**JOINT FLEET MAINTENANCE MANUAL**

**VOLUME IV**

**TESTS AND INSPECTIONS**

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|---|
| FROM:<br>ACTIVITY/SHIP _____ E-MAIL ADDRESS _____<br><br>CODE/DEPT/SHOP _____ DATE _____<br><br>ORIGINATOR _____ TEL EXT (___) _____ |
| VOL-PART-PARA NO. _____ FIGURE _____ TABLE _____<br><br>PROCESSING NORMAL _____ URGENT*_____<br>* (Justify in rationale below if urgent is marked and transmit via e-mail as "High Importance")<br>PROBLEM DESCRIPTION: |
| RECOMMENDED CHANGE: (Include any proposed text addition/deletion) |
| RATIONALE: |

E-mail to PTNH.SUBMEPP.JFMMMGR@Navy.Mil
(If mailing, fold on dotted line on reverse sideand mail to Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity or send facsimile to (207) 438-6210.)

FOLD

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Commanding Officer

OFFICIAL BUSINESS

Commanding Officer
Submarine Maintenance Engineering,
Planning and Procurement (SUBMEPP) Activity
Attn: Code 1832JM
P.O. Box 2500
Portsmouth Naval Shipyard
Portsmouth, NH 03804-2500

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FOLD

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**VOLUME IV**

**TESTS AND INSPECTIONS**

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## APPENDIX A

## LIST OF ACRONYMS

| | |
|---|---|
| 3-M | Maintenance and Material Management |
| ABC | Automatic Boiler Control |
| ABO | Aviators Breathing Oxygen |
| ACN | Advance Change Notice |
| AEL | Allowance Equipage List |
| AEOG | Automated Electrolytic Oxygen Generator |
| AIMD | Aviation Intermediate Maintenance Department |
| ALRE | Aircraft Launch and Recovery Equipment |
| ALREMP | Aircraft Launch and Recovery Equipment Maintenance Program |
| APL | Allowance Parts List |
| AWR | Automated Work Request |
| BIRMIS | Boiler Inspection and Repair Maintenance Information System |
| CAFSU | Carrier And Field Service Unit |
| CAI | Completion of Availability Inspection |
| CASREP | Casualty Report |
| CD-ROM | Compact Disk |
| CHT | Collection, Holding and Transfer |
| CLASSRON | Class Squadron |
| CMAV | Continuous Maintenance Availability |
| CNO | Chief of Naval Operations |
| COMLANTFLT | Commander, Atlantic Fleet |
| COMNAVAIRLANT | Commander Naval Air Force Atlantic |
| COMNAVAIRPAC | Commander Naval Air Force Pacific |
| COMNAVRESFOR | Commander Naval Reserve Force |
| COMNAVSURFLANT | Commander Naval Surface Force Atlantic |
| COMNAVSURFPAC | Commander Naval Surface Force Pacific |
| COMPACFLT | Commander, Pacific Fleet |
| COMSUBLANT | Commander Submarine Force Atlantic |
| COMSUBPAC | Commander Submarine Force Pacific |
| COMSUBRON | Commander Submarine Squadron |
| COSAL | Coordinated Shipboard Allowance List |
| CPO | Chief Petty Officer |
| CSMP | Current Ship's Maintenance Project |
| CWP | Controlled Work Package |
| DCA | Damage Control Assistant |
| DDS | Dry Deck Shelter |
| DEI | Diesel Engine Inspector |
| DFS | Departure From Specification |
| DFT | De-Aerating Feed Tank |
| DLSS | Diver Life Support System |
| DMP | Depot Modernization Period |
| DO | Duty Officer |
| DOD | Department of Defense |
| DOP | Designated Overhaul Point |
| ECI | Eddy Current Inspection |
| EDG | Emergency Diesel Generator |
| EDO | Engineering Duty Officer |
| EOG | Electrolytic Oxygen Generator |

| | |
|---|---|
| EOOW | Engineering Officer Of the Watch |
| EOSS | Engineering Operational Sequencing System |
| ESU | Elevator Support Unit |
| FMA | Fleet Maintenance Activity |
| FWP | Formal Work Procedure |
| GFE | Gas Free Engineering |
| GS | Gas Turbine Technician |
| GTB | Gas Turbine Bulletin |
| GTRR | Gas Turbine Readiness Review |
| HSC | Hierarchical Structure Code |
| ILPE | Integrated Low Pressure Electrolyzer |
| ILS | Integrated Logistics Support |
| INSURV | Board of Inspection and Survey |
| IRAC | Interim Rapid Action Change |
| ISIC | Immediate Superior In Command |
| ISV | Industrial Support Visit |
| ITP | Index of Technical Publications |
| JCN | Job Control Number |
| JFMM | Joint Fleet Maintenance Manual |
| JSN | Job Sequence Number |
| LCEM | Life Cycle Engineering Manager |
| LET | Logistics and Escape Trunk |
| LMD | Library Management Database |
| LWC | Lead Work Center |
| MDS | Maintenance Data System |
| METCAL | Metrology and Calibration |
| MGTI | Marine Gas Turbine Inspector |
| MGTIS | Marine Gas Turbine Information System |
| MI | Material Inspection |
| MILSPEC | Military Specification |
| MIP | Maintenance Index Page |
| MOA | Memorandum of Agreement |
| MPA | Main Propulsion Assistant |
| MPDE | Main Propulsion Diesel Engine |
| MR | Maintenance Requirement |
| MRC | Maintenance Requirement Card |
| MS | Maintenance Standard |
| MSC | Maintenance Support Center |
| MSD | Marine Sanitation Device |
| NATEC | Naval Air Technical Data and Engineering Service Command |
| NAVAIR | Naval Air Systems Command |
| NAVAIRWARCEN | Naval Air Warfare Center |
| NAVFAC | Naval Facilities Engineering Command |
| NAVSEA | Naval Sea Systems Command |
| NAVSEA 08 | Naval Sea Systems Command Nuclear Propulsion Directorate |
| NAVSUP | Naval Supply Systems Command |
| NEC | Navy Enlisted Classification |
| NFPA | National Fire Protection Agency |

| | |
|---|---|
| NMF | Naval Maintenance Facility |
| NSF | Nuclear Support Facility |
| NSN | National Stock Number |
| NSTM | Naval Ship's Technical Manual |
| NSWCCD | Naval Surface Warfare Center, Carderock Division |
| NSWCCD-SSES | Naval Surface Warfare Center, Carderock Division - Ship System Engineering Station |
| NTE | Nuclear Test Equipment |
| | |
| $O_2$-$N_2$ | Oxygen - Nitrogen |
| OEM | Original Equipment Manufacturer |
| OGP | Oxygen Generating Plant |
| OJT | On the Job Training |
| OOD | Officer Of the Deck |
| OPNAVINST | Office of the Chief of Naval Operations Instruction |
| | |
| PLAD | Plain Language Address Directory |
| PMS | Planned Maintenance System |
| PMT | Performance Monitoring Team |
| POAM | Plan of Action and Milestones |
| PQS | Personnel Qualification Standard |
| PSAI | Pre-Start of Availability Inspection |
| | |
| QA | Quality Assurance |
| QPL | Qualified Products List |
| | |
| RBO | Repair Before Operating |
| REC | Re-Entry Control |
| RIRMIS | Reboiler Inspection and Repair Management Information System |
| RMC | Regional Maintenance Center |
| RMCSG | Regional Maintenance Center Support Group |
| RPM | Reactor Plant Manual |
| RSG | Regional Support Group |
| RTE | Remote Temperature Element |
| | |
| SAI | Start of Availability Inspection |
| SAMM | Shipboard Automated Maintenance Module |
| SCA | System Certification Authority |
| SCIRMIS | Steam Catapult Inspection and Repair Maintenance Information System |
| SCSC | System Certification Survey Cards |
| SDI | Ship's Drawing Index |
| SEIE | Submarine Escape Immersion Ensemble |
| SEMAT | Systems and Equipment Material Assessment Team |
| SGPI | Steam Generating Plant Inspector |
| SME | Subject Matter Expert |
| SOC | Scope Of Certification |
| SOSMIL | Safety Of Ship Maintenance Item List |
| SRC | Submarine Rescue Chamber |
| SRDRS | Submarine Rescue Diving Recompression System |
| SSDG | Ship Service Diesel Generator |
| SSES | Ship System Engineering Station |
| SUBSAFE | Submarine Safety |
| SWL | Safe Working Load |
| | |
| TDMIS | Technical Document Management Information System |

| | |
|---|---|
| TRF | TRIDENT Refit Facility |
| TWD | Technical Work Document |
| TYCOM | Type Commander |
| VLA | Visual Landing Aids |
| VRT | Voyage Repair Team |
| VSV | Variable Stator Vane |
| WAF | Work Authorization Form |
| WC | Work Center |
| WHE | Weight Handling Equipment |

# VOLUME IV

## CHAPTER 3

## BOILER INSPECTION

REFERENCES.

(a) OPNAVINST 9220.3 - Propulsion and Auxiliary Plant Inspection and Inspector Certification Program
(b) NAVSEA S9086-GY-STM-010 - NSTM Chapter 221 (Boilers)
(c) NAVSEA S9221-D2-MMA-010 - Steam Generating Plant Inspection (Non-Nuclear)
(d) NWP 1-03.1 - Naval Warfare Publication Operational Report
(e) NAVSEA S6470-AA-SAF-010 - Gas Free Engineering Manual
(f) NAVSEA S9086-CH-STM-030 - NSTM Chapter 074 Volume 3 (Gas Free Engineering)
(g) NAVSEA S9086-GX-STM-020 - NSTM Chapter 220 Volume 2, (Boiler Water/Feedwater Test and Treatment)
(h) NAVSEA S9086-RK-STM-010 - NSTM Chapter 505 (Piping Systems)
(i) NAVSEA S9086-G3-STM-010 - NSTM Chapter 225 (Steam Machinery Controls Systems)
(j) OPNAVINST 9220.2 - U.S. Navy Boiler Water and Feedwater Test and Treatment Program (Nuclear Excluded)
(k) OPNAVINST 4100.11 - Navy Energy Usage Reporting System (NEURS)
(l) COMLANTFLTINST/COMPACFLTINST 4100.3 - Navy Energy Usage Reporting System (NEURS)

LISTING OF APPENDICES.

A Sample Boiler Inspection Request Message
B Sample Inspection Confirmation Message
C Summary of Boiler Inspection Scheduling and Responsibilities
D Sample Boiler Inspection Report Cover Letter
E Sample Boiler Inspection - RBO/Severely Degraded Deficiencies Message
F Sample RBO Rescission Message
G Sample 30 Day Update Message

3.1 PURPOSE. To establish policy and provide procedures and inspection requirements for the inspection of all conventional steam generating plants in surface ships and training sites including schedules, preparations for inspection, inspection guidelines and reporting.

3.1.1 Policy. Periodic standardized inspections are required of all non-nuclear propulsion, auxiliary, waste heat and training site boilers by a certified Steam Generating Plant Inspector (SGPI) and/or Naval Surface Warfare Center, Carderock Division (NSWCCD) Life Cycle Engineering Manager (LCEM), as applicable. The maximum interval between boiler inspections and other occasions requiring boiler inspections, including responsibilities for continuation and standardization of the boiler inspection program, are formally assigned in reference (a).

3.2 TYPES OF BOILER INSPECTIONS.

a. Routine Inspection.

b. Pre-start of Availability Inspection (PSAI).

c. Start of Availability Inspection (SAI).

d. Strength and Integrity Inspection.

e. Industrial Support Visit (ISV).

f. Completion of Availability Inspection (CAI).

g. Inactivation or Reactivation Inspection.

h. Engineer Officer Inspection.

i. Major Repair Inspection.

j. Special Inspection.

k. Operational Assessments.

3.3 RESPONSIBILITIES.

3.3.1 Naval Sea Systems Command. NAVSEA shall provide technical authority oversight over all main, auxiliary, waste heat and training site boiler systems and associated equipment. The designated NAVSEA Technical Warrant Holder shall:

a. Assure safe and reliable system operation.

b. Set and enforce all technical requirements.

c. Approve all major Departure from Specifications (DFS).

d. Provide technical oversight and management of the SGPI and NSWCCD LCEM programs:

(1) Establish and enforce requirements for SGPI certification and recertification.

(2) Ensure periodic SGPI seminars are conducted.

(3) Ensure periodic technical audits of all Integrated Logistics Support documentation and Training.

(4) Maintain the Boiler Inspection and Repair Management Information System (BIRMIS).

(5) Routinely evaluate and ensure state of the art inspection, maintenance and repair tools and techniques are used.

3.3.2 Naval Surface Warfare Center, Carderock Division. NSWCCD shall:

a. Provide support to NAVSEA for the SGPI and NSWCCD LCEM programs. Ensure that the required technical documentation to support the SGPI/NSWCCD LCEM Inspector programs is maintained current.

b. Establish and monitor the requirements and standards for routine and industrial inspections of steam generating plants.

c. Develop, implement and maintain a program to train and certify NSWCCD LCEM Inspectors in accordance with reference (a).

d. Ensure that inspections of newly constructed ships and ships undergoing major overhaul and/or conversion are conducted in accordance with this instruction.

e. Conduct periodic technical audits of the SGPI Training Course per reference (a).

f. Provide management of technical data, boiler history and the associated repair management information database system.

g. Provide technical support to the semi annual seminars.

h. Maintain a roster of all certified SGPIs by name, rating, duty station, date of certification and expiration date of certification. Revoke inspector certification and initiate action to decertify inspectors who fail to comply with requirements of reference (a).

i. Ensure that the requirements for SGPI certification, recertification and certification extensions are met prior to final approval.

3.3.3 Fleet Commander. The Fleet Commander shall:

a. Identify and designate those fleet activities which have inspection responsibilities and maintain a base of certified SGPIs within those activities.

b. Ensure the availability of "school ships" to support SGPI/NSWCCD LCEM Inspector training. Student certification must be conducted on "D" type boilers.

c. Host the semi-annual SGPI seminars on an alternating coast basis.

3.3.4 Regional Maintenance Center. The Regional Maintenance Center (RMC) shall:

a. Provide certified SGPIs to perform inspections per section 3.6 of this chapter.

b. Review the guidelines and inspection requirements for all boiler inspections required by this instruction and ensure that each inspection report is recorded and updated into BIRMIS.

c. Schedule and coordinate inspections of all steam generating plants required by this instruction with the appropriate technical activities to avoid the unnecessary opening of boilers.

d. Provide a qualified SGPI when requested by the ship, Immediate Superior in Command (ISIC) or Type Commander (TYCOM).

3.3.5 Regional Maintenance Center Commanding Officers. RMC Commanding Officers shall:

a. Coordinate inspections in cognizant maintenance areas.

b. Maintain an up-to-date status of required steam generating plant inspections which shall include the latest inspection for all ships assigned to RMCs in their respective area of responsibility.

3.3.6 Immediate Superior In Command. The ISIC shall:

a. Maintain overall cognizance of the Steam Generating Plant Inspection Program within their area of responsibility to ensure requirements and standards are met.

b. Schedule routine steam generating plant inspections in coordination with the cognizant RMC.

c. Arrange for the availability of an SGPI during the SAI and CAI in coordination with NSWCCD and the cognizant RMC.

d. Monitor the follow-up action required to correct noted discrepancies by randomly sampling the ship's deferred maintenance action file and most recent boiler inspection report.

e. Assist Commanding Officers in arranging for the corrective action of items beyond the capability of Ship's Force, when requested.

3.3.7 Ship Commanding Officer/Officer In Charge/Maintenance Team. Ship Commanding Officers/Officers In Charge/Maintenance Team shall:

a. Request boiler inspections via Naval Message using the format in Appendix A of this chapter.

b. Prepare for scheduled inspections to include required operational testing in accordance with references (b) and (c).

c. Review inspection results and initiate corrective action for those items within Ship's Force capability. Initiate requests for the correction of items beyond Ship's Force capability. If any of the discrepancies of paragraph 3.9.2 of this chapter cannot be corrected within 72 hours following completion of the inspection, or if said discrepancies will impact the ship's operational schedule, initiate a Casualty Report (CASREP) for the affected boiler(s) in accordance with reference (d).

d. Assess the impact (if any) of corrective action on operating schedules and advise the operational commanders. Decide (with repair activities) the optimum timing of repair actions to minimize impact on operating schedules.

e. Submit reports per paragraph 3.7.2 of this chapter.

f. Schedule boiler inspections as required by appropriate Planned Maintenance System (PMS)/Class Maintenance Plan item.

3.3.8 Regional Maintenance Center Senior Inspector. RMC Senior Inspectors shall:

a. Ensure all assigned SGPIs maintain current certifications per reference (a).

b. Perform steam generating plant inspections per section 3.9 of this chapter, when directed.

c. Review and submit reports per paragraph 3.7.2 of this chapter.

d. Send inspection confirmation messages using Appendix B of this chapter.

e. Administer an SGPI pre-test for SGPI training school candidates per reference (a).

3.3.9 Steam Generating Plant Inspector. The SGPI shall:

a. Maintain SGPI certifications per reference (a).

b. Perform steam generating plant inspections per section 3.9 of this chapter, when directed.

c. SGPIs are part of the technical authority chain-of-command and are accountable to the NAVSEA Technical Warrant Holder for the performance of their inspection duties.

**NOTE: THE SHIP'S FORCE SGPI CAN ONLY ACCOMPLISH SPECIAL INSPECTIONS AND OPERATIONAL ASSESSMENTS ON THEIR OWN SHIP, AS DESCRIBED IN PARAGRAPHS 3.6.9 AND 3.6.10 OF THIS CHAPTER. THE SHIP'S FORCE SGPI WILL ASSIST THE RMC SGPI/NSWCCD LCEM INSPECTOR DURING ROUTINE AND AVAILABILITY RELATED INSPECTIONS. THE SHIP'S FORCE SGPI MAY NOT INDEPENDENTLY CONDUCT ROUTINE, STRENGTH AND INTEGRITY, PSAI, SAI, ISV, CAI INSPECTIONS ON THEIR OWN SHIP.**

3.4 INSPECTION SCHEDULING. Commands will initiate boiler inspection requests in a timely manner to assist with inspection scheduling coordination to include operational testing. Commands shall ensure the inspection scheduling complies with the following:

a. Commanding Officers/Officers In Charge of ships shall request boiler inspections by message. In addition, OPNAV 4790/2-Kilo shall be submitted to the RMC requesting a certified SGPI/NSWCCD LCEM inspector as required to conduct inspections.

b. Inspections should coincide with the required routine waterside and fireside maintenance.

c. Boiler inspection services shall be coordinated by geographic areas for maximum utilization of SGPIs/NSWCCD LCEM Inspectors. ISICs will combine inspection requests and schedule inspections.

d. The TYCOM may utilize PSAIs, CAIs, and Strength and Integrity Inspections, which are documented in BIRMIS, to satisfy the pressure vessel portion of a routine boiler inspection. This will reduce the number of boiler openings. A Routine Inspection will not be considered completed until an SGPI has certified all items required in NSTM 221-2.1.2.3 Ship's Pre-inspection Checklist For Up-coming Routine Boiler Inspection by U.S. Navy Steam Generating Plant Inspector and reference (c), Appendix E, F and Figure E-6 addressing Operational Assessments has been accomplished. Once completed, this resets the periodicity required for the next inspection to 18 months not to exceed 24 months.

3.5 BOILER SAFETY PROCEDURES. The safety of personnel must be given the highest priority. Observance of good engineering practices and careful control of boiler water chemistry will reduce the frequency of pressure vessel entry.

a. Ensure "idle boiler condition" is accomplished per the provisions of the Engineering Operational Sequencing System (EOSS) and reference (b). Where conflicts occur, an EOSS feedback form should be submitted for resolution.

b. Do not enter any part of a boiler or De-Aerating Feed Tank (DFT) until it has been fully ventilated and certified by a Naval Maintenance Facility Gas Free Engineer/National Fire Protection Agency marine chemist as safe for entry in accordance with references (e) and (f), as applicable, and Chapter 25 of this volume.

c. Ensure the idle boiler is tagged out (valves wired shut and danger tagged). Observe two-valve protection per Chapter 10 of this volume where applicable. Open to the atmosphere the drain connections on all dead interconnecting piping to observe drainage.

d. The use of unshielded or non-approved portable lighting in an open boiler is prohibited. Portable lighting shall be watertight. (National Stock Number (NSN) 9S-6230-00-701-2947 applies.)

e. Ensure all precautions cited in Section 2.24 of reference (b) are followed before entering an idle boiler.

f. There shall be a safety observer outside the boiler entrance to provide assistance whenever personnel are inside a boiler (steam drum, water drum, firebox or smokepipe).

g. Maintain an inventory log for accountability of all items taken into a boiler. The pockets of all personnel working in a boiler shall be emptied and all jewelry removed. The removal of all items from the boiler shall be verified from the inventory log prior to the close-up inspection. The Chief Engineer or his designated representative shall inspect the boiler prior to final close-out.

h. Cleaning of firesides or repairs conducted to the pressure vessel exterior of a boiler is acceptable with a steaming boiler in the same space provided the precautions cited in Section 2.7 of reference (b) are observed. Water washing of the firesides is not authorized without NAVSEA approval.

i. Requiring personnel to enter the steam/water side of a boiler with an adjacent steaming boiler is considered an unnecessary risk and will be avoided unless operations dictate otherwise. The decision to override normal safety precautions will be made by the Commanding Officer/Officer In Charge and will be reported to the TYCOM by message.

j. Keep the area under the boiler clean and dry.

k. Place signs warning that personnel are working in the boiler at the Boiler Console Operating station in the boiler operating space. The sign shall remain there until the work has been completed and personnel are clear of the secured boiler.

3.6 BOILER INSPECTIONS AND REQUIREMENTS. Main propulsion, auxiliary, waste heat and training site boiler inspections conducted per the requirements of this chapter shall fulfill all other requirements for comprehensive inspections of propulsion, auxiliary and waste heat boilers. All boiler inspections, including pre- and post-operational assessments, should be scheduled for coincidental performance. Appendix C of this chapter is a summary of boiler inspection scheduling and responsibilities. Propulsion, auxiliary and waste heat boilers will be inspected by a certified SGPI at the following intervals:

3.6.1 Routine Inspection. Routine Inspections will be conducted at least once every Inter-Deployment Training Cycle and shall not exceed 24 months from its last inspection. For newly constructed ships, the 24 month period shall begin at the completion of the Board of Inspection and Survey (INSURV) Acceptance Trials. The normal interval between routine boiler inspections shall be 18 months. To provide scheduling flexibility, boiler inspections may be performed as early as 12 months or as late as 24 months after the previous inspection. Inspections that exceed the 18 month interval will require a minor DFS to the TYCOM with recommendation from NSWCCD-SSES. Extensions shall not result in the inspection interval exceeding 24 months. Any boiler which exceeds the inspection interval shall be placed out of commission until inspected by a certified SGPI. A major DFS with NAVSEA Technical Warrant Holder approval is required to operate a boiler beyond 24 months without a Routine Boiler inspection. The CAI or Strength and Integrity required inspections fulfill the requirements of a routine inspection.

a. The boiler inspection will be scheduled by the cognizant ISIC.

b. The boiler inspection will be performed by the cognizant SGPI.

c. The TYCOM/CLASSRON may utilize PSAIs, CAIs, and Strength and Integrity Inspections which are documented in BIRMIS, to satisfy the pressure vessel portion of a routine boiler inspection. This will reduce the number of boiler openings. A Routine Inspection will not be considered completed until an SGPI has certified all items required in NSTM 221-2.1.2.3 Ship's Pre-inspection Checklist For Up-coming Routine Boiler Inspection by U.S. Navy Steam Generating Plant Inspector and reference (c), Appendix E, F and Figure E-6 addressing Operational Assessments has been accomplished. Once completed, this resets the periodicity required for the next inspection to 18 months not to exceed 24 months.

3.6.2 Pre-start of Availability Inspection. The PSAI may be required at the discretion of the TYCOM to support early bid specification and work package development.

a. The PSAI will be scheduled by the ISIC, as approved by the cognizant TYCOM.

b. The PSAI will be performed by the NSWCCD LCEM Inspector and the RMC SGPI.

3.6.3 Start of Availability Inspection. The SAI may be required to be accomplished at the beginning of an overhaul/availability to better define or re-evaluate the boiler bid specifications and/or work items at the discretion of the ISIC with TYCOM concurrence.

a. The SAI will be scheduled by the ISIC, as approved by the cognizant TYCOM.

b. The SAI will be performed by the NSWCCD LCEM Inspector and the RMC SGPI.

3.6.4 Strength and Integrity Inspection. The normal interval between Strength and Integrity Inspections shall be 60 months. Strength and Integrity Inspections may be performed as early as 48 months or as late as 72 months after the last Strength and Integrity Inspection to provide scheduling flexibility. Inspections that exceed the 60 month interval will require a minor DFS to the TYCOM with recommendation from NSWCCD-SSES. Strength and Integrity Inspections **shall not** exceed 72 months since the last inspection. Any boiler which exceeds the inspection interval shall be placed out of commission until inspected by an NSWCCD LCEM Inspector and a certified SGPI. A major DFS with NAVSEA Technical Warrant Holder approval is required to operate a boiler beyond 72 months without a Strength and Integrity Inspection.

a. The Strength and Integrity Inspection will be scheduled by the cognizant ISIC.

b. The Strength and Integrity Inspection will be performed by an NSWCCD LCEM Inspector and the cognizant RMC SGPI.

3.6.5 Industrial Support Visit Inspection. The ISV inspection shall be scheduled during the availability, but may be waived by the TYCOM for availabilities of short duration.

a. The ISV inspection will be scheduled by the industrial activity or Supervising Authority as applicable.

b. The ISV inspection will be performed by an NSWCCD LCEM Inspector and the cognizant SGPI.

3.6.6 Completion of Availability Inspection. The CAI will be conducted before reinstallation of steam drum internals and de-superheater for the Strength and Integrity Inspection.

a. The CAI will be scheduled by the industrial activity or Supervising Authority, as applicable, and may be conducted in conjunction with a Routine Inspection.

b. The CAI will be performed by an NSWCCD LCEM Inspector and the cognizant SGPI.

3.6.7 Inactivation or Reactivation Inspection. The Inactivation/Reactivation Inspection shall be conducted on all boilers prior to completion of the inactivation/reactivation.

a. The Inactivation/Reactivation Inspection will be scheduled by the industrial activity, Supervising Authority or Inactive Ship Facility as applicable.

b. The Inactivation/Reactivation Inspection will be performed by an NSWCCD LCEM Inspector and the cognizant SGPI.

3.6.8 Engineer Officer Inspection. The Engineer Officer Inspection shall be conducted per PMS and situational requirements of references (b) and (c), but does not qualify as a Routine Inspection described in paragraph 3.6.1 of this chapter. This inspection will be scheduled and performed by the ship's Engineer Officer. All results are to be documented in the Boiler/Water Feedwater logs and the Engineering Logs.

3.6.9 Special Inspection.

a. A special inspection shall be conducted whenever major repair work as defined by references (b) and (g) is accomplished. This inspection is arranged by the ISIC in coordination with the TYCOM and the RMC and performed by an SGPI.

b. Additionally, SGPIs are authorized to conduct special no-notice inspections at their discretion to assess operational, chemistry and maintenance related problems.

3.6.10 Operational Assessments. An operational assessment shall be accomplished prior to and at the completion of all Chief of Naval Operations (CNO) scheduled maintenance availabilities. These assessments are part of the Routine and Strength and Integrity Inspection requirements. These assessments will include both cold and hot plant inport safety checks and an operational evaluation. Detailed assessment requirements and check lists are available in reference (c), Figure E-6.

3.7 BOILER INSPECTION GUIDELINES AND REPORTS.

3.7.1 Guidelines.

a. Routine Inspections of boilers will be conducted by certified SGPIs.

b. Only an SGPI with a current certification may issue a Repair Before Operating (RBO) deficiency. All RBO items shall be corrected prior to boiler operation and reinspected by a certified SGPI or NSWCCD LCEM Inspector, as applicable, and preferably the same SGPI/NSWCCD LCEM Inspector who originally inspected the boiler. RBO discrepancies include those for which continued unrestricted operation could endanger personnel. RBOs may not be departed via DFS. If there is not an immediate or near future danger to personnel, the discrepancy shall be assigned as SEVERELY DEGRADED with major operational restrictions.

c. An SGPI-designated discrepancy discovered in accordance with reference (c) and paragraph 3.9.2 of this chapter which is assigned as severely degraded with major operational restrictions, and is considered for a DFS submission, is a major DFS and must be brought forward to the attention of the NAVSEA Boiler and Condenser Technical Warrant. A Major DFS must be forwarded for NAVSEA review and approval with accompanying engineering analysis recommendations from the originator. A severely degraded discrepancy in accordance with this chapter must be corrected/repaired prior to boiler operation unless it has been properly approved as a Major DFS.

d. The status of a boiler related DFS will be verified by the SGPI during the inspection for conformance with the requirements of this manual prior to placing the boiler into operation.

3.7.2 Reports.

a. The SGPI shall provide an oral critique and preliminary report to the ship's Commanding Officer or his designated representative. The report will contain the findings of the inspection, with special note of recurring discrepancies from previous inspections. The SGPI shall ensure a maintenance ready 2-Kilo for every discrepancy found during the inspection is entered into the Current Ship's Maintenance Project.

b. The Senior Inspector will forward a copy of the BIRMIS report with cover letter per the sample shown in Appendix D of this chapter to the ship's Commanding Officer no later than ten days after satisfactory clearance of all discrepancies.

c. The SGPI shall report deficiencies discovered during the inspection by message within 24 hours, using the message format of Appendix E of this chapter. This message shall contain both RBO and severely degraded deficiencies as described in paragraph 3.7.1 of this chapter.

## APPENDIX C

## SUMMARY OF BOILER INSPECTION SCHEDULING AND RESPONSIBILITIES

| Type Inspection | Schedule Date | Scheduling Responsibility | Responsibility for Inspections |
|---|---|---|---|
| 1. Routine | Every 18 months | ISIC/Ship | Cognizant SGPI |
| 2. Pre-Start of Availability Inspection | Schedule PSAI and operational testing in conjunction with Routine boiler appraisal 3-12 months prior to availability | ISIC | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 3. Start of Availability Inspection | At start of overhaul/with strength and integrity inspection | Naval Shipyard RMC | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 4. Strength and Integrity Inspection | Once every 60 Months | ISIC/RMC | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 5. ISV* | During availability | Industrial Activity or Supervising Authority | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 6. CAI | To be conducted before reassembling boiler for final hydrostatic test | Industrial Activity or Supervising Authority | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 7. Inactivation or Reactivation | Prior to final action | Industrial Activity, Supervising Authority or Inactive Ship Facility | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 8. Engineer Officer | Per PMS and references (b) and (c) | Engineer Officer | Engineer Officer |
| 9. Special | Subsequent to major repairs No-Notice at SGPI discretion | ISIC (Coordinate with Regional Maintenance Center) | NSWCCD LCEM INSPECTOR and Cognizant SGPI |
| 10. Operational Availabilities | Prior to and at completion of all CNO maintenance | TYCOM | Cognizant SGPI |

*The ISV inspection may be waived by the TYCOM for availabilities of short duration.

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## APPENDIX D

## SAMPLE BOILER INSPECTION REPORT COVER LETTER

From: Commanding Officer, Regional Maintenance Center
To: Commanding Officer, USS (Ship's Name and Hull No.)

Subj: (Routine, etc.) INSPECTION OF BOILER(S) NUMBER (1A, 1B, 2A, etc.) AND REVIEW OF BOILER WATER/FEEDWATER TEST AND TREATMENT IN USS (Ship's Name and Hull No.)

Encl: (1) Boiler Inspection Report of Boiler(s) Number (1A, 1B, 2A, etc.)

1. (Parent Command) Steam Generating Plant Inspector, (Inspector's Name) inspected Boiler(s) Number (1A, 1B, 2A, etc.) in USS (Ship's Name and Hull No.) on (Day, Month, Year) while (ship's location).

