7 AND 11.6	S9074-AR-GIB-010/278, PARAGRAPH 7	S9221-C1-GTP-010/020	S9074-AR-GIB-010/278, PARAGRAPH 7
9	VISUAL INSPECT JOINT FIT-UP	S9074-AR-GIB-010/278, PARAGRAPH 9 MIL-STD-22	0900-LP-001-7000, SECTION 7 FOR CLASS P-3a SPECIAL CATEGORY	NOT APPLICABLE	S9074-AR-GIB-010/278, PARAGRAPH 9 MIL-STD-22	S9221-C1-GTP-010/020	DOD-STD-2185, PARAGRAPH 5
10	VISUAL INSPECTION	S9074-AR-GIB-010/278, PARAGRAPH 10 MIL-STD-2035, PARAGRAPH 4	0900-LP-001-7000, SECTION 7 AND 8 FOR CLASS P-3a SPECIAL CATEGORY	S9074-AR-GIB-010/278, PARAGRAPH 11.6.3 MIL-STD-2035, PARAGRAPH 4	S9074-AR-GIB-010/278, PARAGRAPH 10 MIL-STD-2035, PARAGRAPH 4		MIL-STD-2035, PARAGRAPH 4
11	RADIOGRAPHIC INSPECTION (RT)	S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 3 MIL-STD-2035, PARAGRAPH 5 (NORMALLY ONLY P-1 AND P-LT)	NOT APPLICABLE		S9074-AR-GIB-010/278 PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 3 MIL-STD-2035, PARAGRAPH 5		NOT APPLICABLE

* - PARAGRAPH 3.4.4 APPLIES
** - PARAGRAPH 3.10 APPLIES

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

L I N E	COLUMN	A	B	C	D		E
	SITUATION EVOLUTION	CLASS P-1, P-2 AND P-LT PIPING	CLASS P-3a SPECIAL CATEGORY, OTHER CLASS P-3a, AND P-3b PIPING	HARD FACING VALVE PARTS	CLASS A PRESSURE VESSEL	** PROPULSION BOILERS	*PROPELLERS (BRONZE)
12	ULTRASONIC INSPECTION (UT)	NOT APPLICABLE	0900-LP-001-7000, SECTIONS 6,7,8 AND 9 FOR CLASS P-3a SPECIAL CATEGORY PIPING ONLY	NOT APPLICABLE			S9245-AR-TSM- 010/PROP, PARAGRAPH 5-7.5.2
13	LIQUID PENETRANT INSPECTION (PT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7 (NORMALLY ONLY P-1 AND P-LT)	0900-LP-001-7000, SECTION 7 AND 8 FOR CLASS P-3a SPECIAL CATEGORY SEE 3.4.2.2	S9074-AR-GIB- 010/278, PARAGRAPH 11.6.3 MIL-STD-2035, PARAGRAPH 7	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7		MIL-STD-2035, PARAGRAPH 7 T9074-AS-GIB- 010/271, PARAGRAPH 5
14	MAGNETIC PARTICLE INSPECTION (MT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035, PARAGRAPH 6 (NORMALLY ONLY P-1 AND P-LT)	NOT APPLICABLE		S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035 PARAGRAPH 6		NOT APPLICABLE

* - PARAGRAPH 3.4.4 APPLIES
** - PARAGRAPH 3.10 APPLIES

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

L I N E	COLUMN	F	G	H	I	J
	SITUATION EVOLUTION	MACHINERY CLASS M	TURBINE PARTS	CASTINGS	FORCED DRAFT BLOWERS	REDUCTION AND STEAM TURBINE DRIVEN AUXILIARY GEARS
1	WELDER AND BRAZER QUALIFICATIONS	S9074-AQ-GIB-010/248, PARAGRAPH 5				
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4				
3	BRAZING PROCEDURE	NOT APPLICABLE				
4	WELDING REQUIREMENTS	S9074-AR-GIB-010/278, PARAGRAPH 6				
5	FILLER MATERIAL	S9074-AR-GIB-010/278, PARAGRAPH 5				
6	JOINT DESIGN	S9074-AR-GIB-010/278, PARAGRAPH 9, AND MIL-STD-22				
7	HEAT TREATMENT	S9074-AR-GIB-010/278, PARAGRAPHS 6 AND 8				
8	WORKMANSHIP REQUIREMENTS	S9074-AR-GIB-010/278, PARAGRAPH 7				
9	VISUAL INSPECT JOINT FIT-UP	S9074-AR-GIB-010/278, PARAGRAPH 10, AND MIL-STD-22				
10	VISUAL INSPECTION	S9074-AR-GIB-010/278, PARAGRAPH 10 MIL-STD-2035, PARAGRAPH 4	S9074-AR-GIB-010/278, PARAGRAPH 14	S9074-AR-GIB-010/278, PARAGRAPH 13 MIL-STD-2035, PARAGRAPH 4	S9074-AR-GIB-010/278, PARAGRAPH 16	S9074-AR-GIB-010/278, PARAGRAPH 15
11	RADIOGRAPHIC INSPECTION (RT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 3 MIL-STD-2035, PARAGRAPH 5	S9074-AR-GIB-010/278, PARAGRAPH 14 T9074-AS-GIB-010/271, PARAGRAPH 3 MIL-STD-2035, PARAGRAPH 5	S9074-AR-GIB-010/278, PARAGRAPH 13	S9074-AR-GIB-010/278, PARAGRAPH 16 T9074-AS-GIB-010/271, PARAGRAPH 3 MIL-STD-2035, PARAGRAPH 5	NOT APPLICABLE

TABLE 1
WELDING, FABRICATION, AND INSPECTION OF PIPING, PRESSURE VESSELS, PROPELLERS, AND MACHINERY

L I N E	COLUMN	F	G	H	I	J
	SITUATION EVOLUTION	MACHINERY CLASS M	TURBINE PARTS	CASTINGS	FORCED DRAFT BLOWERS	REDUCTION AND STEAM TURBINE DRIVEN AUXILIARY GEARS
12	ULTRASONIC INSPECTION (UT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 6 MIL-STD-2035, PARAGRAPH 8	S9074-AR-GIB-010/278, PARAGRAPH 14	S9074-AR-GIB-010/278, PARAGRAPH 13	S9074-AR-GIB-010/278, PARAGRAPH 16	S9074-AR-GIB-010/278, PARAGRAPH 15
13	LIQUID PENETRANT INSPECTION (PT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7	S9074-AR-GIB-010/278, PARAGRAPH 14 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7	S9074-AR-GIB-010/278, PARAGRAPH 13 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7	S9074-AR-GIB-010/278, PARAGRAPH 16 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7	S9074-AR-GIB-010/278, PARAGRAPH 15 T9074-AS-GIB-010/271, PARAGRAPH 5 MIL-STD-2035, PARAGRAPH 7
14	MAGNETIC PARTICLE INSPECTION (MT)	S9074-AR-GIB-010/278, PARAGRAPH 10 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035, PARAGRAPH 6	S9074-AR-GIB-010/278, PARAGRAPH 14 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035, PARAGRAPH 6	S9074-AR-GIB-010/278, PARAGRAPH 13 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035, PARAGRAPH 6	S9074-AR-GIB-010/278, PARAGRAPH 16 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035, PARAGRAPH 6	S9074-AR-GIB-010/278, PARAGRAPH 15 T9074-AS-GIB-010/271, PARAGRAPH 4 MIL-STD-2035, PARAGRAPH 6

TABLE 2
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (COMBATANT)

L I N E	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS), ORDINARY STRENGTH STEEL(OS), AND HIGHER STRENGTH STEEL (HSS)	(HY-80/100, HSLA-80 AND STS)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
1	WELDER QUALIFICATION	S9074-AQ-GIB-010/248, PARAGRAPH 5					
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4					
3	ELECTRODE	MIL-STD-1689, PARAGRAPH 10 TABLE X	MIL-STD-1689, PARAGRAPH 10 TABLE XI	MIL-STD-1689, PARAGRAPH 10 TABLE XVI	MI-STD-1689, PARAGRAPH 10 TABLES XII AND XIII	MIL-STD-1689, PARAGRAPH 10 TABLES XIV AND XV	S9074-AR-GIB-010/278, TABLE II
4	JOINT DESIGN	MIL-STD-22 MIL-STD-1689, PARAGRAPH 11					
5	WELDING REQUIREMENTS	MIL-STD-1689, PARAGRAPH 13					
6	WORKMANSHIP REQUIREMENTS	MIL-STD-1689, PARAGRAPHS 12 AND 14					
7	VISUAL	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 MIL-STD-2035, PARAGRAPH 4 T9074-AS-GIB-010/271, PARAGRAPH 8					
8	RADIOGRAPHIC INSPECTION (RT)	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 MIL-STD-2035, PARAGRAPH 5 T9074-AS-GIB-010/271, PARAGRAPH 3					

***PARAGRAPH 3.8 APPLIES**

TABLE 2
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (COMBATANT)

L I N E	COLUMN	A	B	C	D	E	F
		MATERIAL EVOLUTION	CARBON STEEL (MS), ORDINARY STRENGTH STEEL(OS), AND HIGHER STRENGTH STEEL (HSS)	(HY-80/100, HSLA-80 AND STS)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS
9	ULTRASONIC INSPECTION (UT)	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 MIL-STD-2035, PARAGRAPH 8 T9074-AS-GIB-010/271, PARAGRAPH 6					
10	LIQUID PENETRANT INSPECTION (PT)	MIL-STD-1689, PARAGRAPHS 6, 7, AND 8 MIL-STD-2035, PARAGRAPH 7 T9074-AS-GIB-010/271, PARAGRAPH 5					
11	MAGNETIC PARTICLE INSPECTION (MT)	MIL-STD-1689, PARAGRAPH 6 MIL-STD-2035, PARAGRAPH 6 T9074-AS-GIB-010/271, PARAGRAPH 4	NOT APPLICABLE				

***PARAGRAPH 3.8 APPLIES**

TABLE 3
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (NON-COMBATANT) * **

L I N E	COLUMN	A	B	C	D	E	F
		MATERIAL EVOLUTION	CARBON STEEL (MS), ORDINARY STRENGTH STEEL(OS), AND HIGHER STRENGTH STEEL (HSS)	*** (HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS
1	WELDER QUALIFICATION	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
2	WELDING PROCEDURE	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
3	ELECTRODE	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
4	JOINT DESIGN	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
5	WELDING REQUIREMENTS	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
6	WORKMANSHIP REQUIREMENTS	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
7	VISUAL	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
8	RADIOGRAPHIC INSPECTION (RT)	ABS RULES, PART 2, CHAPTER 4, SECTION 1					

TABLE 3
WELDING, FABRICATION, AND INSPECTION OF SURFACE SHIP HULLS (NON-COMBATANT) * **

	COLUMN	A	B	C	D	E	F
L I N E	MATERIAL EVOLUTION	CARBON STEEL (MS), ORDINARY STRENGTH STEEL(OS), AND HIGHER STRENGTH STEEL (HSS)	*** (HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
9	ULTRASONIC INSPECTION (UT)	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
10	LIQUID PENETRANT INSPECTION (PT)	ABS RULES, PART 2, CHAPTER 4, SECTION 1					
11	MAGNETIC PARTICLE INSPECTION (MT)	ABS RULES, PART 2, CHAPTER 4, SECTION 1	NOT APPLICABLE				

* - IDENTIFICATION OF "SURVEYOR" IN ABS RULES SIGNIFIES SUPERVISOR OF SHIPBUILDING (SUPERVISOR) ACTION. THE SUPERVISOR MAY USE MIL-STD-1689 FOR GUIDANCE WHERE ADDITIONAL DIRECTION IS NECESSARY. SUCH GUIDANCE MAY BE USED TO: ESTABLISH NDT REQUIREMENTS, ESTABLISH WELDING/NDT PROCEDURE AND PERSONNEL QUALIFICATION REQUIREMENTS, OR TO DEFINE OTHER ATTRIBUTES LISTED IN THE "MATERIAL EVOLUTION" LINE OF TABLE 3.

** - THE SUPERVISOR MAY ALSO ALLOW THE SHIPBUILDER TO CHOOSE FROM THE FOLLOWING OPTIONS, PROVIDING:

- THE SHIPBUILDER'S UTILIZATION OF THE FOLLOWING OPTIONS SHALL RESULT IN NO ADDITIONAL COST TO THE GOVERNMENT.
- THE SHIPBUILDER SHALL UTILIZE THE FABRICATION DOCUMENT SELECTED FOR THE ENTIRE AVAILABILITY AND SHALL NOT SWITCH BACK AND FORTH BETWEEN DOCUMENTS.
- THE SHIPBUILDER SHALL NOTIFY THE SUPERVISOR OF WHICH FABRICATION DOCUMENT HAS BEEN SELECTED.

OPTIONS:

- A) MIL-STD-1689 MAY BE UTILIZED BY THE SHIPBUILDER AT THE SHIPBUILDER'S DISCRETION. THE REQUIREMENTS OF TABLE 2 ABOVE WOULD THEN APPLY.
- B) FOR DETERMINATION OF NDT METHOD(S) AND EXTENT OF NDT INSPECTION WHEN REPAIRS ARE TO BE ACCOMPLISHED, THE SHIPBUILDER MAY REQUEST TO UTILIZE THE SAME NDT REQUIREMENTS THAT WERE INVOKED IN CONSTRUCTION OF THE VESSEL. IN SUCH CASES, THE SHIPBUILDER SHALL BE RESPONSIBLE TO DETERMINE THE ORIGINAL NDT REQUIREMENTS AND SUBMIT EVIDENCE SUCH AS DRAWINGS OR SPECIFICATIONS WHICH DETAIL THE REQUIREMENTS TO THE SUPERVISOR ALONG WITH A REQUEST FOR APPROVAL.
- C) THE SHIPBUILDER MAY REQUEST TO UTILIZE PRE-ESTABLISHED WELDING AND/OR NDT PROCEDURES AND PERSONNEL QUALIFICATION PROGRAM(S) WHICH HAVE BEEN PREVIOUSLY UTILIZED IN THE PERFORMANCE OF SIMILAR ABS-ACCEPTED WORK. IN SUCH CASES, THE SHIPBUILDER SHALL SUBMIT EVIDENCE OF SUCH ABS ACCEPTABILITY TO THE SUPERVISOR ALONG WITH DESCRIPTIVE DETAILS AND SUPPORTING DOCUMENTATION FOR THE PROPOSED PROGRAM(S). SUCH DOCUMENTATION SHALL INCLUDE THE WELDING/NDT PROCEDURES AND METHODS OF WELDING/NDT PERSONNEL QUALIFICATION THAT WERE UTILIZED IN FORMER ABS-ACCEPTED WORK. THE SHIPBUILDER SHALL ALSO SUBMIT OTHER SUPPORTING EVIDENCE THAT MAY BE REQUESTED BY THE SUPERVISOR TO ESTABLISH THAT THE PROPOSED PROGRAMS HAVE BEEN PREVIOUSLY UTILIZED FOR SIMILAR ABS-ACCEPTED WORK.

*** - PARAGRAPH 3.8 APPLIES.

TABLE 4
WELDING, FABRICATION, AND INSPECTION OF METAL BOAT AND CRAFT HULLS

L I N E	COLUMN	A	B	C	D	E	F
	MATERIAL EVOLUTION	CARBON STEEL (MS)	(HY-80/100)	ALUMINUM ALLOY	CHROMIUM NICKEL STEEL (STAINLESS)	COPPER AND/OR NICKEL BASE ALLOYS	SILICONE BRONZE ALUMINUM BRONZE
1	WELDER QUALIFICATION	S9074-AQ-GIB-010/248, PARAGRAPH 5					
2	WELDING PROCEDURE	S9074-AQ-GIB-010/248, PARAGRAPH 4					
3	ELECTRODE	0900-060-4010, SECTION 10, TABLE 10-1	0900-060-4010, SECTION 10, TABLES 10-2 AND 10-3	0900-060-4010, SECTION 10, TABLE 10-7	0900-060-4010, SECTION 10, TABLE 10-4	0900-060-4010 SECTION 10, TABLES 10-5 AND 10-6	S9074-AR-GIB-010/278, TABLE II
4	JOINT DESIGN	MIL-STD-22 0900-060-4010, SECTION 11					
5	WELDING REQUIREMENTS	0900-060-4010, SECTION 13					
6	WORKMANSHIP REQUIREMENTS	0900-060-4010, SECTIONS 12 AND 14					
7	VISUAL	0900-060-4010, SECTIONS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 8					
8	RADIOGRAPHIC INSPECTION (RT)	0900-060-4010, SECTION 6, TABLE 6-1 AND SECTIONS 7 AND 8 T9074-AS-GIB-010/271, PARAGRAPH 3					
9	ULTRASONIC INSPECTION (UT)	T9074-AS-GIB-010/271, PARAGRAPH 6					
10	LIQUID PENETRANT INSPECTION (PT)	0900-060-4010, SECTIONS 6, 7, AND 8 T9074-AS-GIB-010/271, PARAGRAPH 5					
11	MAGNETIC PARTICLE INSPECTION (MT)	0900-060-4010 SECTION 6 T9074-AS-GIB-010/271, PARAGRAPH 4		NOT APPLICABLE			

ATTACHMENT A

COMBATANT SURFACE SHIPS

WARSHIPS

TABLE

Aircraft Carriers:

Aircraft Carrier	CV.....	2
Aircraft Carrier (nuclear propulsion)	CVN.....	2

Surface Combatants:

Guided Missile Cruiser	CG.....	2
Guided Missile Destroyer	DDG.....	2
Guided Missile Frigate	FFG.....	2
Littoral Combat Ship	LCS.....	2

Patrol Combatants:

Patrol Coastal	PC.....	4
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AMPHIBIOUS WARFARE SHIPS

Amphibious Command Ship	LCC.....	2
Amphibious Assault Ship (general purpose)	LHA.....	2
Amphibious Cargo Ship	LKA.....	2
Amphibious Transport Dock	LPD.....	2
Dock Landing Ship	LSD.....	2
Amphibious Assault Ship (general purpose)	LHD.....	2