2. Discrepancies which require corrective action are outlined in enclosure (1).

3. Advance copies of enclosure (1) have been delivered to the ship's Commanding Officer.

Copy to: (as appropriate)
TYCOM (N43AD)
ISIC
NSWCCD (Code 9222)
NAVSEA 05Z11

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## APPENDIX E

### SAMPLE BOILER INSPECTION - RBO/SEVERELY DEGRADED DEFICIENCIES MESSAGE

FM COMMANDING OFFICER, REGIONAL MAINTENANCE CENTER
TO USS (SHIP'S NAME AND HULL NO.)
INFO TYCOM//(AS APPROPRIATE)
ISIC//(AS APPROPRIATE)
COMNAVSEASYSCOM WASHINGTON DC//05Z23//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
BT
UNCLAS //N09221//
MSGID/GENADMIN/COMMANDING OFFICER, REGIONAL MAINTENANCE CENTER
SUBJ/USS (SHIP'S NAME AND HULL NO.) NR (1A, 1B, 2A, ETC.) ROUTINE/STRENGTH AND INTEGRITY INSPECTION (AS APPROPRIATE)//
REF/A/DOC/COMFLTFORCOMINST 4790.3//
REF/B/DOC/NAVSEAINST 4790.8/OPNAVINST 4790.4//
NARR/REF A IS JOINT FLEET MAINTENANCE MANUAL VOL IV CH 3 AND PROVIDES GUIDANCE FOR BOILER INSPECTIONS. REF B IS 3-M MANUAL AND PROVIDES GUIDANCE FOR CSMP DOCUMENTATION//
RMKS/1. BOILER NUMBER (1A, 1B, 2A, ETC.) ROUTINE/STRENGTH AND INTEGRITY (AS APPROPRIATE). INSPECTION CONDUCTED (DATE) BY (INSPECTOR'S NAME) WHILE (SHIPS LOCATION). RBO DEFICIENCIES AND PROPOSED CORRECTIVE ACTION ARE REPORTED IAW REF A AS FOLLOWS:

A. (BIRMIS ITEM NO, DEFICIENCY, REPAIR, ETC.)
B.
C.

2. BOILER NUMBER (1A, 1B, 2A, ETC.) SHALL NOT BE STEAMED UNTIL ABOVE LISTED DEFICIENCIES ARE CORRECTED AND A REINSPECTION IS CONDUCTED IAW REF A.
3. SEVERELY DEGRADED DEFICIENCIES AND PROPOSED CORRECTIVE ACTION ARE REPORTED IAW REF A AS FOLLOWS:

A.
B.
C.

4. SEVERELY DEGRADED DEFICIENCIES ARE REQUIRED TO BE CORRECTED PRIOR TO STEAMING OR MUST BE SUBMITTED FOR MAJOR DEPARTURE FROM SPECIFICATION (DFS).
5. IAW REF A DEFICIENCIES COMPLETED SHALL BE REPORTED EVERY 30 DAYS USING THE GUIDANCE PROVIDED IN REF A APPENDIX F. ALL DEFICIENCIES HAVE BEEN DOCUMENTED IN THE SHIPS CSMP FOR CORRECTIVE ACTION IAW REF B.//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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# VOLUME IV

# CHAPTER 4

# DIESEL ENGINES

REFERENCES.

(a) OPNAVINST 9220.3 - Propulsion and Auxiliary Plant Inspection and Inspector Certification Program
(b) NAVSEA S9233-CJ-HBK-010/020 - U.S. Navy Diesel Engine Inspectors Handbook, Parts 1 (Inspection Procedures) and 2 (Technical Information)
(c) NAVSEAINST 4730.1 - Shipyard Inspection and Required Conditions of Propulsion Plant Systems (Non-Nuclear) on Nuclear Powered Submarines
(d) NAVSEA S9086-HB-STM-010 - NSTM Chapter 233 (Diesel Engines)
(e) NWP 1-03.1 - Naval Warfare Publication Operational Report
(f) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
(g) NAVSEA S9086-H7-STM-010 - NSTM Chapter 262 (Lubricating Oil)
(h) NAVSEA S9086-GX-STM-020 - NSTM Chapter 220, V3 (Water Treatment)

LISTING OF APPENDICES.

A Assessment/Inspection Main Propulsion Diesel Engine and Ship Service Diesel Generators for LSD-41/49 and LPD-17 Class Ships

4.1 PURPOSE. To provide guidance for the conduct of diesel engine inspections, timely correction of discrepancies and the general operation and maintenance of diesel engines.

4.2 DIESEL ENGINE INSPECTOR CERTIFICATION. The Diesel Engine Inspector (DEI) Program Manager is Naval Sea Systems Command (NAVSEA) Philadelphia. The Regional Maintenance Center (RMC) is the administrative manager for their respective region. DEI certification and certification extension requirements as outlined in reference (a), are amplified as follows:

a. Initial Certification. All DEI candidates that have satisfactorily completed the required Certification course, Service School Command A-652-0311, shall receive an Interim Navy Enlisted Classification (NEC). The DEI candidate will have a period of one year from course completion date to satisfactorily perform two diesel inspections under instruction from a certified DEI. Upon completion of the second, successful inspection, the candidate must submit a request to be assigned the DEI NEC 4314, through his chain of command to the appropriate RMC for their review. The RMC will forward their endorsement to the Type Commander (TYCOM) for their endorsement, if required, and then to NAVSEA Philadelphia, who initiates the process of assigning the 4314 NEC. Initial qualification to perform diesel inspections will be for a period of 36 months. The requesting letter must contain:

(1) A copy of the two completed inspection reports performed under the observation and supervision of a DEI.

(2) Date of graduation from the certification course of instruction.

b. Transfer of the DEI will not require re-designation or re-qualification, as long as the DEI has maintained his qualifications in accordance with paragraph 4.2.c. of this chapter.

c. Maintaining Certification. All DEIs must maintain up to date knowledge of approved inspection practices and policies. Certification will be maintained by:

(1) Successfully conducting a minimum of two inspections annually in accordance with reference (b).

(2) In each calendar year, attending one of the semi-annual inspector seminars. DEIs unable to meet this requirement may obtain a waiver from the Program Manager.

(3) Extending Qualification. Qualified inspectors may request to extend their initial or subsequent qualifications, in 36 month increments, providing that the requirements in paragraph 4.2.c. of this chapter are met. To extend qualification:

(a) The DEI shall submit a letter to the RMC requesting qualification extension that includes a brief description of the inspector's duties during the qualification period, specify the date of the latest seminar attended and provide as enclosures a copy of the two most recent inspection report cover letters performed by the inspector.

(b) The RMC shall endorse the letter and forward it to the Diesel Program Manager.

(c) The TYCOM may require endorsement on these extension requests.

d. Revoking Certification. If an inspector has not maintained the qualification requirements of paragraph 4.2 of this chapter, the RMC may submit a request to the Program Manager to have the DEI NEC4314, removed from the inspector. The TYCOM requires endorsement on this action.

e. Reinstatement of Expired/Revoked Certification. A DEI whose certification either expired or was revoked may request reinstatement of his certification by submitting a letter to the Program Manager via his chain of command and the RMC. The letter must contain:

(1) A brief description of the DEI's duties during and following the certification period.

(2) Copies of the two most recent inspections performed. If the DEI's certification has been expired for more than six months prior to the request or was revoked, the two most recent inspections shall be completed under the instruction of a certified DEI.

4.3 DIESEL INSPECTIONS.

**NOTE: FOR THE ASSESSMENT/INSPECTION OF MAIN PROPULSION DIESEL ENGINES (MPDE) AND SHIP SERVICE DIESEL GENERATORS (SSDG) ON LSD-41/49 AND LPD-17 CLASS SHIPS SEE APPENDIX A.**

4.3.1 Diesel Engines Requiring Inspections.

a. All diesel engines, including main propulsion, ship service and emergency diesel generators onboard ships and submarines shall be inspected in accordance with references (a) and (b).

b. All small boat diesel engines, including main propulsion, ship service and emergency diesel generators that are 400 Brake Horsepower and above, unless otherwise determined by TYCOM, shall be inspected in accordance with references (a) and (b). TYCOMs may exempt diesel engines on small boats and craft from inspection requirements where the engine or boat configuration provides insufficient access to accomplish the inspection.

4.3.2 Periodicity of Inspections. Diesel engines shall be inspected in accordance with references (a) and (b) on the following events:

a. Routine/Pre-Availability Inspections.

(1) Once during the unit's cycle, not to exceed 24 months. The normal interval between routine diesel inspections is 18 months. Routine/Pre-Availability Inspections may be performed as early as 12 months or as late as 24 months to allow for maximum scheduling flexibility and utilization of assessment findings. The TYCOM, Immediate Superior in Command (ISIC) and other Fleet Maintenance Managers shall ensure the Routine/Pre-Availability Inspection is scheduled to allow adequate time prior to availabilities to utilize the inspection/assessment results to plan work on the diesel. As per reference (a), in no case shall the interval between Routine Inspections exceed 24 months. A Routine/Pre-Availability Inspection normally consists of all three phases as discussed in paragraph 4.3.4 of this chapter. For Emergency Diesel Generators (EDG) onboard nuclear powered vessels, industrial activity work on the diesel engine(s) or its support systems will not normally be approved except during a Chief of Naval Operations (CNO) Availability. The TYCOM/ISIC shall ensure that adequate upkeep time is made available prior to the availability to ensure there are a sufficient number of diesel engines with no outstanding discrepancies to provide the required standby power during the availability.

(2) For Submarine CNO Availabilities greater than six months.

(a) The Pre-Availability Inspection shall be integrated into the Shipyard's work definition period and shall be considered the Pre-Availability Test for the EDG.

(b) SUBMEPP shall enter this Pre-Availability Inspection in the applicable 000-Series SWLIN as a Pre-Availability Test assigned to Forces Afloat.

(c) The DEI shall include the Executing Shipyard (Code 260) and the Supervisor of Shipbuilding/NAVSEA Shipyard Representative's Office, as applicable, on distribution for all DEI reports conducted as a Pre-Availability Inspection or during the availability.

(d) As Lead Maintenance Activity, the executing shipyard will work with the TYCOM to assign all deferred inspection deficiencies to the appropriate repair activity for repair.

(e) The Shipyard's technical review of this inspection report may satisfy the Pre-Availability technical assessment requirement of reference (c).

b. Post Casualty/Pre-Overhaul. When major internal engine malfunctions have occurred or are suspected (e.g., crankcase explosion, major bearing, blower or crankshaft failure), or there are indications that the engine is in need for overhaul. Extent of disassembly/inspection is at the discretion of the DEI based on the casualty or observed indications. For Post Casualty Inspections, the DEI must determine the full extent of damage and the cause, along with recommendations for repairs. For Pre-Overhaul Inspections, the TYCOM may require the DEI confirm that an overhaul is required and determine the scope of the overhaul. Partial inspections do not satisfy the requirement for a complete Routine Inspection and this fact will be annotated in the DEI's written report.

c. Post Overhaul/Repair. When an engine has been overhauled or significant maintenance/repair has been completed. A Post Overhaul/Repair Inspection shall be conducted by a DEI prior to continuous operation. The DEI will make the final determination of whether the overhaul/repair was extensive enough to warrant a Post Overhaul/Repair Inspection. The inspection shall consist of a review of actions taken to complete the overhaul/repair, external visual inspection, tests of safety devices, review of required readings/clearances and a Phase III operational test. Unless there are indications of internal discrepancies, Phase II (internal inspection) is waived and the Routine Inspection periodicity requirement in paragraph 4.3.2.a of this chapter will be considered complete and valid. The Post

Overhaul/Repair inspection should be an integral part of the overhaul/repair vice a separate inspection. Specifically, the Phase III operational test should be part of the final operational testing of the overhaul/repair vice a separate operational test.

(1) For contractor accomplished work, the contractor specification will contain requirements for the contractor to document required readings/clearances on applicable forms and have appropriate check points made by a DEI/Industrial Subject Matter Expert (SME) during the overhaul/repair. If there is evidence of poor workmanship, use of improper parts, discrepancies in reassembly/test documentation or missing information as part of the repair process or during the inspection, the DEI/Industrial SME will advise the Repair Project Manager of the quality issues and required actions. The Repair Project Manager will coordinate required actions with the RMC Technical Authority and Maintenance Team. The RMC shall liaise with the TYCOM and obtain TYCOM concurrence on all required actions and shall advise the TYCOM of all potential cost and schedule impacts.

(2) For Ship's Force/Fleet Maintenance Activity accomplished engine overhauls, a Post Overhaul/Repair Inspection will be conducted by a DEI prior to starting the engine. The scope of the inspection will be as specified in paragraph 4.3.2.c of this chapter. Commanding Officer (or designated representative) permission is required to perform Phase II (internal inspection) when requested by the DEI.

d. New Construction (Acceptance Inspection).

(1) Prior to the delivery of a newly constructed ship, when requested by the Board of Inspection and Survey. An acceptance inspection will normally be conducted in conjunction with the open-and-inspect phase of Board of Inspection Survey acceptance trials. The acceptance inspection does not satisfy the requirements of a routine inspection.

(2) The initial Routine Inspection on a new construction unit shall occur prior to initial start up by Ship's Force. The cognizant Supervisor of Shipbuilding should incorporate the DEI as part of the Government Test Plan/Acceptance Plan. The cognizant Supervisor of Shipbuilding shall notify the DEI for new construction acceptance test prior to Ship's Force accepting responsibility of the diesel engine. This will ensure that an inspection baseline is established and construction discrepancies are identified/corrected early in the life of the unit.

(3) For submarine and CVN construction programs, the initial Routine Inspection on a new construction unit shall occur prior to initial start up by Ship's Force. For ships with temporary systems in place or less than 95 percent load available, the Phase I (see paragraph 4.3.4a of this chapter) and Phase II (see paragraph 4.3.4b of this chapter) inspections shall occur in conjunction with crew Operational Control Transfer including an operational test at available load. The Phase III (see paragraph 4.3.4c of this chapter) inspection shall occur prior to ship delivery when sufficient loading is available. Any as found conditions requiring corrections shall be adjudicated via the normal shipyard Operational Control Transfer inspections adjudication process. The routine diesel inspection periodicity shall commence upon completion of all three diesel engine inspection phases.

e. Reactivation of Engines in Inactive Equipment Maintenance. Prior to the first operation of engines which have been placed in Inactive Equipment Maintenance. The inspection consists of a Phase I review of the actions taken to place the engine in and out of lay-up status, external visual inspection, test of safety devices and a Phase III operational test. Unless there are indications that an internal inspection (Phase II) is required, the inspection will be considered complete. This inspection should be requested far enough in advance of the first key event requiring use of the diesel. This will ensure any significant

discrepancies found can be corrected prior to the start of the key event. This inspection does not satisfy the requirements of a routine inspection as per paragraph 4.3.2.a of this chapter unless a complete Phase II is accomplished.

4.3.3 Inspection Scheduling.

a. Diesel inspections are scheduled by the ship with RMC, via ISIC when appropriate, in accordance with reference (a) and the Planned Maintenance System (PMS). As part of this process, units shall contact the local RMC/ISIC Diesel Inspector to schedule the diesel inspection 120 days prior to the desired inspection date and submit a work request (OPNAV 4790/2K) to the appropriate RMC a minimum of 90 days in advance of the desired dates to allow for DEI scheduling.

b. It is the responsibility of the Fleet Maintenance Managers (the ship, ISIC, and RMC Port Engineers, as appropriate) to schedule the diesel inspection with the RMC during a period where the inspection's condition assessment can be best utilized for repair planning. The inspection may require that each engine being inspected normally be placed out of commission for five to seven days at the minimum. This time frame may increase when significant Repair Before Operating (RBO) discrepancies are discovered that require extensive repairs. Sufficient time must be allowed for the performance of the operational phase of the inspection which requires specific load testing as defined by PMS. SSDGs normally have the operational phase performed inport, whereas operational assessment of MPDEs requires the ship to be underway for a minimum of one day. Units with MPDEs must allot underway time to allow the DEI to complete the operational phase. The operational phase of the inspection must be completed within 90 days of the start of the inspection. If the operational phase cannot be completed within these 90 days, a TYCOM approved Departure From Specification (DFS) per Volume V, Part I, Chapter 8 of this manual is required. Without a DFS, the inspection will be terminated and rescheduled. Ships should integrate the operational phase of the inspection into the Inter Deployment Training Cycle underway schedule.

c. A Diesel Inspection shall be accomplished by an ISIC/RMC DEI. It is encouraged that persons holding the DEI NEC that may be assigned to the ship being inspected be part of this inspection.

4.3.3.1 Inspection Deferrals. TYCOMs may approve a minor DFS for diesel inspections in the 18 to 24 month window. With the flexibility to schedule a diesel inspection within a 24 month period, requests to delay or cancel required inspections shall only be granted in extreme circumstances. It is therefore critical that the Ship and the Fleet Maintenance Managers schedule the diesel inspection/assessment in accordance with paragraph 4.3.3.a of this chapter well in advance of the 24 month date since the last inspection. In those extreme circumstances when an inspection cannot be accomplished within 24 months, the unit shall submit a DFS request to the TYCOM no later than the 23rd month since the last inspection, that includes satisfactory operating trend data reviewed by a DEI confirming that the engine is in sound operating condition. For inspection deferrals of greater than 24 months, the TYCOM will forward endorsement to NAVSEA 05Z for approval of the DFS.

4.3.4 Inspection Phases. The diesel inspection consists of a detailed records check, internal material condition inspection and observation of engine operating characteristics. During all phases of an inspection, all safety precautions with the engine and space shall be strictly adhered to. The degree of the inspection shall be decided by the DEI based on the results of reference (b) mandatory check points, TYCOM directed check points, if any, operating data and other records maintained on the diesel engine. The inspection will include the following phases (For LSD-41/49 Class ships and LPD-17 Class ships see Appendix A):

a. Phase I - Administrative Inspection. This is a complete review of the administrative records associated with the diesel engine(s).

b. Phase II - Secured Inspection (partial disassembly). Based on the results of Phase I, the inspector will decide the degree of disassembly and will conduct a thorough evaluation of the internal condition of the engine as warranted by Phase I and Phase II findings. In accordance with reference (b), disassembly of the engine will be minimized. Submarines shall have a complete Phase II Inspection in accordance with reference (b).

c. Phase III - Operation Inspection. The DEI will observe and analyze operating data on all inspected engines in accordance with reference (b) and PMS Maintenance Requirement Card (MRC) for performance testing/troubleshooting the engine. If no PMS guidance exists, then 100 percent or maximum attainable load on all inspected engines should be achieved.

4.3.5 Preparation for Diesel Engine Inspection.

a. The DEI shall meet with the inspected ship's Commanding Officer or his designated representative, Engineer Officer and a diesel system expert prior to the start of the inspection. For CVN, LHA and LHD Class ships the Reactor Officer or the Engineer Officer may fulfill this role. This visit will ensure that Ship's Force is aware of the extent of the inspection, what PMS is to be accomplished, required support to be provided to the DEI and interference to be removed to allow access to the diesel engine. Coordination between the ship and the DEI can significantly reduce the time the diesel will be out of commission for inspection purposes and maximize the training to Ship's Force. Ship's Force will perform diesel engine disassembly, reassembly and operation, as well as correcting Ship's Force capable discrepancies concurrent with the inspection. It is the responsibility of Ship's Force to order all software and repair parts for Ship's Force capable work, to include all gaskets, lockwire, etc., for engine reassembly. Discrepancies beyond Ship's Force capability will be scheduled to be corrected through the Fleet Maintenance Managers, utilizing the Current Ship's Maintenance Project. At all times during the inspection, safety precautions with the engine and the space will be strictly adhered to. The DEI will meet with the Main Propulsion Assistant or Engineer Officer on a daily basis to ensure the unit's leadership is informed and produce optimal coordination efforts.

b. The ship will:

(1) Prepare the diesel engine for inspection.

(2) Provide the DEI with dedicated time and the appropriate personnel to conduct the inspection. The inspection will be structured to maximize training of shipboard personnel. The ship should ensure continuity of personnel is maintained during the inspection/assessment.

(3) Assign a Job Control Number for accomplishing the inspection and record all parts usage through the Maintenance and Material Management system.

(4) Ensure all equipment directly associated with the engine(s) is operable.

(5) Ensure all records are available and in good order.

(6) Ensure that the tools listed on the appropriate MRCs, technical manuals, and DEI check sheets are available for use during the inspection.

(7) Ensure that all applicable MRCs and technical manuals for the engine and related support systems are available.

(8) Test diesel engine lubricating oil in accordance with the applicable Lube Oil Quality Management program, as defined by PMS, prior to the inspection. In most cases, this requires Navy Oil Analysis Program results of recent oil sample be available.

(9) Test jacket water treatment in accordance with PMS prior to the inspection.

(10) For SSN/SSBN/SSGN Class Submarine EDGs, the unit should evaluate existing conditions of battery capacity, propulsion plant status and shore power reliability. Based upon this evaluation, if conditions warrant, the ship will submit a request for a stand-by generator for emergency power during the diesel inspection.

4.3.6 Inspection Findings. The inspection will report "as found" conditions.

4.3.6.1 Repair Before Operating. RBO discrepancies include those for which continued unrestricted operation could endanger personnel and/or cause serious damage to the engine or associated equipment. If there is not an immediate or near future danger to personnel or equipment the discrepancy shall be assigned as Major and a DFS submitted by Ship's Force. Discrepancies that may cause an RBO include but are not limited to:

a. Malfunctioning overspeed governor or trip.

b. Inoperative alarms or safety devices.

c. Low lube oil pressure.

d. Readings that exceed the limits of PMS or manufacturer specifications that are unsafe for continued unrestricted operation.

e. Uncontrollable lube oil or fuel oil leaks. Reference (d) provides guidance for lube oil and fuel oil leaks.

f. Lube oil fuel dilution (five percent or greater) and/or lube oil unfit for further use. (For additional guidance on LSD-41/49 Class, see Appendix A.)

g. Evidence of serious internal failure (bearing, connecting rod, crankshaft, or piston failure).

4.3.6.2 Major Deficiency. This finding is made when major problems exist, but the engine is still operable with restrictions approved by the TYCOM. Any deficiency that has been noted as major shall require either immediate correction within 30 days of discovery or reported by Naval message in accordance with paragraph 4.4.b(3) of this chapter. This requirement does not alter the normal Casualty Reporting or DFS reporting requirements. In accordance with references (a) and (b), major deficiencies include, but are not limited to:

a. Engine unable to maintain rated load.

b. Automatic equipment inoperative or not functioning properly.

c. Critical components exceed prescribed limits but do not meet the RBO criteria.

d. Temperature and/or pressure between cylinders are not within specification.

e. Either Remote or Local engine starting (one of two must be operational) or remote securing devices are inoperative.

f. Excessive blower clearance readings.

g. Air box exhaust belt/muffler is excessively dirty or oil laden.

h. Clogged valves or ports.

i. Malfunctioning fuel injection system.

j. Jacket water treatment out of specification.

4.3.6.3 Minor Deficiency. Categorize all other deficiencies as minor.

4.3.6.4 Re-inspections. RBO deficiencies must be re-inspected prior to engine operation by a DEI. If possible, the original DEI should be used, if available. Re-inspection of major and minor deficiencies is not required unless stated in the engine's inspection report.

4.3.6.5 Recurring Discrepancies. A recurring discrepancy from a previous inspection will be so noted on the inspection report.

4.4 REPORTING REQUIREMENTS.

a. Casualty Reporting.

(1) Purpose. To provide guidance for Casualty Reporting (CASREP) requirements for submarine diesel generators. CASREPs are in addition to, and do not replace the reporting requirements of other documents (e.g., Naval Reactors Technical Bulletins, Operational Orders, Mishap Reports, etc.).

(2) Background. The significance of a submarine's emergency and backup power supplies cannot be overstated. Reference (e) defines the CASREP types, requirements and format. CASREP requirements of Out of Commission power generating or storage equipment require additional clarification.

(3) SSBN/SSGN Class Submarine EDGs. Report EDG casualties by message as allowed by operational constraints.

b. The ship's Commanding Officer shall:

(1) Ensure that each inspection/assessment is entered in the applicable machinery history with a brief description of any RBO conditions found at the conclusion of the assessment/inspection.

(2) All maintenance actions and parts usage as the result of the inspection/assessment are properly documented in accordance with reference (f).

(3) Send a Naval message listing the status of all discrepancies listed in the inspection/assessment report within 30 days of receipt of the serialized report and every quarter thereafter until all deficiencies are corrected/resolved or brokered by the Maintenance Manager. The message must contain the engine number, date of inspection, type of inspection conducted, and the status of deficiencies not previously reported as corrected or a listing of what has been brokered. All deficiencies not corrected during or immediately after the inspection must have a Job Control Number assigned and be listed in the message. The ISIC/Fleet Maintenance Managers shall ensure that the deficiencies listed in the inspection/assessment message are corrected at the earliest opportunity in the unit's maintenance cycle.

c. The DEI shall:

(1) The DEI shall ensure a maintenance ready 2-Kilo for every discrepancy found during the inspection is entered into the Current Ship's Maintenance Project. The DEI shall also make a verbal report to the ship's Commanding Officer or his designated representative. The verbal report should discuss the findings of the inspection/assessment, with special note of recurring discrepancies from previous inspections/assessments.

(2) Prepare the inspection report in accordance with reference (b) within 30 days following completion of the inspection. The write up shall further detail the cause or conditions that lead to the discrepancy noted on the 2-Kilo or in the report. The report shall identify what was accomplished during the inspection/assessment to correct any discrepancies and any actions required to correct outstanding discrepancies.

(3) Utilize the Diesel Inspection Management Information System using the DEI report generator for classes of ships that are currently in use. For classes of ships that are not yet in the system, use the current guidance that is in reference (b). This inspection shall be reviewed by the RMC prior to forwarding the report to the Commanding Officer of the inspected ship, with information copies to the ISIC, TYCOM, Fleet Maintenance Managers, the cognizant Shipyard (Code 260) and Supervisors of ShipBuilding/NAVSEA Shipyard Representative's Office (Pre-Availability and during Availability Inspections only) and In Service Engineering Agent.

4.5 OPERATION AND MAINTENANCE. This section does not supersede existing engine, ship or ship class specific guidance and is only meant to provide guidance where currently none exists.

a. Per reference (d), the light loading of a diesel engine (less than 60 percent) should be avoided. Consistently light loading a diesel engine will cause one or more undesirable conditions, depending on specific engine design:

(1) A loss of cylinder compression due to glazed cylinder walls, leading to an unnecessary premature engine overhaul.

(2) Carryover of engine lube oil into the exhaust, causing excessive exhaust smoke and creating conditions for a possible exhaust stack fire.

(3) Fuel oil dilution of lube oil, leading to frequent oil changes.

(4) Carbon formation on exhaust valves, leading to valve failure.

In situations where light loading of a diesel engine is unavoidable, arrangements should be made to operate the engine at 60-80 percent rated load capacity for a minimum of thirty minutes, preferably three hours, unless other guidance exists specific to the engine's application. This can help offset the detrimental effects of light loading; however, it is not to be considered a suitable alternative to the avoidance of light loading. Further details are provided for LSD-41/49 Class MPDE in Appendix A.

b. Per reference (g), diesel engines that have online purification capability shall operate the purifier continuously while the diesel engine is operating. On installations where multiple engines are serviced by one purifier, the purifier alignment should be shifted periodically within a 24 hour period to ensure all engines receive adequate oil purification and maintain satisfactory oil condition. Each engine's operating hours and oil condition should be considered when scheduling purification of several engines on a rotational basis.

c. Per reference (h) and PMS, diesel engine jacket water treatment must be tested and maintained to ensure proper corrosion control and freeze protection, as applicable.

d. Engine Operation Hours since Overhaul and Engine Operating Hours since Commissioning, at a minimum, shall be kept for all MPDEs, SSDGs, and EDGs. For Colt Pielstick Engines on LSD-41/49, LPD-17, and LHD-8 Class ships, operating hours since cylinder head refurbishment and individual power pack change outs shall also be kept. Engine Operating Hours since Overhaul is zeroed only when the engine is overhauled. An overhaul typically includes rebuilding/replacing, as sets to new criteria, cylinder heads, piston rings, liners, main and connecting rod bearings. If one of these sets is not

rebuilt/replaced, the repair is generally not considered an overhaul. For example, a "top end overhaul" (replacing/rebuilding just cylinder heads) and replacing piston rings/cylinder liners is not considered an engine overhaul (main bearings not replaced), and the Engine Operating Hours since Overhaul is not zeroed. However, the number of operating hours since these significant repairs have been accomplished shall be tracked. Due to the large variety of engine configurations, a definitive description of what constitutes an engine overhaul for every engine is not possible. A certified DEI shall make the final determination of an engine overhaul for a particular engine.

4.6 COMPLIANCE.

a. All ships, submarines and craft shall comply with the procedures herein for the operation, maintenance and inspection of installed diesel engines.

b. Ship's Commanding Officers shall ensure all diesel records are readily available for the inspector's review and Ship's Force use, including:

(1) Engine operating logs.

(2) Navy Oil Analysis Program test results, or, for submarines, the applicable oil analysis results.

(3) Onboard lube oil testing logs.

(4) Diesel Maintenance/history records to include all maintenance and significant items accomplished on the engine since last engine overhaul.

(5) Diesel operating and maintenance documents, including Engineering Organization Sequencing System, Steam Plant Manual, Ship System Manual (Submarines only), PMS, Engineering Standing Orders, etc., as appropriate.

(6) Engine hours log.

(7) Diesel inspection reports since last overhaul and associated Naval message on the status of discrepancies.

(8) Fuel Oil Quality Management records.

(9) Diesel Engine Technical Manuals.

(10) References (d), (g) and (h).

(11) Appropriate diesel-related Training records.

c. The TYCOM/ISIC shall ensure that assigned ships operate and maintain diesel engines in accordance with the procedures in references (a), (b), (d), (g) and (h). Specifically, they shall:

(1) Ensure ships are complying with all required instructions by observation of diesel engine operations during shipboard visits.

(2) Conduct follow-up action to ensure that any unsatisfactory conditions found are correct at the earliest possible date.

(3) Maintain a library of technical material and appropriate visual aids for use by assigned ships in training diesel operations.

d. (Submarines only) Ensure the induction and exhaust systems are inspected in accordance with the appropriate Maintenance Requirement, and/or Maintenance Requirements for continued Unrestricted Operation.

4.7 SUBJECT MATTER EXPERT IN THE REPAIR AND MAINTENANCE OF DIESEL ENGINES. The SME provides technical oversight on all scheduled and emergent work performed by the RMC personnel, and contractor, as required. The SME ensures work packages include proper repair procedures and are used with maintenance standards and appropriate technical documentation related to the diesel engine assessment/inspection. The SME shall have direct communication with the RMC Engineering Department regarding resolutions of repairs that do not meet Original Equipment Manufacturer specifications.

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# APPENDIX A

## ASSESSMENT/INSPECTION MAIN PROPULSION DIESEL ENGINE AND SHIP SERVICE DIESEL GENERATORS FOR LSD-41/49 AND LPD-17 CLASS SHIPS

Purpose: To provide direction for assessing vice inspection of LSD-41/49 and LPD-17 Class ship engines.

1. ROUTINE/PRE-AVAILABILITY DIESEL INSPECTION. Per Commander Naval Surface Force policy and concurred by NAVSEA Technical Warrant, the Routine/Pre-Availability diesel inspection directed by reference (a) is replaced with this Appendix's diesel assessment process. Note that Paragraphs 4.3.2.(b) through 4.3.2.(e) of this chapter remain applicable for LSD-41/49 and LPD-17 class MPDE and SSDGs.

2. OBJECTIVE. Significant repairs and I/D-Level work packages shall be accomplished by directive maintenance. Condition based maintenance is defined as maintenance that is directed by the engine's condition. Engine condition shall be assessed by non-intrusive monitoring and analysis of operating data, supplemented by engine performance data. The goal is to avoid significant disassembly, which includes such things as removal of cylinder heads, bearings, vertical drive assemblies, etc. Significant disassembly does not include removal of covers, use of borescopes, conducting main bearing presses, or removal of fuel injection components.

3. ASSESSMENT. Assessment of engine condition shall be accomplished by two, interrelated processes: Continuous Assessment/Analysis of data and Formal Periodic Assessment/Analysis of equipment condition and on board documentation. This process is based on continuous assessment and continuous analysis, focuses on the integration of fluid management, measured engine performance, assessment, analysis, recommendations and feedback.

4. CONTINUOUS ASSESSMENT/ANALYSIS. Each engine's condition data shall be analyzed on a monthly basis to identify any abnormalities, downward trends or other issues. Results of each Continuous Assessment shall be reported, with recommendations for corrections of any problems/potential problems, to the Ship's Engineer Officer and ISIC and documented in the Shipboard Automated Maintenance Module (SAMM). Condition data assessed shall include, but not limited to:

a. Lube oil results from onboard oil test kits (Kittiwake).

b. Lube oil results from shore based oil testing lab (PREDICT).

c. Fuel oil log results.

d. Jacket water log results.

e. Engine hour data.

f. Engine repair data.

g. Electronic log review.

h. Engine performance data (DOCTOR).

If the ship is locally available, a visit shall be conducted to review the data with ship's personnel.

5. FORMAL PERIODIC ASSESSMENT/ANALYSIS. A Periodic Assessment will be accomplished with the same periodicity as non-LSD-41/49 and LPD-17 MPDE and SSDG diesel engine inspections. At the 18th month point, a formal data review of the previous 18 months of collected data will be completed to determine if the data supports continued engine operation without inspection. This analysis will also be used as the foundation for recommending directed inspection of specific engine components as required. A minor DFS is required to the TYCOM with recommendation from RMC to extend engine operation to 24 months without completion of the formal periodic assessment. Extension of the assessment beyond 24 months will require a major DFS granted by NAVSEA 05. The 18 month clock is either measured from the last Periodic Assessment, the last diesel inspection, or the one-time baseline assessment, or as directed by an approved DFS (see below), as applicable. The DEI shall perform everything in the Continuous Assessment plus Phase III – Operational Inspection (paragraph 4.3.4.c. of this chapter). The DEI will determine if a full Phase II (paragraph 4.3.4.b. of this chapter), a focused portion of Phase II, as required PMS MRCs related to a Phase II, or any other significant disassembly is warranted. If the DEI concludes that all or part of Phase II, specific PMS MRCs, and/or significant disassembly is warranted, then the RMC shall recommend this to the TYCOM by Naval Message for TYCOM approval. If the DEI concludes that the diesel engine is in sound condition and does not warrant any part of Phase II, applicable MRCs, or significant disassembly, then the RMC shall recommend by Naval Message to the ship to submit a DFS extending their periodic assessment. TYCOM can extend the periodic assessment up to 24 months with a minor DFS; beyond 24 months will require a major DFS granted by NAVSEA 05. The DFS approval shall include when the next Periodic Assessment should be scheduled.

6. RESPONSIBILITIES.

a. TYCOM. Review/approve RMC recommendations resulting from Formal Periodic Assessments/Analysis.

b. ISIC. Ensure that the ship has available time in the schedule to execute the Formal Periodic Assessment/Analysis.

c. RMC. Maintenance Team to schedule Formal Periodic Assessments/Analysis. The RMC shall provide the Formal Periodic Assessment/Analysis recommendations to TYCOM by Naval Message. Maintenance Team will schedule diesel engine repair work based on results of the Continuous Assessments, Formal Periodic Assessments, Current Ship's Maintenance Project, emergent repairs and Class Maintenance Plan.

d. DEI. DEI will complete the appropriate sections of the DEI Report, defined by reference (b), for each Periodic Assessment and post them in SAMM. DEI will also post results of Continuous Assessments in SAMM. When performing steps 4.3.2.b through e of this chapter, DEIs shall utilize engine condition data to the fullest extent possible.

e. SHIP. To submit oil samples, record DOCTOR data, Kittiwake results, engine operating hours, maintenance actions accomplished (including PMS), fuel oil, jacket water data and any abnormal conditions in SAMM. To follow the actions recommended by the shore based technical community's assessment and report the actions taken and the results in SAMM.

f. IN-SERVICE ENGINEERING ACTIVITY. Monitor the Continuous Assessment/Analysis and Formal Periodic Assessment/Analysis process, utilizing SAMM.

7. FUEL OIL DILUTION. Additional guidance for fuel oil dilution of lube oil for LSD-41/49 MPDEs and SSDGs:

a. Fuel dilution 1.0-2 percent is a cautionary condition and requires monitoring by daily sampling.

b. Fuel dilution greater than 2 percent is a hazard condition and considered unacceptable for continued use.

# VOLUME IV

## CHAPTER 7

## ACCOUNTABILITY AND CERTIFICATION OF NUCLEAR PROPULSION PLANT TEST AND SUPPORT EQUIPMENT

REFERENCES.

(a) NAVSEA 0989-031-4000 - Reactor Plant Instrumentation and Control Equipment Maintenance
(b) NAVSEA 0989-064-3000 - Cleanliness Requirements for Naval Nuclear Plant Maintenance by Forces Afloat

LISTING OF APPENDICES.

A Nuclear Test Equipment Check-Out/Check-In Form
B Nuclear Support and Test Equipment Certification Record

7.1 PURPOSE. To promulgate requirements for the certification and accountability of Nuclear Propulsion Plant Test and Support Equipment as required by the applicable Reactor Plant Manual (RPM) and reference (a). Nuclear Propulsion Plant Test and Support Equipment is commonly referred to as Nuclear Test Equipment (NTE).

7.1.1 Discussion. NTE specified by the applicable RPM and reference (a) to support planned and corrective maintenance of Nuclear Propulsion Plant systems must be carefully controlled. Maintaining accountability and certifying accuracy, operability, and reliability per the most current Field Changes and technical specifications is an essential element of reactor safety. The basic elements of the NTE program are certification and verification.

a. Certification is the detailed technical evaluation of the equipment to conclude that the item conforms to the required specification. Certification is conducted prior to initial issue and after any event that invalidates the certification, such as repair, Field Change installation or a revision to the equipment reference drawing/figure and is recorded on a NTE Certification Record. Equipment will normally be maintained in a Ready for Issue, certified condition, requiring verification prior to each issue.

b. Verification is the validation that the equipment is certified based on a review of records and is in a physically acceptable condition for issue and use. Verification is conducted prior to each issue and is recorded on a NTE Check-out/Check-in Form contained in Appendix A of this chapter.

7.2 NUCLEAR TEST EQUIPMENT CATEGORIES. For purposes of this chapter, NTE is divided into three categories.

a. General Purpose Electronic Test Equipment.

b. Electronic/Electrical Test Equipment, non-General Purpose Electronic Test Equipment (e.g., switchboard test equipment, scram breaker time response equipment, etc.).

c. Mechanical Test Equipment.

7.3 ACTION. The Repair Officer shall implement the requirements of this chapter. The Nuclear Repair Officer is designated as the custodian of NTE and shall ensure that assigned personnel carry out the requirements of this chapter.

7.4 PROCUREMENT. Only test equipment meeting the specifications of the applicable RPM and reference (a) may be used to conduct testing on Nuclear Propulsion Plant Systems. Requisitions for new equipment shall contain sufficient detail to ensure the correct item is purchased. Allowance Equipage Lists for required NTE are provided in

the tender Coordinated Shipboard Allowance List or Q-Coordinated Shipboard Allowance List. The requirements for General Purpose Electronic Test Equipment to support nuclear electrical/electronics testing are contained in the applicable Ship's Portable Electronic Test Equipment Requirements List.

7.5 NUCLEAR TEST EQUIPMENT CERTIFICATION. NTE shall be certified using a Formal Work Package (FWP) for Electronic/Electrical Test Equipment and a Controlled Work Package (CWP) for Mechanical Test Equipment. Certification is required for new equipment prior to initial issue and following repairs or modifications which could impact performance. Periodic recertification is not required. The FWP/CWP should be as simple as possible. As a minimum, the FWP/CWP shall provide the exact equipment reference and indicate the attributes that must be verified and the required testing. Recertification following repair shall be a step in the repair FWP/CWP. Certification shall be documented on NTE Certification Records and is discussed in detail in paragraph 7.5.4 of this chapter. Certification shall be accomplished per paragraph 7.5.1 or 7.5.2 of this chapter. The ultimate objective is to demonstrate that the NTE available for Nuclear Propulsion Plant application is technically correct.

7.5.1 Electronic/Electrical Test Equipment. The FWP shall require completing and retaining an NTE Certification Record.

a. To certify new or existing measuring and recording equipment, such as a Visicorder or strip chart recorder, verify that the specifications given in the equipment technical manual match the specifications required by the applicable RPM, reference (a), or applicable test reference.

b. To certify repaired or re-calibrated measuring and recording equipment, the repair and/or calibration activity shall certify that the item still conforms to the original technical specifications and is properly calibrated (as evidenced by a calibration sticker). The Fleet Maintenance Activity Work Center performing the repair/calibration shall complete the NTE Certification Record. If the repair/calibration was not performed by the Fleet Maintenance Activity, Nuclear Repair shall certify the equipment. Work orders for repair shall require conformance to referenced drawings and figures.

c. To certify other existing electrical test equipment not previously certified, such as switch boxes, jumper boxes, cables, Under Voltage/Under Frequency test boxes, etc., each component and the wiring configuration shall be compared to the referenced drawing for correctness.

d. To certify other new electrical test equipment verify the test equipment as correct with respect to what was ordered and the nameplate data or other markings compared to the equipment requirements of the RPM, reference (a), or referenced test procedure.

7.5.2 Mechanical Test Equipment.

a. To certify existing or newly manufactured mechanical test equipment, the CWP that manufactures the test equipment shall include steps to verify that the material specifications and configuration match the equipment reference. The CWP shall also include all required testing.

b. To certify purchased mechanical test equipment, the CWP shall include steps to verify the equipment as correct with respect to what was ordered, compare the equipment to the requirements of the RPM, reference (a) and or referenced test procedure and shall also specify any testing that may be required prior to use.

7.5.3 Recertification Following Reference Revision. To certify existing equipment after a revision to the equipment configuration reference, take the actions necessary for the NTE to conform to the revision and complete an NTE Certification Record for recertification. The FWP for Electronic/Electrical Test Equipment and a CWP for Mechanical Test Equipment used to accomplish the equipment changes will specify recertification. A new NTE Certification Record will be generated regardless of whether or not the equipment required modification. The new certification record will serve to update the applicable revision and will provide evidence that the NTE was in fact validated to the correct revision.

# VOLUME IV

## CHAPTER 10

## WORK AUTHORIZATION AND CONTROL

REFERENCES.

(a) NAVSEA S9002-AK-CCM-010/6010 - Industrial Ship Safety Manual for Submarines
(b) S0400-AD-URM-010/TUM - Tag-Out User's Manual
(c) NAVSEA MS 6310-081-015 - Submarine Preservation
(d) NAVSEA S9505-AF-MMA-010 - Submarine Non-Nuclear Piping Systems Test Manual
(e) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
(f) OPNAVINST 5100.23 - Navy Occupational Safety and Health (NAVOSH) Program Manual
(g) NAVSEA S9165-AC-HBK-010 - Submarine Sonar Dome Handbook
(h) NAVSEA SE300-AZ-MMA-010 - Description, Operation and Maintenance SSN21 Class Sonar Bow Dome
(i) NAVSEA SE300-MA-MMA-011 - Glass Reinforced Plastic (GRP) Bow Sonar Dome
(j) COMSUBPACNOTE 9086 - COMSUBPAC Engineering Notes and Technical Notes

LISTING OF APPENDICES.

A Work Authorization Form
B Technical Work Document Record Sheet
C Work Authorization Form Continuation and Revision Sheets
D Barrier Criteria for Submarine Hull Penetrations
E Safety of Ship Maintenance Item List Example
F Safety of Ship Maintenance Item List
G Procedures and Safety Precautions for Entering Submarine Spaces, Tanks and Voids
H Close-out Inspection Check-off List

10.1 PURPOSE. To provide the procedures for authorization and control of shipboard work.

10.2 WORK AUTHORIZATION. Work on ship's systems and components, as defined in Volume I, Chapter 1, Appendix D of this manual, must be properly authorized and controlled in order to ensure rigorous personnel and ship safety standards are met at all times. All outside activity work on ship's systems and components, regardless of who performs the work, requires formal authorization through a Work Authorization Form (WAF) for the specific work to be accomplished. This applies to all U.S. Naval ships in all types of maintenance availabilities, public and private. The Work Authorization System and preparation of the WAF are discussed below.

10.3 WORK AUTHORIZATION CONTROL. Work on the Fleet's ships is conducted under positive Work Authorization Control in order to ensure rigorous personnel and ship safety standards are met at all times. The following considerations apply in meeting these standards:

a. Work requiring formal authorization may include Planned Maintenance System (PMS), troubleshooting, corrective maintenance (repair) or alterations. It may also include removal of system components for repairs.

b. As many ship systems, such as hydraulics and high-pressure air, are operationally interrelated, caution must be exercised in planning work so that other systems are not unintentionally disabled when setting work boundaries for the system to be worked.

10.4 WORK AUTHORIZATION SYSTEM. Work Authorization shall be controlled as follows:

a. Designation of Work Requiring Formal Control. The WAF is the vehicle by which work requiring formal control is authorized for accomplishment and tracked to completion or otherwise no longer requiring isolation or authorization.

b. A WAF, shown in Appendix A, is required to authorize the start of work on all ship systems and equipment by activities other than Ship's Force. Work includes all maintenance, repairs or modifications and installation or removal of temporary support systems and equipment. Repair activity non-intrusive work (e.g., painting, lagging, sheet metal work, deck plate, structural foundation) that does not affect ship or personnel safety does not normally require a WAF.

c. For Ship's Force maintenance conducted in nuclear propulsion plants, the Engineering Department Manual contains the requirements regarding when a WAF is needed. For Ship's Force work conducted outside the nuclear propulsion plant, the cognizant department head shall determine the necessity for a WAF.

d. For availabilities where a repair activity is assigned responsibilities for work authorization control by Memorandum of Agreement (MOA), the requirement regarding when Ship's Force must submit a WAF shall be specified in the MOA.

10.4.1 Administration. The following administrative process is to be used in executing Work Authorization Control:

10.4.1.1 Work Authorization Form. The WAF, shown in Appendix A, shall be filled out by the organization conducting the work, or Ship's Force, as determined by the MOA signed for the availability per Volume II, Part I, Chapters 3 and 4 of this manual.

10.4.1.2 Work Authorization Log. The Work Authorization Log(s) shall be maintained at the same location and administered by the same individuals as the ship's tagout logs or, when the repair activity is assigned responsibilities for work authorization control by MOA, the repair activity shall retain original WAFs with a copy of all WAFs (or as specified by local MOA) and the WAF index shall be provided to Ship's Force either by hard copy or electronically via a database that can be easily accessed by the Ship's Duty Officers.

**NOTE: FOR SHIP'S FORCE GENERATED WAFS, THE SERIAL NUMBER SHALL USE THE SAME PREFIXES USED FOR THE TAGOUTS THAT SET THE SYSTEM ISOLATION FOR THE WORK. WHEN A REPAIR ACTIVITY IS ASSIGNED RESPONSIBILITIES FOR WORK AUTHORIZATION CONTROL, THAT ACTIVITY WILL SPECIFY THE SERIALIZATION PROCESS USED BY ALL ACTIVITIES INCLUDING SHIP'S FORCE FOR THE AVAILABILITY.**

10.4.1.3 Technical Work Document Record Sheet. When the job description on the WAF covers multiple components and their associated Technical Work Documents (TWD), a TWD Record Sheet (Appendix B) in addition to the WAF may be used to document this work.

10.4.1.4 Work Authorization Form Continuation and Revision Sheets. If necessary, a WAF Continuation Sheet similar to the one shown in Appendix C may be used when information on the initial original WAF will not fit in the blocks provided in the WAF form in Appendix A. The WAF Continuation Sheet shown in Appendix C depicts the minimum blocks that must be filled out. Additional blocks may be utilized as deemed appropriate. Any changes necessary to the information on the WAF form after Block 14 is signed will be on the WAF Revision Sheet or changes to the existing WAF as described in paragraph 10.4.4 of this chapter. Existing WAF Continuation Sheets may be used until exhausted if desired. The WAF Revision Sheet, similar to the one shown in Appendix C, may be used to accomplish WAF revisions as permitted by paragraph 10.4.4 of this chapter. The WAF Revision Sheet shown in Appendix C depicts the minimum blocks that must be filled out. Additional blocks may be utilized as deemed appropriate.

10.4.1.5 Numbering Work Authorization Form Continuation and Revision Sheets. Revisions and continuation sheets generated by computer software may be numbered as determined by the software programming. Paper WAF continuation and revision sheets are to be numbered as follows:

a. The WAF (Appendix A) will be identified as "Sheet 1".

b. Continuation sheets will be identified as "Sheet 1A, Sheet 1B", etc.

c. Revision sheets will be identified as "Sheet 2, Sheet 3", etc.

10.4.2 Work Authorization Procedure. The following procedure is to be followed for properly authorizing work:

a. The WAF is presented to the Watch/Duty Officer by the division/repair activity tasked with the work.

b. (Submarines Only) For Safety of Ship items, as defined in paragraph 10.4.8 of this chapter and reference (a), the Watch/Duty Officer shall obtain the Commanding Officer's permission prior to authorizing work. When assigned, the repair activity's Ship Safety Officer signature is required.

c. The Watch/Duty Officer will then determine if adequate isolation and plant/system conditions exist to safely and properly conduct the work including that the system is drained, deenergized and depressurized. The tagout is then established in accordance with reference (b). The work is not to be authorized if doubt exists on either of these points. For high energy systems (i.e., >200°F, >1000 psi) that could have the potential for trapped energies, the repair activity after consulting with Ship's Force, may provide a written plan (i.e., valve lineup, procedure, marked up drawings) to Ship's Force to ensure all parties are satisfied the system is properly drained and depressurized.

d. When system isolation and plant conditions are satisfactory to conduct the work (e.g., tagout complete, system depressurized, drained and deenergized), the Watch/Duty Officer authorizes the work and signs the WAF. For repair activity generated WAFs, the Repair Activity Representative (RAR) also signs the WAF. The Watch/Duty Officer and RAR signature indicates that, based on personal observation, certified records or direct report from watchstanders or divisional personnel, that system isolation and plant/ship conditions are set and the division/repair activity is authorized to start work.

**NOTE: ELECTRICAL SAFETY CHECKS (E.G., VOLTAGE CHECKS TO ENSURE CIRCUITS ARE DE-ENERGIZED) ARE PART OF THE WORK PROCESS, NOT PART OF THE TAGOUT PROCESS, AND THEREFORE SHOULD BE PERFORMED AFTER BLOCK 14 OF THE WAF IS SIGNED. VOLTAGE CHECKS PERFORMED PRIOR TO SIGNING BLOCK 14 OF THE WAF MUST BE APPROVED BY THE COMMANDING OFFICER AND PERFORMED IN ACCORDANCE WITH NAVSEA S9086-KC-STM-010/CH-300.**

e. Some component contractor personnel who perform work on ships are not knowledgeable of ship systems and are not qualified to determine if plant/ship conditions are satisfactory to conduct work. For such cases, the contractor's signature will be based on a direct report or briefing they receive from Ship's Force or the Lead Maintenance Activity (if assigned), unless another method of providing the information to the contractor is specified in a MOA. The contractor's signature represents confirmation that the contractor understands the hazards presented by the ship's systems on which he will be working, and that he/she has received assurances the work area has been appropriately isolated, depressurized, de-energized or drained. As an alternative, the contractor may specifically agree via their contract or MOA that all repair activity responsibilities as defined in this chapter will be assigned to a Lead Maintenance Activity per paragraph 10.4.5 of this chapter. In all cases, appropriate information should be provided to the contractor prior to initiating work to ensure the contractor understands the hazards involved.

f. The original WAF is placed in the Work Authorization Log and a copy shall be maintained with the TWD until the work is completed.

g. Once the work is completed, the WAF is signed by the repair activity as work complete and forwarded to Ship's Force for clearing of Tagout Record Sheet line items in accordance with reference (b).

h. Following completion of testing (if there is no formal test program) and setting of appropriate system status (e.g., clear tags and perform valve line-ups as appropriate for the situation), the WAF is signed as closed and forwarded to the cognizant department head for review.

10.4.3 Transfer of Non-Nuclear Systems and Nuclear Instrumentation and Control Systems (Depot availabilities only). During depot availabilities, large amounts of work will be performed on ship's systems. Formal work control practices in place by a shipyard enable Ship's Force to transfer non-nuclear systems and Nuclear Instrumentation and Control systems to the shipyard. Transfer of systems is the process by which Ship's Force transfers the authority to approve all actions within a system or portion of a system to a shipyard and subsequent return of systems back to Ship's Force prior to major events. Systems, or portions of systems, are transferred with or without transferring the ability to operate ship's equipment. By transferring a system or portion of a system to the shipyard, the shipyard is responsible for authorizing all work, testing and equipment operation within the boundary transferred. Transfer of systems does not diminish a Commanding Officer's overall responsibility for the safety of personnel, equipment and the ship. Although other activities may perform work within the boundaries and Ship's Force normally retains responsibility for operating ship's equipment, all actions (i.e., work, testing, equipment operations, etc.) within the boundary must be approved by the shipyard.

a. The MOA between the shipyard and ship for the availability shall include the following minimum attributes regarding transfers:

(1) Clearly state that all actions performed within the boundary being transferred must be approved by the shipyard.

(2) Normally, Ship's Force retains responsibility for operating ship's equipment. If any transfers with operations are planned, the MOA shall define the extent to which the shipyard will operate ship's equipment within the boundaries.

(3) Normally, Ship's Force retains responsibility for PMS, unless otherwise specified in the MOA.

(4) Delineate who is responsible to maintain system status within the boundary.

(5) Identify the process (e.g., Joint Fleet Maintenance Manual Volume IV, Chapter 10, paragraphs 10.2 through 10.4.5) by which work control shall be administered, including interface between the shipyard, Ship's Force and other applicable activities.

b. A WAF shall be used to transfer a system or portion of a system to the shipyard. Block 7 of the WAF shall clearly state this intent (i.e., specify "transfer" or "transfer including operations"). Ship's Force formally transfers a system or portion of a system to the shipyard by signing Block 14 of the WAF. Unless Block 7 of the WAF states the transfer is "including operations", the shipyard is not authorized to operate ship's equipment within the transferred boundary.

c. The shipyard returns a system or portion of a system back to Ship's Force by completing all authorized work and testing specified on the WAF and signing Blocks 16, 17 and 18 of the WAF. Ship's Force indicates acceptance of the work and testing and, if applicable, operation by signing Block 18 of the WAF. For nuclear powered ships, the Engineering Department Manual contains requirements for accepting operational control from the shipyard.

d. When the shipyard is responsible for operating ship's equipment as specified in the transfer MOA, operation of ship's equipment shall be in accordance with shipyard or Naval Sea Systems Command (NAVSEA) procedures (e.g., test procedures, ship's operating instructions, Steam and Electric Plant Manual, etc.).

e. Iterative Tagouts. When using the reference (b) Iterative Tagout procedure, a revision to the WAF is not required provided the specific tests or maintenance evolutions are controlled by a formal process. This process is to be defined and concurred with by a MOA established between Ship's Force and the Lead Maintenance Activity. The process shall ensure that isolation is re-established and system conditions verified prior to recommencing work.

10.4.5 Centralized Work Control Procedures. It is the responsibility of the Lead Maintenance Activity to determine the need for centralized work control and to assign the responsibility for work authorization control. During depot availabilities, a centralized work control team will be established. For other availabilities, this decision is based on the number of repair activities performing work during the availability and the complexity of the work. When centralized work control procedures are invoked, the following process shall be used:

a. Work by all repair activities is processed by the centralized work control team including work covered by paragraph 10.4.3 of this chapter. Ship's Force involvement will be defined by MOA.

b. The Lead Maintenance Activity will specify participation and supervision of the centralized work control team by MOA. Ship's Force is an integral part of the centralized work control team and should man the team with experienced officers or senior petty officers.

c. The repair activity performing the work shall prepare the WAF, sign as RAR on the Tagout Record Sheet and sign the WAF, Blocks 10, 14, 16 and 17 if applicable, unless specified otherwise by MOA (e.g., repair activity does not maintain qualified personnel). The Lead Maintenance Activity assigned responsibility for centralized work control is responsible for processing the WAF and signing all other repair activity blocks on the WAF.

d. For work covered by paragraph 10.4.3 of this chapter, the Ship's Force member(s) of the centralized work control team would notify the responsible Division or Work Center Supervisor and Duty Officer of added work to a TWD Record Sheet to ensure that Ship's Force remains informed of all work being performed on ship's systems.

10.4.6 Equipment Tagout Procedures. Tagouts shall be accomplished in accordance with the requirements of reference (b).

10.4.7 Barrier Criteria.

a. Barrier criteria for maintenance is located in reference (b) and applicable Reactor Plant and Steam and Electric Plant manuals.

**NOTE: BARRIER CRITERIA REQUIRED BY REACTOR PLANT AND STEAM AND ELECTRIC PLANT MANUALS HAVE PRECEDENCE OVER REFERENCE (b) CRITERIA.**

b. (Submarines only) Specific guidance for submarine hull penetrations is located in Appendix D.

10.4.8 Safety of Ship Maintenance Item Identification, Listing and Control (Submarines only).

a. Safety of Ship Maintenance Item List (SOSMIL). Safety of Ship maintenance items are those evolutions having significant potential to impact the ship's watertight integrity, damage control capability or which require special attention to ensure ship safety.

**NOTE: DESIGNATION OF SAFETY OF SHIP MAINTENANCE ITEMS FOR BOTH SHIP'S FORCE AND ANY OUTSIDE ORGANIZATION IS REQUIRED WHEN FLEET MAINTENANCE ACTIVITY (FMA), INDUSTRIAL ACTIVITIES AND CONTRACTOR PRODUCTION WORK IS IN PROGRESS. REQUIREMENTS OF PARAGRAPH 10.4.8 OF THIS CHAPTER OR A SHIP'S PLAN OF THE DAY WILL BE IMPLEMENTED ANY TIME WORK AFFECTING SAFETY OF SHIP ITEMS IS PERFORMED REGARDLESS OF AVAILABILITY STATUS.**

b. Safety of Ship Maintenance Items. The ship's Commanding Officer's permission is required prior to authorizing the maintenance evolution. The following, as a minimum, shall be scheduled on the SOSMIL:

(1) All maintenance involving single closure isolation from sea.

(2) All maintenance which removes a means of blowing main ballast tanks.

(3) All maintenance requiring the use of flat patches, hull blanks or cofferdams, with specific entries identifying the actual installation and removal of these items.

(4) All maintenance which removes the capability to dewater the ship using either the trim or the main drain systems.

(5) All maintenance which removes the ship's installed firefighting capability (e.g., maintenance which prevents pressurization of the trim system).

(6) Bleeding or charging oxygen banks.

(7) Handling or loading of explosives or weapons.

(8) All maintenance which removes portions of, or the entire Emergency Air Breathing system.

(9) Fueling or defueling.

(10) Diver operations.

(11) Pumping or flooding the sonar dome.

(12) Battery charges.

(13) Nitrogen load.

(14) Refrigerant on/off load.

(15) Ballasting evolutions with an expected change of >3 inches.

(16) Securing the Emergency Diesel Generator.

(17) Other maintenance or evolutions which require special coordination between Ship's Force and maintenance providers to ensure safe accomplishment of authorized work (i.e., Sail Safety, Loading Vertical Launch System Platform).

(18) All maintenance that violates the integrity of the pressure hull, watertight bulkhead or watertight doors, excluding the routine operations of access hatches.

(19) All maintenance that disables any bilge alarm or any portion of an emergency announcing circuit when temporary alarms or indications are not installed.

(20) All maintenance that secures normal or emergency lighting circuits in a compartment or space such that damage control response would be significantly impacted.

**NOTE: USE OF TEMPORARY SYSTEMS TO REPLACE FUNCTIONS OF SHIP'S INSTALLED SYSTEMS SHOULD BE CONSIDERED WHEN DEEMED NECESSARY. CLASS SUBMARINE ORGANIZATION AND REGULATIONS MANUALS AND SHIP SYSTEM MANUALS MAY PROVIDE FURTHER GUIDANCE.**

c. SOSMIL Preparation. The SOSMIL will be prepared by a person designated by the ship's Commanding Officer using written input provided by Ship's Force divisions and the FMA representative. A new SOSMIL will be prepared prior to the FMA Daily Production Meeting of Volume II, Part I, Chapter 4, paragraph 4.6.5.2 of this manual. Appendix E of this chapter is provided as an example and depicts the minimum attributes that must be documented on the SOSMIL. Appendix F of this chapter may be reproduced locally for use. Prepare the SOSMIL as follows:

(1) Indicate ship's name, hull number, upkeep number, calculated maximum expected draft, actual morning draft and date prepared.

(2) For each job, list the Job Control Number/WAF number (as applicable) (operating instruction, PMS item, operating procedure), job description, scheduled end date and any remarks.

(3) The SOSMIL should indicate planned work for the next seven days. A thick black line shall be used on the left side of the current day to indicate the current days work.

(4) In the job description block, indicate in parentheses a number that corresponds to the list at the bottom of the sheet as to why the job requires a SOSMIL entry.

(5) Items shall remain listed on the SOSMIL until work has been verified complete and associated WAF has been completed or Block 11 of the WAF revised as no longer affects Safety of Ship.

d. Maximum Expected Draft. For those items which will have an affect on ship's draft, expected draft changes greater than three (3) inches will be calculated fore and aft for that evolution and indicated in the remarks section. Draft calculations will be made by a Diving Officer of the Watch qualified individual. Additionally, for all ballasting evolutions, a second independent calculation will be performed and provided by a second Diving Officer of the Watch qualified individual. The worst-case draft change for each item will be totaled to arrive at a "maximum draft" and a maximum one foot buffer added to arrive at the "maximum expected draft". (The ship's Commanding Officer can decide to reduce the buffer as he desires. If Safety Draft Marks are in use, the bottom edge of the mark shall match the "maximum expected draft".) The "maximum expected draft" is listed at the top of the SOSMIL. Calculation sheets will be retained until the job is no longer carried on the SOSMIL. If the ship exceeds the "maximum expected draft", the Duty Officer will stop the evolution, place the ship in a safe condition and notify all parties who signed the SOSMIL and the ship's Commanding Officer.

**NOTE: THIS SHALL IN NO WAY BE CONSTRUED AS LIMITING ACTIONS BY THE DUTY OFFICER OR NOTIFICATION OF THE SHIP'S COMMANDING OFFICER OF SMALLER DRAFT CHANGES. ANY UNEXPECTED DRAFT CHANGE SHOULD BE THOROUGHLY INVESTIGATED AND UNDERSTOOD.**

e. Morning Actual Draft. The actual ship's draft recorded each morning prior to the Daily Production Meeting. This draft will serve as a baseline value for draft changes that occur throughout the day.

f. The Ship's Force Availability Coordinator will present the SOSMIL at the FMA daily production meeting for review and signatures. The SOSMIL will be signed by:

(1) Ship's Force (signed by a department head). Signature indicates that all evolutions that affect ballast have been identified, the form has been completed in accordance with this instruction and the correct drafts have been calculated and at least four feet of freeboard is available to all hull openings.

(2) Immediate Superior In Command (ISIC) (signed by an ISIC representative). Signature indicates that all maintenance has been identified, the form has been completed in accordance with this instruction and the draft measurements are noted.

(3) Maintenance Organization (signed by appropriate senior level person of the repair activity, normally the Production Officer, as he leads the FMA Daily Production Meeting). Signature indicates all authorized Safety of Ship work items are listed. If any additional items are to be worked, a formal change to the SOSMIL will be required.

g. Following review and signature, the Ship's Force Availability Coordinator will provide the original copy to the ship's Duty Officer. Reproduced copies for distribution shall be made from the "original document" only. Copies will be provided to:

(1) Each Production Meeting attendee listed below:

(a) FMA Division Officers

(b) FMA Repair Duty Officer/Repair Duty Chief Petty Officer

(c) FMA Regional Maintenance Team Leader. He/she shall receive enough copies to make further distribution to the FMA Duty Officers and each FMA Division Officer having work listed on the SOSMIL.

(d) Supply Repair Other Vessel Officer

(e) Ship's Force Availability Coordinator

(f) ISIC Material/Squadron Representative

(g) FMA Availability Coordinator

(2) The ship's Engineering Duty Officer.

(3) The ship's Below Decks Watch.

(4) The ship's Petty Officer of the Deck.