AUXILIARY SHIPS

Oiler	AO.....	2
Fast Combat Support Ship	AOE.....	2

MINE WARFARE SHIPS

Mine Countermeasures Ship	MCM.....	2
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ATTACHMENT A
(Con't)

COMBATANT SURFACE CRAFT

AMPHIBIOUS WARFARE CRAFT TABLE

Landing Craft, Air Cushion	LCAC.....	4
Landing Craft, Mechanized	LCM.....	4
Landing Craft, Personnel, Large	LCPL.....	4
Landing Craft, Utility	LCU.....	2
Landing Craft, Vehicle, Personnel	LCVP.....	4
Light Seal Support Craft	LSSC.....	4
Amphibious Warping Tug	LWT.....	4
Medium Seal Support Craft	MSSC.....	4
Swimmer Delivery Vehicle	SDV.....	4
Side Loading Warping Tug	SLWT.....	4
Special Warfare Craft, Light	SWCL.....	4
Special Warfare Craft, Medium	SWCM.....	4

PATROL CRAFT

Mini-Armored Troop Carrier	ATC.....	4
Patrol Boat	PB.....	4
River Patrol Boat	PBR.....	4
Patrol Craft (fast)	PCF.....	4
Fast Patrol Craft	PTF.....	4

NON-COMBATANT SURFACE SHIPS

AUXILIARY SHIPS

Auxiliary Crane Ship	ACS.....	3
Missile Range Instrumentation Ship	AGM.....	3
Oceanographic Research Ship	AGOR.....	3
Ocean Surveillance Ship	AGOS.....	3
Surveying Ship	AGS.....	3
Hospital Ship	AH.....	3
Cargo Ship	AK.....	3
Auxiliary Cargo Barge/Lighter Ship	AKB.....	3
Auxiliary Cargo Float-On/Float-Off Ship	AKF.....	3
Transport Oiler	AOT.....	3
Barracks Craft	APL.....	3
Cable Repairing Ship	ARC.....	3
Salvage Ship	ARS.....	3
Submarine Tender	AS.....	3
Fleet Ocean Tug	ATF.....	3
Aviation Logistic Support Ship	AVB.....	3

ATTACHMENT A
(Con't)

NON-COMBATANT SURFACE CRAFT

SERVICE CRAFT

TABLE

Small Auxiliary Floating Dry Dock (non-self-propelled) ...AFDL...	3
Medium Auxiliary Floating Dry Dock (non-self-propelled) ..AFDM...	3
Medium Auxiliary Repair Dry Dock (non-self-propelled)ARDM...	3
Causeway Section, Powered	CSP... 3
Causeway Section (non-self-propelled)	CSNP... 3
Unclassified Miscellaneous	IX... 3
Open Lighter (non-self-propelled)	YC... 3
Aircraft Transportation Lighter (non-self-propelled)	YCV... 3
Cargo Semi-Submersible Barge	YCSS... 3
Floating Crane (non-self-propelled)	YD... 3
Diving Tender (non-self-propelled)	YDT... 3
Ferryboat or Launch (self-propelled)	YFB... 3
Covered Lighter (non-self-propelled)	YFN... 3
Large Covered Lighter (non-self-propelled)	YFNB... 3
Dry Dock Companion Craft (non-self-propelled)	YFND... 3
Lighter (special purpose) (non-self-propelled)	YFNX... 3
Floating Power Barge (non-self-propelled)	YFP... 3
Salvage Lift Craft, Light	YLC... 3
Gasoline Barge (non-self-propelled)	YOGN... 3
Fuel Oil Barge (non-self-propelled)	YON... 3
Oil Storage Barge (non-self-propelled)	YOS... 3
Patrol Craft (self-propelled)	YP... 4
Floating Workshop (non-self-propelled)	YR... 3
Repair and Berthing Barge (non-self-propelled)	YRB... 3
Repair, Berthing and Messing Barge (non-self-propelled) ..	YRBM... 3
Floating Dry Dock Workshop (hull) (non-self-propelled) ...	YRDH... 3
Floating Dry Dock Workshop (machine) (non-self-propelled)	YRDM... 3
Radiological Repair Barge (non-self-propelled)	YRR... 3
Seaplane Wrecking Derrick (self-propelled)	YSD... 3
Large Harbor Tug	YTB... 4
Small Harbor Tug	YTL... 4
Torpedo Trials Craft	YTT... 4
Water Barge (non-self-propelled)	YWN... 3

NOTES:

Letter prefixes to classification symbols may add identification:

- E -- Prototype ship or craft in an experimental or developmental status.
- T -- Assigned to MSC (Military Sealift Command)
- F -- Being Constructed for a foreign government.
- X -- Often added to existing classifications to indicate a new class whose characteristics have not been defined.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-13

DATE: 01 OCT 2017

CATEGORY: II

1. SCOPE:

1.1 Title: Meter; repair

2. REFERENCES:

- 2.1 Calibration Requirements List (CRL) for Shipboard Installed Instrumentation
- 2.2 NAVSEA OD 45845, Metrology Requirements List
- 2.3 S9300-A6-GYD-010, Electrical Workmanship Inspection Guide for Surface Ships and Submarines
- 2.4 ISO 17025, General Requirements for the Competence of Testing and Calibration Laboratories, First Edition
- 2.5 ANSI/NCSL Z540-3, Requirements for the Calibration of Measuring and Test Equipment
- 2.6 NAVSEA 04-04734, Naval and Marine Corps Calibration Laboratory Audit/Certification Manual
- 2.7 NAVAIR 17-35TR-8, Technical Requirements for Calibration Labels and Tags

3. REQUIREMENTS:

3.1 Prior to the installation of meters, verify instrument calibration requirements in applicable NAVSEA documentation. Permanently installed meters are addressed by 2.1; all other non-installed meters are addressed by 2.2.

3.1.1 If calibration is required, the meter shall have at least two-thirds of its calibration life remaining. If it does not, the meter shall be calibrated in accordance with 3.6.

3.1.2 If the meter is designated as No Calibration Required (NCR), perform a functional check to ensure proper functioning of the meter if it is not required for system acceptance testing. Meters identified as requiring calibration for system/acceptance testing/trials but designated as NCR in the ship's CRL, shall be calibrated in accordance with 3.6 and shall be labeled

with a special calibration label NAVSEA 4734/6, and an NCR label NAVSEA 4734/26. The special calibration label shall be annotated to read, "CALIBRATION PERFORMED TO SUPPORT TESTING". All such special calibration labels shall be removed and the meter shall have NCR labels affixed upon completion of testing/trials.

3.1.3 System or chain calibrations (designated as Level 2 in the ship's CRL) are not to be performed by commercial activities. For system calibration, contact the SUPERVISOR. Level 2 calibrated meters installed in systems shall be subject to system or chain calibrations at the next available period.

3.2 Disconnect and remove each meter and associated impeders, reactors, resistor boxes, and shunts.

3.2.1 Record and retain hook-up data and mounting hardware.

(V) "CONDITION OF WIRE LEADS"

3.2.1.1 Inspect lead wires and insulation; broken or partially broken lead wires shall be cut back to remove damaged/questionable portions of the wire and new terminal ends installed in accordance with 2.3.

3.2.2 Remove existing and install new conductor identification sleeving in place of conductor identification sleeving identified to be illegible. Install new sleeving where missing. New conductor identification sleeving shall conform to SAE-AMS-DTL-23053, Class One, white, marked with indelible ink.

3.3 Disassemble and clean equipment to remove loose paint and foreign matter.

3.4 Repair each meter and associated equipment to manufacturer's specifications.

3.4.1 Remove existing and install new components in place of those identified to be defective. Install new components where missing.

3.4.2 Free-up and adjust moving parts.

3.4.3 Restore unit cases to original finish.

3.5 Assemble equipment. Install new seals and gaskets conforming to manufacturer's specifications.

3.6 Calibrate and adjust each meter, including associated accessories, to manufacturer's specifications, using appropriate calibration procedures and test equipment in accordance with 2.1 for permanently installed meters, or 2.2 for portable/non-installed meters.

3.6.1 Calibration laboratories shall be accredited to either 2.4 or 2.5 by a Commercial Accreditation Activity, or certified by a Navy Certification Activity to 2.6, and the scope of accreditation must cover the appropriate measurement parameters and ranges of the calibrations performed. Calibration must meet a minimum Test Accuracy Ratio (TAR) of 4:1, or a Test Uncertainty Ratio (TUR) equal to or greater than 4:1, or a Probability of False Accept (PFA) not to exceed 2 percent.

3.6.2 In the absence of manufacturer's specifications, tolerances shall be in accordance with Section 1 of 2.2.

3.6.3 Affix a calibration label to the face of each meter, denoting the name and location of the calibration facility, the NAVSEA Lab Code if assigned, the date of calibration, and date of next calibration. Department of the Navy calibration activities and Test, Measurement, and Diagnostic Equipment (TMDE) custodians shall use calibration labels and tags in accordance with 2.7.

3.6.4 The calibration interval assigned for shipboard installed instrumentation shall be in accordance with 2.1. All other meters shall have a calibration interval assigned in accordance with 2.2.

3.6.5 Submit one legible copy, in hard copy and approved transferrable media (in Excel format), of a calibration events data file in accordance with Attachment A for each contractor and subcontractor-performed calibration event to the ship's Field Calibration Activity (FCA), Engineering/Maintenance Officer and AIMD Officer (if assigned) via the SUPERVISOR on a bi-weekly basis. The cognizant shipboard representative shall enter the calibration data into the Navy's calibration recall system.

3.7 Install and connect each meter, including associated accessories, using hook-up data and mounting hardware retained in 3.2.1.

(V) "VERIFY CORRECT INDICATION"

3.8 Verify correct indication of each meter during operational test of equipment.

4. NOTES:

4.1 The SUPERVISOR will supply the contractor with a copy of the CRL provided by the Ship's Chief Engineer.

4.2 The SUPERVISOR will provide a copy of the calibration data to the Ship's Force Calibration Coordinator for the purpose of updating the ship's RECALL list.

4.3 Contact NAVSEA 04RM3 for information on commercial accreditation in accordance with 2.4 and 2.5 by NAVSEA approved commercial Accrediting Bodies (AB).

4.4 Contact one of the following Navy Certification Activities for certification requirements in accordance with 2.6:

Mid-Atlantic Regional Maintenance Center
Laboratory Certification Branch
(Code 212)
Phone: (757) **400-0735**
FAX: (757) **400-3160**

Southwest Regional Maintenance Center
Laboratory Certification Branch
(Code 240C)
Phone: (619) 556-6699 / (619) 556-1346
FAX: (619) 556-4877

ATTACHMENT A

- Entries in the calibration events file shall not be abbreviated.
- The event data for NOFORN/Reactor/Steam plant instruments shall be handled in accordance with the applicable SEA 08 directives.
- For existing, permanently installed instruments, the calibration events file data set shall include the nomenclature, CRL reference number, condition received (i.e., In Tolerance (IT) or Out of Tolerance (OOT)), date calibrated, date due, procedure used, calibration standard used, servicing lab code and service label applied (i.e., calibrated, special calibration, rejected, etc.) in accordance with 2.7.
- For existing, non-installed instruments, the calibration events file data set shall include the nomenclature, National Stock Number, Sub-Category (SCAT) Code, instrument serial number, manufacturer's Commercial and government Entity (CAGE), procedure used, calibration standard used, sub-custodian, work center. Manufacture's model number, condition received, Metrology Requirements List (METRL) cycle, servicing laboratory code (if applicable), date serviced, due date, and servicing label attached.
- For newly added instruments, the minimum data set includes manufacturer, model, serial number, nomenclature, manufacturer's CAGE, range, procedure used, calibration standard used, date calibrated, date due, servicing lab code, service label attached, location, part-of (System), function within the system (if permanently installed), National Stock Number and SCAT Code.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-14
DATE: 01 OCT 2017
CATEGORY: II

1. SCOPE:

1.1 Title: Gage, Switch, and Thermometer; repair

2. REFERENCES:

2.1 Calibration Requirements List (CRL) for Shipboard Installed Instrumentation

2.2 NAVSEA OD 45845, Metrology Requirements List

2.3 ISO 17025, General Requirements for the Competence of Testing and Calibration Laboratories, First Edition

2.4 ANSI/NCSL Z540-3, Requirements for the Calibration of Measuring and Test Equipment

2.5 NAVSEA 04-04734, Naval and Marine Corps Calibration Laboratory Audit/Certification Manual

2.6 NAVAIR 17-35TR-8, Technical Requirements for Calibration Labels and Tags

3. REQUIREMENTS:

3.1 Prior to the installation of gages, switches, and thermometers, verify instrument calibration requirements in applicable NAVSEA documentation to determine if the instrument requires calibration. Permanently installed gages, switches, and thermometers are addressed by 2.1; all other non-installed instruments are addressed by 2.2.

3.1.1 If required to be calibrated, the instrument shall have at least two-thirds of its calibration life remaining. If it does not, calibrate the instrument in accordance with 3.7.

3.1.2 If the instrument is designated as No Calibration Required (NCR), perform a functional check to ensure proper functioning of the instrument if it is not required for system acceptance testing. Instruments identified as requiring calibration for system/acceptance testing/trials but designated as NCR in the ship's CRL, shall be calibrated in accordance with manufacturer's specifications and shall be labeled with a special calibration label NAVSEA 4734/6, and an NCR label NAVSEA 4734/26. The special calibration label shall be annotated to read, "CALIBRATION PERFORMED TO

SUPPORT TESTING. THIS LABEL MUST BE REMOVED UPON COMPLETION OF TESTING/TRIALS TO REFLECT THE CRL CAL-N (NCR) DESIGNATION OF THE INSTRUMENT". All such special calibration labels shall be removed and the instrument shall have NCR labels affixed upon completion of testing/trials.

3.1.3 System or chain calibrations (designated as Level 2 in the ship's CRL) are not to be performed by commercial activities. For system calibration, contact the SUPERVISOR. (See 4.6)

3.2 Disconnect and remove each gage, switch, and thermometer.

3.2.1 Remove sealed gages as a complete unit.

3.3 Clear gage lines from instrument side of root connection of obstructions by blowing clean, dry air through the lines.

3.4 Disassemble and clean equipment to remove loose paint and foreign matter.

3.4.1 Do not disassemble sealed gage unit.

3.5 Repair the gages, switches, and thermometers to manufacturer's specifications.

3.5.1 Remove existing and install new components in place of those identified to be defective. Install new components where missing.

3.5.2 Free-up and adjust moving parts.

3.5.3 Restore unit cases to original finish.

3.6 Assemble equipment.

3.7 Calibrate and adjust each gage, switch, and thermometer, including associated accessories, to the manufacturer's specifications, using appropriate calibration procedures and test equipment in accordance with 2.1 for permanently installed gages, switches, and thermometers, or 2.2 for portable/non-installed gages, switches, and thermometers.

3.7.1 Calibration laboratories shall be accredited to either 2.3 or 2.4 by a Commercial Accreditation Activity, or certified by a Navy Certification Activity to 2.5, and the scope of accreditation must cover the appropriate measurement parameters and ranges of the calibrations performed. Calibration must meet a minimum Test Accuracy Ratio (TAR) of 4:1, or a Test Uncertainty Ratio (TUR) equal to or greater than 4:1, or a Probability of False Accept (PFA) not to exceed 2 percent.

3.7.2 In the absence of manufacturer's specifications, tolerances shall be in accordance with Section 1 of 2.2.

3.7.3 Affix a calibration label to the face of each gage, switch, and thermometer, denoting the name and location of the calibration facility, the NAVSEA Lab Code if assigned, the date of calibration, and date of next calibration. Department of the Navy calibration activities and Test, Measurement, and Diagnostic Equipment (TMDE) custodians shall use calibration labels and tags in accordance with 2.6.

3.7.4 The calibration interval assigned for shipboard installed instrumentation shall be in accordance with 2.1. All other instrumentation shall have a calibration interval assigned in accordance with 2.2.

3.7.5 Submit one legible copy, in hard copy and approved transferrable media (in Excel format), of a calibration events data file in accordance with Attachment A for each contractor and subcontractor-performed calibration event to the ship's Field Calibration Activity (FCA), Engineering/Maintenance Officer and AIMD Officer (if assigned) via the SUPERVISOR on a bi-weekly basis. The cognizant shipboard representative shall enter the calibration data into the Navy's calibration recall system.

3.8 Install and connect each unit. Install new seals, gaskets, and fasteners.

(V) "VERIFY CORRECT INDICATION/OPERATION"

3.9 Verify correct indication and operation of each gage, switch and thermometer during operational test of equipment.

4. NOTES:

4.1 The SUPERVISOR will supply the contractor with a copy of the CRL provided by the Ship's Chief Engineer.

4.2 The SUPERVISOR will provide a copy of the calibration data to the Ship's Force Calibration Coordinator for the purpose of updating the ship's RECALL list.

4.3 Contact NAVSEA 04RM3 for information on commercial accreditation in accordance with 2.3 and 2.4 by NAVSEA approved commercial Accrediting Bodies (AB).

4.4 Contact one of the following Navy Certification Activities for certification requirements in accordance with 2.5:

Mid-Atlantic Regional Maintenance
Center
Laboratory Certification Branch
(Code 212)
Phone: (757) **400-0735**
FAX: (757) **400-3160**

Southwest Regional Maintenance Center
Laboratory Certification Branch
(Code 240C)
Phone: (619) 556-6699 / (619) 556-1346
FAX: (619) 556-4877

4.5 This item does not apply to Oxygen gages.

4.6 Point of contact for Level 2 system or chain calibrations is NAVSEA
04RM.

ATTACHMENT A

- Entries in the calibration events file shall not be abbreviated.
- The event data for NOFORN/Reactor/steam plant instruments will be handled in accordance with the applicable SEA 08 directives.
- For existing, permanently installed instruments, the calibration events file data set shall include the nomenclature, CRL reference number, condition received (i.e., In Tolerance (IT) or Out of Tolerance (OOT)), date calibrated, date due, procedure used, calibration standard used, servicing lab code and service label applied (i.e., calibrated, special calibration, rejected, etc.) in accordance with 2.6.
- For existing, non-installed instruments, the calibration events file data set shall include the nomenclature, National Stock Number, Sub-category (SCAT) Code, instrument serial number, manufacturer's Commercial and Government Entity (CAGE), procedure used, calibration standard used, sub-custodian, work center, manufacture's model number, condition received, Metrology Requirements List (METRL) cycle, servicing laboratory code (if applicable), date serviced, due date, and servicing label attached.
- For newly added instruments, the minimum data set includes manufacturer, model, serial number, nomenclature, manufacturer's CAGE, range, red hand settings (if applicable), procedure used, calibration standard used, date calibrated, date due, servicing lab code, service label attached, location, part-of (System), function within the system (if permanently installed), National Stock Number and SCAT Code.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-15
DATE: 18 NOV 2016
CATEGORY: II

1. SCOPE:

1.1 Title: Rotating Machinery; balance

2. REFERENCES:

2.1 Standard Items

2.2 S9086-G9-STM-010/CH-231, Propulsion and SSTG Steam Turbines

2.3 MIL-STD-167, Mechanical Vibration of Shipboard Equipment (Type I-Environmental and Type II-Internally Excited)

2.4 S9245-AR-TSM-010/PROP, Marine Propeller Inspection, Repair and Certification

3. REQUIREMENTS:

3.1 Measure and record the maximum eccentricity of the rotor shaft and installed components relative to the points of support using dial indicators.

3.2 Balance rotating machinery assemblies or components in accordance with the following requirements and procedures:

3.2.1 Balance multistage steam turbine rotors in accordance with 2.2.

3.2.1.1 Contact the SUPERVISOR prior to directing balance work for multistage steam turbine rotors.

3.2.1.2 Multistage steam turbine rotors shall only be balanced at high speed (operating speed), in accordance with Section 231-8.13 of 2.2. Balance work must be performed by the OEM, OEM certified equivalent, or NAVSEA approved contractor who has a proven capability to high speed balance rotors in accordance with 2.2, 2.3 and the OEM balance specification for the rotor.

3.2.1.3 No attempt shall be made to straighten a turbine rotor assembly.

3.2.1.4 Steam turbine rotors shall be balanced with the overspeed trip governor installed.

3.2.1.5 Post-repair testing (sea trials for propulsion units) for multistage steam turbines where turbine repairs have been accomplished, shall include a bearing cap vibration survey.

3.2.1.6 Submit one legible copy, in hard copy or approved transferrable media, of an equipment overhaul report to the SUPERVISOR. Report shall include a balance report in accordance with Section 231-8.13 of 2.2 and a vibration survey report in accordance with 009-104 of 2.1. Unsatisfactory vibration balance levels recorded in the post repair testing, as determined by the SUPERVISOR, shall be corrected by in-place balancing in accordance with Section 231-8.13 of 2.2.

3.2.2 Except for propellers, if the design operating speed of the component to be balanced is less than 150 revolutions per minute (RPM), the rotor including shaft shall be balanced by symmetrically supporting the rotor on 2 knife edges and applying a correction to attain a gravity balance.

3.2.3 Except for propellers, if the design operating speed of the component to be balanced is equal to or greater than 150 RPM, the rotor including shaft shall be balanced with equipment which requires rotation of the work piece.

3.2.4 Propellers shall be balanced in accordance with 2.4.

3.2.5 Types of correction:

TYPES OF CORRECTION	N	1/	ROTOR CHARACTERISTIC	1/
Single-plane	0 - 1,000		L/D	Less than or Equal to 0.5
	0 - 150		L/D	Greater than 0.5
2-plane	Greater than 1,000		L/D	Less than or Equal to 0.5
	Greater than 150		L/D	Greater than 0.5

TYPES OF CORRECTION	N	1/	ROTOR CHARACTERISTIC	1/
Multi-plane			Flexible:	Unable to correct by 2-plane balancing

1/

- L = Length of rotor mass, exclusive of shaft
- D = Diameter of rotor mass, exclusive of shaft
- N = Maximum operating RPM

3.2.6 Allowable unbalance: The values determined by Paragraph 5.2.2.2 of 2.3 are permitted in each plane of correction, except for multistage steam turbine rotors which shall be in accordance with Section 231-8.13 of 2.2.

3.2.7 When the computation for converting displacement measurements to ounce-inches of force unbalance is an approximation, verification shall be made by adding a trial weight to the rotor, equal and opposite to the calculated ounce-inches of force. If putty is used as a trial weight, it shall be removed, weighed and a permanent compensating weight shall be installed in its place.

3.3 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.1 and 3.2 to the SUPERVISOR. The report shall include the following information:

- 3.3.1 Ship's name and hull number
- 3.3.2 Contractor and subcontractor
- 3.3.3 Job Order and Work Item number
- 3.3.4 Unit and component identification
- 3.3.5 Manufacturer and model number of balance machine
- 3.3.6 Date of last calibration, by whom it was calibrated, and when the next calibration is due for the balancing machine
- 3.3.7 Maximum total indicated runout of rotor or balancing arbor
- 3.3.8 Weight of rotor assembly in pounds
- 3.3.9 Design operating RPM of rotor
- 3.3.10 Computation of allowable unbalance in ounce-inches
- 3.3.11 Measured unbalance, prior to and after balancing, in ounce-inches
- 3.3.12 Computations or procedures for converting displacement measurements to ounce-inches of unbalance force, when the machine used to balance components indicates displacement measurements in lieu of direct unbalance forces.

4. NOTES:

4.1 For multistage steam turbine rotors only:

4.1.1 Prior to performing machine or in-place balance, SUPERVISOR shall contact NAVSEA 05Z22.

4.1.2 SUPERVISOR shall forward as-found/final balance result and shipboard vibration survey to NAVSEA 05Z22 and NSWCCD-SSES Code 922.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-18
DATE: 07 MAR 2017
CATEGORY: I

1. SCOPE:

1.1 Title: Magnetic Material; control

2. REFERENCES:

- 2.1 801-5844249, Location of Magnetic Material MCM-1
- 2.2 800-5977033, Location of Magnetic Material MCM-2
- 2.3 801-6134737, Location of Magnetic Material MCM-3
- 2.4 800-6135526, Location of Magnetic Material MCM-4
- 2.5 801-6356761, Location of Magnetic Material MCM-6
- 2.6 800-6787960, Location of Magnetic Material MCM-7
- 2.7 801-6356761, Location of Magnetic Material MCM-8
- 2.8 801-6645302, Location of Magnetic Material MCM-9 thru 14
- 2.9 524-7048237, IF Engine Emergency Cutout Valve
- 2.10 S9086-CJ-STM-010/CH-075, Fasteners
- 2.11 508-6644926, Insulation and Lagging Schedule, Pipe and Machinery

3. REQUIREMENTS:

3.1 Provide and implement a procedure for maintaining a maximum permeability factor of 2.0 on board mine warfare ships and craft for material and equipment installed, repaired, or relocated during the accomplishment of work required by the Job Order. The procedure shall have been reviewed and accepted by the SUPERVISOR prior to the implementation.

3.1.1 The procedure requires a one-time submittal/acceptance unless Standard Items and/or references change or are updated.

3.1.2 Describe a receipt inspection system to verify Government, contractor, and subcontractor furnished material is in compliance with the permeability limits.

3.1.3 Describe controls used in fabrication work to ensure compliance with the permeability limits after fabrication.

3.1.4 Describe the method used to determine magnetic content of materials removed from or brought on board the ship or craft including monitoring station locations.

3.1.5 Identify type of instrumentation, conforming to Method 3 of ASTM A 342, used to measure the magnetic permeability of material.

3.1.6 Describe the record and reporting system utilized to list material required, but determined to have exceeded the permeability factor 2.0 after fabrication and the maximum dimension of the part exceeds 2 inches or the maximum dimension of all parts having a similar function in a 30 foot section of the ship exceeds 60 inches. This list shall include material and equipment removed, repaired, installed, or relocated. The record and reporting system shall contain description, magnetic dimensions, approximate weight, location installed on board ship or craft, and a record verifying that the item is contained in the current Location of Magnetic Material electronic database, a new database entry made for previously NAVSEA-approved items missing an entry or both a new entry made and waiver granted for new items or substitutions. Use 2.1 thru 2.8 as applicable, and the electronic database to determine if the 60 inches in 30 foot rule above is met.

3.2 Maintain or reduce permeability of items at or below 2.0, including proposing alternative materials for existing designs to the SUPERVISOR. Where alternatives are not possible or practical, submit one legible copy, in approved transferrable media, of a report in the format of Attachment A, to document repaired or replaced items in excess of the magnetic material control limit of 3.1.6. Ensure the part number, permeability range, and magnitude and location match component material and design. Equipment which is magnetic and not currently authorized by applicable NAVSEA drawing or technical manual (i.e., substitution or new item) additionally requires evaluation and acceptance by the SUPERVISOR prior to installation.

3.3 Verify the following attributes on all reinstalled magnetic material, whether in accordance with current design or not, to minimize magnetic signature.

3.3.1 Vendor or stock number matches or crosses to NAVSEA document, if per current design.

3.3.2 Magnetic field location is limited to areas appropriate to the component (e.g., solenoids).

3.3.3 Magnetic permeability is appropriate for the specified material. Measured permeability will be affected by material, geometry, location temperature and degree of magnetization.

3.3.4 400 Series Monel and 304 CRES can be weakly magnetized by machining or welding; permeability must be less than 5 in accordance with Note 3.07 of 2.9.

3.3.5 Material Upgrades: Technical documentation may be used in lieu of surveys for identification for items that could become magnetic even if not when installed.

3.3.5.1 Upgrade low energy, non-safety critical system fasteners which are magnetic or potentially so, such as carbon steel, 304 CRES and 400 Series Monel to 500 Series Monel or 316L CRES as appropriate for the working environment. Replacement fasteners must be of identical thread size, type, shape and fit.

3.3.5.2 Submit one legible copy, in approved transferrable media, of a list of all proposed replacement fasteners with costs and sizes to the SUPERVISOR for approval prior to procurement.

3.3.5.3 Upgrade mechanical wire which is magnetic or potentially so, such as carbon steel wire used for lagging pad installation in accordance with 2.10, to 500 Series Monel or 316L CRES lockwire in accordance with Paragraph 5.5.1 of 2.11. Replacement wire must be of equivalent size.

3.3.5.4 Select 500 Series Monel or 316L CRES as appropriate for the working environment for items with material not specified in NAVSEA documentation, such as the lagging pad hooks and washers of 2.11.

3.3.5.5 Upgrade non-critical load bearing hardware which is magnetic or potentially magnetic, such as carbon steel, 304 CRES and 400 Series Monel hinges, hasps, latches, chair swivels, corner reinforcements, etc., to 500 Series Monel or 316L CRES as appropriate for the working environment.

3.3.5.46 Upgrade electrical fittings which are magnetic or potentially magnetic, such as carbon steel, 304 CRES and 400 Series Monel stuffing tube packing nuts, cover plates, knockout plugs, etc., to 500 Series Monel, 316L CRES or Underwriter's Laboratory fire rated nylon or plastic as appropriate for the working environment.

3.3.6 Submit one legible copy, in approved transferrable media, of a report furnishing documentation provided by supplier, as required by 3.1.6.

4. NOTES:

4.1 The magnetic field of mine warfare ships and craft consists of the superposition of the magnetic field from 4 basic sources: ferrous field,

eddy current field, ship service stray field, and minesweep generator stray field. The stray field sources are the electric currents in cables and wiring associated with the operation of the equipment of the ship or craft. The ferrous field and eddy current field sources are as follows:

4.1.1 Ferrous Field Source: The ferrous field sources are the items on or part of the ship or craft which use a material in their construction that exhibits a relative magnetic permeability different than 1.0, the relative magnetic permeability of air. Each ferrous field source acts like a bar magnet whose magnetic field depends upon the material's relative magnetic permeability, volume (not mass), and shape of the earth's magnetic field. At a point or location external to a ferrous field source, the magnetic field of this source is essentially the same whether the source is hollow (such as a block or pedestal). A material whose relative magnetic permeability is 2.0 or less is arbitrarily defined to be nonmagnetic when used in conjunction with mine warfare ships and craft; otherwise, the material is said to be magnetic. Whether the material of an item is classified magnetic or nonmagnetic, according to the above arbitrary definition, a change in relative magnetic permeability of the material will, in general, result in a change in the magnetic field associated with this item.

4.1.2 Eddy Current Field Source: The eddy current field sources are the items on or part of the ship or craft which use a material in their construction that exhibits an electrical conductivity. A material whose electrical conductivity is less than 10.0 percent of the electrical conductivity of copper (5.8×10^5 /cm at 20 degrees Centigrade) is arbitrarily defined to be nonconductive when used in conjunction with mine warfare ships and craft; otherwise, the material is said to be electrically conductive. Each eddy current field source acts like a generator when it oscillates in the earth's magnetic field due to the rolling and pitching of the ship or craft. The current in this source, resulting from the generator action, has associated with it a magnetic field - an eddy current field. The magnitude of this field is dependent upon the conductivity of the material, the size of the electrical path in the material, the cross-sectional area of the electrical path, and the orientation of the source with respect to the earth's magnetic field due to the rolling and pitching of the ship or craft.

4.1.3 If an item is both highly magnetic and electrically conductive, such as mild steel or steel, the ferrous field will mask out the eddy current field. If an electrically conductive item is located inside a highly magnetic enclosure, such as mild steel or steel, the enclosure will mask the magnetic effects of its contents and will appear as if it were a solid magnetic block.

4.2 The SUPERVISOR will provide written direction for accomplishment of one of the following prior to reinstallation of temporarily removed existing or new material/equipment as a result of the deviation request.

4.2.1 Authorization for deviation request.

4.2.2 Identification and authorization of an acceptable Contractor
Furnished Material (CFM) substitute material or equipment.

4.2.3 Receipt of an acceptable Government Furnished Material (GFM)
substitute material or equipment.

4.2.4 Technical direction and information for manufacturing of
acceptable material or equipment.

4.2.5 Other direction as determined acceptable by the ship class
planning yard or higher authority.

ATTACHMENT

A

Permeability Range	System/ESWBS	Compartment #	Frame #	Port or Starboard	Location Description (distance from reference point)	Material	Size of Magnetic Portion	Authorizing Document(s) (tech manual, DWG)	per plan (YES/NO)	Data Recorder Name	Data Recorder Company	Shipbuilding Specialist	Work Item #	IDR #	PN	NSN	Comments	

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-23

DATE: **01 OCT 2017**

CATEGORY: I

1. SCOPE:

1.1 Title: Interference; remove and install

2. REFERENCES:

2.1 Standard Items

2.2 0948-LP-045-7010, Material Control Standard

2.3 0924-LP-062-0010, Submarine Safety (SUBSAFE) Requirements Manual

2.4 S9086-KC-STM-010/CH-300, Electric Plant-General

2.5 NAVSEA OD32382, Grounding and Bonding Equipment Enclosures, Chassis and Cases, Design and Installation

2.6 S9086-RK-STM-010/CH-505, Shipboard Piping Systems

3. REQUIREMENTS:

3.1 Do not remove components from the following systems as interferences, except when the scope of work requires repairs to components of these systems or when specified in the Work Item:

3.1.1 Main steam and catapult systems

3.1.2 Gaseous oxygen piping systems which operate at pressures higher than 100 PSIG, liquid oxygen piping from oxygen plant to the liquid oxygen charging carts, and the overboard drain piping from the liquid oxygen storage plant and spillage drain

3.1.3 Degaussing systems

3.1.4 Electric cables which cannot be removed without cutting

3.1.5 Hydraulic systems

3.1.6 High pressure air systems. High pressure air systems are those systems designed for pressures of 1,000 PSIG or greater.

3.1.7 **Support systems (e.g., SCBA Charging and Swimmer and Diver support and protection systems, this list is not all inclusive), which supply breathable air.**

3.1.8 Cryogenic systems

3.1.9 Spring hangers

3.1.10 Ship's strength members involving structural integrity

3.1.11 Halon systems

3.1.12 LEVEL I systems in accordance with 2.2

3.1.13 Sonar dome pressurization system

3.1.14 Passive countermeasure materials

3.1.15 Ballistic plating

3.1.16 Waveguides

3.1.17 Collective Protection System (CPS)

3.1.18 MRG Lube oil piping

3.1.19 For submarines and SUBSAFE capable ships only, in addition to the systems identified above, SUBSAFE components/systems in accordance with 2.3

3.1.20 For nuclear-powered ships only, in addition to the systems identified above, steam plant systems that carry steam, water, or gas and which introduce these fluids either directly or indirectly into the steam generators, including:

3.1.20.1 Main Steam

3.1.20.2 Steam Generating

3.1.20.3 Feed

3.1.20.4 Condensate

3.1.20.5 Auxiliary Steam/Reduced Pressure Steam

3.1.20.6 Auxiliary Exhaust Steam

3.1.20.7 Gland Seal and Exhaust Steam

3.1.20.8 Bleed Steam

3.1.20.9 High Pressure Drain

3.1.20.10 Reserve Feed (except for reserve feed day tanks in surface ships)

3.1.20.11 Fresh Water Drain/Low Pressure Drain/Turbine Drain Catapult Steam Drain (up to catapult fill/charging valves and associated high-pressure drain system)

3.1.20.12 Catapult Trough Heating and Drain Systems

3.1.20.13 Main Steam Supply to reboiler and reboiler drains to the Deaerating Feed Tank (DFT)

3.1.20.14 Heating steam and condensate return piping to and from distilling units and lithium bromide air conditioners

3.1.20.15 Those portions of the propulsion plant makeup water distribution system downstream of the distiller output or reverse osmosis outlet demineralizer used to supply water directly or indirectly to the steam plant

3.1.20.16 Nitrogen supply system used for sparging of aircraft carrier steam generators

3.1.20.17 Reactor Plant Fresh Water System (RPFW), Propulsion Plant Fresh Water System (PPFW), and Steam Generator Cooldown

3.1.20.18 Support systems (such as nitrogen systems, hydrostatic test rigs, and temporary steam generator makeup systems), which add water, steam, or gas directly or indirectly into steam generators

3.1.20.19 Any other systems or components governed by NAVSEA Instruction C 9210.4

3.2 Submit one legible copy, in approved transferrable media, of a report of components of the systems listed in 3.1 that must be removed as interferences and the work is not required by the Work Item, to the SUPERVISOR. The report shall list the following information:

3.2.1 Identification of the item to be removed or disturbed:

3.2.1.1 Location/Space

3.2.1.2 Item description (e.g., piping size, valve number, cable identification, gage number, etc)

3.2.1.3 System

3.2.2 Necessity for the action

3.2.3 Protective measures which will be taken to protect equipment from damage or contamination

3.2.4 Alignment procedures and details for tests that will be accomplished to verify acceptability after reinstallation

3.3 The SUPERVISOR will review and respond to the report required by 3.2 and if removal of the components is approved, an appropriate change to the Work Item will be prepared.