(5) Naval Submarine Support Center Representative.

h. SOSMIL Use and Pre-Job Briefs. None of the evolutions or maintenance specified in paragraph 10.4.8.b of this chapter shall commence unless it is scheduled on the current SOSMIL. The activity performing any maintenance or evolutions listed on the SOSMIL is responsible for a pre-job brief prior to commencing work. A pre-job brief is required for all items listed on the SOSMIL and will be attended by all parties involved as desired by the Ship's Duty Officer.

10.5 FINAL CERTIFICATION, CLOSE-OUT AND RE-ENTRY OF SUBMARINE SPACES, TANKS AND VOIDS.

10.5.1 Purpose. To establish procedures for the final certification, close-out and re-entry of submarine spaces, tanks and voids.

10.5.2 Discussion. Historically during space, tank or void close-out, a large number of diverse and inconspicuous items have been overlooked. These items have, at times, seriously degraded both material readiness and acoustic signature of submarines. This section establishes a procedure to ensure a thorough certification of all spaces prior to final close-out and provides a check-off list when re-entry is required. The check-off list/sheet is not all inclusive.

Common sense and effective use of personnel experience and knowledge must be used to ensure complete and thorough inspections. Non-steel damping and acoustic restraining covers are not required to be painted. Accidental overspray is acceptable. Full paintout of damping restraining covers and acoustic tile covers is not the intent. If damping and acoustic tiles are painted they must be checked to ensure that the paint will not bridge the gap between the rubber and the restraining cover more than 75% over an area. Degradation of the performance of tiles is possible. A suggested way to repair the area is to score the gap between the restraining cover and the damping tile and between the acoustic tile covers and the rubber. Previously painted serviceable tiles may remain in service. Reference (c) allows paint on piping.

**NOTE APPENDIX G MAY BE USED AS AN AID FOR ENTERING SUBMARINE SPACES, TANKS AND VOIDS.**

10.5.3 Action.

a. The Damage Control Assistant (DCA) is designated the coordinator for the close-out of all spaces. As such he is responsible for the following:

(1) Assigning responsible personnel to close-out or assist in closing out specific spaces, tanks and voids.

(2) Providing personnel designated to conduct tank, void, or space close-outs with a copy of Appendices G or H as applicable.

(3) Ensuring personnel performing close-outs are aware of their responsibilities and are adequately trained. He shall provide, by periodic notice, a list of personnel qualified to perform close-out inspections.

(4) Maintaining a folder for completed copies of Appendix H. This folder will serve as a space, tank and void close-out certification record. Only the most recent copies of these Appendices are required to be retained. This folder should also include an index of all spaces, tanks and voids applicable to close-out certification and their status.

(5) Keeping the Commanding Officer and the Engineer Officer informed as to the status of close-outs and significant deficiencies noted.

b. Personnel performing tank, void and space close-out or entry are responsible for:

(1) Obtaining a copy of Appendix G and Appendix H.

(2) Forwarding to the DCA completed copies of Appendix H.

c. Responsibility for Re-Entry Controls (REC) and final certification is as follows:

(1) In cases where entry is required to be made for production work by both Ship's Force and FMA personnel, the FMA will be responsible for REC and Ship's Force will be responsible for final certification close-out.

(2) For cases where only FMA work is anticipated, the FMA will be responsible for REC and Ship's Force will be responsible for final certification close-out. For the cases in which only the maintenance activity has access (e.g., waterborne entry into mud tanks or ballast tanks by divers) the maintenance activity will be responsible for final certification close-out.

(3) For cases where only Ship's Force work is anticipated, Ship's Force will be responsible for REC and final certification close-out.

10.5.4 Applicability. All SSN and SSBN/SSGN Class submarines and FMAs.

**WORK AUTHORIZATION FORM REVISION SHEET**

| 1. USS | 3. WAF NO. | REV |
|---|---|---|
| | | |

9. RESTRICTIONS/PRECAUTIONS/REMARKS

AUTHORIZATION TO WORK

11. SAFETY OF SHIP (Submarine Only): ☐ YES ☐ NO

RA SSO (if SPOD used) or QUALIFIED WATCH/DUTY OFFICER (if SOSMIL used)

_____ _____ DATE _____

12. CONCURRENCES:

_____ DATE _____ DATE _____DATE _____

13. TAGOUT REQUIRED: ☐ YES ☐ NO

TAGOUT NO._____

SYSTEM/COMPONENT IS LINED UP FOR WORK, A TAGOUT IS HUNG, VERIFIED AND SIGNED BY THE REPAIR ACTIVITY (IF REQUIRED) AND SHIP.

_____

WATCH/DUTY OFFICER DATE

14. PLANT/SHIP CONDITIONS (E.G., DRAINED, DE-PRESSURIZED, DE-ENERGIZED) SET. DIVISION/RA IS AUTHORIZED TO START WORK.

_____

WATCH/DUTY OFFICER DATE

_____

REPAIR ACTIVITY DATE

☐ CHECK IF CONTINUED ON ANOTHER SHEET

Sheet _____

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## APPENDIX E

## SAFETY OF SHIP MAINTENANCE ITEM LIST EXAMPLE

| Ship name: USS Bigcity<br>Hull #: SSN-799 | Upkeep #:<br>802 | Maximum expected draft: Fore: 32'0"<br>aft: 34'6" | Actual Morning Draft:<br>Fore: 32'0" aft: 32'0" | Date prepared: Wednesday<br>23 SEP 98 |
|---|---|---|---|---|

NOTE: THE MAXIMUM EXPECTED DRAFT SHALL IN NO WAY BE CONSTRUED AS LIMITING ACTIONS BY THE DUTY OFFICER OR NOTIFICATION OF THE SHIP'S CO OF SMALLER DRAFT CHANGES. ANY UNEXPECTED DRAFT CHANGE SHOULD BE THOROUGHLY INVESTIGATED AND UNDERSTOOD.

| JCN/ WAF # | Job Description<br>Reason on SOSMIL | Days work planned<br>28 Mon | 29 Tue | 23 Wed | 24 Thurs | 25 Fri | 26 Sat | 27 Sun | Scheduled end date | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| EA01-2345/ WAF # | TD-101 repair (1,3) | | | testing | Remove flange | | | | 24SEP98 | Restoration in progress |
| EM01-3456/ WAF # | Divers: inspect screw for fouling (10) | | | Brief 0830 | | | | | 23SEP98 | |
| | | | | | | | | | | |
| WQ01-1986/ WAF # | Inspect sonar dome/ (11) | | | Pump down dome, brief 0830 | | | | | 23SEP98 | Draft change expected: 1' up fore 1.5' down aft |
| EA01-3509/ WAF # | TD-1 ball/seat repair (4,5) | Trim system restored | | | | | Stage temp firefighting | Testing | 28SEP98 | Valve worked in place; temporary firefighting capability staged |
| WK01-4568/ WAF # | Off-loading countermeasures (7) | | | | | Off-load | | | 25SEP98 | through weapons shipping hatch |
| EA01-3525/ WAF # | LP Blower MRC M-2, change oil on LP Blower (2) | Down for 1 hour at 1300 | | | | | | | 28SEP98 | |

The following items are Safety of Ship:

1. Single closure from sea
2. MBT blow removed
3. Belly bands, hull blanks, cofferdams
4. Dewatering ability removed
5. Firefighting capability removed
6 Bleeding charging Oxygen banks
7. Weapons handling
8. EAB system maintenance
9. Fueling or defueling
10. Diver operations
11. Pumping or flooding sonar dome
12. Special coordination btwn S/F and FMA
13. Battery charges
14. Nitrogen load
15. Refrigerant on/off load
16. Ballasting evolutions with an expected change of >3 inches
17. Securing the Emergency Diesel Generator
18. Pressure hull watertight bulkhead/doors maintenance
19. Bilge alarm/emergency announcing circuit maintenance
20. Normal/emergency lighting maintenance

Review and approval (all parties must sign):

| ISIC Rep: | FMA Rep: | Ship's Force DH: |
|---|---|---|

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## APPENDIX F

## SAFETY OF SHIP MAINTENANCE ITEM LIST

| Ship name:<br>Hull #: | Upkeep #: | Maximum expected draft:<br>Fore: aft: | Actual Morning Draft:<br>Fore: aft: | Date<br>prepared: |
|---|---|---|---|---|

NOTE: THE MAXIMUM EXPECTED DRAFT SHALL IN NO WAY BE CONSTRUED AS LIMITING ACTIONS BY THE DUTY OFFICER OR NOTIFICATION OF THE SHIP'S CO OF SMALLER DRAFT CHANGES. ANY UNEXPECTED DRAFT CHANGE SHOULD BE THOROUGHLY INVESTIGATED AND UNDERSTOOD.

| JCN/ WAF # | Job Description<br>Reason on SOSMIL | Days work planned<br>___ Mon | ___ Tue | ___ Wed | ___ Thurs | ___ Fri | ___ Sat | ___ Sun | Scheduled end date | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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| | | | | | | | | | | |

The following items are Safety of Ship:

5. Single closure from sea
6. MBT blow removed
7. Belly bands, hull blanks, cofferdams
8. Dewatering ability removed
5. Firefighting capability removed
6 Bleeding charging Oxygen banks
7. Weapons handling
8. EAB system maintenance
9. Fueling or defueling
10. Diver operations
11. Pumping or flooding sonar dome
12. Special coordination btwn S/F and FMA
13. Battery charges
14. Nitrogen load
15. Refrigerant on/off load
16. Ballasting evolutions with an expected change of >3 inches
17. Securing the Emergency Diesel Generator
18. Pressure hull watertight bulkhead/doors maintenance
19. Bilge alarm/emergency announcing circuit maintenance
20. Normal/emergency lighting maintenance

Review and approval (all parties must sign):

| ISIC Rep: | FMA Rep: | Ship's Force DH: |
|---|---|---|

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# VOLUME IV

## CHAPTER 11

## TECHNICAL DATA AND INFORMATION MANAGEMENT

REFERENCES.

(a) NAVSUP P2003 - Navy Stock List of Forms and Publications
(b) TL130-A1-HBK-010 MSC Procedures Manual - Maintenance Support Center Library Procedures Manual
(c) SECNAVINST 5510.36 - Department of the Navy Information Security Program Regulation
(d) S0005-AA-GYD-030 - Guide for User Maintenance of NAVSEA Technical Manuals; NAVSEA Technical Manual Management Program
(e) NAVSEA S8800-00-GIP-000 - Handbook for Fleet Maintenance Activity Technical Library Personnel
(f) COMNAVAIRFORINST 4700.23 - Aircraft Carrier Maintenance Support Centers (MSC) Policy and Procedures
(g) FGC 2200 - Outfit Logistics Support Requirements
(h) SECNAVINST 5510.30 - Department of the Navy Personnel Security Program
(i) SL720-AA-MAN-010 - Fleet Modernization Program (FMP) Management and Operations Manual
(j) S9040-AC-IDX-010 - Ships 3-M Reference Information CD
(k) NAVAIR 00-25-100 - Naval Air System Command Technical Manual Program

11.1 PURPOSE. This chapter defines the responsibilities of assigned departments with respect to the management of technical documentation and data and requires the establishment and operation of technical libraries.

11.1.1 Discussion. Technical data and information are critical for the proper operation, maintenance, troubleshooting and repair of all plant equipment. Improper maintenance or equipment remaining not repaired and inoperative can result from a lack of proper documentation in the form of technical manuals, ship's drawings and blueprints, Military Specifications and standards, etc.

11.2 TECHNICAL LIBRARIES. Maintenance Support Center (MSC) Technical Library personnel maintain a complete master technical library including technical manuals, drawing/aperture cards, Coordinated Shipboard Allowance Lists, provisioning Allowance Parts Lists (APL), computerized databases and any other technical documents or aids which support maintenance functions. The Technical Library Management or locally generated Library Management Database (LMD) and Technical Document Management Information System (TDMIS) computer programs will be used to maintain the library. In general, the technical library serves the following basic functions:

a. Acquisition of new documents and data and the updating of existing materials.

b. Cataloging, indexing and filing all documents, data and information materials to allow for effective use of library technical information.

c. Accountability and control to ensure continuous integrity of the library collection and to enhance periodic inventories.

d. Central control point for all technical documents received, held, used, transferred or disposed of by the repair department (Fleet Maintenance Activity (FMA) only) or command. For FMAs having a Nuclear Support Facility (NSF), all Naval Sea Systems Command Nuclear Propulsion Directorate (NAVSEA 08) controlled documents shall be controlled by the NSF. For MSCs aboard nuclear powered aircraft carriers, all NAVSEA 08 controlled documents shall be controlled by the Reactor Department Technical Publication Library. For MSCs having an Aviation Intermediate Maintenance Department (AIMD), all AIMD documents shall be controlled by the AIMD Librarian. The AIMD Library shall control all AIMD documents.

e. Maintain modem/internet access to the following computer networks/websites whenever possible.

(1) Technical Document Management Information System (TDMIS). https://mercury.tdmis.navy.mil/default.cfm

(2) Military Engineering Drawing Asset Locator System. https://www.dlis.dla.mil/medals

(3) Naval Surface Forces, Atlantic Planning and Execution of Alterations and Repair (FMA and COMNAVSURFLANT and COMNAVSURFPAC commands only) https://www.spear.navy.mil click on SPEAR info.

(4) Fleet Modernization Program Management Information System.

(5) Monthly Advance Change Notice Report. https://nsdsa.nmci.navy.mil/

(6) Department of Defense Index for Military Specifications, Standards and Related Publications (DODSSP) http://dodssp.daps.dla.mil

(7) https://assist.daps.dla.mil/

11.2.1 Technical Library Supervisor. The Technical Library Supervisor is responsible for keeping current plans, prints, specifications, manuals and all other technical documents and information needed by ship and FMA departments and for managing the daily operation of the library. The Technical Library Supervisor shall:

a. Have a sufficient understanding of technical library organization requirements in references (a) through (k) (as applicable) to supply the necessary technical information.

b. Have at least a "Confidential" security clearance.

c. Supervise personnel assigned to library.

d. Operate the technical library in the following manner:

(1) Schedule and carry out a frequent and recurring on the job training program for all personnel assigned to the technical library staff or to satellite librarian positions. As a minimum, training shall include topics that provide guidance for performing each library or satellite library function. Satellite librarian training may be tailored to cover only those areas applicable to satellite libraries. Lesson plans shall be developed for each topic.

(2) Maintain and provide applicable and current plans, prints, specification, manuals and all other technical documents and information needed by the cognizant department. FMAs will also provide technical documents to tended units, other FMAs, non-FMA government activities or qualified Department of Defense contractor personnel.

(3) Maintain an inventory of technical publications/manuals and manufacturer instruction books and other technical/repair documents available in the technical library and/or any satellite libraries (Work Centers/division offices, etc.).

h. Static Load Test. A stationary overload test conducted to verify the structural and mechanical integrity of the lifting equipment. The lifting equipment holds the test load for a short period of time while the test inspector checks the equipment for signs of brake slippage or damage.

13.2.2 Procedure. Fabrication, repair and testing of Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment will be conducted using a Controlled Work Package developed in accordance with Volume V, Part I, Chapter 2 of this manual. This requirement does not apply to periodic weight test of Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment. Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment requiring a weight test based on Planned Maintenance System (PMS) or other periodic testing requirements, excluding tests in conjunction with repair or manufacture, will be inspected and tested using Technical Work Documents, such as a pre-existing maintenance procedure, test load methods drawing, technical manual or Formal Work Procedure. Periodic weight testing must be witnessed by a qualified inspector.

a. Testing Sequence. Newly installed/overhauled equipment shall be tested in the following order:

(1) No-load Test.

(2) Static Load Test.

(3) Dynamic Load Test.

(4) Rated Load Test.

b. Results of completed weight tests will be documented on QA form 17W, using the procedures of Volume V, Part I, Chapter 11 of this manual. The serial number (if known) of the equipment shall be recorded on the weight test record.

c. Handling equipment that has satisfactorily passed the required inspections and load testing shall be so marked by the activity conducting the tests. As a minimum, this marking shall include the name of the testing activity, the date (year and month) tested, date of re-inspection due date, the rated load or SWL and a unique serial number that will allow it to be traced to its test and inspection documentation.

(1) Where there is little available space for surface marking, such as on wire rope slings, the item may be marked with a Periodic Load Test Record Strap as shown in reference (e).

(2) Nylon webbing slings shall have etched leather tags sewn to each sling leg to identify the leg and indicate test results as described in reference (f).

(3) Stamped, etched or engraved metal tags, which are attached to the tested item with mechanical fasteners or adhesives, may also be used.

(4) Color coding, for local control only, may be used in addition to, but not as an alternate to, one of the authorized marking methods.

(5) Wire rope (1/32" through 3/16" diameter) may be used to attach metal tags to WHE provided that the wire rope is secured using mechanical fasteners designed to secure wire rope such as swedges. Metal tags attached using lockwire style twisted wires are prohibited.

d. A permanent log, written or electronic, shall be maintained to record the following information:

(1) Equipment identification.

(2) Date of the test or inspection.

(3) Description of the test or inspection.

(4) Weight used for the test, in pounds.

(5) Testing activity.

e. New hooks, blocks, sheaves, wire rope, fiber rope, and other loose hardware or gear need not be load tested after installation if it has not been modified and has been purchased to Military Specifications (MILSPEC) or NAVSEA standard drawings through the Naval Supply System. Any load carrying loose gear procured otherwise shall be tested prior to placing in-service to 200% of the SWL of the part in question. If any sheave, block or hook assembly is received that does not bear the manufacturer's test stamp, it shall be tested to 200% of the SWL.

f. Unless otherwise specified, load test capacity tolerance shall be +5%, -0%.

13.2.3 Load Test Types and Duration. For each test, the equipment shall withstand the load test for a minimum of two minutes (10 minutes for hoists, cranes and crane structures) with no permanent deformation. For hoists, trolleys and other moving machinery, lift (travel) through three cycles of all moving parts at maximum rated speed.

13.2.3.1 Static Load Test.

a. Unless otherwise specified, all arrangements for handling and supporting weights (including weights of personnel), all arrangements for taking heavy strains, and all parts upon which the safety of the ship or life depend, shall be given a static load test equal to twice the rated load. In cases where the rated load is not specified, the test load shall be based on the expected duty of the auxiliary, appliance, or fitting. For hoisting arrangements, the static test load shall be suspended clear of all supports and held suspended for a sufficient period to permit inspection of welds and other fastenings, but need not be lifted or moved by a gear under test. After relieving the static test load, there shall be no evidence of permanent deformation of structure.

b. The equipment or system to be tested shall not be used to lift the total static test load. Static load tests shall be completed prior to performance of operational tests. Where static test loads exceed 40% of rope breaking strength, the ship's rope shall not be used for the static test.

13.2.3.2 Dynamic Load Test. Weight handling arrangements shall be tested to demonstrate capacity to withstand additional loads imposed on a system when operating under unfavorable sea conditions at reduced speed. The dynamic load test shall be conducted to demonstrate handling equipment load capabilities throughout the complete operating range. As far as practicable, test loads shall be moved completely through the equipment operating range, within the limits of all operating modes.

**NOTE: IF THE EQUIPMENT USES HYDRAULIC POWER, THE SYSTEM RELIEF VALVES SHALL BE CHECKED FOR PROPER SETTINGS BEFORE PERFORMING A DYNAMIC LOAD TEST.**

13.2.3.3 Rated Load Test. Following satisfactory completion of the dynamic load test, the rated load test shall be conducted to demonstrate capability to operate with a full load, at rated speed, through the complete range of operating limits. As far as practicable, test loads shall be moved completely through the equipment operating range, within the limits of all operating modes. Proper operational functions shall be demonstrated at each speed in all operating modes. The mechanical safety devices shall be tested for their ability to stop and hold when carrying rated load at rated speed.

13.2.4 Load Test Periodicity.

a. In the interest of personnel safety and equipment protection, inspection and testing of all WHE not covered by PMS or other directives will be performed at intervals not to exceed four years. A PMS feedback will be submitted for each piece of WHE not covered by PMS.

| EQUIPMENT/SYSTEM INSPECTIONS AND TESTING | GOVERNING DOCUMENT(S) FOR MAINTENANCE |
|---|---|
| Deck Screw Reversible Eyebolts | Reference (v) |
| Hoists | Reference (w), PMS |
| Hull Fittings | Reference (x), PMS |
| Portable Davits | Reference (y) |
| Reactor Plant Lifting and Handling Equipment | References (b) through (d) |
| Stores & Provision Handling | Reference (w), PMS |
| Temporary Padeyes | Reference (z), Section 611 |
| Trunk Safety Nets | Reference (aa) |
| Underway Replenishment | Reference (ab), PMS |
| Vehicle Tiedowns | Reference (ac) |
| Weapons Handling Equipment SSN 688 Class | Reference (ad) |
| Vertical Launch System - Weapons Handling Equipment SSN 688 Class | Reference (ae) |
| Weapons Handling Equipment SSBN/SSGN 726 Class | Reference (af) |
| Weapons Handling Equipment SSN 21 Class | Reference (ag) |
| Wire and Fiber Rope and Rigging | Reference (ah) |
| Shipboard Crane and Miscellaneous Rigging Gear | Reference (g) |

13.2.9 Identification of Equipment. (Submarines only) Following the weight test, ensure the Weapons Handling Equipment is properly marked as detailed in accordance with reference (e) section 4.

13.2.10 Witnessing Qualification. (Submarines only) Tended units Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment requiring weight test based on PMS or other governing documents for periodic purposes must be witnessed by a qualified Weight Handling Test Inspector. The Weight Handling Test Inspector will be qualified in accordance with Quality Maintenance Personnel Qualification Standard (NAVEDTRA 43523) and certified by the Commanding Officer.

13.2.11 Record Keeping. (Submarines only) QA form 17W will be used to document Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment weight testing. The Weight Handling Test Inspector will sign the Quality Assurance blocks of QA form 17W. The signed QA form 17W or a copy will be provided to the activity who maintains the Shipboard Weight Handling and/or Weapons Handling Equipment in all cases. QA form 17W will be retained by the end user and/or maintaining activity until superseded by successive testing for each piece of Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment. QA form 17W used to document Shipboard Weight Handling and/or Weapons Handling and Stowage Equipment testing in a Controlled Work Package will be retained with the Controlled Work Package as prescribed by Volume V of this manual.

13.3 NAVAL FACILITIES ENGINEERING COMMAND ASHORE REQUIREMENTS. WHE assigned to naval shore activities and utilized only in ashore operations or aboard ships when the ship is pierside shall be certified, tested, inspected and operated in compliance with reference (a). For general purpose lifting and rigging, shore based rigging gear and portable hoists meeting the requirements of reference (a) may be used aboard ship when the ship is pierside (this does not apply to ordnance or radiological lifting and handling). Reference (a) covers line handling mechanisms on floating cranes, hoists and chainfalls which are used in multiple locations, and portable and adjustable gantry cranes and floor cranes. Material handling equipment is covered by Naval Supply Systems Command criteria.

13.3.1 Certification Program. The Commanding Officer is responsible for ensuring safety within the activity and shall designate a WHE certifying official who shall ensure the activity's WHE is inspected, tested and certified in accordance with reference (a).

13.3.2 Operator Licensing Program. All Navy civilian and military personnel assigned duties involving the operation of Navy shore based Category 1, 2, Cab Operated Category 3 or Category 4 WHE shall be qualified and licensed in accordance with the provisions of reference (a).

13.3.2.1 Operator Qualification and Testing. All applicants for Crane Operation Licenses shall meet the requirements of reference (a).

13.3.2.2 Licensing Procedures and Documentation. Reference (a) contains the necessary procedural requirements for licensing and documentation.

13.3.3 Inspections.

a. Pre-Use Check (Category 1, 2, Cab Operated Category 3 and Category 4 Cranes). The operator shall perform an inspection of their assigned crane using a Crane Operator's Daily Checklist as required by reference (a).

b. Reference (a) gives specific instructions for conducting and reporting the following inspections:

(1) Walk Around Inspection.

(2) Machinery House Inspection.

(3) Operator Cab Inspection.

(4) Operating Inspection.

c. Pre-Use Check (Non-Cab Operated Category 3 Cranes) shall be performed in accordance with reference (a).

13.3.4 Test Procedures. Reference (a) contains instructions for performing crane test procedures.

13.3.5 Special Purpose Service. Activities using special purpose service cranes shall follow the requirements of reference (ai) in addition to criteria contained in reference (a).

13.4 SLINGS. Slings used in conjunction with other material handling equipment for the movement of material ashore by hoisting are covered by references (a) and (g).

a. A sling is an assembly which connects the load to the material handling equipment.

b. Slings include those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).

13.4.1 Crane Rigging Gear and Miscellaneous Equipment. Reference (a) contains maintenance, inspection and test requirements for the following common rigging gear used ashore and reference (g) contains maintenance, inspection and test requirements for the following common rigging gear used shipboard. Reference (g) allows shore based rigging gear and portable hoists meeting the requirements of reference (a) to be used aboard ship with shipboard cranes when the ship is pierside.

a. Slings.

b. Shackles, links, rings, swivels, eye bolts, turnbuckles, hooks and swivel hoist rings.

c. Tackle blocks.

d. Portable load indicating devices (dynamometers, load cells, crane scales, etc.).

e. Lashing (e.g., wire rope, synthetic rope, synthetic webbing).

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# VOLUME IV

## CHAPTER 17

## STEAM CATAPULT INSPECTION

REFERENCES.

(a) OPNAVINST 9220.3 - Propulsion and Auxiliary Plant Inspection and Inspector Certification Program
(b) NAVSEA S9587-B1-MMA-010 - Catapult Steam Support Systems for CV/CVN Class Ships; Description, Operation and Maintenance
(c) NWP 1-03.1 - Naval Warfare Publication Operational Report
(d) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
(e) NAVSEA S9086-CH-STM-030 - NSTM Chapter 074 V3 (Gas Free Engineering)
(f) NAVSEA S6470-AA-SAF-010 - Gas Free Engineering Manual
(g) NAVSEA S9086-RK-STM-010 - NSTM Chapter 505 (Piping Systems)
(h) NAVSEA S9587-AT-MMA-010 - Electronic Controls Charging System Tech Manual

LISTING OF APPENDICES.

A Sample Catapult Accumulator Inspection Request
B Sample Inspection Confirmation Letter
C Summary of Catapult Accumulator Inspection Scheduling and Responsibilities
D Sample Catapult Accumulator Inspection Report Cover Letter
E Sample Catapult Accumulator Inspection RBO-Deficiencies Message
F Sample 30 Day Update Message
G Sample Catapult Accumulator Rescission Message

17.1 PURPOSE. To establish policy and provide procedures and inspection requirements for Steam Catapult Accumulators and support systems including:

a. Inspection scheduling.

b. Required preparations.

c. Inspection guidelines.

d. Reporting requirements.

17.1.1 Policy. Periodic standardized inspections are required of all steam catapult accumulators and associated support systems including steam fill and blowdown systems, feed water fill and drain systems, steam piping and accumulator drain systems, control and indicating systems associated with the fill, pressurization and blowdown of the steam catapult accumulators, and steam supply and drain piping for the trough heating system. Inspections shall be conducted by a certified Steam Generating Plant Inspector (SGPI) and/or Naval Surface Warfare Center, Carderock Division (NSWCCD) Life Cycle Engineering Manager (LCEM), as applicable in accordance with the requirements of reference (a). The maximum interval between inspections and other occasions requiring inspections, as well as responsibilities for continuation and standardization of the inspection program, are formally assigned in reference (a). Specific inspection criteria, attributes and intervals are detailed in reference (b).

17.2 TYPES OF INSPECTIONS.

a. Routine Inspection.

b. Pre-start of Availability Inspection (PSAI).

c. Start of Availability Inspection (SAI).

d. Strength and Integrity Inspection.

e. Industrial Support Visit (ISV).

f. Completion of Availability Inspection (CAI).

g. Inactivation or Reactivation inspection.

h. Special Inspections.

17.3 RESPONSIBILITIES.

17.3.1 Naval Sea Systems Command. Naval Sea Systems Command (NAVSEA) shall provide Technical Authority oversight over all steam catapult accumulators and associated equipment. The designated NAVSEA Technical Warrant Holder shall:

a. Assure safe and reliable system operation.

b. Set and enforce all technical requirements.

c. Be the approval authority for all major Departure from Specifications (DFS).

d. Provide technical oversight and management of the SGPI and NSWCCD LCEM programs.

(1) Establish and enforce requirements for SGPI certification and recertification.

(2) Ensure periodic SGPI Seminars are conducted.

(3) Ensure periodic technical audits of all Integrated Logistics Support documentation and training.

(4) Maintain the Steam Catapult Inspection and Repair Management Information System (SCIRMIS).

(5) Routinely evaluate and ensure state of the art inspection, maintenance and repair tools and techniques are used.

17.3.2 Naval Surface Warfare Center, Carderock Division.

a. Provide support to NAVSEA for the SGPI and NSWCCD LCEM programs. Ensure that the required technical documentation to support the SGPI/NSWCCD LCEM Inspector programs is maintained current.

b. Establish and monitor the requirements and standards for routine and industrial inspections of steam catapult accumulators.

c. Develop, implement and maintain a program to train and certify NSWCCD LCEM Inspectors in accordance with reference (a).

d. Ensure that inspection of ships undergoing major overhaul and/or conversion are conducted in accordance with this instruction.

e. Conduct periodic technical audits of the SGPI Training Course per reference (a).

f. Provide management of technical data, SCIRMIS accumulator history associated repair management information database system.

g. Provide technical support to the semi annual SGPI seminars.

h. Maintain a roster of all Certified SGPIs by name, rating, duty station, date of certification and expiration date of certification. Recommend inspector certification and initiate action to decertify inspectors who fail to comply with the requirements of reference (a).

i. Ensure that the requirements for SGPI certification, recertification and certification extensions are met prior to final approval.

j. Conduct PSAI, SAI, ISV, Strength and Integrity Inspections, CAI and Special Inspections as specified in section 17.6 of this chapter and reference (b).

17.3.3 Type Commander.

a. Provide or arrange for certified SGPIs to perform inspections in accordance with the requirements of reference (b).

b. Schedule inspections of all catapult accumulators and support systems required by reference (b). Coordinate the inspections with the appropriate technical activities to avoid unnecessary opening of accumulators.

c. Assist Commanding Officers in arranging for the corrective action of deficient items which are beyond the capability of Ship's Force to perform. Monitor the follow-up action required to correct these deficiencies.

d. Review the SCIRMIS to ensure deferred inspection deficiencies are entered into the Current Ship's Maintenance Project (CSMP) and are planned/programmed for repair.

17.3.4 Regional Support Group/Regional Maintenance Center/Fleet Maintenance Activity Commanding Officers. Maintenance Activity Commanding Officers shall provide a certified SGPI, when requested by the ship, Immediate Superior in Command (ISIC) or Type Commander (TYCOM), to conduct the accumulator inspections.

17.3.5 Ship Commanding Officer.

a. Request inspections via Naval Message with the desired primary and alternate dates to the TYCOM with info copies to Cognizant Regional Maintenance Center (RMC) and NSWCCD for accomplishment of the inspections using the format in Appendix A.

b. Prepare for the scheduled inspections in accordance with references (a) and (b).

c. Conduct Ship's Force responsible inspections and provide reports required by reference (b).

d. Review inspection results and initiate corrective action for those deficiencies within Ship's Force capability. Initiate requests for those corrective actions beyond Ship's Force capability. If any discrepancies of paragraph 17.9.2 of this chapter cannot be corrected within 72 hours following completion of the inspection, or if said discrepancies will impact ship's operational schedule, initiate a Casualty Report for the affected catapult accumulator(s) in accordance with reference (c).

e. Assess the impact of corrective actions (if any) on the ship's operating schedules and advise the TYCOM and operational commanders of any adverse effects.

f. Submit reports per paragraph 17.7.2 of this chapter.

g. Schedule catapult accumulator inspections as required by appropriate Planned Maintenance System (PMS)/Class Maintenance Plan items.

17.3.6 Regional Maintenance Center Senior Inspector. RMC Senior Inspector shall:

a. Ensure all assigned SGPIs maintain current SGPI certificates per reference (a).

b. Perform catapult accumulator inspections per reference (a).

c. Review and submit reports per paragraph 17.7.2 of this chapter.

d. Coordinate inspections in cognizant maintenance areas.

e. Send inspection confirmation messages using Appendix B of this chapter.

f. Maintain an up to date list of required catapult accumulator inspections which shall include the latest inspection for all ships assigned to the RMCs in their geographic area of responsibility.