3.4 Visually examine interferences prior to and during removal for previous damage and deterioration.

3.4.1 Submit one legible copy, in approved transferrable media, of a report listing previously damaged and deteriorated interferences to the SUPERVISOR within 5 days after removal.

3.5 Material containing asbestos that requires removal as an interference shall not be reinstalled.

3.5.1 Submit one legible copy, in approved transferrable media, of a report listing location and system identification of asbestos removed and non-asbestos installed which has not been identified elsewhere in the Job Order, to the SUPERVISOR.

3.6 Remove interferences.

3.6.1 Protect interferences from damage or loss and prevent contamination of removed components and remaining parts of the system.

3.6.2 Submit one legible copy, in approved transferrable media, of a report listing interferences removed to the SUPERVISOR within 5 days of removal. The report shall identify and include the following information for each interference that was disturbed:

3.6.2.1 Location/Space

3.6.2.2 Item description (e.g., piping size, valve number, cable identification, gage number, etc)

3.6.2.3 System

3.6.3 When energized components (e.g., lights, receptacles, sensors) greater than 30 volts are removed for interference and a path to ground will no longer exist, a temporary ground shall be installed before the component is disconnected from its permanent ground connection. Verify ground connection exists and that it is securely fastened with metal-to-metal contact in accordance with 2.4.

3.6.3.1 Components will be adequately secured to a permanent structure so that there is no tension/stress on cable/energy source.

3.7 Install interferences removed in 3.6.

3.7.1 Install interferences that were neither reported as previously damaged or deteriorated, nor rendered unsuitable for reinstallation during removal.

3.7.2 Install interferences reported in 3.4.1 in the as-found condition or after authorized repairs have been accomplished.

3.7.3 Install new material in place of material rendered unsuitable for reinstallation during removal or storage.

3.7.3.1 New material shall be equal in composition, strength, design, type, and size as existed prior to removal of the interferences.

3.7.3.2 Ground and bond AEGIS combat systems equipment and related electrical equipment enclosures, chassis, and cases in accordance with 2.5.

3.7.4 Accomplish the requirements of 2.6 for system cleanliness.

3.7.5 Accomplish the requirements of 009-12 of 2.1.

3.7.6 Accomplish the requirements of 009-71 of 2.1 for disturbed joints.

3.7.6.1 Test pressure and test medium shall be in accordance with 2.6.

3.7.7 Accomplish the requirements of 009-37 of 2.1.

3.7.8 Accomplish the requirements of 009-11 of 2.1.

3.7.8.1 Damaged reusable covers shall not be reinstalled.

3.7.8.2 Install new insulation, lagging, and reusable covers where missing.

3.7.9 Install new silicone coated aluminized cloth spray shields on mechanical joints and components in accordance with ASTM F 1138 in place of those removed as interference.

3.7.10 Install new gaskets and assemble in accordance with Section 5 of 2.6 when reinstalling interferences.

3.7.11 Accomplish the requirements of 009-32 of 2.1 for new and disturbed surfaces.

3.7.12 Restore compartment, equipment, and systems labeling.

3.7.13 Accomplish the requirements of 009-26 of 2.1 for deck covering removed or damaged as interference.

3.7.13.1 New material shall be equal to existing in color and composition.

(V) (G) "STRENGTH, TIGHTNESS, AND OPERATIONAL TESTS"

3.8 Align and accomplish appropriate strength, tightness, system cleanliness, and operational tests and ensure that the reinstalled interferences perform their normal functions within the system.

3.8.1 Tests shall be incorporated into the contractor's Test and Inspection Plan.

4. NOTES:

4.1 An interference is any part of a ship, whether installed or portable, that must be moved or disturbed in the accomplishment of work specified in the Job Order.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-24
DATE:	01 OCT 2017
CATEGORY:	I

1. SCOPE:

1.1 Title: Authorization, Control, Isolation, Blanking, Tagging, and Cleanliness; accomplish

2. REFERENCES:

- 2.1 Standard Items
- 2.2 Joint Fleet Maintenance Manual (JFMM)
- 2.3 9002-AK-CCM-010/6010, Industrial Ship Safety Manual (ISSM) for Submarines
- 2.4 S0400-AD-URM-010/TUM, Tag-Out User's Manual
- 2.5 29 CFR Part 1915, Occupational Safety and Health Standards for Shipyard Employment
- 2.6 S9AAO-AB-GOS-010, General Specifications for Overhaul of Surface Ships (GSO)
- 2.7 0902-018-2010, General Specifications for Deep Diving SSBN/SSN Submarines
- 2.8 S9086-RK-STM-010/CH-505, Shipboard Piping Systems
- 2.9 845-4612172, Hydrostatic Test Blanks
- 2.10 MIL-STD-777, Schedule of Piping, Valves, Fittings, and Associated Piping Components for Naval Surface Ships
- 2.11 802-5959353, MIL-STD-777D Modified for DDG-51 Class, Schedule of Piping, Valves, Fittings, and Associated Piping Components
- 2.12 S9074-AR-GIB-010/278, Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

3. REQUIREMENTS:

3.1 Accomplish the Work Authorization requirements of Volume IV, Chapter 10 of 2.2 for all non-nuclear work performed shipboard during Chief of

Naval Operations (CNO) Availabilities, Continuous Maintenance Availabilities (CMAV), Window of Opportunity (WOO), or Emergent Maintenance (EM) Availabilities. Ensure all work on ship's systems and components is properly authorized and controlled in order to ensure rigorous personnel and ship safety standards are met. Include work such as planned maintenance, troubleshooting, corrective maintenance, and modernization and assessments.

3.1.1 Ensure all outside activity work (non-Ship's Force) on ship's systems and components, regardless of who performs the work, is formally authorized through a Work Authorization Form (WAF) completed and processed in accordance with Volume IV, Chapter 10 (including Appendix A) of 2.2. A copy of the authorized WAF shall be maintained at the worksite during productive work.

3.1.2 For submarines only, accomplish the Work Authorization requirements of Volume IV, Chapter 10 of 2.2 for safety of ship maintenance item identification, listing, and control, or the requirements of 2.3 for Ship's Plan of the Day (SPOD).

3.1.3 Maintain the WAF in the Work Authorization Log from the time of original authorization, through production work and testing, and until the WAF is formally closed out. When notified by the cognizant Repair Activity's (RA) designated representative that the work is complete and ready for tags to be cleared, the RA's designated representative will sign the WAF work completion block, then obtain ship's concurrence to clear the associated Tagout Record Sheet line item(s). Additional sign-offs required by the WAF for testing and closure shall be made as work progresses in accordance with Volume IV, Chapter 10 of 2.2.

3.1.4 When a WAF Coordinator (WAFCOR) is required in accordance with 009-106 of 2.1, all repair activities participating in the availability shall submit properly prepared WAFs to the Lead Maintenance Activity (LMA) WAFCOR for processing.

3.1.4.1 The Repair Activity (RA) responsible for the work shall **accomplish the requirements of 2.4 and** complete blocks 1, 2, and 4 through 10 of the WAF and submit to the WAFCOR.

3.1.4.2 The WAFCOR shall obtain the appropriate WAF serial number from the Ship's Force WAF Log and enter it into block 3 of the WAF. The WAFCOR shall then submit the WAF to the ship's Watch/Duty Officer for processing blocks 11 through 14. The WAFCOR will sign block 14 for **concurrence to start work.** |

3.1.4.3 **The RA responsible for the work shall sign Block 14 in conjunction with the Ship's Watch/Duty Officer.**

3.1.4.4 The WAFCOR will issue a copy of the authorized WAF to the Repair Activity indicating authorization to begin work.

3.1.4.5 When work is complete, the RA will complete blocks 15 and 16 of the WAF in accordance with Volume IV, Chapter 10, Appendix A instructions of 2.2.

3.1.4.6 When all work and testing are completed, block 18 shall first be signed by the WAFCOR and then the SF Watch/Duty Officer shall be the final signature in block 18 to close the WAF.

3.2 Accomplish the requirements of 2.4 for equipment, systems, circuits, components, tanks, voids, piping, and valves that require isolation.

3.2.1 Ensure the isolation, de-energization, drainage of the isolated area, and depressurization of mechanical, electrical, electronics, and pressure system has been accomplished.

3.2.2 Train and qualify contractor's designated representative in the WAF and Tag-Out process in accordance with 2.2 and 2.4.

3.2.2.1 Maintain a current copy of the plan utilized to train and qualify contractor's designated representatives in accordance with 2.2 and 2.4 for reference by the SUPERVISOR.

3.2.2.2 Notify the SUPERVISOR of revisions to the plan as they occur.

3.3 Accomplish the requirements of the contractor's lockout/tags-plus program for unmanned craft and barges in accordance with 2.5.

3.3.1 Submit one legible copy, in hard copy or approved transferrable media, of contractor's lockout/tags-plus program to the SUPERVISOR when requested.

3.3.2 Position equipment to achieve required isolation, by de-energizing, draining of the isolated area, and depressurization, and use lockout/tags-plus program when lock-out of equipment, systems, circuits, components, piping, or valves is required in accordance with 2.5.

3.4 Post warning signs and barriers and install temporary positive means to prevent closure or movement of components that create a safety hazard at hull and deck openings.

3.5 Provide and maintain a written record by work item using Attachment A (Accountability of Temporary Blanks and Plugs Check-Off Sheet), verifying installation and removal of temporary blanks/plugs used for Foreign Material Exclusion (FME), isolation of pressure boundaries, or hydrostatic testing. **Location information shall include the** associated system/equipment name or tank number; frame, port or starboard, below or above water line. |

3.5.1 Ensure the Accountability of Temporary Blanks and Plugs Check-Off Sheet (Attachment A) is at all tank closings; ensure the removal of blanks/plugs in tanks are verified and documented via signature on the check-

off sheet by Ship's Force representative and the SUPERVISOR prior to tank closing.

3.5.1.1 Submit one legible copy, in hard copy or transferable media, of the Accountability of Temporary Blanks and Plugs Check-Off Sheet (Attachment A) to the SUPERVISOR upon each satisfactory tank closing to document blanks/plugs were removed.

3.5.2 Maintain the Accountability of Temporary Blanks and Plugs Check-Off Sheet (Attachment A) for the duration of the availability.

3.5.2.1 Maintaining the Accountability of Temporary Blanks and Plugs Check-Off Sheet (Attachment A) for material that has been removed from the ship is not required; however that material must be entered in the Accountability of Temporary Blanks and Plugs Check-Off Sheet (Attachment A) when material is returned to the ship.

3.5.3 Submit one legible copy, in hard copy or approved transferrable media, of the completed Attachment A to the SUPERVISOR at the end of the availability.

3.6 Install identification tags on each removed piping section, valve, ventilation system, and equipment to indicate company name, ship's name, hull number, system, location, and Work Item number prior to removal from system. Tags must endure the repair process, and must stay attached and be readable until the removed piping section, valve, ventilation system, or equipment is reinstalled.

3.6.1 Include quantity when components are grouped/bagged/comingled together in a bucket or any other type of storage having only one identification tag.

3.6.2 Ensure FME is maintained on equipment removed from the ship.

3.7 Install and maintain blanks/plugs, nuts and bolts, painted blaze orange for use as FME immediately upon openings in equipment, valves, and piping systems not subject to pressure to prevent entry of foreign material and protect flanges and threaded areas. Existing system fasteners used for blanking that will be reused for installation are excluded from the requirement for blaze orange color. FME may be used for systems normally under pressure but are tagged-out for maintenance. The use of cloth, polyvinyl sheet, paper, tape, and rubber sheeting as FME is prohibited. All FME material must be applied with care, without using excessive force, to avoid damage to surfaces/components being protected.

3.7.1 Wood products, including damage control (DC) plugs are permitted for use as FME external to the ship for hull penetrations not in immediate vicinity of the flight deck. Wood products, including DC plugs, may be used as FME internal to the ship in piping and ventilation systems where permitted explicitly in the applicable Naval Ship's Technical Manual. DC plugs, wood, or wood products are prohibited for use in tanks/voids.

3.7.2 Piping, ventilation, and equipment components designated as scrap prior to removal do not need to be blanked to maintain cleanliness; however, they shall be properly marked as scrap material prior to removal. Precautions shall be taken to preclude spillage of system contents.

3.8 Maintain the cleanliness of new, modified, repaired and disturbed non-nuclear piping systems and components of nuclear and non-nuclear powered naval vessels in accordance with 2.6 through 2.8. Cleanliness levels shall be as assigned in 2.6.

3.8.1 Maintain cleanliness at the following acceptance standard:

3.8.1.1 Cleanliness Level II: Surface shall be visually free of grease, oil, flux, scale, dirt, loose particles and any other contamination foreign to the base metal. Tap water residues on all metals and light superficial rust on carbon steel surfaces, caused by short time exposure to the atmosphere, are permitted. Light dust on cleaned surfaces is not objectionable, provided that the quantity and size of the particle does not adversely affect system operations.

3.8.1.2 Cleanliness Level III: Surface shall be reasonably free of contamination and any remaining residue on the surface does not interfere with system operations or damage system components.

3.8.2 Re-establishing local cleanliness status: Local cleaning is permitted in accordance with 505j4 of 2.6. If existing system cleanliness has been lost in a localized area (such as metal shavings deposited in a pipeline while removing a section for replacement), cleanliness condition can be re-established by locally swabbing, wiping, vacuuming, etc. the area to meet the cleanliness requirements of 505j2 of 2.6. Local cleaning is limited to piping sections which can be accessed directly and the results of cleaning fully observed without the aid of borescopes, mirrors or other devices.

(V) "VERIFY CLEANLINESS"

3.8.3 Verify that existing cleanliness was maintained.

3.8.4 Submit one legible copy, in approved transferrable media, of a report identifying any location where cleanliness has not been maintained in accordance with 3.8.1 and cannot be restored by local cleaning in accordance with 3.8.2. Include the cause of system contamination and recommended actions for cleanliness recovery.

3.9 Install and maintain blanks/plugs, nuts and bolts, colored blaze orange that will be used for hydrostatic testing on equipment, valves, and piping systems in accordance with 2.9 to withstand maximum system pressure for systems which will serve as the primary or secondary barrier to support hydrostatic testing. Existing system fasteners used for blanking that will be reused for installation are excluded from the requirement for blaze orange color. Secure blanks in place with gaskets and fasteners in accordance with 2.10 and 2.11, or weld in place. Ensure welding requirements for blanks meet the same requirement as the piping welds, in accordance with 2.8, 2.12, and

009-12 of 2.1. The use of cloth, polyvinyl sheet, paper, tape, and rubber sheeting as blanks is prohibited. DC plugs, wood, or wood products are prohibited as blanks on pressurized systems, but may be used on non-pressurized systems to include gravity drain piping.

3.9.1 Ensure pressure blanks have a positive means of attachment for affixing tags. Tags must endure the repair process, and must stay attached and be readable until the blanks are removed. Include company/contractor name, Work Item number, WAF number, Contractor blanking/plugging log entry number, along with system/equipment/component name, number, and location.

3.10 Ensure blanks, plugs or cable end protection installed is removed and system/equipment is restored as soon as possible after completion of work. Ensure all tag-out requirements of 2.4 are followed.

4. NOTES:

4.1 JFMM (2.2), 6010 (2.3), and TUM (2.4) are available on-line at:
<https://www.submepp.csd.disa.mil/jfmm/index.htm>

4.2 FME is used to maintain system cleanliness. Accomplishment of NSI 009-107 of 2.1 **will be invoked within the Work Item** to restore cleanliness, when lost or suspected of being lost. |

4.3 General piping system cleanliness is addressed in Section 505 of 2.6.

4.4 Cleaning requirements for specific systems are addressed in individual sections of 2.6 and 2.7.

4.5 The Lead Maintenance Activity (LMA) is defined in 2.2. MSRA/ABR contractors tasked with availability schedule management under 009-60/009-111 of 2.1 are considered the LMA.

4.6 MSRA/ABR contractors fulfilling the role of Lead Maintenance Activity under 2.2, or tasked with availability schedule managements under 009-60/009-111 of 2.1 are not "component contractors" and are responsible for the full scope of Repair Activity obligations under Volume IV, Chapter 10, of 2.2.

4.7 Worksite is defined as within the specific compartment or space where physical productive work is occurring. For tanks and voids, the WAF may be posted at the entry point of the space.

ATTACHMENT A

ACCOUNTABILITY OF TEMPORARY BLANKS AND PLUGS CHECK-OFF SHEET

COMPANY NAME

HULL AND AVAILABILITY

WORK ITEM NUMBER

SYSTEM COMPONENT EQUIPMENT	LOCATION, TANK NUMBER	TYPE, SIZE,	SERIAL NUMBER	DATE INSTALLED	MECHANIC'S NAME, BADGE NUMBER & SIGNATURE	DATE REMOVED	MECHANIC'S NAME, BADGE NUMBER & SIGNATURE	SHIP'S FORCE REPRESENTATIVE SIGNATURE	SUPERVISOR SIGNATURE

NAVSEA
STANDARD ITEM

FY-19

<u>ITEM NO:</u>	<u>009-43</u>
<u>DATE:</u>	<u>30 JUL 2015</u>
<u>CATEGORY:</u>	<u>II</u>

1. SCOPE:

1.1 Title: Engineering Plant Production Completion Date (PCD), Light-Off Assessment (LOA) Support; provide

2. REFERENCES:

2.1 Standard Items

2.2 S9095-AD-TRQ-010, Total Ship Test Program Manual

3. REQUIREMENTS:

3.1 Complete all work in the engineering spaces prior to PCD. For availabilities in excess of 120 days (140 days for forward deployed CVNs), PCD will be scheduled 14 days prior to the LOA. For availabilities 120 days or less (140 days for forward deployed CVNs), PCD will be scheduled between 4-14 days prior to engineering plant light-off. PCD will not be less than 4 days prior to engineering plant light-off regardless of whether a LOA is scheduled. For availabilities 120 days and less (140 days for forward deployed CVNs), the requirement for a LOA will be determined by the TYCOM.