17.3.7 Steam Generating Plant Inspector.

a. Maintain certification per the requirements of reference (a).

b. Perform inspections in accordance with the requirements of reference (a), (b) and section 17.9 of this chapter when directed.

c. SGPIs are part of the technical authority chain-of-command and are accountable to the NAVSEA Technical Warrant Holder for the performance of their inspection duties.

17.4 INSPECTION SCHEDULING. Commands will initiate inspection requests in a timely manner to assist with inspection scheduling coordination. Commands shall ensure inspection scheduling complies with reference (b) and the following:

a. Commanding Officers/Officers In Charge of ships shall request inspections by message. In addition, OPNAV 4790/2-Kilo shall be submitted to the RMC requesting a certified SGPI/NSWCCD LCEM inspector as required to conduct inspections.

b. Inspections should coincide with the required routine waterside maintenance.

c. Inspection services shall be coordinated by geographic areas for optimum utilization of SGPIs/NSWCCD LCEM Inspectors.

d. The TYCOM may utilize PSAIs and CAIs, which are documented in SCIRMIS to satisfy the pressure vessel portion of a routine inspection. This will reduce the number of catapult accumulator openings. A Routine Inspection will not be considered completed until an SGPI has certified all items required have been accomplished.

17.5 SAFETY PROCEDURES. The safety of personnel must be given the highest priority. Observance of good engineering practices will reduce the frequency of pressure vessel entry.

a. Ensure idle accumulator condition is accomplished in accordance with the provisions of the Catapult Engineering Operational Sequencing System and reference (b) in preparations for the inspection. Where conflicts occur, an Engineering Operational Sequencing System feedback form should be submitted for resolution.

b. Ensure the idle catapult accumulator is tagged out (valves wired shut and danger tagged). Observe two-valve protection per Chapter 10 of this volume. Open to the atmosphere the drain connections on all dead interconnecting piping to observe drainage.

c. Place signs warning at the catapult control console/central charging panel that personnel are working in the accumulator and in conspicuous places in the accumulator room and in rooms containing fill/blowdown isolation valves. The signs shall remain there until the work has been completed and personnel are clear of the secured accumulator.

d. Ensure all precautions cited in Section 5.3 of reference (b) are followed before entering an accumulator.

e. Do not enter any part of the accumulator until it has been fully ventilated and certified by a Naval Maintenance Facility Gas Free Engineer/National Fire Protection Agency Marine Chemist as safe for entry. Ensure all safety precautions associated with entry into sealed tanks, voids and/or pressure vessels including gas-free certification are performed in accordance with the requirements of references (d), (e) and (f), as applicable, and Chapter 25 of this volume.

f. The use of unshielded or non approved lighting in an open accumulator is prohibited. Portable lighting shall be watertight (National Stock Number (NSN) 9S-6230-00-701-2947).

g. Station an attendant outside the accumulator to provide assistance when any personnel are working inside the accumulator.

h. Maintain accountability of all items taken into an accumulator. Foreign Material Exclusion closures will be used to the maximum extent practical to prevent tools or other foreign materials from being inadvertently left in the accumulator or associated ship's systems.

(1) Personnel entering accumulators will remove all jewelry and empty their pockets of all unnecessary items.

(2) Removal of all items and foreign material exclusion closures from the accumulator will be verified and accounted for prior to conducting a final close-out inspection. Final close-out inspection of the catapult accumulator shall be accomplished by the Chief Engineer or his designated representative.

17.6 CATAPULT ACCUMULATOR INSPECTIONS AND REQUIREMENTS. Catapult accumulator inspections conducted in accordance with the requirements of reference (b) shall fulfill all other catapult accumulator inspection requirements. When practical, various inspections should be scheduled for coincidental performance. Appendix C of this chapter is a summary of inspection scheduling and responsibilities.

17.6.1 Routine Inspection. Routine inspections will be conducted at least once every 18 months not to exceed 24 months from its last inspection. For newly constructed ships, the 24 month period shall begin at the completion of the Board of Inspection and Survey Acceptance Trials. The normal interval between routine inspections shall be 18 months. The 18 month period begins with the first warm-up of the catapult accumulator to normal operating temperature and pressure following the previous routine inspection. To provide scheduling flexibility, inspections may be performed as early as 12 months not to exceed 24 months after the previous inspection. Inspections that exceed the 18 month interval will require a minor Departure From Specification to the TYCOM with concurrence

from NSWCCD-SSES. Any catapult accumulator which exceeds the inspection interval shall be placed out of commission until inspected by a certified SGPI or a Major DFS is approved by the NAVSEA Technical Warrant Holder to operate beyond 24 months without a Routine inspection.

a. The catapult accumulator inspection will be scheduled by the TYCOM.

b. The catapult accumulator inspection will be performed by a certified SGPI.

c. The TYCOM may utilize PSAIs, CAIs and Strength and Integrity Inspections which are documented in SCIRMIS, to satisfy the pressure vessel portion of a routine accumulator inspection. This will reduce the number of boiler openings. A Routine Inspection will not be considered completed until an SGPI has certified all items required have been accomplished. Once completed, this resets the periodicity required for the next inspection to 18 months not to exceed 24 months.

17.6.2 Pre-Start of Availability Inspection. The PSAI may be required at the discretion of the TYCOM to support early bid specification and work package development.

a. The PSAI will be scheduled by the TYCOM.

b. The PSAI will be performed by the NSWCCD LCEM Inspector and an SGPI.

17.6.3 Start of Availability Inspection. The SAI is required to be accomplished at the beginning of an availability to better define or re-evaluate the accumulator bid specification and identify those major repair items which may impact ship's operational schedule.

a. The SAI will be scheduled by the TYCOM, Industrial Activity or Supervising Activity as applicable.

b. The SAI will be performed by the NSWCCD LCEM Inspector and an SGPI.

17.6.4 Strength and Integrity Inspection. The normal interval between strength and integrity inspections shall be 60 months. Strength and Integrity Inspections may be conducted as early as 48 months not exceed 72 months after the last Strength and Integrity Inspection to provide flexibility in scheduling. Inspections that exceed the 60 month interval will require a minor DFS to the TYCOM with concurrence from NSWCCD-SSES. Any catapult accumulator which exceeds the inspection interval shall be placed out of commission until inspected by a certified SGPI, or a Major DFS is approved by the NAVSEA Technical Warrant Holder to operate beyond 72 months without a Strength and Integrity Inspection.

17.6.5 Industrial Support Visit Inspection. The ISV inspection shall be scheduled during the availability, but may be waived by the TYCOM for availabilities of short duration.

a. The ISV inspection will be scheduled by the industrial activity or Supervising Authority, as applicable.

b. The ISV inspection will be performed by an NSWCCD LCEM Inspector and an SGPI.

17.6.6 Completion of Availability Inspection. The CAI will be conducted prior to final close-out of the catapult accumulator.

a. The CAI will be scheduled by the industrial activity or Supervising Authority, as applicable, and may be conducted in conjunction with a Routine inspection.

b. The CAI will be performed by an NSWCCD LCEM Inspector and an SGPI, preferably the same SGPI who conducted the SAI.

17.6.7 Inactivation or Reactivation Inspection. This Inactivation or Reactivation inspection shall use the attributes of a strength and integrity inspection and shall be conducted prior to the final action (in the case of inactivation) unless a strength and integrity inspection has been conducted in the last 18 months. In this instance, the last inspection report may be used to document accumulator lay-up condition. For reactivations, a strength and integrity inspection shall be scheduled by the cognizant activity and conducted by NSWCCD and a cognizant RMC SGPI prior to reactivation of the unit.

17.6.8 Special Inspections. Additional catapult accumulator inspections, arranged by Ship's Force in coordination with the TYCOM and performed by an SGPI, will be conducted in accordance with the requirements of reference (a) whenever the following conditions exist:

a. Variations in end speed exist. Whenever variations in catapult end speed are experienced, a special inspection will be accomplished by an NSWCCD LCEM Inspector and an SGPI.

b. Re-inspection of replaced manifold gasket. Whenever the internal steam charging flanged joint gasket is replaced, the joint shall be re-inspected on a not to interfere with operations basis, upon the first cool down following initial operations. This Inspection is accomplished by the Engineering Officer.

c. Whenever major work as defined below by reference (b) is accomplished, the inspection is arranged by Ship's Force in coordination with the TYCOM and performed by a NSWCCD-SSES LCEM inspector and an SGPI.

(1) Repair or adjustments to safety devices or remote isolation devices.

(2) Repairs to the accumulator pressure vessel, including nozzles, circumferential welds, shell and head plates, manhole plate and attachment hinge welds which exceed reference (b), section 5.8 criteria.

(3) Repairs to or replacement of pressure vessel piping and valves.

(4) Repairs to the internal charging manifold.

d. When the TYCOM desires to assess the material condition, the inspection is arranged by Ship's Force in coordination with the TYCOM and performed by a NSWCCD-SSES LCEM inspector and or an SGPI.

17.7 INSPECTION GUIDELINES AND REPORTS.

17.7.1 Guidelines.

a. All inspections will be conducted using the requirements of reference (b). The catapult accumulator, including the support systems identified in paragraph 17.1.1 of this chapter will be inspected and the results documented in the SCIRMIS.

b. Routine Inspection of catapult accumulators and associated systems will be conducted by an SGPI.

c. All Repair Before Operate (RBO) deficiencies shall be corrected and re-inspected by a certified SGPI or NSWCCD LCEM inspector and preferably the same SGPI/NSWCCD-SSES/LCEM inspector who originally identified the discrepancy prior to warm-up of the catapult accumulator. As RBOs are safety related, all inspector-designated RBO discrepancies discovered in accordance with reference (b) and section 17.9.2 of this chapter shall be corrected prior to catapult operation and reinspected by a certified SGPI or NSWCCD LCEM Inspector, as applicable, and preferably the same SGPI/NSWCCD LCEM Inspector who originally inspected the accumulator. RBO discrepancies include those for which

continued unrestricted operation could endanger personnel. RBOs may not be departed via DFS. If there is not an immediate or near future danger to personnel, the discrepancy shall be assigned as SEVERELY DEGRADED with major operational restrictions.

d. All catapult accumulator related DFSs will be verified by the SGPI during the inspection for conformance with JFMM requirements prior to placing the accumulator into operation.

17.7.2 Reports. The inspector(s) conducting the inspection shall personally debrief and provide a preliminary report of the inspection results to the ship's Commanding Officer (or designated representative) following completion of the inspection. The results shall also be entered into the SCIRMIS database. A copy of the final report will be provided to the TYCOM, Regional Maintenance Center/Fleet Maintenance Activity and NSWCCD no later than 10 days after the completion of all repairs identified during the inspection using the Appendix D cover letter format.

a. The inspector conducting the inspection shall report RBO deficiencies discovered during the inspection to the TYCOM by message within 24 hours using the format in Appendix E of this chapter.

b. The SGPI shall report by message to the TYCOM, using the format in Appendices F and G of this chapter, the correction and re-inspection of all RBO deficiencies prior to close-out and warm up of the accumulator.

c. The ship's Engineering Officer shall report corrected deficiencies, by message, using the format in Appendix F of this chapter within 30 days of the completed inspection and at 30 day intervals thereafter until all deficiencies are corrected.

17.8 CATAPULT ACCUMULATOR INSPECTION PREPARATION.

a. Demonstrate the performance of the catapult electronic controls, including the uninterruptible power source and the safety devices of the fill and blowdown valves.

b. Prepare the accumulator in accordance with reference (b) paragraph 5.6.1 for routine inspections and paragraph 5.6.2 for strength and integrity inspections.

c. Wire shut and danger tag all steam and water valves to the catapult accumulator per the Ship's Tag-Out Instruction and the Tag-Out Users Manual. Post warning signs, PERSONNEL WORKING IN ACCUMULATOR, in accordance with reference (a).

d. The ship's Engineering Officer shall ensure all Ship's Force responsibilities are complete.

17.9 CATAPULT ACCUMULATOR INSPECTION.

17.9.1 Catapult Accumulator Inspection Forms. Catapult accumulator inspections will be conducted using the appropriate SCIRMIS forms. Include specific comments on the state of preservation and material condition of the accumulator and all support systems.

17.9.2 Catapult Accumulator Inspection Areas. A discrepancy is classified as "Repair Before Operating" if left uncorrected it could cause injury to personnel. All RBO items shall be corrected prior to operation and re-inspected by a certified SGPI or NSWCCD LCEM inspector, as applicable, and preferably the same inspector who originally inspected the accumulator. RBO discrepancies may include but are not limited to the following:

a. Inoperative/misadjusted safety devices.

b. Fire/Safety hazards, oil soaked lagging, oil leaks or other fire hazards such as inoperative or missing fire fighting equipment.

c. Inoperative electronic controls (Fairmont controllers, Smars transmitters, uninterruptible power source).

d. Non-deferrable defects, defects indications within the pressure vessel boundary.

e. Ultra-sonic test results of pressure vessel piping that are below minimum requirements, out of periodicity or inspectors discretion of piping of questionable service.

f. Improperly assembled internal steam charging flanged joint.

g. Improperly assembled flanged joints (mixed fasteners, undersized flexitallic gaskets, non level in Level I systems).

h. In-operative system remote isolation devices.

i. Out of periodicity, in-operative temperature or pressure measuring instruments.

j. Valve tightness integrity which limits its ability to perform intended function and exceeds the criteria of reference (g).

k. Non-conformance of electrical safety and deteriorated or damaged wiring or components.

17.9.3 Completion of Inspection. A debrief and a preliminary inspection report, including a summary of restrictive deficiencies, will follow the inspection. Paragraph 17.7.2 of this chapter identifies official reporting requirements.

17.9.4 Automatic Controls Systems Inspection Guidelines. The automatic control system consists of a series of transmitters, controllers, interface devices, control valves and positioners. Inspection, calibration and alignment of this equipment is detailed in reference (h) and applicable system PMS for test and inspection guidelines.

17.9.5 Operating and Casualty Procedures. Each ship with steam catapults will have approved Operating Procedures in the format prescribed by their respective TYCOM. They shall contain detailed procedures and precautions for:

a. Normal operations including startup and shutdown.

b. Infrequent operations such as initial charging following an availability.

c. Operating parameters, limitations, alarms and set points.

d. Casualty conditions including indications, immediate and supplementary actions.

e. Quality Assurance requirements for repairs.

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APPENDIX A

**SAMPLE CATAPULT ACCUMULATOR INSPECTION REQUEST**

FM USS (SHIPS NAME AND HULL NO)//
TO (RMC)//
INFO COMNAVAIRPAC SAN DIEGO CA/COMNAVAIRLANT NORFOLK VA (as applicable)//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
COMNAVSEASYCOM WASHINGTON DC //05Z11//
BT
UNCLAS//
MSGID/GENADMIN/ USS (SHIPS NAME HULL NO)//
SUBJ/REQUEST FOR ROUTINE CATAPULT ACCUMULATOR INSPECTION//
REF/A/DOC/COMFLTFORCOMINST 4790.3//
AMPN/REF A IS THE JOINT FLEET MAINTENANCE MANUAL//
RMKS/1. PER REF A REQUEST RMC PROVIDE A CERTIFIED SGPI TO ACCOMPLISH ROUTINE CATAPULT ACCUMULATOR INSPECTION OF (NUMBER CATAPULT).
2. REQUEST PRIMARY INSPECTION START DATE OF (PROVIDE DATE) AND AN ALTERNATE START DATE OF (PROVIDE DATE).
3. AWR ENTERED IN SHIP'S CSMP (JSN NUMBER).//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.**

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## APPENDIX B

## SAMPLE INSPECTION CONFIRMATION LETTER

FM (RMC)//
TO USS (SHIPS NAME AND HULL NUMBER)//
INFO COMNAVAIRPAC SAN DIEGO CA/COMNAVAIRLANT NORFOLK VA (as applicable)//
COMNAVSEASYCOM WASHINGTON DC //05Z11//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
RMC//
BT
MSGID/GENADMIN//
SUBJ/INSPECTION DATE CONFIRMATION//
REF/A/ (INSPECTION REQUEST MESSAGE DTG)//
REF/B//DOC//COMFLTFORCOMINST 4790.3//
NARR/REF A IS REQUESTING CATAPULT INSPECTION. REF B IS COMFLTFORCOMINST 4790.3 DEFINING CATAPULT INSPECTION CRITERIA AND PROCEDURES.//
POC/ (SENIOR INSPECTOR NAME/ RATE/UIC/LOC: CITY/TEL: DSN//
SUBJ/INSPECTION DATE CONFIRMATION//
RMKS/1 IN RESPONSE TO REF A, A CATAPULT INSPECTION WILL BE CONDUCTED IAW REF B BEGINNING (DATE) ON NUMBER ( ) CATAPULT. ONE OR MORE OF THE FOLLOWING CERTIFIED INSPECTORS ARE ASSIGNED TO CONDUCT THE INSPECTIONS. INSPECTOR/NAME/RATE/LAST FOUR/CLEARANCE.//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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## APPENDIX C

## SUMMARY OF CATAPULT ACCUMULATOR INSPECTION SCHEDULING AND RESPONSIBILITIES

| Type Inspection | Schedule Date | Scheduling Responsibility | Responsibility for Inspections |
|---|---|---|---|
| Routine | Every 18 Months | TYCOM | Certified SGPI |
| Start of Availability Inspection | At start of availability with strength and integrity inspection | TYCOM | NSWCCD INSPECTOR and Certified SGPI |
| Strength and Integrity Inspection | Once every 60 months | TYCOM | NSWCCD LCEM INSPECTOR and Certified SGPI |
| ISV | During availability | Industrial Activity Supervisory Authority | NSWCCD INSPECTOR and Certified SGPI |
| CAI | To be conducted prior to final close-out | Industrial Activity Supervisory Authority | NSWCCD INSPECTOR and Certified SGPI |
| Inactivation or Reactivation | Prior to final action | Industrial Activity Supervisory Authority Inactive Ship Facility | NSWCCD INSPECTOR and Certified SGPI |
| Special | Variations in end speed | TYCOM | NSWCCD INSPECTOR and Certified SGPI |
| Special | Replacement of Steam Charging Flange Gasket | Ship's Force | Engineer Officer |
| Special | Major Repairs/Mechanical casualty | TYCOM | NSWCCD Inspector and Certified SGPI |
| Engineering Officer | PMS Requirements | Engineering Officer | Engineering Officer |

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## APPENDIX D

## SAMPLE CATAPULT ACCUMULATOR INSPECTION REPORT COVER LETTER

From: Commanding Officer, Regional Maintenance Center
To: Commanding Officer, USS (Ship's name and Hull No.)

Subj: (Routine, etc.) Inspection of Catapult(s) Number(s)

Ref: (a) COMFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual

Encl: (1) SCIRMIS Report (Number Catapult)

1. (Parent Command) Steam Generating Plant Inspector(s) (Inspector's Name) inspected Catapult(s) Number(s) in USS (Ships Name and Hull No) on (date) while (ship's location).

2. Discrepancies, which require corrective action, are outlined in enclosures (Number of Enclosures).

3. Advance copies of Enclosure(s) have been delivered to the Ship's Commanding Officer.

4. (Command) point of contact is (Senior Inspector), Code (Number), commercial telephone, (Number), DSN (Number) e-mail address is: (Address).

COPY TO (W/ENCL):

CNAP/CNAL N43 (as applicable)
USS (Name Hull Number)
COPY TO (W/O ENCL):
NSWCCD-SSES (C922)
COMNAVSEASYSCOM WASHINGTON DC (O5Z11)

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## APPENDIX E

## SAMPLE CATAPULT ACCUMULATOR INSPECTION RBO/SEVERELY DEGRADED DEFICIENCIES MESSAGE

FM Commander, Regional Maintenance Center//
TO USS (Ship Name and Hull Number)//
INFO COMNAVAIRPAC SAN DIEGO CA/COMNAVAIRLANT NORFOLK VA (as applicable)//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
PEO CARRIERS WASHINGTON DC//PMS312//
(REPAIR ACTIVITY)//(Code)//
COMNAVSEASYSCOM WASHINGTON DC//05Z11//
BT
UNCLASS//N09537//
MSGID/GENADMIN/(REGIONAL MAINTENANCE CENTER/CODE) //
SUBJ/(Type) INSPECTION REPAIR BEFORE OPERATE (RBO) DEFICIENCIES OF NUMBER ( )
CATAPULT ABOARD USS (Ship Name Hull Number)//
REF/A/DOC/COMFLTFORCOMINST 4790.3//
REF/B/DOC/OPNAVINST 4790.4//
NARR/REF A IS JOINT FLEET MAINTENANCE MANUAL VOLUME IV CHAPTER 17 AND PROVIDES GUIDANCE FOR CATAPULT INSPECTIONS. REF B IS 3-M MANUAL AND PROVIDES GUIDANCE FOR CSMP DOCUMENTATION.//
POC/(Senior Inspector) (UIC)/LOC: (City, State)/TEL:(Number)/TEL:DSN (Number)//
RMKS/1. CATAPULT NUMBER (s) ROUTINE/STRENGTH AND INTEGRITY (AS APPROPRIATE) INSPECTION CONDUCTED (DATE) BY (INSPECTORS NAME) WHILE (SHIPS LOCATION). RBO DEFICIENCIES AND PROPOSED CORRECTIVE ACTION ARE REPORTED IAW REF A AS FOLLOWS:
(SCIRMIS ITEM NO, DEFICIENCY, REPAIR, ETC)
A.
B.
C.
2. CATAPULT NUMBER() SHALL NOT BE OPERATED UNTIL ALL ABOVE LISTED DEFICIENCIES ARE CORRECTED AND A REINSPECTION IS CONDUCTED IAW REF A.
3. SEVERLY DEGRADED DEFICIENCIES AND PROPOSED CORRECTIVE ACTION ARE REPORTED IAW REF A AS FOLLOWS:
A.
B.
C.
4. SEVERELY DEGRADED DEFICIENCIES ARE REQUIRED TO BE CORRECTED PRIOR TO CATAPULT CHARGING OR MUST BE SUBMITTED FOR MAJOR DEPARTURE FROM SPECIFICATION (DFS).
5. IAW REF A DEFICIENCIES COMPLETED SHALL BE REPORTED EVERY 30 DAYS USING THE GUIDANCE PROVIDED IN REF A APPENDIX F.//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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## APPENDIX F

## SAMPLE 30 DAY UPDATE MESSAGE

FM USS (SHIP'S NAME AND HULL NO)//
TO (RMC)//
INFO COMNAVAIRPAC SAN DIEGO CA/COMNAVAIRLANT NORFOLK VA (as applicable)//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
COMNAVSEASYSCOM WASHINGTON DC//05Z11//
TYCOM//
BT
MSGID/GENADMIN/USS (SHIPS NAME AND HULL NO)//
SUBJ/ USS (SHIP'S NAME AND HULL NO.) NR ( ) CATAPULT ACCUMULATOR INSPECTION.//
REF/A/DOC/SCIRMIS REPORT FROM (RMC AND DATE)//
REF/B/DOC/COMFLTFORCOMINST 4790.3//
REF/C/DOC/OPNAVINST 4790.4//
NARR/REF A IS SCIRMIS REPORT FROM COMMANDER (RMC). REF B IS COMFLTFORCOMINST 4790.3 JOINT FLEET MAINTENANCE MANUAL AND PROVIDES GUIDANCE FOR CATAPULT INSPECTIONS. REF C IS OPNAVINST 4790.4 3-M MAINTENANCE MANUAL AND PROVIDES DIRECTION FOR CSMP DOCUMENTATION.//
RMKS/ NR ( ) CATAPULT)(s) ROUTINE INSPECTION WAS CONDUCTED (DATE) BY (SGPI INSPECTOR NAME) ITEMS CORRECTED ARE REPORTED IAW REF B AS FOLLOWS.
1. (CATAPULT NUMBER)
2. SCIRMIS ITEM (I.E., A41/01) JOB SUBMITTED JSN (NUMBER).//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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## APPENDIX G

## SAMPLE CATAPULT ACCUMULATOR RESCISSION MESSAGE

FM RMC/NSSA//
TO USS (SHIPS NAME AND HULL NO)//
INFO/COMNAVAIRPAC SAN DIEGO CA/COMNAVAIRLANT NORFOLK VA (as applicable)//
USS (SHIPS NAME AND HULL NO.//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
PEO CARRIERS WASHINGTON DC//
COMNAVSEASYSCOM WASHINGTON DC//05Z11//
BT
//SUBJ/USS (SHIPS NAME AND HULL NUMBER) NUMBER ( )CATAPULTS/REPAIR
BEFORE OPERATE (RBO) RESCISSION// REF/A/ (ORIGINATING RBO MESSAGE DTG)//
NARR/REF A ADDRESSES RBO DEFICIENCIES FOUND DURING STEAM CATAPULT
INSPECTIONS CONDUCTED ON (Date)//
RMKS/1. REF A RESTRICTIONS RESCINDED BASED UPON RE-INSPECTION.
2. FOR FURTHER INFO, CONTACT UNCLASSIFIED E-MAIL (Senior Inspector).//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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# APPENDIX A

## SSN 21 CLASS SUBMARINE SALVAGE INSPECTION CHECK-OFF LIST

**General Information**

**1. Items pertaining to rescue vehicle seating surfaces and buoy cable angle tests require substantial support equipment and are designated for industrial activity accomplishment.**

**2. Configuration differences are noted as comments in the reference column.**

**3. Portions of the Salvage Inspection (as specified by the maintenance activity) may be conducted prior to the start of CNO availabilities as "pre-availability inspections" to support planning of the availability. These items need not be re-inspected provided no work was performed during the availability which affects their status. When specified, these items will be performed by Ship's Force and written certification by the Commanding Officer provided to the maintenance activity, the ISIC, and the Senior Inspecting Officer.**

PART I: SALVAGE

| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| 1. Salvage Drawings: | | | | | |
| a. Verify salvage drawings: | Fleet Modernization Program Management and Operations Manual NAVSEA SL720-AA-MAN-010 | | | | |
| (1) Have been updated during ship's new construction period/last CNO Maintenance Availability or | | | | | |
| (2) Latest revision is identified in ship's plan index. | | | | | |
| (3) Have correct distribution. | Ship Dwg. Consolidated Index Number 594 or 845 | | | | |
| (4) Are identified as Selected Record Drawings | | | | | |
| 2. High/Low Salvage Connections: | | | | | |
| a. Verify deck touch plate markings are installed and per plan. | Ship's Plans | | | | |
| b. Check that each valve is free to operate with the inspecting command's salvage wrench. | Notes 1 and 2 | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| c. Perform a "J" pressure and a low pressure 100 psi seat tightness test from the sea side. No leakage is allowed. | Note 1 | | | | |
| d. External salvage system caps: | | | | | |
| (1) Verify the ship's salvage system arrangement plan contains a note that Roylyn type fittings are installed. | Note 3 | | | | |
| (2) Remove cap assembly, test connect/disconnect with the inspecting command's female fitting. | Kaiser Aero Space & Electronics Dwg. 9495 (Formally Roylyn Inc.) | | | | |
| (3) Inspect all Roylyn caps. Ensure cap operates properly and is free of paint and/or debris. Reinstall cap with safety wire, where applicable. | | | | | |
| e. Verify strainers are properly installed on all compartment low salvage lines and are clear of debris. | | | | | |
| 3. Internal Air Salvage: | | | | | |
| a. Test satisfactory operation of all internal salvage air valves. | Note 4 | | | | |
| b. Verify all compartment pressure gages are in calibration as indicated on calibration label. | | | | | |
| 4. Bulkhead Flappers: | | | | | |
| a. Test satisfactory local and remote (as applicable) operation of all ventilation system bulkhead flappers. | | | | | |
| 5. Hull Access Hatches, Watertight Doors and Torpedo Loading Hatches: Inspection performed by local PMT. | | | | | |
| a. Perform/witness maintenance required by Planned Maintenance System (PMS) Maintenance Index Page (MIP) to complete salvage inspection and reference the PMT annual inspection. | MIP 1671/921, MRCs 7CLR and 7CLS | | | | |
| 6. External Gagging Devices: | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| a. Witness demonstration that all valves with external gagging devices can be gagged from open to shut with the inspecting command's salvage wrench and with the number of turns specified on the ship's salvage system arrangement plan. Record number of turns to operate. _____ | Notes 2, 5, and 6 | | | | |
| b. Witness resetting of each gagging device and demonstrate satisfactory operation of the valves by normal means. | Notes 6 and 7 | | | | |
| 7. Diving Equipment: | | | | | |
| a. Verify latest revision of U.S. Navy Diving Manual is onboard. | NAVSEA SS521-AG-PRO-010 | | | | |
| b. Verify the requirements of MILPERSMAN have been implemented and that assigned scuba divers are currently qualified/requalified and that the ship's Diving Officer has been designated in writing by the Commanding Officer. | MILPERSMAN Art. 1220-100 Series | | | | |
| c. Verify allowance of scuba diving equipment onboard. | Ship's Coordinated Shipboard Allowance List (COSAL) | | | | |
| d. Inspect equipment for condition and conformance with U.S. Navy Diving Manual and applicable NAVSHIPS Technical Manuals. Ensure no unauthorized alterations have been accomplished and that equipment, including charging connections and filters, is in satisfactory working order and approved for service use. | NAVSEA SS521-AG-PRO-010 | | | | |
| e. Assigned divers demonstrate capability to conduct diving operations (assembly of equipment and check out, set up record keeping data for repetitive dives, use of dive tables, PMS on equipment). State if actual diving operations are observed. | MIP 5921/Series | | | | |
| 8. Air Bank Dew Points: | | | | | |
| a. Verify air samples from all air banks and verify High Pressure Air Compressors are in specification and in periodicity. | MIP 5542/921<br>MRC 7CHE | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