3.1.1 The term complete is defined to mean the accomplishment of all contractor-responsible work, testing, and certification that is possible without lighting off boilers, gas turbine engines, or main propulsion diesels (as applicable). Steam shall not be introduced into propulsion systems from any source until after a successful LOA.

3.1.2 All work required to conduct engineering plant light-off regardless of whether an LOA is scheduled shall be assigned to be completed to meet the Engineering Plant PCD Key Event using 009-60 and 009-67 of 2.1. All work is defined as any work planned for accomplishment during the maintenance availability by all organizations other than Ship's Force including: Alteration Installation Team (AIT), Commercial Industrial Services (CIS), and Fleet Maintenance Activity (FMA).

3.1.3 The Engineering Plant PCD key event can only be called met after all required reports and OQE have been submitted to, reviewed and approved by the SUPERVISOR. In order to meet the PCD Key Event, the minimum equipment listed in Attachment A must be ready for start-up in its normal configuration, and ready for testing per applicable test requirements. The following work shall be completed to declare the PCD met:

3.1.3.1 Complete work to the degree such that no workers are required to occupy the affected spaces for any reason. The affected spaces are defined as those spaces or compartments in which workers must enter to accomplish work. This includes not only the spaces where work is being accomplished, but also adjacent spaces where fire watches or other workers must be present to complete work. The degree required for the completion of work in associated spaces includes filling of lube oil, fuel oil, and feedwater tanks, cleaning and gas freeing of all bilge spaces to "Safe for Workers" conditions, final paint, decking, lagging or any other repair work which requires workers to be in the space to complete. Spaces are required to be operationally ready for all systems listed in Attachment A and subsequent sustained engineering plant operations, including completion of support systems test procedures or applicable portions thereof so that the equipment is operating within design parameters. Additionally, full, unimpeded access to all engineering spaces, escape trunks, access doors, scuttles, repair lockers and firefighting equipment is required without exception. The selected tests to be conducted prior to PCD shall be identified in the Integrated Test Schedule managed by the Lead Maintenance Activity (LMA) Chief Test Engineer as defined in 009-67 of 2.1.

3.1.3.2 Repair and installation of machinery, equipment, blowers, piping systems, gages, thermometers, meters, operating instructions and warning plates, protective guards, flange shields, remote shutdown devices, strainer shields, valves and hand wheels, insulation and lagging, check valves, steam traps and orifices, regulators and reducing valves, remote operating gear and pull cables, valve reach rods, pipe hangers and braces, valve locking devices, valve position indicators, indicators, gage lines, label plates, relief valves and hand lifting levers, boiler safety valves and easing gear, boiler uptakes and stacks, fuel burner drip pans, boiler combustion monitoring system, boiler igniter system, automatic boiler control system, main feed pump control system, deck plates, sight glasses and guards, fuel strainers, soot blowers, boiler casings, firefighting systems and equipment, handrails, ladders, access doors and scuttles, ventilation systems, supply and exhaust vent screens, lighting systems (incandescent, fluorescent, and emergency battle lanterns), electric cables and runs, cable straps, cable packing, cable tags, alarm systems, ground straps, flex hoses, resilient mounts, safety devices, stenciling, interior communication systems, access closures, tachometers, and resiliently-mounted pipe hangers.

3.1.3.3 Calibration of gages, thermometers, tachometers, pyrometers, and meters.

3.1.3.4 Cold setting of relief valves, governors for steam turbine, gas turbine or diesel engines (as applicable), over-speed trips, piping spring hangers, regulators and reducing valves, low suction trips, high temperature alarms and switches, high and low pressure control switches, low lube oil pressure alarms, ship service boiler water high and low level alarms, main boiler water high and low level alarms, and waste heat boiler water high and low level alarms.

3.1.4 Proposed exceptions shall be submitted to the SUPERVISOR in writing in accordance with 009-01 of 2.1. Proposed exceptions shall include a methodical plan for completion of work that does not interrupt activities planned during LOA or activities during non-LOA hours planned by Ship's Force for training (see 4.5). In the event of incomplete work, an evaluation by the ship's Commanding Officer, SUPERVISOR and LMA must be performed to determine if that work will impede uninterrupted preparations and accomplishment of LOA. Exceptions must be approved by the SUPERVISOR and agreed to in writing by the Ship's Commanding Officer.

3.1.5 Hold a dedicated PCD progress meeting no later than 2 weeks prior to PCD and get positive concurrence (by name) from all entities involved in the availability that all work tied to PCD is on schedule. Submit in writing to the SUPERVISOR a list of any work items with anticipated completion delays. These work items must be tracked daily thereafter and the status thereof discussed during daily production meetings until adequate solutions are identified to complete the work on its original schedule date or on a new date as agreed upon by the SUPERVISOR and Ship's Force. In all cases, do not wait for meetings to convene to inform the SUPERVISOR that work tied to PCD may not be completed and certified on time. Immediate notification is required.

3.1.6 Correct contractor-responsible discrepancies discovered during preliminary LOA inspections prior to the turnover of engineering spaces to Ship's Force. Reserve the 2-week period prior to LOA for Ship's Force preparations for LOA. Do not allow contractor work in engineering spaces during this period unless approved by the Ship's Commanding Officer and specifically authorized by the SUPERVISOR.

3.1.7 After the PCD progress meeting required in 3.1.5, submit to the SUPERVISOR, a daily status report on contractor-responsible preliminary LOA discrepancies. Additionally, notify the SUPERVISOR verbally, immediately upon determination of any discrepancies that cannot be corrected prior to the scheduled LOA, and provide in writing the reason and expected completion date. Propose exceptions in accordance with the process required in 3.1.4.

3.2 Provide the services of a contractor quick response team during the LOA to correct Government discrepancies.

3.2.1 Coordinate the correction of discrepancies as they are discovered.

3.2.2 Ensure that quick response team members have with them (or readily accessible), the tools of their trade for immediate use in the correction of discrepancies.

4. NOTES:

4.1 Definitions.

4.1.1 Engineering Plant Production Completion Date (PCD): Key Event scheduled prior to propulsion plant hot operations to document that all

production work effecting the minimum equipment requirements for Light-Off Assessment (LOA) is completed and certified up through Stage 2 testing per 2.2. Stage 2 testing is accomplished prior to operation of installed or relocated equipment, cabling, piping, ventilation, etc., to ensure that each installation has been accomplished in accordance with established plans and specifications. PCD includes all required reports and Objective Quality Evidence (OQE) have been submitted to, reviewed and approved by the SUPERVISOR. The SUPERVISOR and Lead Maintenance Activity (LMA) are responsible for thorough and rigorous management of this Key Event and minimizing exceptions. In the event of incomplete work, an evaluation by the Ship's Commanding Officer, SUPERVISOR and TYCOM must be performed to determine if the incomplete work will impede uninterrupted preparations and accomplishment of LOA. Exceptions must be approved by the SUPERVISOR and agreed with in writing by the Ship's Commanding Officer. PCD is scheduled to provide the crew sufficient time to prepare and train for LOA, and to shift from a maintenance environment to an operations environment.

4.2 The LOA is a comprehensive assessment of the ship in the key areas of: The level of knowledge and firefighting capability of engineering plant personnel; the adequacy of Engineering Department administrative programs and procedures; the material readiness of the engineering plant; and the state of cleanliness and preservation of main engineering and auxiliary machinery spaces. The LOA will be accomplished by the Immediate Superior in Command (ISIC), Afloat Training Group (ATG) or the Type Commander Staff. The assessment will be conducted and concluded immediately prior to Main Propulsion Systems light-off. The material assessment portion usually takes less than 12 hours. If restrictive discrepancies are identified, those discrepancies must be corrected prior to Main Propulsion Systems light-off.

4.3 The SUPERVISOR will establish an inspection team and accomplish a preliminary LOA inspection in conjunction with Ship's Force 4 to 8 weeks prior to the LOA to determine and record discrepancies which would impact uninterrupted completion of LOA. The pre-LOA will be about 4 days in duration and will result in the identification of discrepancies and incomplete work considered necessary to support a successful LOA. Each discrepancy noted in the inspection will be described in simple terms on a 4-part, serialized form. The form will identify the general location of the discrepancy and the associated work Item number, if applicable. The fourth copy of the form, made of hard card with an attachment wire, will be hung by the SUPERVISOR'S inspection team in the immediate proximity of the discrepancy (on the deficient item itself, when practical). Upon completion of the pre-LOA the SUPERVISOR will identify contractor-responsible discrepancies to the contractor. Deficient items identified that are the responsibility of the Government will be screened for accomplishment by the Ship's Force. That portion of this work that cannot be accomplished by the Ship's Force will be considered for accomplishment by the contractor.

4.3.1 Any time after completion of the pre-LOA inspection that additional discrepancies are discovered, they will be similarly identified and screened.

4.4 It is never anticipated or expected that exceptions to the completion of work are an acceptable practice and in no case should exceptions happen at a rate that indicates a trend. The process for handling exceptions is only included in this NSI in the event unforeseen circumstances prevent work from being accomplished on time.

4.5 An example of an acceptable plan for work completion is as follows: Unfinished work on piping in an engineering main space that requires 2 days (beyond PCD) of hot work, painting and lagging to complete. Work shall be planned for and accomplished during the hours of the day that the space isn't occupied for activities related to LOA. However, all tools, materials, hoses, lines, workers, and equipment must be cleared from the space and all interference removals reinstalled no later than one hour prior to commencement of the next LOA event taking place in that space. The space must pass safety walk-through requirements as determined by Ship's Force and the SUPERVISOR.

ATTACHMENT A
CLASS SPECIFIC MINIMUM EQUIPMENT LISTS

Equipment	CG	DDG	FFG	LCS-1	LCS-2
B2B/VHF	1	1	1	1	1
C&M Console	-	-	-	1 of 1	-
TSCE	-	-	-	1 of 1	1 of 1
Fire Pumps	3 of 6	3 of 6	3 of 5	2 of 3	2 of 3
SCBA Charging Stations	2 of 3	FLT I: 2 of 3; 79 AF: 1 of 2	2 of 3	1 of 1	1 of 1
SCBA ABPA	2 of 2	2 of 2 (FLT I)	2 of 2	-	-
SCBA EBAC	2 of 3	2 of 3	2 of 3	1 of 1	1 of 1
SCBA	50 of 55 (90%)	66 of 73 (90%)	50 of 55 (90%)	33 of 36 (90%)	33 of 76
P100	2 of 3	2 of 4	2 of 3	2 of 3	1 of 2
Hull integrity	Yes	Yes	Yes	Yes	Yes
AFFF Stations	1 of 2	1 of 2	1 of 2	1 of 2	2 of 3
Bilge Sprinkling	MMR/AMR	MMR/AMR	MMR/AMR	MMR/AMR	MMR/AMR
Watermist	-	-	-	100%	2 of 2, each operational main space
Halon (Main Spaces)	100%	100%	100%	-	-
Fixed CO2/Halon/HFP for GTE/GTG Modules	100%	100%	100%	100%	100%
Main Drainage Capability (defined as the ability to dewater a main space locally, or using that space's educator remotely, or cross-connected from a directly adjacent space)	Yes	Yes	Yes	Yes	Yes
Shafts	2 of 2	2 of 2	1 of 1	2 of 2	2 of 4
Engines	1 of 2 per shaft	1 of 2 per shaft	2 of 2	1 of 2 per shaft	2 of 4
S/W Serv Pumps (ASW)	2 of 3	3 of 5	1 of 2	3 of 5	2 of 3
F/O Serv Pumps	1 of 2 per MMR	1 of 2 per MMR	1 of 2	1 of 2 diesel 2 of 2 GTM	1 of 2
L/O Serv Pumps, per shaft	1 of 2 (A, B) and attached	1 of 2 (A, B) and attached	1 of 2 (A, B) and Coast Down Pump	4 of 4 electric and attached	2 of 2 electric and attached, 1 of 1 thrust bearing pump
CRP/CPD pumps elec	2 of 2	2 of 2	1 of 1	-	-
F/O Xfer Pumps	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
F/O purifiers	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2 (filter separators)
Consoles	3 of 7 CCS 1 of 3 each MER	3 of 3 CCS 2 of 2 CCS (Fwd/Backfit) 1 of 1 MER 4 of 7 TAC 4 4 of 7 RSCs (Fwd/Backfit)	4 of 4 CCS 1 of 1 MER	2 of 2 (CCS/RCO)	ECS at minimum of 2 consoles

NAVLAN svrs with aux & prop loops functioning	-	-	-	1 of 2	-
MPCMS PLCs	-	-	-	1 of 2	-
All I/O boxes	-	-	-	Yes	-
ECS/SFCS (100% Bullnose functionality)	-	-	-	-	1 of 1
Generators	2 of 3	2 of 3	2 of 4 with 1 of 2 SACs	2 of 4	2 of 4
SFCs (400hz)	2 of 4	1 of 2	2 of 3	1 of 1	2 of 2
HPACs	1 of 2	1 of 2 (FLT 1)	1 of 2	-	-
MPACs	-	-	-	1 of 2	1 of 2
LPACs	2 of 3	2 of 3	1 of 2	-	-
HPU Fwd	-	-	-	-	1 of 1
HPU Aft	-	-	-	-	1 of 2
A/C	2 of 4	2 of 4 (51-90) 2 of 5 (91 AF)	2 of 3	1 of 2	2 of 3
CHT sys operational	Yes	Yes	Yes	Yes	Yes
Oily Waste sys operational (must be able to process or hold oily waste onboard)	Yes	Yes	Yes	Yes	Yes
Waste Heat Boilers (Pre-MOD)	1 of 3	-	-	-	-
Hot water tanks/heaters	1 of 2	1 of 1	1 of 1	1 of 2	1 of 2
Evap/RO units	1 of 2	1 of 2	1 of 2	1 of 2	2 of 3
Splitter Gear L/O scavenging pumps	-	-	-	1 of 2 per gear	-
Auxiliary Propulsion Unit	-	-	1 of 2	-	-
Steering Units or Steerable Waterjets	1 of 2 per rudder	1 of 2 per rudder	2 of 2	2 of 2	2 of 4 waterjets with 1 of 2 electric and 1 attached hydraulic/lubricating oil pumps per shaft
Rudder	1 of 2	1 of 2	1 of 2	-	0 of 2
Canman Waterjet Control System	-	-	-	1 of 1	-
Surface radars	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Gyro	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Gyro Repeaters (Helm, Bridge Centerline, Aft Steering)	1 each	1 each	1 each	1 each	1 each
Fathometer	1	1	1	1	1
Military GPS, NAVSSI, or plug in	1	1	1	1	1
Rudder indicators (Helm, Aft Steering)	2 of 3	2 of 3	2 of 3	-	-
Radar Display (Bridge, CIC)	1 each	1 each	1 each	-	-
Internal Comms (IVCS or Sound Powered Phones)	Yes	Yes	Yes	Yes	Yes

Meet COLREGS	Yes	Yes	Yes	Yes	Yes
ECDIS-N (for ECDIS-N ships)	Yes	Yes	-	-	-
Voyage Management System/BME-VMS/ARPA	-	-	-	2 of 3	1 of 2
Ship Control Consoles	Yes	Yes	Yes	Yes (IBS)	4 of 5
Navigation Data Conv Unit/NDC	-	-	-	1 of 1	1 of 1
Anchor Windlass	1 of 2	1 of 1	1 of 1	1 of 1	1 of 1
Anchors	1 of 2	1 of 2	1 of 1	1 of 1	1 of 1
Reefers	1 of 2	1 of 2	1 of 2	2 of 3 freezers 1 of 2 chill boxes	1 of 2
Pot Wtr Pumps (and associated priming pump if applicable)	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Hot Water Circ Pumps	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2

Equipment	LHA	LHD-1	LHD-8	LPD-4	LPD-17	LSD	MCM	PC	LCC
B2B/VHF	1	1	1	1	1	1	1	1	1
Fire Pumps	6 of 12	6 of 12	8 of 16	3 of 5	5 of 10	3 of 5 (41-48) 4 of 7 (49-52)	2 of 3	2 of 3	2 of 4
SCBA Charging Stations	3 of 5	3 of 5	3 of 5	3 of 5	2 of 3	2 of 3	-	-	1 of 3
SCBA ABPA	2 of 3	2 of 3	2 of 3	2 of 3	-	2 of 2	-	-	1 of 3
SCBA EBAC	3 of 6	3 of 6	3 of 6	2 of 3	2 of 3	2 of 3	1 of 1	1 of 1	1 of 3
SCBA	115 of 144 (80%)	222 of 278 (80%)	228 of 285 (80%)	65 of 72 (90%)	153 of 191 (80%)	105 of 116 (90%)	21 of 24 (90%)	9 of 10 (90%)	246 of 308 (80%)
P100	2 of 3	3 of 5	2 of 3	2 of 4	2 of 4	2 of 4	1 of 2	1 of 1	3 of 5
Hull integrity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AFFF Stations	3 of 6	3 of 6	3 of 6	2 of 4	4 of 7	2 of 4	1 of 2	in-line eductors, bilge sprinkling entry fire stations	1 of 2
Bilge Sprinkling	MMR/ AMR	MMR/ AMR/ 1 & 2 Diesel Rooms	MMR/ AMR/ 1 & 2 Diesel Rooms	MMR	MMR/ AMR	MMR/ AMR	Yes	Yes, as applicable	Yes
Watermist	-	-	MMR/ Diesel Enclosure/ 1 & 2 Diesel Rooms	-	2 of 2	-	-	-	-
Halon (Main Spaces)	100%	100%	100%	100%	-	100%	100%	100%	100%
Fixed CO2/Halon/HFP for GT/GTG Modules	-	-	1 & 2 GTE Enclosure (HFP)	-	100%	-	-	-	-
Main Drainage Capability (<i>defined as the ability to dewater a main space locally, or using that space's educator remotely, or cross-connected from a directly adjacent space</i>)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MOB-E									
Shafts	2 of 2	2 of 2	2 of 2	2 of 2	2 of 2	2 of 2	2 of 2	2 of 4	1 of 1
Engines	2 of 2	2 of 2	2 of 2	2 of 2	1 of 2 per shaft	1 of 2 per shaft	1 of 2 per shaft	Support 2 shafts	1 of 1
Boilers	2 of 2	2 of 2	-	2 of 2	-	1 of 2 Aux (if applic)	-	-	2 of 2

DFT	2 of 2	2 of 2	-	2 of 2	-	-	-	-	1 of 1
FDB per MMR	1 of 2	1 of 2	-	2 of 2	-	-	-	-	4 of 4
MFP/Emerg FP Per MMR	2 of 3	2 of 3	-	2 of 3	-	-	-	-	2 of 3
ME Gland Exhaust Fans per MMR	2 of 2	2 of 2	-	2 of 2	-	-	-	-	1 of 1
MFBP per MMR	1 of 2	1 of 2	-	2 of 2	-	-	-	-	3 of 3
Main Condensate Pumps per MMR	1 of 2	1 of 2	-	2 of 2	-	-	-	-	1 of 2
Main Condenser Sea Water Circulating Pumps per MMR	1 of 1	1 of 1	-	1 of 1	-	-	-	-	1 of 1
MPDE L/O Pumps	-	-	-	-	2 of 4	-	-	-	-
S/W Service Pumps (ASW)	-	-	2 of 2	-	3 of 6	2 of 4	1 of 2	-	-
L/O Service Pumps per MMR	2 of 3; ALOP, A or B	2 of 3; ALOP, A or B	2 of 3; A or B, and coastdown	2 of 3; ALOP, A or B	2 of 3; ALOP, A or B	2 of 3; ALOP, A or B	2 of 2; ALOP or STBY	-	1 of 1 electric
Gearbox Trailing Pump	-	-	1 of 2	-	-	-	-	2 of 4	-
CRP/PPP pumps elec	-	-	2 of 4	-	2 of 2	2 of 2	2 of 2	-	-
F/O Xfer Pumps	1 of 2	1 of 2	1 of 2	2 of 2	1 of 2	1 of 2	1 FOTP or FOP	1	2 of 4
F/O purifiers	-	-	1 of 2	-	1 of 2	1 of 2	1 FOP or FOTP	-	-
Consoles	Local Control	Local Control	2 of 4 in CCS	Local Ctrl	3 of 5 in CCS	2 of 4 (if appl)	-	-	-
Multi-Function Work Station (MFWS)	-	-	4 of 7	-	-	-	-	-	-
Eng System Control /Ship's WAN (ESC/SWAN)	-	-	-	-	Yes	Yes (if appl)	-	-	-
Generators	2 of 4	3 of 5	4 of 6	2 of 4	3 of 5	2 of 4	2 of 3	2 of 2	-
Emergency Generators	1 of 2	1 of 2	-	1 of 2	-	-	-	-	1 of 2
Fwd EPCP	1 of 1	1 of 1	-	1 of 1	-	1 of 1	-	-	-
Aft EPCP	1 of 1	-	-	-	-	-	-	-	-
SFCs (400hz)	2 of 3	3 of 5	3 of 5	1 of 2	1 of 3	2 of 3	1 of 2	1	2 of 2
HPACs	2 of 3	1 of 2	1 of 2	-	-	1 of 2	-	-	1 of 2
MPAC	-	-	-	-	1 of 2	-	1 of 2	-	-
LPACs	3 of 5	3 of 5	3 of 5	2 of 2	2 of 3	2 of 3	-	-	2 of 4
A/C	3 of 6	3 of 6	4 of 7	2 of 4	4 of 7	2 of 4 or 3 of 5/6	1 of 2	2 of 2 or 2 of 4	4 of 6
CHT sys operational	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes
Oily Waste sys operational (must be able to process or hold oily waste)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

onboard)									
Evap/RO units	1 of 2	1 of 2	2 of 4	1 of 2	2 of 3	1 of 2	1 of 2	1 of 2	1 of 2
MOB-N									
Steering Units or Steerable Waterjets	1 of 2 per rudder	1 of 2 per rudder	1 of 2 per rudder	2 of 2	2 of 2	2 of 2	2 of 2	2 of 2	1 of 1
Rudder	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Surface radars	1	1	1	1	1 of 1	1 of 2	1	1	1 of 2
Gyro	1 of 2	1 of 2	1 of 2	1	1 of 1	1 of 1	1 of 2	1	1 of 2
Gyro Repeaters (Helm, Bridge Centerline, Aft Steering)	1 each	1 each	1 each	1 each	1 each	1 each	1 each	Bridge, Aft Steering	1 each
Fathometer	1	1	1	1	1	1	1	1	1
Military GPS, NAVSSI, or plug in	1	1	1	1	1	1	1	1	1
Rudder indicators (Helm, Aft Strg)	1 each	1 each	1 each	1 each	1 each	1 each	1 each	1 each	1 each
Radar Display (Bridge, CIC)	1 each	1 each	1 each	1 each	-	1 each	1	-	1 each
Internal Comms (IVCS or Sound Powered Phones)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meet COLREGS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ECDIS-N (for ECDIS-N ships)	1	1	-	-	1	1	1	-	-
Ship Control Consoles	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MOB-S									
Anchor Windlass	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 1	1 of 1	1 of 2
Anchor	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 1	1 of 1	1 of 2
NCO									
Reefers	1 of 3	1 of 3	1 of 3	1 of 2	1 of 2	1 of 2	1 of 2	1 of 1	1 of 2
Pot Wtr Pumps	2 of 4	2 of 4	2 of 4	1 of 2	2 of 4	1 of 2	1 of 2	1 of 2	2 of 4
Pot Wtr Booster Pumps	1 of 2	1 of 2	-	1 of 2	-	-	-	-	-

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-57
DATE: 18 NOV 2016
CATEGORY: II

1. SCOPE:

1.1 Title: Reduction Gear Security; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 S9086-H7-STM-010/CH-262, Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems

2.3 S9086-HK-STM-010/CH-241, Propulsion Reduction Gears, Couplings, Clutches, and Associated Components

3. REQUIREMENTS:

3.1 Accomplish the requirements of Paragraphs 262-3.5.6 and 262-3.5.7 of 2.2 to prevent entry of foreign matter into the lube oil system during work accomplished by the Work Item.

3.1.1 Notify the ship's Engineering Officer via the SUPERVISOR before opening and closing each main reduction gear or main reduction gear attached components.

3.1.2 Accomplish the requirements of Paragraph 241-3.5.2 of 2.3 to prevent rust/moisture damage to components when the reduction gear is going to remain inoperative in excess of 2 weeks.

3.2 Remove and dispose of system fluids to accomplish the requirements of the Work Item.

3.3 Provide and install temporary machinery protection in accordance with Paragraph 241-6.1.1.m of 2.3 and the following requirements:

3.3.1 Establish a limited access area and the physical boundary of the security control area.

3.3.2 The security control area shall be established prior to and maintained during the time an access to the reduction gears (including the main reduction gear [MRG] case, MRG sump, lube oil [LO] lines which terminate in the MRG, or LO cooler) is opened.

(V) (G) "INSPECTION/APPROVAL OF SECURITY CONTROL AREA"

3.3.3 Notify the SUPERVISOR prior to opening any clean system or component within the area. The SUPERVISOR shall inspect and approve the security control area prior to start of work.

3.3.4 Maintain on site Accountability Logs, Attachments A and B, of all tools, equipment, and personnel entering and leaving the security control area to verify adherence to the requirements set forth in 3.7 and 3.8.

3.3.4.1 Inspect the log at the beginning and end of each shift to ensure that it describes the equipment and tools within the security control area.

3.3.4.2 Use Attachment A to log all tools, equipment, and personnel.

3.3.4.3 Use Attachment B for shift turnover verification.

3.3.5 Post warning signs at the entry points to the security control area and limited access area to maintain control of the area and inform personnel that the reduction gear is open.

3.3.5.1 Set up Limited Access Area with rope/line and signs to restrict unnecessary traffic.

3.3.6 Provide 24-hour continuous on-site surveillance by contractor personnel in the area as long as the reduction gear is exposed.

3.3.6.1 Policing of limited access area shall be routine while gear is exposed or systems which flow into the MRG are open (e.g., propulsion lube oil [PLO] system, dehumidifier, vent fog precipitator [VFP]).

3.4 Observe Ship's Force security control/accountability measures.

3.5 Provide reduction gear security in accordance with Paragraph 241-4.2 of 2.3 during periods that require the gear train to be exposed from access openings where direct or indirect paths to gearing will result.

3.5.1 Notify the ship's Engineering Officer or designated representative prior to disassembly and removal of the following gear casing components:

3.5.1.1 Hinged, pinned, or bolted gear casing covers, inspection ports, and plates

3.5.1.2 Sight flow indicators, gear mesh spray nozzles, thermometers, and associated fittings

3.5.1.3 Oil supply and return piping, vent lines, fittings, and plugs.

3.5.2 The ship's Engineering Officer or designated representative shall be present at all times when external connections are attached to the reduction gear casing, oil sump, and oil piping.

3.5.3 The surrounding limited access area shall be secured and policed to remove overhead or local dirt, loose objects, or any potential security violating objects prior to and during gear exposure.

(V) (G) "PRE-OPENING CLEANLINESS"

3.5.4 Prior to opening casing, ensure no foreign material exists on adjacent surfaces that could contaminate the internal areas upon lifting casing covers, piping, and associated equipment.

3.5.5 Construct a temporary cover over openings of the gear train, in addition to the required limited access area controls, if it becomes necessary to stop work with the casing/covers removed.

3.6 Protective coverings:

3.6.1 When repairs require the removal of main bolted cover plates, assemble an enclosure made from Herculite or canvas covering conforming to A-A-55308 over the top of the reduction gear housing, lashing the bottom of the enclosure to the deck structure or piping at deck level.

3.6.1.1 Snaps, staples, or similar shall not be used on enclosure. Utilize heavy duty zippers and Velcro hook-pile. Secure all grommets attached to enclosure with line or lanyard to prevent loss of grommets.

3.6.1.2 Lash the top edge of the enclosure to overhead structural members to form a work area over and around the reduction gear casing.

3.6.1.3 Lace the top flaps to the sides. The top shall utilize a center joint if lifting gear is utilized. Unlace center joint when utilizing lifting gear.

3.6.1.4 Lace all but one of the corners to each other, utilizing stiffeners, to form a secure work area. The unlaced corner shall be used for a security door constructed to be capable of being secured. Stencil "CONTROLLED AREA - AUTHORIZED PERSONNEL ONLY" on the sides and top of the enclosure or install signs at enclosure boundaries.

3.6.2 When repairs do not require removal of main bolted cover plates, protect planned open and accessible areas of the reduction gear by assembling an enclosure made from Herculite or canvas covering conforming to A-A-55308.

3.6.2.1 Submit one legible drawing or sketch of proposed enclosure(s) to the SUPERVISOR 5 days prior to entering the reduction gear. Drawing shall include enclosure access for installation of lifting gear (if required).

3.6.2.2 Snaps, staples, or similar shall not be used on enclosure. Utilize heavy duty zippers and Velcro hook-pile. Secure all grommets attached to enclosure with line or lanyard to prevent loss of grommets.

3.6.2.3 Stencil "CONTROLLED AREA - AUTHORIZED PERSONNEL ONLY" on the sides and top of the enclosure or install signs at enclosure boundaries.

3.7 Prepare an Accountability Log, Attachment A and B, immediately after limited access area has been approved by the SUPERVISOR, but prior to opening an access. Maintain the Accountability Log while reduction gears and attached components are open.

3.7.1 Station a Control Watch at the enclosure door/flap and maintain Attachment A for all material and hardware which is small enough to fit inside access opening.

3.7.2 The Control Watch shall record the date and time in the appropriate block on Attachment B each time accountability is started or stopped, and each time access is opened or closed. Any time the log is turned over to another Control Watch, both the outgoing and incoming Control Watches shall sign Attachment B to document that all items are accounted for.

3.7.3 Any material permanently or temporarily installed shall be noted as such in the remarks column on Attachment A.

3.8 Inspection equipment, tools, and personnel clothing shall be captured, secured, and accounted for to preclude introduction of foreign matter into the reduction gear.

3.8.1 Acceptable methods of capturing are:

3.8.1.1 Drilling and lockwiring

3.8.1.2 Tackwelding or silver brazing

3.8.1.3 Using nylock-type locking devices

3.8.1.4 Upsetting or staking threads

3.8.1.5 Attaching a lanyard

3.8.1.6 Taping with duct tape

3.8.2 All personnel working in or around an open gear casing shall have all eye glasses, buttons, zippers, and other loose items on their clothing properly taped to prevent them from breaking loose and falling into the gear casing. All jewelry, pens, change, metal objects, loose items, etc., shall be removed from the person and clothing pockets prior to entering area.

3.9 Notify the SUPERVISOR in all matters involving foreign material retrieval from the reduction gear. Report all incidents breaching reduction gear security to the ship's Engineering Officer or Engineering Duty Officer via the SUPERVISOR.

(V) (G) "INSPECTION PRIOR TO CLOSURE"

3.10 Accomplish a visual inspection of the exposed reduction gear and associated components prior to each closing (daily and final). Ensure no foreign matter has entered or remains within the reduction gear and/or components. Inspect each ledges, including the underside of ledges, pockets, gear teeth, and bearing journals and caps, using mirrors, periscopes, and borescopes.

3.10.1 The inspection shall be made jointly with the SUPERVISOR and the ship's Engineering Officer or designated representative.

3.10.2 Prior to each closing verify that all tools and equipment listed on Attachments A and B have been either logged out satisfactorily or are annotated as installed, permanently or temporarily, in the remarks column.

3.10.2.1 Accountability shall stop when the access is closed.

3.10.3 Attachments A and B shall be available for review by the SUPERVISOR at time of final closure.

3.10.3.1 Submit one legible copy, in hard copy or approved transferrable media, of completed Attachments A and B to the SUPERVISOR within 2 days of final closure.

3.11 Disassemble and remove the enclosure and limited area boundary when directed by the SUPERVISOR.

3.12 Accomplishment of cleaning and painting for new and disturbed surfaces shall be in accordance with NAVSEA Standard Items (See Note 4.3).

4. NOTES:

4.1 In support of emergency inspections, limited inspections or minor repairs to the propulsion reduction gear, the requirements for a security control area may be omitted at the discretion of the SUPERVISOR with the concurrence of the ship's Engineering Officer. If the security control area

is precluded during these special circumstances, the security of the reduction gear shall be maintained.

4.1.1 The requirements for contractor accountability cannot be waived.

4.2 Definitions of terms used are:

4.2.1 Clean Work Area: An area requiring a cleanliness/ accountability level at least equal to that required for in-shop repair of similar equipment to permit the easy recovery of any dropped tools, material, etc. This area shall be free of excess moisture and contaminants, i.e., abrasive materials resulting from blasting, grinding, or other particle generating processes. Areas where this condition would apply are inspection and/or access covers removed or open.

4.2.2 Security Control Area: An area or enclosure that provides a physical boundary around access opening (Herculite) which will preclude the inadvertent introduction of any uncontrolled personnel, tools, equipment or foreign material. This area shall always meet the requirements of a Clean Work Area and can be upgraded to a Limited Access/Exclusion Area. A Controlled Area shall always require Physical Separation.

4.2.3 Full Enclosure: An enclosure that has all edges (sides, top, and bottom) secured with cabling that is woven through grommets and secured to stanchions, foundations, deck grating, etc. The enclosure will be considered adequately secured if a person cannot enter through any opening other than the designed entry accesses.

4.2.4 Limited Access Area: An area requiring the maximum level of concern and accountability for personnel and material. During this condition a Full Enclosure is required. This type of area isolation is required where the recovery of dropped or broken material would be difficult and/or requires extensive rework of the task in progress. The Full Enclosure shall be locked when unattended by production and during the unattended time keys shall be controlled by the Ship's Engineering Office. An area established outside the security control area to limit the personnel allowed to enter the reduction gear area and is intended to prevent unnecessary traffic.

4.2.5 Accountability: The method used to maintain foreign material exclusion from reduction gears by keeping a formal record (accountability log) of all materials, including tools and hardware that may pass through access opening.

4.3 If cleaning and painting for new and disturbed surfaces of 3.12 are required; the use of Category II Standard Item 009-32 "Cleaning and Painting Requirements; accomplish" of 2.1 will be specified in the Work Item.

ATTACHMENT A
ACCOUNTABILITY LOG

SHEET _____ OF _____

SHIP/HULL _____ SPEC. ITEM _____ SYSTEM-LOCATION _____

Item No.	Personnel Name/Item Description	Entered Area (Note 1)			Exited Area (Note 2)			Remarks (Note 3)
		Qty of Item (N/A for Personnel)	Date/Time	CTRL Watch*	Qty of Item (N/A for Personnel)	Date/Time	CTRL Watch*	

* The person designated to sign for an action verifies, based on personal observation, and certifies by their signature that the action has actually been performed in accordance with the specified requirements.

Note 1: Verify personnel and material entering area meet the requirements of 3.8

Note 2: Existing material removed shall be documented with "Entered Area" marked "N/A".

Note 3: Record if item is temporarily or permanently installed in system per para 3.7.3. Include additional remarks as required for clarification.

ATTACHMENT B
ACCOUNTABILITY LOG (WATCH TURNOVER VERIFICATION)

SHIP/HULL _____ SPEC. ITEM _____ SYSTEM-LOCATION _____

Logged items remaining within the exposed location at the change of watch shall be verified present by the in-coming and out-going control watches. This verification shall be accomplished by physically checking the area and confirming those items required to be logged. Both the outgoing and incoming watches shall sign the watch turnover verification to certify that the remaining items have been physically verified, no unnecessary items are left in accountability area, containments are satisfactory, and area is cleaned.