PART II: RESCUE

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| 1. Submarine Rescue Chamber (SRC)/Submarine Rescue Diving and Recompression System (SRDRS)/Deep Submergence Rescue Vehicle (DSRV) Fittings: | Naval Ships' Technical Manual (NSTM) S9086-T9-STM-010 Chapter 594 | | | | | | |
| a. Verify four rescue vehicle holddown sockets are installed per plan or authorized alteration on all escape trunk seating surfaces. From one socket per hatch, remove capscrew and plug; demonstrate guide is free. (SSN 23 and SSN 21 Class with S/A 4274.) Verify 4 padeyes installed for rescue vehicle in upper hatch free flood areas (SSN 21 Class prior to S/A 4274). | Ship's Plans<br>Note 8 | | | | | | |
| b. Inspect rescue vehicle seating surface. | Notes 8 and 9 | | | | | | |
| c. Remove plug from hatch fairing. Check condition of SRC downhaul shackle. Verify downhaul shackle is free of corrosion and can be operated by hand. Use of plastisol on downhaul shackle is not authorized as it prevents visual inspection of shackle for corrosion and promotes corrosion. The shackle must be powder coated white. | Ship's Plans<br>Note 8 | | | | | | |
| d. AN/BQN-13. | | | | | | | |
| (1) Inspect AN/BQN-13 Beacon to ensure that: | | | | | | | |
| (a) Cable is free of abrasions, cuts or damage. | | | | | | | |
| (b) Cable plug and encapsulation are free of defects. | | | | | | | |
| (c) Unit has no physical damage. | | | | | | | |
| (d) Transducer is free of oil leaks, bubbles and paint. | | | | | | | |
| (2) Verify from ship's records that all applicable AN/BQN-13 PMS has been performed and witness satisfactory performance of all procedures (except R-1). | MIP SO-104/902 | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (3) Inventory allowance of spare batteries for AN/BQN-13. Ensure shelf life of batteries has not been exceeded. | Ship's COSAL Note 10 | | | | | | |
| 2. <u>Escape Trunks, Logistics Escape Trunks and Forward Lockout Trunks</u>: | Note 11 | | | | | | |
| a. Escape trunk hatch fairings must be maintained in a condition to be easily disassembled to support submarine rescue. Verify Planned Maintenance has been completed within the required periodicity on all escape trunk hatches. Visually inspect escape trunk hatch fairings for compliance with the specifications called out in MRC 7CUL. Paint fouling or corrosion of fairing fasteners must be immediately corrected. Demonstrate the ability to remove one fastener in each fairing piece required to be removed in the fairing disassembly procedure. | MIP 1671/921, MRC 7CUL | | | | | | |
| b. Demonstrate that each access hatch operates satisfactorily with all respects of locking/unlocking, opening/shutting from below/above (with salvage wrench/handwheel as applicable). | | | | | | | |
| c. Demonstrate that each access hatch can be opened with 5th percentile swing force operability criteria for surfaced emergency egress (SSN 23 and SSN 21 Class with S/A 4149). | | | | | | | |
| d. Demonstrate satisfactory operation of the escape hatch closing mechanisms in accordance with the installed instruction plates and equipment. | | | | | | | |
| (1) Demonstrate satisfactory installation of Improved Powered Hatch Operator with intensifier and compensator as one mode of hatch operation of Logistics Escape Trunks (SSN 23 and SSN 21 Class with S/A 4149). | Ship's Drawing<br>MIP 1671/921<br>MRCs E4PH, E4PK | | | | | | |
| (a) Verify inventory of all parts. | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (b) Verify periodic pressure testing of hoses. | | | | | | | |
| (c) Verify proper operation of sensing line and trunk gage. | | | | | | | |
| (d) Verify assembly of intensifier and gearbox to upper hatch operator. | | | | | | | |
| (e) Verify installation of upper hatch operator compensator. | | | | | | | |
| (f) Demonstrate satisfactory operational check of intensifier pump and gears. | | | | | | | |
| e. Demonstrate satisfactory operation and examine the condition of the following equipment: | | | | | | | |
| (1) Vent valves (trunk and compartment). | | | | | | | |
| (2) Blow valves (trunk and compartment). | | | | | | | |
| (3) Flood and drain valves (including remote operation mechanisms and strainer installations). | | | | | | | |
| (4) Demonstrate satisfactory operation and examine the condition of the following equipment: Conduct Hood Inflation System/Stole Charging Valve operational check to confirm valves operate properly and verify watertight caps installed. | SEIE MIP 5940/005, MRC 7DKE | | | | | | |
| (5) Pressure proof lights, mounted above waterline, checked to ensure correct globe sealing, and verified that globe is free from cracks. | | | | | | | |
| (6) Electric lantern screened lenses and pressure relief hole sealed with plastic (MIL-I-3064) and mounted above waterline. | | | | | | | |
| (7) 31MC installed above waterline. | | | | | | | |
| (8) Verify accomplishment of PMS to clear sea pressure sensing lines. | MIP 5641/921<br>MRC F3XS, F3XT | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| f. Verify the following equipment installed: | | | | | | | |
| (1) Hammer signal label plate posted above waterline. | | | | | | | |
| (2) Diver's knife. | Note 12 | | | | | | |
| (3) Ballpeen hammer. | Note 12 | | | | | | |
| (4) Persuader (crows foot). | | | | | | | |
| g. Check Flood Line Orifice Size (For SSN 23 and SSN 21 Class after S/A 4149, orifice size is 1.37" for initial trials only.) | Installed | | | | | | |
| h. Verify valve handwheels are properly color coded and labeled in accordance with Ship's Drawing Index, Ship's placards and Posted Information Plates. | NSTM S9086-RK-STM-010 Chapter 505 | | | | | | |
| i. Verify gages are in calibration as indicated on calibration label. | | | | | | | |
| j. Verify upper watertight hatch cavity drain valve operation is satisfactory. | | | | | | | |
| k. Witness satisfactory rigging and operation of escape trunk portable skirt, verify ability to remove the bubble skirt with the upper hatch shut within 5 minutes without the use of tools. (N/A if A&I N3486 has been accomplished.) | Ship's Plans | | | | | | |
| 3. Emergency Communications Equipment: | | | | | | | |
| a. Inventory allowance of the following equipment and confirm proper stowage as indicated: | Ship Configuration and Logistics Support Information System (SCLSIS) & COSAL | | | | | | |
| (1) SEPIRB Model T-1630/SRT. | | | | | | | |
| (2) AN/PRC-96 (2 onboard). | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| b. Verify from ship's records that all applicable PMS has been performed and witness satisfactory performance of indicated MRCs. | | | | | | | |
| (1) SEPIRB. | MIP 4413/015 | | | | | | |
| (2) AN/PRC-96 (all procedures). | MIP 4415/004 | | | | | | |
| c. Inventory allowance of spare batteries for AN/PRC-96. Ensure shelf life of batteries has not been exceeded. | Ship's COSAL Note 10 | | | | | | |
| 4. Life Saving and Safety Equipment: | | | | | | | |
| a. Inventory allowance (randomly, type and quantity as applicable) and witness satisfactory performance of PMS procedures on the following: (PMS procedures are to be demonstrated on one representative candidate from each of the sub groups listed below). | Ship's COSAL Note 13 | | | | | | |
| (1) Non-inflatable life preservers. | MIP 5832/014 or 5832/015 | | | | | | |
| (2) Life rafts (not applicable to SSN 23 or SSN 21 Class after S/A 4149). | | | | | | | |
| (3) Man overboard bag. | Note 14<br>MIP 5832/021 | | | | | | |
| (4) Qualified swimmer designated for man overboard. | Note 15<br>MILPERS MAN Art. 1414-010 Series | | | | | | |
| (5) Safety harness (belts). | MIP 6231/001 | | | | | | |
| (6) Safety track. | MIP 6111/R06<br>NAVSEA Dwg. 612-6408578 | | | | | | |
| (7) Distress marker lights. | MIP 5832/010 | | | | | | |
| (8) Life lines and stanchions. | MIP 6121/SUB | | | | | | |
| (9) Portable desalinators. | Ship's COSAL<br>MIP 5940/003 | | | | | | |
| (10) SEIE Suits. | MIP 5940/005 | | | | | | |
| (11) Crash Bags. (SSN 23 and SSN 21 Class after S/A 4149.) | MIP 5940/005, MRC 1SC3 and AEL 2-330023072 | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (12) Guard Book. | Latest Revision per AEL 2-330023072 | | | | | | |
| (13) OP 61-1. | | | | | | | |
| (14) OI 638-4. | | | | | | | |
| 5. Escape Training: | | | | | | | |
| a. Verify that all hands are trained in buoyant ascent and buoyant free breathing ascent or SEIE escape. | | | | | | | |
| 6. Atmosphere Control: | | | | | | | |
| a. Inventory quantity onboard and inspect condition of the following: | | | | | | | |
| (1) $CO_2$ absorbent canisters. | Ship's COSAL | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (2) LiOH curtains. | AEL 2-330023035 | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (3) $O_2$ candles. | Ship's COSAL | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (4) $O_2$ candle furnace. | | | | | | | |
| Comment on condition._____ | | | | | | | |
| (5) Emergency Air Breathing masks (test random 5% for proper operation per applicable MRC). | Ship's COSAL MIP 5519/721 | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| b. Verify $CO_2$ absorbent canister PMS has been completed within required periodicity. Additionally, randomly select 10% of canisters onboard and weigh them in accordance with the applicable MRC. | MIP 6641/009 MRC B6CW | | | | | | |
| c. Inspect ten percent per compartment of emergency air breathing manifold in-line filters and filter housing for presence of corrosion. | | | | | | | |
| 7. Launchers: | | | | | | | |
| a. Demonstrate satisfactory operation of each launcher manually and hydropneumatically as applicable. | | | | | | | |
| b. Verify a minimum of six Red Submarine Emergency Identification Signals and Submarine Floating Signal pyrotechnics stowed in compartment with launcher. | | | | | | | |
| c. Operational verification shall include a demonstrated launch (water slug) from both remote and local operating stations. | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (3) Inventory allowance of spare batteries for AN/BQN-13. Ensure shelf life of batteries has not been exceeded. | Ship's COSAL Note 9 | | | | | | |
| 2. Escape Trunks: | | | | | | | |
| a. Escape trunk hatch fairings must be maintained in a condition to be easily disassembled to support submarine rescue. Verify Planned Maintenance has been completed within the required periodicity on all escape trunk hatches. Visually inspect escape trunk hatch fairings for compliance with the specifications called out in MRC 7CLF. Paint fouling or corrosion of fairing fasteners must be immediately corrected. Demonstrate the ability to remove one fastener in each fairing piece required to be removed in the fairing disassembly procedure. | MIP 1671/905, MRC 7CLF | | | | | | |
| b. Demonstrate that each access hatch operates satisfactorily with all respects of locking/unlocking, opening/shutting from below/above (with salvage wrench/handwheel as applicable). | | | | | | | |
| c. Demonstrate the escape upper hatches have the minimum specified pop-up. | | | | | | | |
| d. Demonstrate satisfactory operation of the escape hatch closing mechanisms in accordance with the installed instruction plates and equipment. | | | | | | | |
| e. Demonstrate satisfactory operation and examine the condition of the following equipment: | | | | | | | |
| (1) Vent valves (trunk and compartment). | | | | | | | |
| (2) Blow valves (trunk and compartment). | | | | | | | |
| (3) Flood and drain valves (including remote operation mechanisms and strainer installations). | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (4) Demonstrate satisfactory operation and examine the condition of the following equipment: Conduct Hood Inflation System/Stole Charging Valve operational check to confirm valves operate properly and verify water tight caps installed. | SEIE MIP 5940/005 MRC 7DKE | | | | | | |
| (5) Pressure proof lights, mounted above waterline, checked to ensure correct globe sealing, and verified that globe is free from cracks. | | | | | | | |
| (6) Electric lantern screened lenses and pressure relief hole sealed with plastic (MIL-I-3064). | | | | | | | |
| (7) 31MC installed above waterline. | | | | | | | |
| (8) Verify accomplishment of PMS to clear sea pressure sensing lines. | MIP 5641/9R2<br>MRC 9MAY, 9MAZ | | | | | | |
| f. Verify the following equipment installed: | | | | | | | |
| (1) Hammer signal label plate posted above waterline. | | | | | | | |
| (2) Diver's knife. | Note 10 | | | | | | |
| (3) Ball peen hammer. | Note 10 | | | | | | |
| (4) Persuader (crows foot). | | | | | | | |
| (5) Mechanical timer above waterline. (Not applicable to ships with SEIE suits.) | Note 10 | | | | | | |
| (6) Maximum permissible bottom time plate posted near timer and above waterline. (Not applicable to ships with SEIE suits.) | | | | | | | |
| g. Check Flood Line Orifice Size (1.25" for SSN 688 Class with S/A 4142 installed.) | Installed | | | | | | |
| h. Verify valve handwheels are properly color coded and labeled in accordance with Ship's Drawing Index, Ship's placards and Posted Information Plates. | NSTM S9086-RK-STM-010 Chapter 505 | | | | | | |
| i. Verify gages are in calibration as indicated on calibration label. | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| j. Verify upper watertight hatch cavity drain valve operation is satisfactory. | | | | | | | |
| k. Witness satisfactory rigging and operation of escape trunk portable skirt, verify ability to remove the bubble skirt with the upper hatch shut within 5 minutes without the use of tools. (N/A if A&I N3485 has been accomplished.) | Ship's Plans | | | | | | |
| l. Demonstrate that escape trunk upper hatch maximum hydraulic closing pressure is satisfactory. Demonstrate that the hydraulic accumulator maintains the nitrogen pre-charge as specified in OP 61-1 (rig-for-dive) and that the hand pump operates satisfactory (after S/A 4189 completed). | | | | | | | |
| 3. Emergency Communications Equipment: | | | | | | | |
| a. Inventory allowance of the following equipment and confirm proper stowage as applicable: | Ship Configuration and Logistics Support Information System (SCLSIS) & COSAL | | | | | | |
| (1) AN/CRT-3. | | | | | | | |
| (2) SEPIRB Model T-1630/SRT. | | | | | | | |
| (3) AN/URC-4 or AN/PRC-96 (2 onboard). | | | | | | | |
| b. Verify from ship's records that all applicable PMS has been performed and witness satisfactory performance of indicated MRCs. | | | | | | | |
| (1) AN/CRT-3 (all procedures). | MIP 4415/004 | | | | | | |
| (2) SEPIRB. | MIP 4413/015 | | | | | | |
| (3) AN/URC-4 or AN/PRC-96 (all procedures). | MIP 4415/004 | | | | | | |
| c. Inventory allowance of spare batteries for AN/URC-4 and AN/PRC-96. Ensure shelf life of batteries has not been exceeded. | Ship's COSAL Note 9 | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| 4. Life Saving and Safety Equipment: | | | | | | | |
| a. Inventory allowance (randomly, type and quantity as applicable) and witness satisfactory performance of PMS procedures on the following: (PMS procedures are to be demonstrated on one representative candidate from each of the sub groups listed below). | Ship's COSAL Note 11 | | | | | | |
| (1) Inflatable life preservers. | MIP 5832/014 | | | | | | |
| (2) Non-inflatable life preservers. | MIP 5832/015 | | | | | | |
| (3) Man overboard bag. | Note 12<br>MIP 5832/021 | | | | | | |
| (4) Qualified swimmer designated for man overboard. | Note 13<br>MILPERS MAN Art. 1414-010 Series | | | | | | |
| (5) Safety harness (belts). | MIP 6231/001 | | | | | | |
| (6) Safety track. | Note 14<br>MIP 6111/R06 | | | | | | |
| (7) Distress marker lights. | MIP 5832/010 | | | | | | |
| (8) Life lines and stanchions. | MIP 6121/SUB | | | | | | |
| (9) Portable desalinators. | Ship's COSAL MIP 5940/003 | | | | | | |
| (10) SEIE Suits.<br>(Installed by S/A 4142) | MIP 5940/005 | | | | | | |
| (11) Crash Bags.<br>(Installed by S/A 4142) | MIP 5940/005, MRC 1SC3 and AEL 2-330023072 | | | | | | |
| (12) Guard Book | Latest Revision per AEL 2-330023072 | | | | | | |
| (13) OP 61-1 | | | | | | | |
| (14) OI 638-4 | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| 5. Escape Training: | | | | | | | |
| a. Verify that all hands are trained in buoyant ascent and buoyant free breathing ascent or SEIE escape. | | | | | | | |
| 6. Atmosphere Control: | | | | | | | |
| a. Inventory quantity onboard and inspect condition of the following: | | | | | | | |
| (1) $CO_2$ absorbent canisters. | Ship's COSAL | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (2) LiOH curtains. | Per AEL 2-330023035 | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (3) $O_2$ candles. | Ship's COSAL | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (4) $O_2$ candle furnace. | | | | | | | |
| Comment on condition._____ | | | | | | | |
| (5) Emergency Air Breathing masks (test random 5% for proper operation per applicable MRC). | Ship's COSAL MIP 5519/688 | | | | | | |
| b. Verify $CO_2$ absorbent canister PMS has been completed within required periodicity. Additionally, randomly select 10% of canisters onboard and weigh them in accordance with the applicable MRC. | MIP 6641/009 MRC B6CW | | | | | | |
| c. Inspect ten percent per compartment of emergency air breathing manifold in-line filters and filter housing for presence of corrosion. | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| 7. Launchers:<br><br>a. Demonstrate satisfactory operation of each launcher manually and hydropneumatically as applicable.<br><br>b. Verify a minimum of six Red Submarine Emergency Identification Signals and Submarine Floating Signal pyrotechnics stowed in compartment with launcher.<br><br>c. Operational verification shall include a demonstrated launch (water slug) from both remote and local operating stations. | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

**NOTES**

1. All high/low salvage valves are to be tested for freedom of operation at the frequency specified, except during the salvage inspection conducted incident to an overhaul. Salvage Air valve testing completed up to one year prior to the start of an availability will satisfy the salvage inspection requirements provided that certified records verifying the tests are available. Written certification by the Commanding Officer that specified external salvage valves have been overhauled by the industrial activity or Ship's Force and have been successfully hydrostatically tested will constitute certification that the valve operates freely, providing all inspections (Part I, items 2.b. and 2.c. of this Appendix) for each valve so certified are satisfactory. If the results of the inspection of operating gear are not satisfactory, or doubt exists concerning freedom of operation, the specific valves in question shall be checked. Provide appropriate container for collecting anti-freeze drained from salvage piping when hull valve is cycled. Ensure controlled re-assembly in accordance with Quality Assurance requirements is performed when installing salvage caps. Exercise caution to prevent liquid in salvage air piping from impinging on nearby equipment when hull valve is cycled. Ensure anti-freeze is added to piping after inspection to prevent freezing.

2. The inspected ship's, vice the inspecting command's, salvage wrench shall be used if the inspecting command is another submarine. Discrepancies in the actual, versus plan, number of turns which are greater than one full turn shall be noted in addition to the number of actual turns recorded.

3. Discrepancies between physical installation and salvage plans are to be reported to the TYCOM with an information copy to all plan holders.

4. Exercise extreme caution when testing operation of 4500 psi compartment pressurization valves.

5. When inspecting the gagging gear for the inboard ventilation exhaust valve and the inboard ventilation induction valve, the valve linkages shall be inspected and the valves shall be adjusted in accordance with the requirements in the Non-Primary Plant Valves Technical Manual or individual ship's valve drawing.

6. On some designs, operation of the gagging device overrides the regular operating gear of the valve indicator in such a manner that the entire mechanism must be reset/readjusted before the normal operating gear or the valve position indicator will function as intended. If the gagging mechanism is operated or used for any reason, the mechanism shall be reset and the valve subsequently opened and closed by the normal operating gear in every manner in which the gear is designed to function to ensure the valve is in proper operating condition.

7. Unsatisfactory conditions degrade the SRC and/or SRDRS capability and require a CASREP be submitted in accordance with reference (a).

8. Inspections of the rescue vehicle seating surface for flatness, surface area free of protuberances and thickness requires industrial activity support. Inspections are to be performed as early in the maintenance availability as possible to allow correction of noted deficiencies prior to commencement of fast cruise.

9. Shelf life is computed from date of manufacture which is printed in code on the battery. For example, a battery code "1187" means the battery was manufactured in the 11th month of 1987. For expiration dates, see Naval Supply Systems Command Publication 4105, List of Items Requiring Special Handling.

10. Diver's knife, timer and ballpeen hammer may be stored in secure stowage in escape compartment.

11. The allowance of escape appliances for submarines with two escape compartments consists of 110 percent of complement in each compartment. Additionally, 20 non-inflatable life preservers are to be carried for topside use.

12. Man overboard bags to be equipped as specified in Man Overboard Casualty Procedures.

13. Man overboard swimmer to be competent swimmer/qualified diver as designated by Commanding Officer.

14. Safety track inspection shall be performed as specified by MIP 6111/R06 (MRC 3JTK).

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# APPENDIX C

## SSBN/SSGN 726 CLASS SUBMARINE SALVAGE INSPECTION CHECK-OFF LIST

**General Information**

**1. Items pertaining to rescue vehicle seating surfaces and buoy cable angle tests require substantial support equipment and are designated for industrial activity accomplishment.**

**2. Configuration differences are noted as comments in the reference column.**

**3. Portions of the Salvage Inspection (as specified by the maintenance activity) may be conducted prior to the start of CNO availabilities as "pre-availability inspections" to support planning of the availability. These items need not be re-inspected provided no work was performed during the availability which affects their status. When specified, these items will be performed by Ship's Force and written certification by the Commanding Officer provided to the maintenance activity, the ISIC, and the Senior Inspecting Officer.**

PART I: SALVAGE

| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| 1. Salvage Drawings: | | | | | |
| a. Verify salvage drawings: | Fleet Modernization Program Management and Operations Manual NAVSEA SL720-AA-MAN-010 | | | | |
| (1) Have been updated during ship's new construction period/last CNO Maintenance Availability or | | | | | |
| (2) Latest revision is identified in ship's plan index. | | | | | |
| (3) Have correct distribution. | Ship Dwg. Consolidated Index Number 513 or 845 | | | | |
| (4) Are identified as Selected Record Drawings | | | | | |
| 2. High/Low Salvage Connections: | | | | | |
| a. Verify deck touch plate markings are installed and per plan. | Ship's Plans | | | | |
| b. Inspect external valve operating gear for conditions of the salvage valve; i.e., excessive paint, lack of lubrication, distortion, damaged or missing grease boots. | Note 1 | | | | |

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| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| c. Check that each valve is free to operate with the inspecting command's salvage wrench. | Notes 2 and 3 | | | | |
| d. Perform a "J" pressure and a low pressure 100 psi seat tightness test from the sea side. No leakage is allowed. | Note 2 | | | | |
| e. External salvage system caps: | | | | | |
| (1) Verify the ship's salvage system arrangement plan contains a note that Roylyn type fittings are installed. | Note 4 | | | | |
| (2) Remove cap assembly, test connect/disconnect with the inspecting command's female fitting. | Kaiser Aero Space & Electronics Dwg. 9495 (Formally Roylyn Inc.) | | | | |
| (3) Inspect all Roylyn caps. Ensure cap operates properly and is free of paint and/or debris. Reinstall cap with safety wire, where applicable. | | | | | |
| f. Verify strainers are properly installed on all compartment low salvage lines and are clear of debris. | | | | | |
| 3. Internal Air Salvage: | | | | | |
| a. Test satisfactory operation of all internal salvage air valves. | Note 5 | | | | |
| b. Verify all compartment pressure gages are in calibration as indicated on calibration label. | | | | | |
| 4. Bulkhead Flappers: | | | | | |
| a. Test satisfactory local and remote (as applicable) operation of all ventilation system bulkhead flappers. | | | | | |
| 5. Hull Access Hatches (Upper and Lower if installed), Watertight Doors and Torpedo Loading Hatches: Inspection performed by local PMT. | | | | | |
| a. Perform/witness maintenance required by Planned Maintenance System (PMS) Maintenance Index Page (MIP) to complete salvage inspection and reference the PMT annual inspection. | MIP 1671/900, MRCs 7BYJ, 7DEQ, 7CKQ | | | | |

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| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| 6. External Gagging Devices: | | | | | |
| a. Witness demonstration that all valves with external gagging devices can be gagged from open to shut with the inspecting command's salvage wrench and with the number of turns specified on the ship's salvage system arrangement plan. Record number of turns to operate. _____ | Notes 3, 6, and 7 | | | | |
| b. Witness resetting of each gagging device and demonstrate satisfactory operation of the valves by normal means. | Notes 7 and 8 | | | | |
| 7. Diving Equipment: | | | | | |
| a. Verify latest revision of U.S. Navy Diving Manual is onboard. | NAVSEA SS521-AG-PRO-010 | | | | |
| Items b. - e. are SSGN only | | | | | |
| b. Verify the requirements of MILPERSMAN have been implemented and that assigned scuba divers are currently qualified/requalified and that the ship's Diving Officer has been designated in writing by the Commanding Officer. | MILPERSMAN Art. 1220-100 Series | | | | |
| c. Verify allowance of scuba diving equipment onboard. | Ship's Coordinated Shipboard Allowance List (COSAL) | | | | |
| d. Inspect equipment for condition and conformance with U.S. Navy Diving Manual and applicable NAVSHIPS Technical Manuals. Ensure no unauthorized alterations have been accomplished and that equipment, including charging connections and filters, is in satisfactory working order and approved for service use. | NAVSEA SS521-AG-PRO-010 | | | | |
| e. Assigned divers demonstrate capability to conduct diving operations (assembly of equipment and check out, set up record keeping data for repetitive dives, use of dive tables, PMS on equipment). State if actual diving operations are observed. | MIP 5921/Series | | | | |
| 8. Air Bank Dew Points: | | | | | |
| a. Verify air samples from all air banks and verify High Pressure Air Compressors are in specification and in periodicity. | MIP 5542/904 MRC 7DCR | | | | |

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PART II: RESCUE

| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| 1. Submarine Rescue Chamber (SRC) and/or Submarine Rescue Diving Recompression System(SRDRS) Fittings. | Naval Ships' Technical Manual (NSTM) S9086-T9-STM-010 Chapter 594 | | | | | | | | |
| a. Verify 4 padeyes installed for rescue vehicle in upper hatch free flood areas (prior to TZ 0840). Verify four rescue vehicle holddown sockets are installed per plan or authorized alteration on all escape trunk seating surfaces. From one socket per hatch, remove capscrew and plug; demonstrate guide is free. (After TZ-0840). | Ship's Plans Note 9 | | | | | | | | |
| b. Inspect rescue vehicle seating surface. | Notes 9 and 10 | | | | | | | | |
| c. Remove plug from hatch fairing. Check condition of SRC downhaul shackle. Verify downhaul shackle is free of corrosion and can be operated by hand. Use of plastisol on downhaul shackle is not authorized as it prevents visual inspection of shackle for corrosion and promotes corrosion. The shackle must be powder coated white. | Ship's Plans Note 9 | | | | | | | | |
| 2. Escape Trunks, Logistics Escape Trunks and Forward Lockout Trunks: | Note 11 | | | | | | | | |
| a. Escape trunk hatch fairings must be maintained in a condition to be easily disassembled to support submarine rescue. Verify Planned Maintenance has been completed within the required periodicity on all escape trunk hatches. Visually inspect escape trunk hatch fairings for compliance with the specification called out in the Maintenance Standard (MS). Paint fouling or corrosion of fairing fasteners must be immediately corrected. Demonstrate the ability to remove one fastener in each fairing piece required to be removed in the fairing disassembly procedure. | MS 1670-081-011 | | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| b. Demonstrate that each access hatch operates satisfactorily with all respects of locking/unlocking, opening/shutting from below/above (with salvage wrench/handwheel as applicable). | | | | | | | | | |
| c. Demonstrate satisfactory operation of the escape hatch closing mechanisms in accordance with the installed instruction plates and equipment. | | | | | | | | | |
| (1) Demonstrate satisfactory installation of Improved Powered Hatch Operator with intensifier and compensator as one mode of hatch operation of Logistics Escape Trunks (after TZ-0904 complete). | MIP 1671/900<br>MRC E4PH | | | | | | | | |
| (a) Verify inventory of all parts. | Ship's Drawing | | | | | | | | |
| (b) Verify periodic pressure testing of hoses. | MIP 1671/900<br>MRC E4PK | | | | | | | | |
| (c) Verify proper operation of sensing line and trunk gage. | | | | | | | | | |
| (d) Verify assembly of intensifier and gearbox to upper hatch operator. | | | | | | | | | |
| (e) Verify installation of upper hatch operator compensator. | | | | | | | | | |
| (f) Demonstrate satisfactory operational check of intensifier pump and gears. | | | | | | | | | |
| d. Demonstrate satisfactory operation and examine the condition of the following equipment: | | | | | | | | | |
| (1) Vent valves (trunk and compartment). | | | | | | | | | |
| (2) Blow valves (trunk and compartment). | | | | | | | | | |
| (3) Flood and drain valves (including remote operation mechanisms and strainer installations). | | | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| (4) (a) For ships with Submarine Escape Immersion Ensemble (SEIE) suits (TZ-0890 installed), conduct Hood Inflation System/Stole Charging Valve operational check to confirm valves operate properly and verify watertight caps installed. | SEIE MIP 5940/005 MRC 7DKE | | | | | | | | |
| (5) Electric lantern screened lenses and pressure relief hole sealed with plastic (MIL-I-3064) and mounted above waterline. Not applicable to ships with SEIE suits (TZ-0890 installed). | | | | | | | | | |
| (6) 31MC installed above waterline. Not applicable to ships with SEIE suits (TZ-0890 installed). | | | | | | | | | |
| (7) Verify accomplishment of PMS to clear sea pressure sensing lines. | MIP 5641/9R3<br>MRC 9MAW, 9MAX | | | | | | | | |
| e. Verify the following equipment installed: | | | | | | | | | |
| (1) Hammer signal label plate posted above waterline. Not applicable to ships with SEIE suits (TZ-0890 installed). | | | | | | | | | |
| (2) Diver's knife. | Note 12 | | | | | | | | |
| (3) Ball peen hammer. | Note 12 | | | | | | | | |
| (4) Persuader (crows foot). | | | | | | | | | |
| f. Verify valve handwheels are properly color coded and labeled in accordance with Ship's Drawing Index, Ship's placards and Posted Information Plates. | NSTM S9086-RK-STM-010 Chapter 505 | | | | | | | | |
| g. Verify gages are in calibration as indicated on calibration label. | | | | | | | | | |
| h. Verify upper watertight hatch cavity drain valve operation is satisfactory. | | | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| i. Witness satisfactory rigging and operation of escape trunk portable skirt, verify ability to remove the bubble skirt with the upper hatch shut within 5 minutes without the use of tools. (N/A if A&I T0165 has been accomplished.) | Ship's Plans | | | | | | | | |
| 3. Emergency Communications Equipment: | | | | | | | | | |
| a. Inventory allowance of the following equipment and confirm proper stowage as indicated: | Ship Configuration and Logistics Support Information System (SCLSIS) & Consolidated Shipboard Allowance List (COSAL) | | | | | | | | |
| (1) SEPIRB Model T-1630/SRT (same compartment as launcher). | | | | | | | | | |
| (2) AN/URC-4 or AN/PRC-96 (2 onboard). | | | | | | | | | |
| b. Verify from ship's records that all applicable PMS has been performed and witness satisfactory performance of indicated MRCs. | | | | | | | | | |
| (1) SEPIRB. | MIP 4413/015 | | | | | | | | |
| (2) AN/URC-4 or AN/PRC-96 (all procedures). | MIP 4415/004 | | | | | | | | |
| (3) AN/BQQ-6 Emergency Communications and Distress Beacon Groups. | MIP SO-405/902 MIP SO-404/901 | | | | | | | | |
| c. Inventory allowance of spare batteries for AN/URC-4/PRC-96 and AN/BQQ-6. Ensure shelf life of batteries has not been exceeded. | Ship's COSAL Note 13 | | | | | | | | |
| (1) Check that the AN/BQQ-6 Emergency Communications Group receptacle is marked "61/62/63 Receptacle/Emergency Communications for AN/BQQ-6." | | | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| 4. Life Saving and Safety Equipment: | | | | | | | | | |
| a. Inventory allowance (randomly, type and quantity as applicable) and witness satisfactory performance of PMS procedures on the following: (PMS procedures are to be demonstrated on one representative candidate from each of the sub groups listed below). | Ship's COSAL Note 14 | | | | | | | | |
| (1) Inflatable life preservers. | MIP 5832/014 | | | | | | | | |
| (2) Non-inflatable life preservers. | MIP 5832/015 | | | | | | | | |
| (3) Man overboard bag. | Note 15<br>MIP 5832/021 | | | | | | | | |
| (4) Qualified swimmer designated for man overboard. | Note 16 MILPERS MAN Art. 1414-010 Series | | | | | | | | |
| (5) Safety harness (belts). | MIP 6231/001 | | | | | | | | |
| (6) Safety track. | Note 17 MIP 6111/R06 | | | | | | | | |
| (7) Distress marker lights. | MIP 5832/010 | | | | | | | | |
| (8) Life lines and stanchions. | MIP 6121/SUB | | | | | | | | |
| (9) SEIE Suits. | MIP 5940/005 | | | | | | | | |
| (Installed by TZ-0890) | MRC 9LQX | | | | | | | | |
| (10) Crash Bags. | MIP 5940/005, | | | | | | | | |
| (Installed by TZ-0890) | MRC 1SC3 and AEL 2-330023072 | | | | | | | | |
| (11) Guard Book. | Latest Revision per AEL 2-330023072 | | | | | | | | |
| (12) Portable desalinators. | MIP 5940/003 | | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| (13) OP 61-1 | | | | | | | | | |
| (14) OI 638-4 | | | | | | | | | |
| 5. Escape Training: | | | | | | | | | |
| a. Verify that all hands are trained in buoyant ascent and buoyant free breathing ascent or SEIE escape. | | | | | | | | | |
| 6. Atmosphere Control: | | | | | | | | | |
| a. Inventory quantity onboard and inspect condition of the following: | | | | | | | | | |
| (1) $CO_2$ absorbent canisters. | Ship's COSAL | | | | | | | | |
| Amount onboard _____ | | | | | | | | | |
| Required _____ | | | | | | | | | |
| Comment on condition_____ | | | | | | | | | |
| (2) LiOH curtains. | AEL 2-330023035 | | | | | | | | |
| Amount onboard _____ | | | | | | | | | |
| Required _____ | | | | | | | | | |
| Comment on condition_____ | | | | | | | | | |
| (3) $O_2$ candles. | Ship's COSAL | | | | | | | | |
| Amount onboard _____ | | | | | | | | | |
| Required _____ | | | | | | | | | |
| Comment on condition_____ | | | | | | | | | |
| (4) $O_2$ candle furnace. | | | | | | | | | |
| Comment on condition._____ | | | | | | | | | |
| (5) Emergency Air Breathing masks (test random 5% for proper operation per applicable MRC). | Ship's COSAL MIP 5519/726 | | | | | | | | |
| b. Verify $CO_2$ absorbent canister PMS has been completed within required periodicity. Additionally, randomly select 10% of canisters onboard and weigh them in accordance with the applicable MRC. | MIP 6641/009 MRC B6CW | | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Mid | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | Sat | Unsat | | |
| c. Inspect ten percent per compartment of emergency air breathing manifold in-line filters and filter housing for presence of corrosion.<br><br>7. Launchers:<br><br>a. Demonstrate satisfactory operation of each launcher manually and hydropneumatically as applicable.<br><br>b. Verify a minimum of six Red Submarine Emergency Identification Signals and Submarine Floating Signal pyrotechnics stowed in compartment with launcher.<br><br>c. Operational verification shall include a demonstrated launch (water slug) from both remote and local operating stations. | | | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