Ctrl Watch Name	Date/Time Started	Date/Time Stopped	Date/Time System Open	Date/Time System Closed	Logged items on Attachment A verified at watch turnover		Remarks
					Off Going watch signature*	On Coming watch signature*	

THIS LOG IS CLOSED. ALL ITEMS ARE ACCOUNTED FOR AS INDICATED.

Inspector** _____ Date/Time _____ Supervisor** _____ Date/Time _____

* The person designated to sign for an action verifies, based on personal observation, and certifies by their signature that the action has actually been performed in accordance with the specified requirements.

** The person designated to sign for an action verifies, based on personal observation or certified records, and certifies by their signature that the action has been performed in accordance with the specified requirements.

NAVSEA
STANDARD ITEM

FY-19

<u>ITEM NO:</u>	009-58
<u>DATE:</u>	01 SEP 2015
<u>CATEGORY:</u>	II

1. SCOPE:

1.1 Title: Pump and Driver Shaft Alignment; accomplish

2. REFERENCES:

2.1 S6226-JX-MMA-010, Instruction Manual for the Indicator Reverse Method of Pump Shaft Alignment

2.2 803-6397419, Standard Machinery Shim Kits

3. REQUIREMENTS:

3.1 Measure pump and driver shaft alignment using the indicator reverse method and the mathematical equations or graphs or alignment computer or laser based measuring instruments in accordance with 2.1.

3.1.1 Determine soft foot and correct in accordance with Section 2-2, 2-6.5.13 or 2-6.6.18 of 2.1. Shims shall be in accordance with 2.2.

(V) "INSPECT PIPING ALIGNMENT PRIOR TO REMOVAL"

3.2 Inspect piping alignment in accordance with Section 2-3 of 2.1 prior to removal.

3.2.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.2 to the SUPERVISOR.

(V) (G) "INSPECT PIPING ALIGNMENT AT INSTALLATION"

3.3 Inspect piping alignment in accordance with Section 2-3 of 2.1 at installation.

3.3.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.3 to the SUPERVISOR.

3.4 Measure indicator sag in accordance with Section 2-4 of 2.1.

(V) (G) "COLD ALIGNMENT" (See 4.4)

3.5 Align each shaft to the offset and angular alignments in accordance with the cold alignment settings invoked in the Work Item (see 4.1). Cold alignments for horizontally mounted machinery shall be accomplished in accordance with Chapter 2, Sections 2-1 through 2-7 of 2.1, and vertically mounted machinery shall be in accordance with Chapter 5, Sections 5-1 through 5-3 of 2.1. Pumps/motors with magnetic couplings shall be aligned in accordance with 2.1.

3.5.1 If hot alignment is not required, complete cold final alignment verification. Accomplish a final alignment check of pump with dowels installed.

3.5.1.1 Fit and install new chocks and shims conforming to ASTM A 240 to accomplish alignment. Shims shall be in accordance with 2.2.

3.5.1.2 Drill and ream foundations. Fit and install new SAE-AMS-QQ-S-763, Grade 304, dowels in each unit to retain final satisfactory unit alignment in accordance with Section 2-8 of 2.1.

3.5.2 Submit one legible copy, in hard copy or approved transferrable media, of a completed alignment data collection form (Page 7-2 of 2.1) (see 4.5) for the results of the requirements of 3.5 to the SUPERVISOR.

3.6 Align shafts so that offset and angular alignments are acceptable when the unit is hot. Acceptable alignment tolerances shall be based on the rated speed of the pump and the alignment tolerance listed in Table 1-1 of 2.1 (see 4.2). Hot alignments for horizontally mounted turbine-driven machinery shall be accomplished in accordance with Chapter 2, Section 2-1 through 2-8 of 2.1. Hot alignment is not required for vertically mounted machinery unless specified in the unit's technical manual. Hot alignment is not required for horizontally mounted, motor-driven machinery. Accomplish hot alignment check only on units when the cold alignment has been compensated for thermal growth. (Hot alignment readings must be taken within 30 minutes of shutting down unit).

3.6.1 Fit and install new chocks and shims conforming to ASTM A 240 to accomplish alignment. Shims shall be in accordance with 2.2.

3.6.2 Drill and ream foundations. Fit and install new SAE-AMS-QQ-S-763, Grade 304, dowels in each unit to retain final satisfactory unit alignment in accordance with Section 2-8 of 2.1.

(V) (G) "FINAL HOT ALIGNMENT"

3.7 Accomplish a final hot alignment check of pump in accordance with 2.1 with dowels installed.

3.7.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.7 to the SUPERVISOR. The report shall include the following:

3.7.1.1 Ship's name and hull number

3.7.1.2 Contractor and subcontractor

3.7.1.3 Job Order and Work Item number

3.7.1.4 Identity of pump aligned

3.7.1.5 Completed alignment data collection form (Page 7-2 of 2.1) (see 4.5) for final hot alignment condition.

4. NOTES:

4.1 Reference that contains the cold setting alignment will be identified in the invoking Work Item.

4.2 Hot alignment criteria if different from zero will be identified in the invoking Work Item.

4.3 Turbine driven unit must be run a minimum of 2 hours to achieve operating temperature.

4.4 (V) (G) is invoked only when hot alignment is not required.

4.5 If utilizing laser based measuring instruments, a completed results printout may be utilized in lieu of Page 7-2 of 2.1.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-63

DATE: 18 NOV 2016

CATEGORY: II

1. SCOPE:

1.1 Title: Lubricating Oil and Hydraulic Fluid; analyze

2. REFERENCES:

2.1 S9086-H7-STM-010/CH-262, Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems

2.2 S9086-S4-STM-010/CH-556, Hydraulic Equipment (Power Transmission and Control)

2.3 S9086-HB-STM-010/CH-233, Diesel Engines

3. REQUIREMENTS:

3.1 Provide samples (lubricant oil or hydraulic fluids) to a certified laboratory as listed in Table 262-4-2 of 2.1.

3.2 Accomplish tests of each sample in accordance with the specified test methods of Attachment A or Attachment B.

3.2.1 Test selections shall be based on the sample type and service.

3.3 Analyze each sample for metal content and water contamination by utilizing a spectrographic analysis in accordance with ASTM D-6595.

3.3.1 Determine if water contamination is fresh or salt water based on high sodium levels.

3.3.2 Record and report the concentration of the following elements in ppm with the indicated degree of accuracy:

IRON	COPPER	TIN	MAGNESIUM	LEAD
ALUMINUM	SILVER	CHROMIUM	NICKEL	SILICON
SODIUM				

3.3.2.1 The sensitivity and reliability of the equipment used for the test shall be in accordance with ASTM D-6595.

3.4 Accomplish specific gravity test for each MIL-H-19457 hydraulic fluid sample and determine hydrocarbon oil content in accordance with Table 556-8-1 of 2.2.

3.5 Submit one legible copy, in hard copy or approved transferrable media, of a report listing completed test results of 3.2 through 3.4 for each sample to the SUPERVISOR.

3.5.1 Reports shall be submitted within 2 days after the qualified chemical laboratory receives each sample.

3.5.2 Reports shall include recommendations for continued use, disposal, or re-sampling of each tested oil or fluid sample.

3.6 Use Table 262-4-1 of 2.1 and Table 556-8-1 of 2.2 for guidance for test accept and reject criteria for each in-service sample.

3.6.1 Use Table 233-8-2 of 2.3 for test accept and reject criteria for 9000 Series lube oil/MIL-PRF-2104 lube oil.

3.7 Submit one legible copy, in hard copy or approved transferrable media, of original manufacturer's certificate of compliance and material conformance test data in accordance with Military Specifications listed in Attachment A and Attachment B, 7 days prior to use of new fluids and oils.

4. NOTES:

4.1 Ship's Force will label all samples in accordance with 2.1 and 2.2.

ATTACHMENT A
LUBRICATING OILS

ASTM TEST METHOD	MIL-PRF-17672 MS-2075-TH MS-2110-TH MS-2135-TH	MIL-PRF-17331 MS-2190-TEP	MIL-PRF-9000 9250	MIL-PRF-2104 15W/40	MIL-PRF-23699	VV-L-825
FUEL DILUTION VIA FLASH POINT ASTM D93			X	X		
PERCENT WATER ASTM D6304	X	X		X		X
VISCOSITY ASTM D445		X	X	X	X	
ACID NO. ASTM D974	X	X		X	X	X
TOTAL BASE NO. ASTM D2896			X	X		
SPECTROGRAPHIC ANALYSIS ASTM D6595	X	X	X	X	X	X

ATTACHMENT B
HYDRAULIC FLUIDS

ASTM TEST METHOD	MIL-DTL-17111	MIL-H-19457	MIL-PRF-2104 MIL-PRF-17672 MS-2075-TH MS-2110-TH MS-2135-TH	MIL-PRF-17331 MS-2190-TEP	MIL-H-22072
FLASH POINT ASTM D92	X				X
PERCENT WATER ASTM D95					X
PERCENT WATER ASTM D6304	X	X	X	X	
VISCOSITY ASTM D445	X		X	X	
ACID NO. ASTM D974	X	X	X	X	
PARTICLE COUNT NAS/SAE 4059 (Automatic Particle Count Method)	X	X	X	X	X

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-64

DATE: 18 NOV 2016

CATEGORY: II

1. SCOPE:

1.1 Title: Synthetic Fire-Resistant Hydraulic Fluid; control

2. REFERENCES:

2.1 None.

3. REQUIREMENTS:

3.1 Accomplish the following for control of MIL-H-19457 and/or MIL-H-22072 Synthetic Fire-Resistant Hydraulic Fluid:

3.1.1 Monitor each and exercise positive control of accesses to and egresses from areas in which the hydraulic fluid is being handled.

3.1.1.1 Post warning signs at entrances and in work areas (2-inch minimum letters on signs) stating: CAUTION: SYNTHETIC FIRE-RESISTANT HYDRAULIC FLUID HANDLING. UNAUTHORIZED PERSONNEL KEEP OUT.

3.1.1.2 Each area shall be roped off or otherwise secured and identified.

3.1.2 Hydraulic fluid shall be contained and immediately cleaned up in event of spill.

3.1.2.1 Rags in sufficient quantity shall be on hand to clean up and control spills.

3.1.2.2 Plastic bags for disposal of oily rags shall be available and partially filled or filled bags removed at the end of each shift.

3.1.2.3 Used fluid shall be pumped into drums stenciled: USED SYNTHETIC FLUID, for disposal.

3.1.3 Requirements for handling:

3.1.3.1 In addition to normal personal protective equipment (PPE), rubber gloves, face shields, and rubber aprons shall be used by personnel handling fire-resistant hydraulic fluid.

3.1.3.2 Spills on clothing shall be cause to remove clothing and rinse in fresh water.

3.1.3.3 Spills on skin shall be washed with soap and rinsed with fresh water.

3.2 Report verbally each spill in excess of 5 gallons as soon as management becomes aware of such an event.

3.2.1 Submit one legible copy, in approved transferrable media, of a formal written report of the event to the SUPERVISOR within one day.

3.3 Upon completion of work the contractor shall notify the SUPERVISOR in writing of the completion of the work, certifying that the area is cleaned and that the area is safe to enter.

4. NOTES:

4.1 None.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-91
DATE: 01 OCT 2017
CATEGORY: II

1. SCOPE:

1.1 Title: Propeller In-Place Inspection; accomplish

2. REFERENCES:

2.1 S9086-HP-STM-010/CH-245, Propellers and Propulsors

3. REQUIREMENTS:

(I) "VISUAL INSPECTION"

3.1 Clean and accomplish a visual inspection of each propeller and propeller cap in accordance with Section 3 of 2.1.

3.2 Record all inspection data taken in 3.1.

3.2.1 Submit one legible copy, in approved transferrable media, of completed Propeller Visual Technical Inspection Report Forms, NAVSEA 9245/3, listing results of the visual inspection and a sketch showing the size and location of any cracks or defects to the SUPERVISOR.

3.2.2 Cover the entire periphery of each propeller blade with metal edge guards and secure them with steel straps in accordance with 2.1.

3.3 Stake each screw and plug on the exterior of each propeller cap to prevent backing out.

(V) "INSPECT BLADE ALIGNMENT"

3.4 Inspect for the existence and accuracy of the word "BLADE" in line with each propeller blade on the coupling flange at the main reduction gears.

3.4.1 Stamp coupling hub with the word "BLADE" in line with each propeller blade. Stamping shall be 1/8-inch to 1/4-inch lettering, low stress markings. Etching is prohibited.

3.5 Just prior to undocking, remove blade edge protection installed in 3.2.2.

(V) "INSPECT BLADE EDGE PROTECTION REMOVAL"

3.5.1 Inspect to ensure that blade edge protection has been removed.

4. NOTES:

4.1 Additional inspections or requirements will be specified in invoking Work Item.

4.2 NAVSEA Form 9245/3 is available on the Web at:
<http://www.dcma.mil/NPP/forms.aspx>

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-92
DATE: 18 NOV 2016
CATEGORY: II

1. SCOPE:

1.1 Title: Resilient Mount; install

2. REFERENCES:

2.1 Standard Items

2.2 Equipment Technical Manual

2.3 S9073-A2-HBK-010, Installation and Inspection Information Resilient Mount Handbook

3. REQUIREMENTS:

3.1 Inspect for the presence of heavily mis-loaded or deformed mounts prior to mount removal using 2.2 and 2.3 for guidance.

3.1.1 Submit one legible copy, in approved transferrable media, of heavily mis-loaded or deformed mounts to the SUPERVISOR within one day of identifying the condition.

3.2 Remove resilient mount assemblies, using 2.2 and 2.3 for guidance.

3.2.1 Inspect each equipment foundation for structural integrity, deterioration, pitting, cracks, and areas of damage or distortion.

3.2.1.1 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.2.1 to the SUPERVISOR within 5 days after equipment removal.

3.2.2 Accomplishment of cleaning and painting for disturbed surfaces of each foundation where resilient mount assemblies have been removed shall be in accordance with NAVSEA Standard items (See Note 4.3).

3.3 Select, procure, assemble, install, load, and adjust new resilient mount assemblies including load bolts, foundation bolts, nuts, and snubbers in accordance with 2.3.

3.3.1 Stamp the installation date on each resilient mount flange adjacent to the identification date. The date shall be visible and legible when the mount is installed with 1/8-inch minimum lettering size.

3.3.2 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.3 and 3.3.1 to the SUPERVISOR. The report shall include the following:

3.3.2.1 Ship's name and hull number

3.3.2.2 Contractor and subcontractor

3.3.2.3 Job Order and Work Item number

3.3.2.4 Identity of equipment

3.3.2.5 Amount and designation of mounts installed

4. NOTES:

4.1 Equipment technical manual and drawings referenced in invoking Work Item may identify mount designation and loading requirements.

4.2 This item does not apply to turbine enclosure mounts.

4.3 If cleaning and painting for disturbed surfaces of each foundation where resilient mount assemblies have been removed of 3.2.2 is required; the use of Category II Standard Item 009-32 "Cleaning and Painting Requirements; accomplish" of 2.1 will be specified in the Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-105

DATE: 18 NOV 2016

CATEGORY: II

1. SCOPE:

1.1 Title: Thermal Sprayed Coating for Machinery Component Repair;
accomplish

2. REFERENCES:

2.1 Standard Items

2.2 MIL-STD-1687, Thermal Spray Processes for Naval Ship Machinery
Applications

2.3 0948-LP-045-7010, Material Control Standard

3. REQUIREMENTS:

3.1 For non-LEVEL I Material Identification and Control (MIC) material
repairs, accomplish the requirements of 2.2 for thermal spray coatings on
machinery components.

3.2 For LEVEL I MIC material repairs, accomplish the requirements of 2.2
for thermal spray coatings.

3.2.1 Restore LEVEL I markings after coating process in accordance
with 2.3.

3.2.2 Accomplishment of Material Identification and Control (MIC)
for level I Systems shall be in accordance with NAVSEA Standard Items (See
Note 4.1).

4. NOTES:

4.1 If Material Identification and Control (MIC) for Level I Systems of
3.2.2 is required; the use of Category II Standard item 009-27 "Material
Identification and Control (MIC) for Level I Systems; accomplish" of 2.1 will
be specified in the Work Item.

STANDARD ITEM

FY-19

ITEM NO: 009-112

DATE: 18 NOV 2016

CATEGORY: II

1. SCOPE:

1.1 Title: Prevention of Radiographic-Inspection Ionizing-Radiation Hazard; accomplish

2. REFERENCES:

2.1 None.

3. REQUIREMENTS:

3.1 This item applies to all contracts that utilize radiographic inspection as part of their work. "Foreign contractor" refers to a contractor that is contracted from the U.S. Navy host country in which U.S. Navy contracts may be executed onboard U.S. Government property and/or vessels.

3.2 Each foreign contractor shall comply with the regulatory standards of the host country when conducting radiographic inspections on U.S. Government property and/or vessels.

3.3 Fourteen days prior to start of work, submit one legible copy, in hard copy or approved transferrable media, of completed Radiography Operations Planning Work Sheet, Attachment A, to the SUPERVISOR and obtain approval prior to commencement of radiography operations.

3.4 Fourteen days prior to start of work, submit one legible copy, in hard copy or approved transferrable media, of a diagram illustrating the boundary where the exposure rate shall not exceed 2 mr/hr (0.02 mSv/hr) or under special circumstances the dose to an individual in any unrestricted area would not exceed 2 mrem (0.02mSv) in any one hour. In addition, the boundary shall meet the requirement that no individual member of the public will receive a dose in excess of 100 mrem (1mSv) in a calendar year from the radiographic work, exclusive of background radiation.

3.4.1 In addition to the boundary requirements of 3.4, the foreign contractor shall also illustrate the foreign radiation-boundary requirements.