# APPENDIX D

## SSN 774 CLASS SUBMARINE SALVAGE INSPECTION CHECK-OFF LIST

**General Information**

**1. Items pertaining to rescue vehicle seating surfaces and buoy cable angle tests require substantial support equipment and are designated for industrial activity accomplishment.**

**2. Configuration differences are noted as comments in the reference column.**

**3. Portions of the Salvage Inspection (as specified by the maintenance activity) may be conducted prior to the start of CNO availabilities as "pre-availability inspections" to support planning of the availability. These items need not be re-inspected provided no work was performed during the availability which affects their status. When specified, these items will be performed by Ship's Force and written certification by the Commanding Officer provided to the maintenance activity, the ISIC, and the Senior Inspecting Officer.**

PART I: SALVAGE

| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| 1. Salvage Drawings: | | | | | |
| a. Verify salvage drawings: | Fleet Modernization Program Management and Operations Manual NAVSEA SL720-AA-MAN-010 | | | | |
| (1) Have been updated during ship's new construction period/last CNO Maintenance Availability or | | | | | |
| (2) Latest revision is identified in ship's plan index. | | | | | |
| (3) Have correct distribution. | Ship Dwg. Consolidated Index Number 594 or 845 | | | | |
| (4) Are identified as Selected Record Drawings | | | | | |
| 2. High/Low Salvage Connections | | | | | |
| a. Verify deck touch plate markings are installed and per plan. | Ship's Plans | | | | |
| b. Check that each valve is free to operate with the inspecting command's salvage wrench. | Notes 1 and 2 | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION TEAM | Reference Note | Sat | Unsat | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|
| c. Perform a "J" pressure and a low pressure 100 psi seat tightness test from the sea side. No leakage is allowed. | Notes 1 and 17 | | | | |
| d. External salvage system caps: | | | | | |
| (1) Verify the ship's salvage system arrangement plan contains a note that Roylyn type fittings are installed. | Note 3 | | | | |
| (2) Remove cap assembly, test connect/disconnect with the inspecting command's female fitting. | Kaiser Aero Space & Electronics Dwg. 9495 (Formally Roylyn Inc.) | | | | |
| (3) Inspect all Roylyn caps. Ensure cap operates properly and is free of paint and/or debris. Reinstall cap with safety wire, where applicable. | | | | | |
| e. Verify strainers are properly installed on all compartment low salvage lines and are clear of debris. | | | | | |
| 3. Internal Air Salvage: | | | | | |
| a. Test satisfactory operation of all internal salvage air valves. | Note 4 | | | | |
| b. Verify all compartment pressure gages are in calibration as indicated on calibration label. | | | | | |
| 4. Bulkhead Flappers: | | | | | |
| a. Test satisfactory local and remote (as applicable) operation of all ventilation system bulkhead flappers. | | | | | |
| 5. Hull Access Hatches, Watertight Doors and Torpedo Loading Hatches: Inspection performed by local PMT. | | | | | |
| a. Perform/witness maintenance required by Planned Maintenance System (PMS) Maintenance Index Page (MIP) to complete salvage inspection and reference the PMT annual inspection. | MIP 1671/974, MRC 7CZF, 7CZG and 7CZH | | | | |
| 6. External Gagging Devices: | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| 2. Escape Trunks, Logistics Escape Trunks and Forward Lockout Trunks: | Note 11 | | | | | | |
| a. Escape trunk hatch fairings must be maintained in a condition to be easily disassembled to support submarine rescue. Verify Planned Maintenance has been completed within the required periodicity on all escape trunk hatches. Visually inspect escape trunk hatch fairings for compliance with the specifications called out in MRC 7CZK. Paint fouling or corrosion of fairing fasteners must be immediately corrected. Demonstrate the ability to remove one fastener in each fairing piece required to be removed in the fairing disassembly procedure. | MIP 1671/974, MRC 7CZK | | | | | | |
| b. Demonstrate that each access hatch operates satisfactorily with all respects of locking/unlocking, opening/shutting from below/above (with salvage wrench/handwheel as applicable). | | | | | | | |
| c. Demonstrate that each access hatch can be opened with 5th percentile swing force operability criteria for surfaced emergency egress. | | | | | | | |
| d. Demonstrate satisfactory operation of the escape hatch closing mechanisms in accordance with the installed instruction plates and equipment. | | | | | | | |
| (1) Demonstrate satisfactory installation of Improved Powered Hatch Operator with intensifier and compensator as one mode of hatch operation of Logistics Escape Trunks. | MIP 1671/974<br>MRC E4PH | | | | | | |
| (a) Verify inventory of all parts. | Ship's Drawing | | | | | | |
| (b) Verify periodic pressure testing of hoses. | MIP 1671/974<br>MRC E4PK | | | | | | |
| (c) Verify proper operation of sensing line and trunk gage. | | | | | | | |
| (d) Verify assembly of intensifier and gearbox to upper hatch operator. | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (e) Verify installation of upper hatch operator compensator. | | | | | | | |
| (f) Demonstrate satisfactory operational check of intensifier pump and gears. | | | | | | | |
| e. Demonstrate satisfactory operation and examine the condition of the following equipment: | | | | | | | |
| (1) Vent valves (trunk and compartment). | | | | | | | |
| (2) Blow valves (trunk and compartment). | | | | | | | |
| (3) Flood and drain valves (including remote operation mechanisms and strainer installations). | | | | | | | |
| (4) Conduct Hood Inflation System/Stole Charging Valve operational check to confirm valves operate properly. Verify watertight caps installed. | MIP 5940/005, MRC 7DKE | | | | | | |
| (5) Pressure proof lights, mounted above waterline, checked to ensure correct globe sealing, and verified that globe is free from cracks. | | | | | | | |
| (6) Electric lantern screened lenses and pressure relief hole sealed with plastic (MIL-I-3064) and mounted above waterline. | | | | | | | |
| (7) 31MC installed above waterline. | | | | | | | |
| (8) Verify accomplishment of clearing of sea pressure sensing lines. | MIP 5641/974 MRC E2PT, E2PU | | | | | | |
| f. Verify the following equipment installed: | | | | | | | |
| (1) Hammer signal label plate posted above waterline. | | | | | | | |
| (2) Diver's knife. | Note 12 | | | | | | |
| (3) Ballpeen hammer. | Note 12 | | | | | | |
| (4) Persuader (crows foot). | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| g. Check Flood Line Orifice Size (orifice size is 1.37" for initial trials only). | Installed | | | | | | |
| h. Verify valve handwheels are properly color coded and labeled in accordance with Ship's Drawing Index, Ship's placards and Posted Information Plates. | NSTM S9086-RK-STM-010 Chapter 505 | | | | | | |
| i. Verify gages are in calibration as indicated on calibration label. | | | | | | | |
| j. Verify upper watertight hatch cavity drain valve operation is satisfactory. | | | | | | | |
| k. Witness satisfactory rigging and operation of lockout trunk portable skirt, verify ability to remove the bubble skirt with the upper hatch shut within 5 minutes without the use of tools. | Ship's Plans | | | | | | |
| l. Verify installation of lockout trunk high and low plugs, and demonstrate satisfactory plug operation. | | | | | | | |
| m. Witness satisfactory operation of lockout trunk partition removal and reinstallation. | | | | | | | |
| n. Air Sampling Valve<br>Divers Air Figure 419-1 | S9SSN-ZQ-SSM-EJ0 Part 1, Chapter 9 of this Volume | | | | | | |
| (1) Valve Inspection. Remove the protective cap and the threaded pipe cap from the Air Sampling Valve. Verify that the needle valve is shut and that the internal portion is clean and free of debris. | | | | | | | |
| (2) Cap Inspection. (Controlled assembly required.) Reinstall the threaded pipe cap using the following controlled reassembly procedure: | | | | | | | |
| (a) Inspect the threaded cap to ensure the cap is clean, free of nicks, gouges or other defects which may cause damage to the Air Sampling Valve. | | | | | | | |
| (b) Reinstall Air Sampling Valve threaded cap to ensure proper fit. | | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (c) Inspect the O-ring that seals the protective cap. Ensure that the O-ring is clean, free of cuts, cracks, hardening or irregularities. | | | | | | | |
| (d) Reinstall the protective cap ensuring proper fit. | | | | | | | |
| 3. Emergency Communications Equipment: | | | | | | | |
| a. Inventory allowance of the following equipment and confirm proper stowage as indicated: | Ship Configuration and Logistics Support Information System (SCLSIS) & COSAL | | | | | | |
| (1) SEPIRB Model T-1630/SRT. | | | | | | | |
| (2) AN/PRC-96 (2 onboard). | | | | | | | |
| b. Verify from ship's records that all applicable PMS has been performed and witness satisfactory performance of indicated MRCs. | | | | | | | |
| (1) SEPIRB. | MIP 4413/015 | | | | | | |
| (2) AN/PRC-96 (all procedures). | MIP 4415/004 | | | | | | |
| c. Inventory allowance of spare batteries for AN/PRC-96. Ensure shelf life of batteries has not been exceeded. | Ship's COSAL Note 10 | | | | | | |
| 4. Life Saving and Safety Equipment: | | | | | | | |
| a. Inventory allowance (randomly, type and quantity as applicable) and witness satisfactory performance of PMS procedures on the following: (PMS procedures are to be demonstrated on one representative candidate from each of the sub groups listed below). | Ship's COSAL Note 13 | | | | | | |
| (1) Inflatable life preservers. | MIP 5832/014 | | | | | | |
| (2) Non-inflatable life preservers. | MIP 5832/015 | | | | | | |
| (3) Man overboard bag. | Note 14<br>MIP 5832/021 | | | | | | |
| (4) Qualified swimmer designated for man overboard. | Note 15<br>MILPERS MAN Art. 1414-010 Series | | | | | | |
| (5) Safety harness (belts). | MIP 6231/001 | | | | | | |
| (6) Safety track. | Note 16<br>MIP 6111/R06 | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| (7) Distress marker lights. | MIP 5832/010 | | | | | | |
| (8) Life lines and stanchions. | MIP 6121/SUB | | | | | | |
| (9) Portable desalinators. | Ship's COSAL MIP 5940/003 | | | | | | |
| (10) SEIE Suits. | MIP 5940/005 MRC 9LQX | | | | | | |
| (11) Crash Bags. | MIP 5940/005, MRC 1SC3 and AEL 2-330023072 | | | | | | |
| (12) Guard Book. | Latest Revision per AEL 2-330023072 | | | | | | |
| (13) OP 61-1. | | | | | | | |
| 5. Escape Training: | | | | | | | |
| a. Verify that all hands are trained in SEIE escape. | | | | | | | |
| 6. Atmosphere Control: | | | | | | | |
| a. Inventory quantity onboard and inspect condition of the following: | | | | | | | |
| (1) $CO_2$ absorbent canisters. | Ship's COSAL | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (2) LiOH curtains. | AEL 2-330023035 | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (3) $O_2$ candles. | Ship's COSAL | | | | | | |
| Amount onboard _____ | | | | | | | |
| Required _____ | | | | | | | |
| Comment on condition_____ | | | | | | | |
| (4) $O_2$ candle furnace. | | | | | | | |
| Comment on condition._____ | | | | | | | |
| (5) Emergency Air Breathing masks (test random 5% for proper operation per applicable MRC). | Ship's COSAL MIP 5519/774 | | | | | | |

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| INSPECTION ITEM | Reference Note | Fwd | | Aft | | Submarine Inspector Signature | Inspection Team Member Signature |
|---|---|---|---|---|---|---|---|
| | | Sat | Unsat | Sat | Unsat | | |
| b. Verify $CO_2$ absorbent canister PMS has been completed within required periodicity. Additionally, randomly select 10% of canisters onboard and weigh them in accordance with the applicable MRC. | MIP 6641/009 MRC B6CW | | | | | | |
| c. Inspect ten percent per compartment of emergency air breathing manifold in-line filters and filter housing for presence of corrosion. | | | | | | | |
| 7. Launchers: | | | | | | | |
| a. Demonstrate satisfactory operation of each launcher manually and hydropneumatically as applicable. | | | | | | | |
| b. Verify a minimum of six Red Submarine Emergency Identification Signals and Submarine Floating Signal pyrotechnics stowed in compartment with launcher. | | | | | | | |
| c. Operational verification shall include a demonstrated launch (water slug) from both remote and local operating stations. | | | | | | | |

An asterisk (*) will be used in addition to a check mark (✓) in the unsat column to identify any exceptions. An explanation of the exception will be provided with the Salvage Inspection Report, Appendix F of this chapter.

# VOLUME IV

## CHAPTER 19

## RETENTION OF MATERIAL DEFICIENCY REPORTS AND RECORDS OF EQUIPMENT CHARACTERISTICS AND TESTS

REFERENCES.

(a) NAVSEA S9086-G9-STM-000 - NSTM Chapter 231 (Propulsion and SSTG Steam Turbines)
(b) NAVSEA S9086-HK-STM-010 - NSTM Chapter 241 (Propulsion Reduction Gears, Couplings, Clutches and Associated Components)
(c) NAVSEA S9086-HN-STM-010 - NSTM Chapter 244 (Propulsion Bearings and Seals)

LISTING OF APPENDICES.

A Bearing Log (Submarines Only)

19.1 PURPOSE. This chapter provides a listing of the inspection reports and equipment records, including the retention requirements, which must be maintained by each ship.

19.2 INSPECTION REPORTS. A copy of each of the following inspection reports will be retained until superseded by a subsequent report:

a. Board of Inspection and Survey Inspection Reports.

b. Hull Surveys.

c. Salvage Inspections.

d. Docking Reports (CNO Maintenance Availability to CNO Maintenance Availability).

e. Turbine Lifting and Repair Reports.

f. Technical Assistance Reports by System Commands, Naval Sea Systems Command Technical Representatives, etc.

g. Boiler Inspection Reports (retained until equipment is transferred or vessel is stricken. May be discarded if old data is incorporated in a new report).

h. Battery Inspection Reports.

i. Diesel Engine Inspection Reports.

j. Main and Air Ejector Condenser Eddy Current (Probalog) Reports.

19.3 RETENTION OF RECORDS OF EQUIPMENT CHARACTERISTICS AND TESTS. The following records will be maintained onboard until superseded:

a. Anti Submarine Warfare Test Program Reports.

b. Structureborne, Airborne, and Waterborne Noise Reports.

c. (Submarine Force surface units only) Radar, Radio and Acoustic Radiation Patterns.

d. Equipment Calibration and Alignment Graphs and Charts.

e. Antenna and Superstructure Arrangement Photographs.

f. Record of Shipboard Tests.

g. Lube Oil and Trend Analysis Reports.

h. Battery Record Book (test discharges, etc.).

i. Diesel Trend Analysis Records.

j. (Submarines only) Remote Temperature Element (RTE) Alarm Setpoint, Bearing Maximum Operating Temperature, Proximity to RTE Alarm, Installed Bearing Clearance, Actual Bearing Clearance, Bearing Replacement Clearance, Stamped Depth/Thrust Constant, Depth Micrometer Reading, and calculated bearing Wear for Main Thrust Bearings, Main bearings and Journals (required by reference (a) 231-7.2.1) for:

(1) Main Propulsion Shafting.

(2) Main and Auxiliary Engines.

(3) Main Propulsion Motors and Generators.

(4) Ship Service Turbine Generators.

(5) Reduction Gear (RTE Alarm Setpoint and Bearing Maximum Operating Temperature only).

Appendix A will be used to record data.

k. Readings and Clearances for Main Bearings and Journals:

(1) Rudder and Diving Planes.

(2) Diesel Generator Bearings.

l. Navigational Light Certification.

m. Equilibrium Diagram.

n. Panama Canal Tonnage Certification.

o. Aviation Helicopter Certification.

p. Weight Handling Equipment Certification.

q. Cavitation Curves.

r. Machinery/Vibration Survey Results.

s. (SSN/SSBN/SSGNs only) Resistance Test Records shall be maintained for the following equipment in the Electrical Work Centers PMS Space Manual:

(1) Ship's Service Turbine Generators.

# VOLUME IV

## CHAPTER 20

## DIVER LIFE SUPPORT SYSTEMS, SUBMARINE RESCUE CHAMBER AND DRY DECK SHELTER MAINTENANCE AND CERTIFICATION

REFERENCES.

(a) NAVSEA SS521-AA-MAN-010 - U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual
(b) NAVSEA SS800-AG-MAN-010/P-9290 - System Certification Procedures and Criteria Manual for Deep Submergence Systems
(c) OPNAVINST 3150.27 - Navy Diving Program
(d) NAVSEA SS750-AA-MMA-010 - Submarine Rescue Chamber (SRC), Modernized 850 Ft
(e) NAVSEA S9592-B3-MAN-010 - Dry Deck Shelter Systems Scope of Certification Notebook Volume I

LISTING OF APPENDICES.

A System Certification Requirements
B Submarine Rescue Chamber Scope of Certification Items

20.1 PURPOSE. To provide guidance for the proper administration of a uniform maintenance program in support of the certification requirements for Diver Life Support Systems (DLSS), Submarine Rescue Chambers (SRC), Dry Deck Shelters (DDS), VIRGINIA Class Lock-Out Trunks, SSGN Lock-Out Chambers and Advanced SEAL Delivery Systems.

20.2 DIVER LIFE SUPPORT SYSTEM MAINTENANCE AND CERTIFICATION.

20.2.1 General. The DLSS maintenance program is split into two distinct categories. The first category consists of portable, surface ship afloat and shore-based surface supplied dive systems, recompression chamber systems and saturation dive systems which are certified by Naval Facilities Engineering Command (NAVFAC) Code 07F and Naval Sea Systems Command (NAVSEA) 00C4 in accordance with reference (a). The second category consists of submarine and Deep Submergence System based DLSS such as the DDS, VIRGINIA Class Lock-Out Trunks, SSGN Lock-Out Chambers and Advanced SEAL Delivery Systems which are certified in accordance with reference (b) by NAVSEA 07Q.

20.2.2 Objective. The objective of the certification process is to verify that all dive systems provide acceptable levels of personnel safety throughout the specified operating range when used with approved operating and maintenance procedures. This chapter provides procedures by which repairs, maintenance, and alterations can be accomplished to those systems within the Scope Of Certification (SOC) and in compliance with reference (a).

20.2.3 United States Navy Diving and Manned Hyperbaric Systems Safety Certification. The requirements, procedures, and guidance for the administration of the certification program for all portable, surface ship afloat and shore-based DLSS shall be in accordance with references (a), (c) and (d). Reference (a) provides a single document which:

a. Identifies the administrative and technical requirements leading to the initial dive system material and system certification.

b. Documents the requirements for maintaining satisfactory material and operability conditions to support continued Unrestricted Operation to design depth.

c. Identifies the responsibilities for implementing and executing the certification program policies and procedures.

d. Provides procedures for requesting waivers to approved operating and maintenance procedures, and for departures from approved system design.

20.2.4 System Certification.

a. System certification is required for all U.S. Navy diving systems in accordance with reference (c). System certification is a procedure for ensuring the adequacy of the dive system to safely operate over its intended mission range. System certification is accomplished through technical reviews and periodic on-site inspections. Quality Assurance (QA) procedures are used to provide support for System certification through documented maintenance and repair procedures, on-site surveys and material audits.

b. System certification is required for all dive systems used by the U.S. Navy, except SCUBA. System certification procedures and criteria shall be in accordance with reference (a) or (b), depending on the type of system. Appendix A of this chapter provides a listing of system certification requirements for diving systems and equipment.

c. The SOC contains a list of all primary, secondary and emergency systems that are required to ensure diver safety. The SOC also includes documentation such as system drawings, operating and emergency procedures, maintenance procedures, and various quality assurance documents required to repair and maintain the DLSS.

20.2.5 Maintenance Guidelines.

a. Appendix I of reference (a) contains the technical and administrative QA requirements for maintenance of SOC components, performed by Forces Afloat, and shall be used when planning all maintenance.

b. Technical specifications shall be complied with at all times. For example, when new fasteners are being installed in a system and the applicable plan requires monel fasteners, then substituting stainless steel or any other material type fasteners is not authorized. Temporary repairs with substituted material shall be documented through an approved Departure From Specification (DFS) in accordance with Appendix I of reference (a), and promptly restored to plan specifications.

c. The following areas of the QA Program are applicable to all dive systems:

(1) In-process control of fabrication and/or repair.

(2) Procedure preparation.

(3) Testing, including retesting.

(4) Calibration.

(5) DFS.

(6) Waivers and deviations.

(7) Audits and deficiency corrective action.

(8) QA forms and records.

20.2.6 Formal System Surveys.

g. When emergency situations occur during SRC operations that require immediate corrective action and are beyond the scope of a corrective maintenance action, send a message to the TYCOM, info NAVSEA, advising of the situation.

h. In addition to the annual 400 foot manned dive required for certified SRCs, a 200 foot false seat test shall be conducted quarterly with all SRCs, unless precluded by operational requirements. This serves to exercise the various components that cannot complete operational testing while the chamber is located on the host ship's deck. All SRC operations will be conducted using the procedures provided in chapter 3 of reference (d).

i. All SRC specific equipment, specialized tool kits for SSN 688/SSN 21/SSBN/SSGN 726 Class submarines, and equipment required to support SRC operations will be maintained in an operationally ready condition.

j. Commanding Officers/Officers In Charge are responsible for maintaining the certification of the SRC through satisfactory maintenance and material management of the SRC and accomplishment of all required certification dives. Additionally, they shall ensure all deficiencies identified during a recertification inspection are corrected in an expeditious manner. If a deficiency cannot be corrected by the date required, a request for an extension of the dive date shall be submitted to NAVSEA via the TYCOM.

20.4 DRY DECK SHELTER MAINTENANCE AND CERTIFICATION.

20.4.1 Certification.

a. To meet the intent of references (b), (e), and Volume V, Part III of this manual, and to allow manned operations of DDSs to their designed depth capability, NAVSEA has established a formal certification program.

b. Maintenance is based on the prevention or correction of degradation caused by the effects of exposure and normal use of the DDS.

c. Continued certification of the DDS is based on satisfactory maintenance. Compliance with the maintenance and material requirements of the DDS is verified during periodic NAVSEA inspections. The results of these inspections are promulgated by a NAVSEA letter of certification which identifies the requirements for maintaining certification and, if required, will forward System Certification Cards which identify deficiencies and the corrective actions required to maintain certification.

20.4.2 Action. To maintain the DDS in satisfactory material condition and to provide assurance they will be fully operational in the event of a national tasking, the following is required:

a. Meet all of the requirements of the NAVSEA certification letter.

b. Accomplish corrective maintenance in a manner which returns the components to the specifications shown by the applicable drawing. Material used during any maintenance shall be as specified in NAVSEA approved system/component drawings, technical manuals or other approved technical documents. Material shall be certified in accordance with Volume V, Part III, Chapter 6 of this manual.

**NOTE: IF THE VENDOR OR MANUFACTURER SPECIFIED IN THE NAVSEA DRAWING OR DOCUMENT CANNOT PROVIDE A SPECIFIC COMPONENT, THEN USE OF A SUBSTITUTE COMPONENT OR MANUFACTURER MUST BE APPROVED BY NAVSEA, VIA THE TYCOM, USING A DFS. A DFS IS ALSO REQUIRED WHEN MATERIAL OTHER THAN THAT SPECIFIED IN APPROVED DRAWINGS OR DOCUMENTS IS USED.**

c. Document all work performed on SOC items using the applicable forms and procedures provided in Volume V, Part III of this manual. This applies regardless of whether the work is a planned or corrective maintenance action. Documentation will, as a minimum, include the following:

(1) Name of the person performing the work.

(2) Date the work was performed.

(3) Reason for accomplishing the work.

(4) Applicable drawing number or reference document.

(5) Brief description of the work performed.

(6) Description of the testing performed and test results.

(7) Signature of the officer/Chief Petty Officer responsible for assuring quality of work.

d. Maintain all work documents as official records for a three year period following completion of DDS refurbishment or in accordance with Volume V of this manual, whichever is longer. The documents will be available for inspection by the SCA and QA auditors during this period. The parent DDS Sustaining Activity shall maintain custody over these work documents.

e. Certification of the DDS is the responsibility of the parent DDS Sustaining Activity. It is the responsibility of both the team and the host unit to maintain certification when the DDS is installed on the host unit. Specifics of material and certification maintenance are covered in the applicable Memoranda of Agreement.

(4) Maintain the Gas Turbine Management Information System WEBLOG.

(5) Routinely evaluate and ensure state of the art inspection, maintenance and repair tools and techniques are used.

23.2.2.3 Fleet Commander. The Fleet Commander shall:

a. Identify and designate those fleet activities which have inspection responsibilities and maintain a base of certified MGTIs within those activities.

b. Ensure the availability of "school ships" to support MGTI Inspector training.

c. Host the semi-annual MGTI seminars on an alternating coast basis.

23.2.2.4 Regional Maintenance Center. The RMC shall:

a. Provide certified MGTIs to perform inspection.

b. Review the guidelines and inspection requirements for all gas turbine inspections required by this instruction and ensure that each inspection report is recorded and updated into the Gas Turbine Management Information System.

c. Schedule and coordinate inspections of all marine gas turbine systems required by this instruction with the appropriate technical activities to avoid the unnecessary opening of gas turbines.

d. Provide a qualified MGTI when requested by the ship, Immediate Superior In Command (ISIC) or TYCOM.

23.2.2.5 Regional Maintenance Center Commanding Officers. RMC Commanding Officers shall:

a. Coordinate inspections in cognizant maintenance areas.

b. Maintain an up-to-date status of required marine gas turbine system inspections which shall include the latest inspection for all ships assigned to RMCs in their respective area of responsibility.

23.2.2.6 Immediate Superior In Command. The ISIC shall:

a. Monitor the follow-up action required to correct noted discrepancies by randomly sampling the ship's deferred maintenance action file and most recent gas turbine inspection report.

b. Assist Commanding Officers in arranging for the corrective action of items beyond the capability of Ship's Force, when requested.

23.2.2.7 Ship Commanding Officer/Officer In Charge/Maintenance Team. Ship Commanding Officers/Officers In Charge/Maintenance Team shall:

a. Request gas turbine inspections.

b. Prepare for scheduled inspections to include required operational testing.

c. Review inspection results and initiate corrective action for those items within Ship's Force capability. Initiate requests for the correction of items beyond Ship's Force capability. If any of the discrepancies cannot be corrected within 72 hours following completion of the inspection, or if said discrepancies will impact the ship's operational schedule, initiate a Casualty Report for the affected gas turbine(s).

d. Assess the impact (if any) of corrective action on operating schedules and advise the operational commanders. Decide (with repair activities) the optimum timing of repair actions to minimize impact on operating schedules.

e. Submit reports.

f. Schedule gas turbine inspections as required by appropriate Planned Maintenance System (PMS)/Class Maintenance Plan item.

23.2.2.8 Marine Gas Turbine Inspectors. MGTIs are authorized and responsible for, but not limited to, performing the following:

a. Perform periodic intermediate level inspections per Gas Turbine Bulletins (GTB) and Ancillary Equipment Bulletins.

b. Perform GTRR, SEMAT II, post casualty investigations, pre-deployment inspections and pre-Planned Major Maintenance Availability inspections.

c. Provide troubleshooting assistance to ships and Fleet Maintenance Activities (FMA).

d. Oversee in-place gas turbine repairs if currently qualified for the specific repair.

e. Oversee Gas Turbine Technical Directive installations.

f. Monitor compliance with configuration status accounting and technical directive reporting requirements.

g. Make engine changeout recommendations to NSWCCD-SSES via the RMCs.

h. Act as team leader (if currently qualified for specific repairs) for in-place gas turbine repairs and gas turbine changeout if attendant FMA does not have a team leader qualified for the specific repair.

i. MGTIs are part of the technical authority chain-of-command and are accountable to the NAVSEA Technical Warrant Holder for the performance of their inspection duties.

**NOTE: THE SHIP'S FORCE MGTI CAN ONLY ACCOMPLISH SPECIAL INSPECTIONS AND OPERATIONAL ASSESSMENTS ON THEIR OWN SHIP. THE SHIP'S FORCE MGTI WILL ASSIST THE RMC MGTI DURING ROUTINE AND AVAILABILITY RELATED INSPECTIONS. THE SHIP'S FORCE MGTI MAY NOT INDEPENDENTLY CONDUCT ROUTINE, STRENGTH AND INTEGRITY INSPECTIONS ON THEIR OWN SHIP.**

23.3 GAS TURBINE INSPECTIONS AND REQUIREMENTS.

23.3.1 Applicability.

a. All gas turbine engines on surface, amphibious or auxiliary platforms or craft of the force will be inspected as prescribed in this section.

b. Frequency of inspections of gas turbine installations by a certified MGTI will be scheduled by the Commanding Officer and conducted in accordance with references (a), (b) and (c), established PMS and GTB Inspection requirements as listed in reference (d). ISIC/TYCOM guidance may be solicited to avoid scheduling conflicts.

# VOLUME IV

## CHAPTER 26

## BOARD OF INSPECTION AND SURVEY INSPECTIONS POLICY

REFERENCES.

(a) OPNAVINST 4730.5 - Trials and Material Inspection (MI) of Ships Conducted by the Board of Inspection and Survey
(b) OPNAVINST 4770.5 - General Policy for the Inactivation, Retirement and Disposition of United States Naval Vessels
(c) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
(d) NWP 1-03.1 - Naval Warfare Publication Operational Report
(e) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
(f) OPNAVINST 4700.8 - Trials, Acceptance, Commissioning, Fitting Out, Shakedown, and Post Shakedown Availability of U.S. Naval Ships Undergoing Construction or Conversion
(g) OPNAVINST 4730.7 - Material Inspection of Submarines Conducted by the Board of Inspection and Survey
(h) INSURVINST 4730.1 - Material Inspections (MI) of Surface Ships
(i) INSURVINST 4730.2 - Trials and Material Inspections of Submarines
(j) INSURVINST 4730.11 - Preparation of Deficiency Forms
(k) INSURVINST 4730.8 - Reports of Trials, Material Inspections and Survey Conducted by INSURV
(l) INSURVINST 4730.3 - Trials of Surface Ships

LISTING OF APPENDICES.

A INSURV Plan of Action and Milestones

26.1 PURPOSE. To define the responsibilities and provide guidance for the preparation and conduct of a Board of Inspection and Survey (INSURV) Inspection.

26.1.1 Scope. The policies and actions required by this chapter are applicable to all ships of the U.S. Navy.

26.1.2 Background. INSURV was established by Title 10, U.S. Code, Section 7304, as a board of Naval Officers to make recommendations to the Secretary of the Navy as to which vessels, if any, should be stricken from the Naval register. Additionally, per reference (a), INSURV has been tasked with providing assurance to the Chief of Naval Operations regarding the ship's material readiness and command's self-assessment effectiveness.

26.1.3 Discussion.

a. INSURV is charged with conducting four basic types of inspections.

**NOTE: COMBINED TRIALS AND GUARANTEE MATERIAL INSPECTIONS (MI) ARE CONDUCTED ON SUBMARINES ONLY. ACCEPTANCE TRIALS AND FINAL CONTRACT TRIALS ARE CONDUCTED ON ALL OTHER SHIPS.**

(1) Combined Trials/Acceptance Trials for new construction or conversion ships. Details are discussed in Volume I, Chapter 4 of this manual.