3.5 Establish a physical boundary where the exposure rate is 2mr/hr or less. In some circumstances the boundary may be established at a point where the dose to an individual in any unrestricted area would not exceed 2 mrem in

any one hour. The perimeter of the radiation area shall be a physical barrier established by an enclosure or by stanchions and rope, as necessary. Post this boundary with tri-foil radiation warning symbol, "Radiation Area", "Radiography in Progress", and "Keep Out" signs written in English and host-country language. The signs shall be visible to any person approaching the radiation area barrier from any accessible direction.

3.5.1 Radiographer shall maintain constant surveillance of the entire area boundary through direct observation or Radiation Safety Officer (RSO)/Radiation Safety Oversight Manager (RSOM) approved positive communication with boundary monitor who is in a position to provide visual surveillance.

3.5.2 Monitor the entire boundary using radiation detection equipment appropriate for the source of radiation during the first radiation exposure of the day. If the beam's orientation, kVp, mA, collimation, or shielding is changed between exposures, the boundary shall be re-surveyed and re-established in accordance with 3.5, if necessary.

3.5.2.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.5.2 within one day. The report shall include Attachment A diagram identifying survey locations, time, date and location of the survey, the highest radiation level recorded, the kVp, mA, and beam direction of the x-ray machine or, if using gamma source material, the half value of the collimator and beam direction at the time of exposure.

3.6 If an unauthorized individual crosses the boundary, the boundary monitor shall immediately notify the radiographer who will immediately stop radiography operations.

3.6.1 Report any boundary violation immediately to the SUPERVISOR. Submit one legible copy, in hard copy or approved transferrable media, of a follow-up report within 4 hours of the violation, using Boundary Violation Report, Attachment B. The report shall include the time, date of violation, name of individual(s), the names of the radiography crew, including boundary monitor, the kVp, mA, duration of actual exposure and beam direction for the x-ray machine or if using source material, the half value of the collimator and the beam direction at the time of violation. Include a diagram showing the location of the violation and the egress path in relation to the source.

3.7 Upon discovery of loss or theft of radioactive material or x-ray producing devices, the radiographer shall cease and make safe all radiographic operations and immediately notify the SUPERVISOR.

3.7.1 Report verbally each incident immediately to the SUPERVISOR.

3.7.1.1 Submit one legible copy, in approved transferrable media, of a formal written report of the incident within one day.

4. NOTES:

4.1 The SUPERVISOR shall perform oversight and surveillance of all radiography operations on U.S. Government property and/or vessels associated with contracted work.

4.2 The technical point of contact for the requirements contained in this Standard Item is SUPERVISOR's RSO or RSOM for radiographic inspections conducted in the host-country and any U.S. Government Detachment.

4.3 This Standard Item complies with 10 CFR Parts 19, 20, and 34 and 29 CFR 1910.1096.

ATTACHMENT A

RADIOGRAPHY OPERATIONS PLANNING WORK SHEET

A. General Information

1. Prime Contractor Name: _____
2. Subcontractor Name (if applicable): _____
3. Proposed Date(s) and Time(s) of Planned Radiography: _____
4. Purpose of Radiographic Operation: _____
5. Host country regulatory standards applicable to radiographic inspections preferably translated to English.

B. If conducting gamma radiography complete the following:

1. Radioisotope: _____ Serial Number: _____
2. Activity: _____ Date of Determination of Activity: _____
3. Collimator Serial Number: _____
4. Half Value Thickness: _____
5. Transportation and vehicle information:
 - a. Manufacturer: _____
 - b. Model: _____
 - c. License Plate Number: _____
 - d. Sign on Vehicle: _____
 - e. Driver's Name: _____
 - f. Passengers: _____
 - g. Location of radiography operation site (ship, submarine, building, pier): _____
 - h. Transportation route to be taken to and from work site while on Government activity:

C. If conducting x-ray radiography complete the following:

1. Machine Manufacturer: _____
2. Serial Number: _____
3. Maximum kVp: _____
4. Maximum mA: _____
5. Total Number of Exposures: _____
6. Direction of Beam: _____

D. Provide a diagram of each work site that illustrates:

1. Each location of the radiography, including major features such as walls, bulkheads, tanks, walkways or passageways that may provide shielding or difficulty in controlling the area.
2. The location of the exposure device drive cable, guide tube, and end stop if using gamma radiography equipment, or the location of the tube head and control panel if conducting x-ray radiography.
3. The location of the 2 mr/hr (0.02 mSv/hr) controlled boundary.

E. Provide the calculations for the 2 mr/hr (0.02 mSv/hr) controlled boundary from the distance from the gamma radiography source, or the x-ray machine tube head, to the location where the boundary shall be established.

F. Review/Approval:

Contractor's Radiographer: _____
 Name (Printed)

 Signature

Date: _____

RSO/RSOM (SUPERVISOR's) Approval: _____
 Name (Printed)

 Signature

Date: _____

**ATTACHMENT B
FOR OFFICIAL USE ONLY**

BOUNDARY VIOLATION REPORT
Report #

<u>NAME OF REPORTING INDIVIDUAL:</u>	
<u>TIME/DATE OF THE VIOLATION:</u> <u>LOCATION OF THE VIOLATION:</u>	<u>COMPANY:</u>
<u>EQUIPMENT INVOLVED</u>	
<u>FOR GAMMA RADIOGRAPHY:</u> <u>ISOTOPE:</u> <u>ACTIVITY:</u> <u>HALF VALUE OF THE COLLIMATOR:</u> <u>DURATION OF EXPOSURE:</u>	<u>FOR X-RAY RADIOGRAPHY</u> <u>mA:</u> <u>kVp:</u> <u>DURATION OF EXPOSURE:</u>
<u>WORK ITEM NUMBER:</u>	<u>CONTRACT NUMBER:</u>

INDIVIDUALS WHO VIOLATED THE BOUNDARY

NAME(S)	DEPT.	ORGANIZATION/COMPANY

**NAMES OF THE RADIOGRAPHY CREW MEMBERS,
INCLUDING NAMES OF BOUNDARY MONITORS**

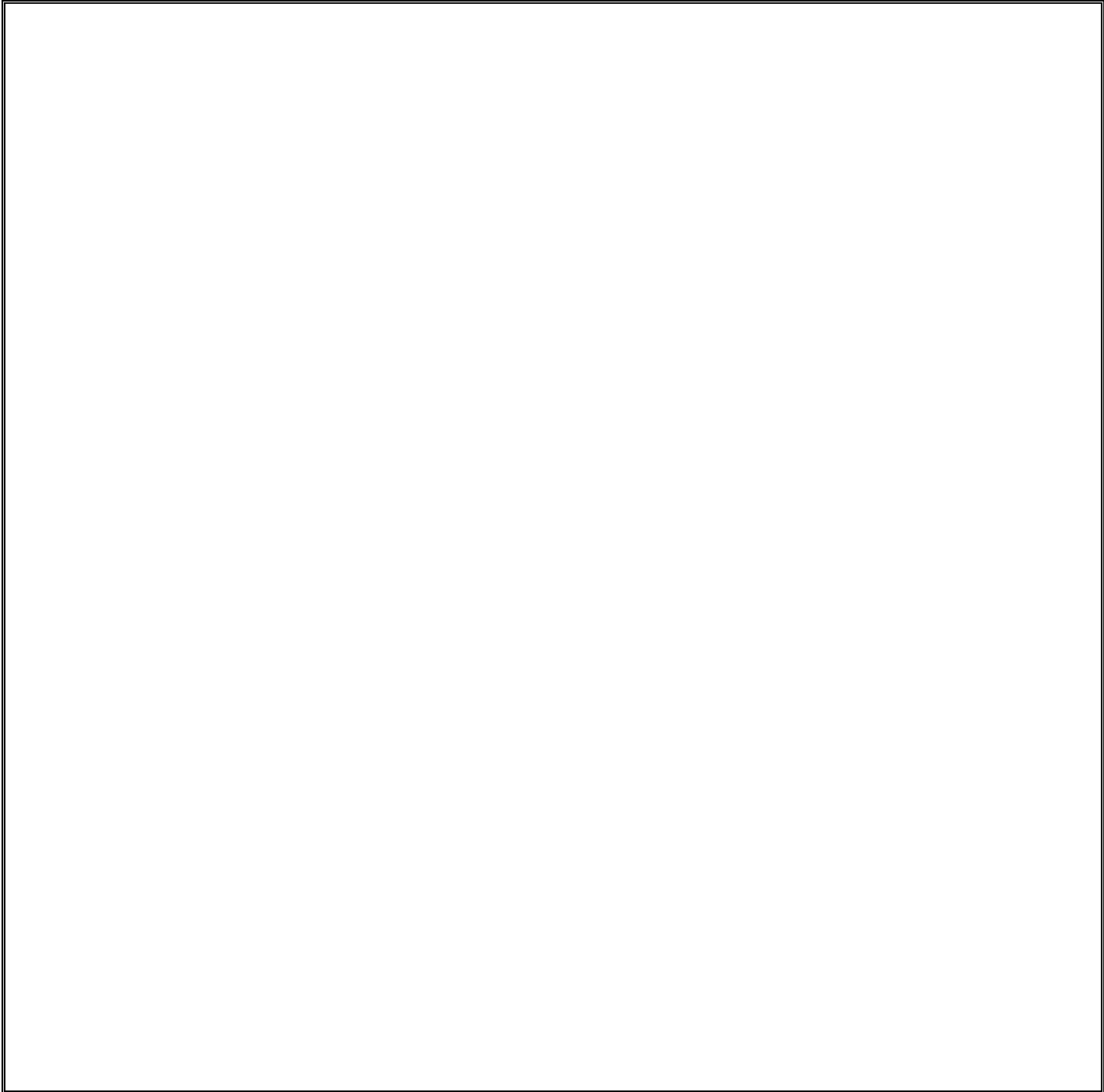
NAME(S)	DEPT.	COMPANY

ATTACHMENT B
FOR OFFICIAL USE ONLY

DESCRIPTION OF BOUNDARY VIOLATION

ATTACHMENT B
FOR OFFICIAL USE ONLY

DIAGRAM SHOWING THE LOCATION OF THE VIOLATION AND THE EGRESS PATH
IN RELATION TO THE SOURCE



<u>SIGNATURE OF REPORTING INDIVIDUAL:</u>	DATE:
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ATTACHMENT B
FOR OFFICIAL USE ONLY

Incident Report Instructions

REPORT NUMBER- Unique tracking number created by contractor

NAME OF REPORTING INDIVIDUAL: – Self Explanatory

DATE/TIME OF THE VIOLATION: – Self Explanatory

LOCATION OF THE VIOLATION: – Base/Yard, Ship name and hull number, space number and compartment name

COMPANY: – Prime and subcontractors involved

SUPERVISOR – Supervisor of employee(s) involved

EQUIPMENT INVOLVED – Self Explanatory

WORK ITEM NUMBER – Work Item being accomplished when incident occurred

CONTRACT NUMBER: – Contract Number assigned by government agency i.e. RMC, AIT Sponsor.

INDIVIDUALS WHO VIOLATED THE BOUNDARY: – Name, Department and Organization/Company of individuals that violated the boundary.

NAMES OF THE RADIOGRAPHY CREW MEMBERS, INCLUDING NAMES OF BOUNDARY MONITORS: – Name, Department and Company of the members of the radiography crew, including names of boundary monitors.

DESCRIPTION OF BOUNDARY VIOLATION: – Narrative description of the boundary violation including the sequence of events, time line, estimated exposures to individuals who violated the boundary, the immediate corrective actions taken to secure operations and emergency notifications that were made.

DIAGRAM SHOWING THE LOCATION OF THE VIOLATION AND THE EGRESS PATH IN RELATION TO THE SOURCE: – A diagram of the location of the boundary violation showing the egress path and location of the individual(s) that violated the boundary, location of the source, beam direction (for x-ray machine radiography or gamma radiography if collimator was used) and the location of any barriers, walls, or equipment that would provide shielding.

SIGNATURE OF REPORTING INDIVIDUAL: – Self Explanatory.

TITLE – Self Explanatory.

DATE – Self Explanatory.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-115

DATE: 30 JUL 2015

CATEGORY: II

1. SCOPE:

1.1 Title: Bearing Rebabbiting; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 SL460-AA-HBK-010, Handbook for Inspection, Packaging, Handling, Storage and Transportation

2.3 DOD-STD-2188, Babbitting of Bearing Shells (METRIC)

2.4 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

3. REQUIREMENTS:

3.1 Crate and secure each bearing identified in the work item. Packaging shall conform to 2.2. Reuse crate for return shipping.

3.1.1 Ship crated material prepaid to and from the contractor's facility.

(I) (G) "SHIPPING CRATE INSPECTION"

3.1.2 Prior to packing and crating, visually inspect the crate for conformance and proper packaging and securing of each bearing.

3.2 Accomplishment of a Process Control Procedure (PCP) for the process of rebabbiting each bearing shall be in accordance with NAVSEA Standard Items (See Note 4.3), each bearing drawing, 2.3, and ASTM B339. The PCP shall provide for accomplishment of all steps from receipt inspection to final dimensional inspection and verify compliance with and documentation of the following steps:

3.2.1 Receipt inspection of babbit and tin to the requirements of 2.3 and ASTM B339.

3.2.2 Receipt inspection of bearing

- 3.2.3 Removal of existing babbit
- 3.2.4 Bearing shell machining
- 3.2.5 Bearing shell cleanliness
- 3.2.6 Bearing shell fluxing
- 3.2.7 Bearing shell tinning temperatures
- 3.2.8 Bearing shell babbitting, centrifugal and or static
- 3.2.9 Centrifugal casting rotation speed
- 3.2.10 Static casting rodding
- 3.2.11 Pouring babbit temperatures of babbit and bearing shell
- 3.2.12 Post babbit machining

(I) (G) "VERIFICATION OF BOND"

3.2.13 Bond testing in accordance with DOD-STD-2188 and 2.4.

3.2.14 Final inspection to determine conformance to referenced drawing dimensional requirements.

(I) (G) "SHIPPING CRATE INSPECTION"

3.2.15 Packaging and crating inspection and conformance to 2.2 packaging requirements.

3.3 Submit one legible copy, in hard copy or approved transferrable media, of the PCP with all substantiating documents within one day of completion of the requirements of 3.2.15. Provide one additional legible hard copy of the completed PCP with the bearing when shipped.

4. NOTES:

4.1 Known source: American Metal Bearing Company
7191 Acacia Avenue,
Garden Grove, CA 92841-5297
Contact number; 714-892-5527 or 800-888-3048

4.2 If drawing for bearing is not available, invoke NSI 009-90 to ensure bearing is correctly refurbished in conformance with equipment manufacturer's requirements and specifications.

4.3 If a Process Control Procedure (PCP) for the process of rebabbitting each bearing in 3.2 is required; the use of Category II Standard Item 009-09 "Process Control Procedure (PCP); provide and accomplish" of 2.1 will be

specified in the Work Item. If rebabbitting is accomplished by the OEM or other NAVSEA approved organization, a NAVSEA approved process may be used in lieu of a PCP.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-122

DATE: **01 OCT 2017**

CATEGORY: I

1. SCOPE:

1.1 Title: Temporary Padeye; install and remove

2. REFERENCES:

2.1 Standard Items

2.2 804-5184133, Padeye, Machinery Lifting

2.3 MIL-STD-1689, Fabrication, Welding, and Inspection of Ships
Structure

3. REQUIREMENTS:

3.1 Fabricate each temporary padeye and rigging attachment in accordance with 2.2 and 2.3.

3.1.1 Each temporary padeye for weight handling on surface ship and non-nuclear loads shall be designed with a safety factor of six, based on ultimate strength of materials for safe working load.

3.1.2 Submit one legible copy, in hard copy or approved transferrable media, of a report listing the design of each planned temporary padeye not in compliance with 2.2 for SUPERVISOR approval 7 days prior to planned installation. Include material specification, dimensional drawing(s), weld joint design, and installation location.

3.2 Install and inspect each temporary padeye in accordance with 2.2 and 2.3.

3.2.1 Inspect each temporary padeye and support structure for cracks and deformation prior to installation.

3.2.1.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the requirements of 3.2 and 3.2.1 to the SUPERVISOR.

3.2.2 Accomplish the requirements of 009-12 of 2.1, including Table 2, Columns A, B, or C, lines one through 7.

3.2.3 Maintain a log of each temporary padeye installed to include a unique serial number, Safe Working Load, location by Compartment and approximate frame, date installed and date removed.

(I) " **Non-Destructive Testing**"

3.3 Accomplish a **NDT** of each temporary padeye, attachment weld, and attachment point to ship's structure for deformation, elongation, and cracking. Allowable Defects: None.

3.3.1 For steel temporary padeyes with a Safe Working Load (SWL) over "2,000" accomplish MT in accordance with 2.3. For steel temporary padeyes with a SWL less than "2,000" accomplish VT in accordance with 2.3.

3.3.2 For aluminum temporary padeyes with a SWL over "1,500" pound accomplish PT in accordance with 2.3. For aluminum temporary padeyes with a SWL less than "1,500" pound accomplish VT in accordance with 2.3.

3.4 Upon completion of satisfactory testing and inspection, label each temporary padeye with paint, paint stick or other permanent marking. Include the padeye serial number, "T" for Temporary, and Safe Working Load (Example: NNN T SWL "2000" lbs).

3.5 Chip and grind surfaces in way of removals each temporary padeye at the conclusion of the work for which they were installed. Removal shall be in accordance with Section 14.10 of 2.3

3.5.1 Weld repair each temporary padeye removal site in accordance with Section 14.10 of 2.3.

3.5.1.1 Accomplish the requirements of 009-12 of 2.1, including Table 2, Columns A, B, or C, lines one through 7.

3.6 Accomplishment of the requirements of 009-32 of 2.1 for new and disturbed surfaces.

3.7 Submit one legible copy, in hard copy or approved transferrable media, of completed log of 3.2.3 to the SUPERVISOR within 72 hours after removing all temporary padeyes, or prior to ship's departure, whichever occurs first.

4. NOTES:

4.1 Weight handling padeyes or devices which are proof-tested **to 200 percent of their SWL with a post-test visual inspection in accordance with paragraph 3.3** do not require inspection of welds by penetrant or magnetic methods unless otherwise specified.