(2) Guarantee Material Inspection/Final Contract Trials for new construction or conversion ships. Details are discussed in Volume I, Chapter 4 of this manual.

(3) MIs are conducted on U.S. Navy commissioned ships and submarines as discussed in this chapter and reference (a).

(4) Surveys for ships scheduled for decommissioning, Retention/Mobilization or as a Foreign Military Sale. Refer to reference (b) for additional information.

b. Detailed procedures for reporting MI deficiencies in the Maintenance and Material Management (3-M) system are contained in reference (c).

c. Milestones for inspections are shown in Appendix A of this chapter.

26.1.4 Policy

a. As designated in reference (a), material inspections are to provide assurance to Commanding Officers and higher authority that mechanisms to identify, document and resolve material deficiencies are adequate. To this end the ship will establish a program to complete administrative and organizational preparations for the INSURV inspection commencing approximately 12 months prior to the scheduled inspection. Ships shall utilize the guidance shown in Appendix A of this chapter.

b. Adequate preparation for an INSURV inspection does not imply that all deficiencies must be corrected. The goal is to present a ship that is fully aware of all existing deficiencies. All deficiencies must be properly documented and those which are considered to be mission degrading must be reported by Casualty Report (CASREP) in accordance with reference (d). Administrative preparations, in addition to deficiency documentation, must be complete and comprehensive.

26.2 RESPONSIBILITIES.

26.2.1 Type Commander. The Type Commander (TYCOM) shall:

a. Act as the cognizant authority for the conduct of INSURV inspections for all ships of the force (including new construction ships and submarines) and maintain a schedule of inspections due.

b. Nominate active ships (including ships scheduled for inactivation, if appropriate) for inspections by INSURV. Promulgate schedules of inspections to be conducted by INSURV on ships of the force.

c. Schedule accomplishment of Class Maintenance Plan maintenance assessments in accordance with Volume VI, Chapter 42 of this manual.

d. Review Safety Survey results and corrective action status report provided by the ship's Commanding Officer.

e. Track and work to resolve historical issues with systems, equipment and processes identified by INSURV.

f. Coordinate with the Immediate Superior In Command (ISIC) to disseminate the best practices and lessons learned.

26.2.2 Immediate Superior In Command. The ISIC shall (TYCOM responsible if ISIC is not assigned):

a. For Surface Ships only, if the ISIC is deployed, the ISIC will request the numbered fleet commander assign non-deployed local Squadron to assist with inspection preparations.

b. Schedule a Navy Safety Center Safety Survey in accordance with reference (e). This survey is to be conducted at some point within the 12 months preceding the inspection. Optimum time to schedule the survey is 3 to 5 months prior to the inspection.

c. Monitor Ship's Force preparation for the inspection.

d. Send reports per Appendix A. Surface Ships ISIC will conduct an inspection readiness assessment prior to submitting. Develop and disseminate a standardized Schedule of Events for assigned ships.

e. Ensure preparation for the sequence of accomplishing inspection underway demonstrations is conducted in advance of inspection.

f. Ensure post inspection reporting procedures are followed.

g. Attend post-INSURV inspection critiques.

h. Ensure supporting subordinate commands are prepared for the scheduled INSURV.

i. Ensure that the ship is prepared to discuss Current Ship's Maintenance Project (CSMP) deficiencies which have not been corrected, and those items which have been removed from the CSMP and passed to history.

j. Monitor the reporting and correction of inspection deficiencies through the CSMP.

26.2.3 Ship Commanding Officer. The Commanding Officer shall:

a. Ensure that the ship is prepared for the inspection.

b. Promulgate a ship wide Plan of Action and Milestones (POAM) in preparation for INSURV.

c. Be prepared to discuss with the senior member of the board any item from the previous INSURV Inspection which is still on the CSMP, all items which were determined to be not correctable and designated "pass to history", or those for which reporting had been deferred by the TYCOM, including supporting rationale and reference material.

d. Designate an officer as INSURV Coordinator and a Chief Petty Officer, preferably the 3-M Coordinator, as his assistant.

e. Assign a senior coordinator for each INSURV functional area as defined in paragraph 26.4.2.b of this chapter.

f. (Surface Ships Only) Submit a letter of concern to INSURV/TYCOM/ISIC.

g. Provide a copy of the Safety Survey inspection report and corrective action/status report to the TYCOM in accordance with reference (e).

26.2.4 INSURV Coordinator. The INSURV Coordinator shall:

a. Brief all Department Heads on the review of the CSMP, confirm existing Job Control Numbers as valid, and report any existing deficiencies which are not in the CSMP.

b. Review the Automated Work Request (AWR)/CSMP package with the TYCOM/ISIC Maintenance Document Control Office to ensure quality (e.g., readability, proper printing and page-break by Work Center).

c. Segregate the AWR originals by INSURV departmental designations for turnover to the INSURV team.

d. Provide the original of the complete CSMP Report to the INSURV team.

e. Retain a copy of the AWRs and the CSMP for use during the inspection.

f. Distribute copies of the AWRs to Department Heads and Work Centers.

g. Collect and track all INSURV deficiencies identified during the inspection.

h. Coordinate Work Center updating of the CSMP and the processing of updated OPNAV 4790/2Ks or AWRs.

26.2.5 Regional Maintenance Centers. In support of the tasking and funding, the Regional Maintenance Centers (RMC) will:

a. Provide RMC support coordination for INSURV in each home port.

b. Upon TYCOM direction, provide a weekly or, if required, daily update for critical path inspection repairs.

c. Provide or obtain subject matter experts with the experience and system knowledge for assessment to accomplish INSURV approved procedures based on the tasking, schedule and funding provided by INSURV.

d. Provide documented subject matter experts findings to, and formatted for, INSURV.

e. Utilize subject matter experts resources in the most cost effective manner to support the tasking.

f. Develop annual INSURV budget estimate based on projected INSURV schedule. Norfolk Ship Support Activity INSURV Support Coordinator will correlate individual estimates for transmittal to INSURV.

26.3 INSPECTION SCHEDULING.

26.3.1 Combined Trial/Acceptance Trial Inspections. The scheduling of these trials for new construction or conversion ships will be coordinated by the TYCOM and Program Executive Officer (PEO) Submarines in accordance with Volume I, Chapter 4 of this manual and reference (f).

26.3.2 Guarantee Material Inspection/Final Contract Trials. The scheduling of the Guarantee Material Inspection or Final Contract Trials will be coordinated by the PEO Ships or PEO Aircraft Carriers in accordance with Volume I, Chapter 4 of this manual and reference (f).

26.3.3 Material Inspections. Scheduling the INSURV MI at a consistent time in the Fleet Response Training Plan will provide invaluable independent assessments of how well our maintenance processes perform.

a. An INSURV MI will be included in a unit's five-year plan. The desired outcome is for INSURV's MIs to be conducted at a consistent time within the Fleet Response Training Plan, and in a manner not to interfere with carrier strike group or amphibious readiness group operations. In achieving this end state, TYCOMs will avoid scheduling INSURV MIs in the time frame between the numbered fleet commander deployment certification event (e.g., Composite Training Unit Exercise, Joint Warrior, etc.) and the end of post-deployment stand down.

(1) Surface Ships. The MI will optimally be conducted after the Unit Level Training phase and prior to the start of the Integrated Level Training phase, after every other deployment, not to exceed 54 months. With these scheduling considerations, the overall average time between examinations for surface ships will be about 48-54 months.

(2) Nuclear-Powered Aircraft Carriers. The optimal time to conduct MIs is 60 to 90 days following the completion of the Chief of Naval Operations maintenance availability. Avoid conducting MIs after the air wing is embarked for carrier qualification. With these scheduling considerations, the overall average time between examinations for carriers will be about 48-54 months, not to exceed 60 months.

(3) Submarines. INSURV MIs are integrated into the submarine engineered operating cycle per reference (g). MIs should be scheduled post major availability and at mid-cycle. With these scheduling considerations, the overall average time between examinations for submarines will be about 65-70 months, not to exceed 84 months.

b. Conduct of INSURV MIs outside of these time frames requires approval from US Fleet Forces/PACFLT (N43). Material inspections of surface ships and aircraft carriers that cannot be conducted within 60 months, and submarines that cannot be conducted within either 84 months or within 90 days Post Shakedown Availability, Depot Modernization Period, Engineered Refueling Overhaul, Engineered Overhaul or Extended Refit Period require a formal waiver of periodicity requirements from Chief of Naval Operations per reference (a).

c. Scheduling the INSURV inspection at a consistent time in the Fleet Response Training Plan will provide invaluable independent audits of our maintenance processes. Coordinating these inspections with TYCOM assessment events reduces the burden on our Sailors and saves money.

26.4 PREPARATION FOR INSURV INSPECTION.

26.4.1 Active Preparation. Ships routinely must maintain their CSMP in accurate condition and continuously monitor and accurately report their own material readiness posture per reference (d). However, due to outside agency assessments/audits/inspections/certifications the scheduling of an inspection should occur at an optimum time when full material condition awareness is maximized. Active preparation for the INSURV inspection will commence upon receipt of the TYCOM approved proposed INSURV inspection schedule. The TYCOM will notify the Commanding Officer (via the ISIC if applicable) of the proposed dates with specific guidance for the preparation and execution of the inspection. Direct and early liaison with the INSURV is essential to ensure agenda approval, facilitate travel arrangements, berthing and other similar items. Ships shall make use of the information and data available at the INSURV website (http://www.public.navy.mil/usff/INSURV/Pages/default.aspx) to better understand and prepare for an inspection. Ships are strongly encouraged to liaison with INSURV regarding current material problem areas that may exist within the fleet and to actively resolve them as appropriate within their own command.

26.4.2 Ship's Internal Organization. The ship will establish an internal organization for the INSURV. While the details of such an organization will vary from ship to ship, two key elements must be addressed:

a. Specific personnel assignments shall be made to ensure that all necessary logistic and support arrangements for the INSURV are adequately covered (e.g., transportation, berthing, laundry, clerical assistance).

b. INSURV inspects by functional areas, which may not exactly correspond to the standard ship's organization. For purposes of the inspection, the ship will assign one-to-one correspondence for each inspector, with a senior coordinator for each INSURV functional area. Assigned individuals should be thoroughly familiar with each CSMP deficiency, show the inspector exactly where the deficiency is, be able to explain why it has not been corrected and answer questions about related items in the same category, etc. Knowledgeable ship's representatives are essential for a successful inspection.

26.4.3 Updating the Current Ship's Maintenance Project.

a. The CSMP must be reviewed, updated and purged of all completed maintenance actions. All outstanding corrective maintenance should be documented as a deferral. This evolution is important since the CSMP is the primary source of deficiencies that will be presented to INSURV. A vital part of the review is to ensure that deficiencies are properly assessed and documented.

b. Any deficiencies noted during the pre-inspection audit will be entered in the CSMP and reissued for final INSURV documentation.

26.5 BOARD OF INSPECTION AND SURVEY INSPECTION CONDUCT AND DOCUMENTATION.

26.5.1 Inspection Conduct. The inspection will be conducted as specified in reference (h) for surface ships and reference (i) for submarines.

a. Flight operations (if applicable) and other ship evolutions will not be scheduled during the conduct of the inspection, except when scheduled in direct support of the inspection or when specifically requested by INSURV.

b. A proposed "open and inspect" list will be submitted to the ship's assigned senior coordinator for each INSURV functional area no later than the start of the underway portion of the inspection. The senior INSURV member may modify the "open and inspect" list at any time.

26.5.2 Deficiency Documentation.

a. Preparation of INSURV deficiency forms will be in accordance with references (c), (j) and this instruction.

b. INSURV will provide the ship with a copy of new deficiencies found during the inspection.

c. The final forms generated by INSURV will be screened by the TYCOM following the inspection. Whenever an item is considered not cost-effective to correct or is inconsistent with reference (c), the TYCOM will authorize passing the item to the history file.

d. Deficiencies corrected while INSURV is on board are still required to be properly documented.

26.6 POST BOARD OF INSPECTION AND SURVEY INSPECTION ACTIONS.

26.6.1 Deficiency Processing and Resolution.

a. INSURV deficiencies will be reported by entering them into the ship's CSMP within 30 days following completion of the inspection (90 days for Naval Air Force ships).

b. Upon completion of the INSURV inspection, Ship's Force shall take the following actions:

(1) With TYCOM assistance, screen all INSURV deficiencies. Identify those which are mission degrading or safety items.

(2) Initiate prompt action on all mission degrading and safety items. All Part I "Mission Degrading" items and any additional items that are deemed to significantly degrade the ability of the ship to carry out its assigned mission shall be documented by an appropriate CASREP in accordance with reference (d).

## APPENDIX A

## INSURV PLAN OF ACTION AND MILESTONES

| MILESTONE | DUE | RESPONSIBLE ACTIVITY |
|---|---|---|
| Notify Ship of Scheduled INSURV | I-365 days | TYCOM |
| Schedule Safety Survey | I-365 days | TYCOM/ISIC |
| (Naval Surface Forces)<br><br>Maintenance Team define and schedule assessments desired prior to INSURV | I-365 days | Ship/RMC |
| Develop Departmental/Ship's Plan of Action and Milestones (POAM) for INSURV Preparation | I-330 days | Ship |
| Begin Review and Update of Current Ship's Maintenance Project | I-180 days | Ship |
| (Naval Air Forces)<br><br>Download applicable INSURV instructions and check sheets and distribute to Ship's Force | I-180 days | Ship |
| Review Previous Inspection Reports (INSURV, Initial Assessment/Underway Demonstration, etc.) | I-180 to I-90 days | ISIC/Ship |
| Update Ship's POAM verify on track | I-180 days | Ship |
| Identify Ship's INSURV Coordinator to INSURV | I-180 days | Ship |
| Develop program to conduct/practice INSURV material checks and identify/correct training deficiencies | I-180 days | Ship |
| Schedule INSURV pre-brief | I-120 days | Ship |
| Download applicable INSURV instructions and check sheets and distribute to Ship's Force | I-120 days | Ship |
| INSURV Package delivered to Ship | I-120 days | INSURV |
| (Naval Air Forces)<br><br>Develop and send linked events request message from TYCOM to INSURV | I-120 days | TYCOM/Ship |
| Provide hull baseline tasking to RMC | I-90 days | INSURV |
| Update Ship's POAM verify on track | I-90 days | Ship |
| Conduct INSURV pre-brief | I-90 to I-60 days | INSURV/Ship |
| Conduct Pre-Trial Self Audit | I-60 days | (TYCOM/ISIC)/Ship |
| Update CSMP following Self Audit | I-60 to I-45 days | Ship |

| MILESTONE | DUE | RESPONSIBLE ACTIVITY |
|---|---|---|
| Send 45-DAY INSURV readiness status message to TYCOM. Message should describe the ship's level of preparedness for INSURV, significant issues and CASREPs, significant preparations and grooms, and the ISIC's determination of the ship's readiness for the inspection | I-45 days | ISIC/Ship |
| Utilizing INSURV proposed trial/inspection Summary of Events agenda listed in references (h) and (i) (reference (l) for new construction), submit trial/inspection Summary of Events agenda to INSURV/RMC | I-45 days | Ship |
| INSURV tasking requirements to RMC locked | I-45 days | INSURV/RMC |
| For all surface ships, complete and deliver CO letter of concerns to INSURV (copy to TYCOM) | I-45 days (Naval Surface Forces)I-30 days (For Naval Air Forces) | Ship |
| INSURV tasking requirements to RMC locked | I -45 days | INSURV/RMC |
| (Naval Air Forces)<br><br>Develop and send readiness to conduct inspection message from TYCOM to INSURV including embarkation points, security clearance forwarding data, and other pertinent event notices such as time of check in for underway personnel. | I-30 days | TYCOM/Ship |
| Send update 14-DAY INSURV readiness status message to TYCOM N43. Message should describe the ship's level of preparedness for INSURV, significant issues and CASREPs, significant preparations and grooms, and the ISIC's determination of the ship's readiness for the inspection | I-14 days | ISIC |
| RMCs provide subject matter expert names to ship/INSURV | I-7 days | RMC |
| RMC ensure timely subject matter expert support | I-0 | RMC |
| Submit CASREPs as appropriate; Enter all Mission Degrading and Safety Deficiencies into CSMP | I+1 day | Ship |
| Report the ship's return to port and any significant results to TYCOM N43 | I+1 day | ISIC/TYCOM Rep |

# VOLUME IV

# CHAPTER 27

# REBOILER INSPECTION

REFERENCES.

(a) NAVSEA S9534-AD-MMA-010 - Steam Reboiler Maintenance
(b) OPNAVINST 9220.3 - Propulsion and Auxiliary Plant Inspection and Inspector Certification Program
(c) NAVSEA STD DWG 514-8316912 - CVN 68 Reboiler Strength and Integrity Inspection
(d) NWP 1-03.1 - Naval Warfare Publication Operational Report
(e) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
(f) NAVSEA S9086-CH-STM-030 - NSTM Chapter 074 V3 (Gas Free Engineering)
(g) NAVSEAINST 9254.1 - Eddy Current Inspection of Condensers and Reboilers on Nuclear Vessels

LISTING OF APPENDICES.

A Sample Steam Reboiler Inspection Request
B Sample Inspection Confirmation Message
C Sample Steam Reboiler Inspection Report Cover Letter
D Sample Boiler Inspection RBO/Severely Degraded Deficiencies Message

27.1 PURPOSE. To establish policy and provide procedures and inspection requirements for Steam Reboilers and support systems, including:

a. Inspection scheduling.

b. Required preparations for inspections.

c. Inspection guidelines.

d. Reporting requirements.

27.1.1 Policy. Periodic standardized inspections are required of all Steam Reboiler and associated support systems including outlet and inlet steam piping, safety devices, feed water and drain systems, control and indicating systems associated with maintaining system pressure and water level controls. Specific inspection criteria, attributes and intervals are detailed in references (a) and (b). Inspections will be conducted by a certified Steam Generating Plant Inspector (SGPI), Naval Surface Warfare Center, Carderock Division (NSWCCD) inspector and Ship's Force in accordance with the requirements of references (a) and (b). Responsibilities for standardization of Steam Reboiler inspections will closely parallel those requirements and responsibilities of the boiler inspection program described in reference (b), as modified by references (a) and (c).

27.2 TYPES OF INSPECTIONS.

a. First six months operating.

b. Second six months operating.

c. Third six months operating.

d. Annually.

e. Eddy current inspections.

f. Routine.

g. Start of Availability Inspection (SAI).

h. Strength and Integrity.

i. Completion of Availability Inspection (CAI).

j. Special.

k. Industrial Support Visit (ISV).

l. Inactivation or Reactivation Inspection.

m. Post Shakedown Availability New Construction.

27.3 RESPONSIBILITIES.

27.3.1 Naval Sea Systems Command. Naval Sea Systems Command (NAVSEA) shall provide Technical Authority oversight for all Steam Reboilers and associated equipment. The designated NAVSEA Technical Warrant Holder shall:

a. Approve all major Departure From Specifications (DFS).

b. Provide technical oversight and management of the SGPI and NSWCCD Life Cycle Engineering Manager (LCEM).

c. Establish and enforce requirements for SGPI certification and recertification.

d. Ensure periodic SGPI seminars are conducted.

e. Maintain the Steam Reboiler Inspection and Repair Management Information System (RIRMIS).

f. Routinely evaluate and ensure state of the art inspection, maintenance and repair tools and techniques are used.

27.3.2 Naval Surface Warfare Center, Carderock Division.

a. Provide support to NAVSEA for the SGPI and NSWCCD-LCEM programs. Ensure that the required technical documentation to support the SGPI/NSWCCD-LCEM Inspector program is maintained current.

b. Establish and monitor the requirements and standards for routine and industrial inspections of Steam Reboilers.

c. Develop, implement and maintain a program to train and certify NSWCCD-LCEM inspectors in accordance with reference (b).

d. Ensure that inspection of newly constructed ships and ships undergoing major overhaul and/or conversion are conducted in accordance with this instruction.

e. Conduct periodic technical audits of the SGPI Training Course per reference (b).

f. Provide management of technical data, Reboiler history and the associated repair management information database.

g. Provide technical support to the SGPI seminars.

h. Maintain a roster of all certified SGPIs by name, rating, duty station, date of certification and expiration date of certification. Recommend inspector certification and initiate action to decertify inspectors who fail to comply with the requirements of reference (b).

i. Ensure that the requirements for SGPI certification, recertification and certification extensions are met prior to final approval.

j. Conduct SAI/ISV, Strength and Integrity Inspections, CAI and special inspections as specified in section 27.5 of this chapter and reference (b).

27.3.3 Type Commander.

a. Arrange for certified SGPIs to perform inspections in accordance with the requirements of references (a) and (b).

b. Schedule inspections of all Steam Reboilers and support systems required by reference (a). Coordinate the inspections with the appropriate technical activities to avoid unnecessary opening of Steam Reboilers.

c. Assist Commanding Officers in arranging for the corrective action of deficient items which are beyond the capability of Ship's Force to perform. Monitor the follow-up action to correct these deficiencies.

d. Review the RIRMIS to ensure deferred inspection deficiencies are entered into the Current Ships Maintenance Project (CSMP), and are planned/programmed for repair.

27.3.4 Regional Maintenance Center Commanding Officer. Provide certified SGPIs to perform inspections per paragraph 27.6.1 of this chapter.

27.3.5 Ship's Commanding Officer.

a. Request inspections via Naval Message with desired primary and alternate dates to the Type Commander (TYCOM) with info copies to cognizant Regional Maintenance Center (RMC) and NSWCCD for accomplishment of inspections using the format in Appendix A.

b. Prepare for the scheduled inspections.

c. Conduct Ship's Force responsible (Annual) inspections as required by references (a) and (b).

d. Review inspection results and initiate corrective action for those deficiencies within Ship's Force capability. Initiate requests for those actions beyond Ship's Force capability and those items that are identified as being deferred. Submit a Casualty Report in accordance with reference (d) for any discrepancies that will impact operational schedule.

e. Assess the impact of corrective actions on the ship's operating schedules and advise the TYCOM and operational commanders of any adverse effects.

f. Submit reports per paragraph 27.7.2 of this chapter.

27.3.6 Regional Maintenance Center Senior Inspector. RMC Senior inspectors shall:

a. Ensure all assigned SGPIs maintain current SGPI certificates per reference (b).

b. Perform Steam Reboiler inspections per references (a) and (b).

c. Review and submit reports per paragraph 27.7.2 of this chapter.

d. Coordinate inspections in cognizant maintenance areas.

e. Send inspection confirmation message using Appendix B of this chapter.

f. Maintain an up to date list of required Steam Reboiler inspections which shall include the latest inspections for all ships assigned to their geographic area of responsibility.

27.3.7 Steam Generating Plant Inspector.

a. Maintain certification per the requirements of reference (b).

b. Perform inspections in accordance with the requirements of references (a) and (b) assigned.

27.4 INSPECTION SCHEDULING. Commands will initiate inspection requests to assist with inspection coordination. Commands shall ensure that the inspection scheduling complies with reference (b) and Commanding Officers shall request Steam Reboiler inspections by message using the format in Appendix A. In addition, an OPNAV 4790/2K shall be submitted to the RMC requesting a certified SGPI/NSWCCD-LCEM inspector as required to conduct inspections.

27.5 SAFETY PROCEDURES.

a. Ensure idle Steam Reboiler condition is accomplished in accordance with the provisions of the Steam Plant Manual and reference (a) in preparation for the inspection.

b. Ensure all safety precautions associated with entry into sealed tanks, voids and/or pressure vessels including gas-free certification are performed in accordance with the requirements of references (e), (f), and Chapter 23 of this volume.

c. Ensure proper maintenance barriers are established per the requirements of Chapter 10 of this volume.

d. Station an attendant outside the Steam Reboiler to provide assistance when maintenance and inspections are performed on the Steam Reboiler internals.

e. Ensure all precautions and warnings cited in Chapter 5 of reference (a) are followed when conducting maintenance and inspections.

f. Maintain accountability of all items taken into the Steam Reboiler. Foreign material exclusion enclosures will be used to the maximum extent practical to prevent tools or other foreign materials from being inadvertently left in the Steam Reboiler or associated ship's systems.

(1) Personnel entering Steam Reboilers will empty their pockets of all unnecessary items.

(2) Removal of all items and foreign material exclusion enclosures from the Steam Reboiler will be verified and accounted for prior to conducting a final close-out inspection.

(3) Final close-out inspection of the Steam Reboiler shall be accomplished by the Reactor Officer or his designated assistant.

27.6 STEAM REBOILER INSPECTIONS AND REQUIREMENTS. Steam Reboiler inspections conducted in accordance with references (a) and (b) shall fulfill all other Steam Reboiler inspection requirements. All boiler inspections, including pre- and post-operational assessments, should be scheduled for coincidental performance.

27.6.1 Eddy Current Inspection. Eddy Current Inspection (ECI) shall be accomplished at Post Shakedown Availability and every 32 months, in accordance with reference (g).

a. The ECI will be scheduled by Planned Maintenance System (PMS) 312.

b. The ECI will be performed by personnel trained and qualified in the use of ECI equipment and ECI data interpretation.

27.6.2 Routine Inspection. Routine visual inspections are required after the first 30 months of operation, and every 30 months after a Strength and Integrity Inspection, not to exceed 36 months. Any extension beyond 36 months requires an approved major DFS which must be brought to the attention of NSWCCD and the NAVSEA Boiler and Condenser Technical Warrant Holder.

a. The Routine inspection will be scheduled by the TYCOM.

b. The Routine inspection will be performed by a certified SGPI.

c. The Routine inspection will be conducted concurrent with ECI or tube renewals.

27.6.3 Start of Availability Inspection. The SAI will be accomplished at the beginning of an availability to better define or re-evaluate the Steam Reboiler bid specification and identify those major items which may impact ship's operational schedule.

a. The SAI will be scheduled by the TYCOM and/or PMS 312.

b. The SAI will be performed by the NSWCCD Inspector accompanied by a certified SGPI.

27.6.4 Strength and Integrity Inspection. The interval between strength and integrity inspections will be 60 months, not to exceed 72 months. The 60 month period commences with the first lite-off of the Steam Reboiler following the previous strength and integrity inspection. Any extension beyond 72 months requires an approved major DFS and must be brought to the attention of NSWCCD and the NAVSEA Boiler and Condenser Technical Warrant Holder.

a. The Strength and Integrity inspection will be scheduled by PMS 312.

b. The Strength and Integrity inspection will be performed by an NSWCCD inspector accompanied by a certified SGPI.

c. The Strength and Integrity inspection will be conducted concurrent with ECI or tube renewals.

27.6.5 Industrial Support Visit Inspection. The ISV inspection shall be scheduled during the availability but may be waived by the TYCOM for availabilities of short duration.

a. The ISV inspection will be scheduled by the industrial activity or supervising authority as applicable.

b. The ISV inspection will be performed by an NSWCCD inspector accompanied by a certified SGPI.

27.6.6 Completion of Availability Inspection. The CAI will be conducted prior to final close out of the Steam Reboiler.

a. The CAI inspection will be scheduled by the industrial activity or supervising authority as applicable.

b. The CAI will be performed by an NSWCCD inspector accompanied by a certified SGPI, preferably the SGPI who conducted the SAI.

27.6.7 Inactivation or Reactivation. The Inactivation/Reactivation inspection shall be conducted on all Steam Reboilers prior to the completion of the inactivation/reactivation.

a. The Inactivation/Reactivation inspection will be scheduled by the industrial activity, Supervising Authority and Inactive Ship Facility as applicable.

b. The Inactivation/Reactivation inspection will be performed by an NSWCCD inspector and the cognizant SGPI.

27.6.8 Special Inspection. An additional Steam Reboiler inspection when the TYCOM desires to assess the material condition of the Steam Reboilers.

27.6.9 Annual Inspection. An Annual inspection of the Reboiler (shell side) will be conducted, as directed by references (a) and (b), by Ship's Force.

27.6.10 Operational Assessments. An operational assessment shall be accomplished prior to and at the completion of all Chief of Naval Operations scheduled maintenance availabilities. These assessments are part of the Routine Strength and Integrity inspection requirements. These assessments will include both cold and hot plant in-port safety checks and an operational evaluation. Detailed assessment requirements are specified in MRC 5173/001.

27.7 REBOILER INSPECTION GUIDELINES AND REPORTS.

27.7.1 Guidelines.

a. Inspections conducted under paragraph 27.6.3 of this chapter normally encompasses the pressure vessel portion of the Steam Reboiler and associated piping connections as outlined by reference (c) and is conducted by NSWCCD-Ship System Engineering Station (SSES) inspectors accompanied by a certified SGPI. Other areas such as, Steam Reboiler controls and Steam Reboiler appurtenances, must be inspected as part of the Routine inspection prior to Steam Reboiler lite-off by a certified SGPI. Inspections to coincide with ECIs or tube renewals.

b. Routine inspections of Steam Reboilers will be conducted by certified SGPIs.

c. All Repair Before Operating (RBO) items shall be corrected and re-inspected by a certified SGPI or NSWCCD-LCEM inspector, and preferably by the same SGPI/NSWCCD-LCEM inspector who originally identified the discrepancy prior to operation of the Reboiler. RBO discrepancies include those for which continued unrestricted operation could endanger personnel. RBOs may not be departed via DFS. If there is not an immediate or near future danger to personnel, the discrepancy shall be assigned as SEVERELY DEGRADED with major operational restrictions.

d. Whenever Steam Reboilers are in a stand down status for routine maintenance or disassembly, an inspection should be conducted simultaneously. Prepare the Steam Reboiler as described in section 27.8 of this chapter for inspection of the Steam Reboiler shell watersides and Steam Reboiler controls and appurtenances.

e. All deficiencies should be corrected as soon as possible, consistent with good engineering practices.

27.7.2 Reports.

a. The SGPI shall provide an oral critique and preliminary report to the ship's Commanding Officer or his designated representative. The report will contain the findings of the inspection, with note of recurring discrepancies from previous inspections.

b. The Senior inspector will forward a copy of the RIRMIS report with cover letter per sample shown in Appendix C to the ship's Commanding Officer no later than ten days after completion of all discrepancies.

c. The SGPI shall report all RBO deficiencies discovered during the inspection to the TYCOM and ship's Commanding Officer by message, using the format in Appendix D, within 24 hours.

d. The SGPI shall report by message to the TYCOM the correction and re-inspection of all RBO deficiencies prior to lighting off an inspected Steam Reboiler.

e. The ship's Engineering Officer shall report corrected deficiencies, by message, to the TYCOM within 30 days of the completed inspection. A corrected RIRMIS report will be provided to the ship after the RIRMIS status codes are updated.

f. The ship's Commanding Officer shall notify the TYCOM when a scheduled Steam Reboiler inspection cannot be conducted by submitting a DFS request. State the reason why the inspection cannot be conducted and recommend a revised date.

27.8 STEAM REBOILER INSPECTION PREPARATION.

a. Demonstrate the performance of the controls to the SGPI assigned to conduct the inspection. Conduct this demonstration when engineering status can support.

b. Wire shut and danger tag all steam and water valves to the Steam Reboiler using the Steam Plant Manual and reference (a) as guidance.

c. Open manway, ventilate and gas free. Notify SGPI that watersides are available for inspection. The purpose of this inspection is to assess the effectiveness of the Steam Reboiler chemistry control procedures. Detailed waterside inspection will be conducted after completion of cleaning if determined by the inspector that a cleaning is necessary. Mechanically clean watersides to be inspected.

d. Install temporary plugs in all nozzles, to prevent foreign debris from entering piping systems.

27.9 STEAM REBOILER INSPECTION.

27.9.1 Steam Reboiler Inspection Forms. Steam Reboiler inspections will be conducted using the appropriate RIRMIS forms. Include specific comments on the state of preservation and material condition of the Steam Reboiler.

27.9.2 Steam Reboiler Inspection Areas. The following areas are closely inspected for possible RBO deficiencies. RBO deficiencies may include but are not limited to the following:

a. Inoperative/misadjusted safety devices.

b. Lube oil contamination of control systems.

c. Control equipment inoperable in their automatic mode or failed cold checks.

d. Steam Reboiler that does not pass design hydrostatic test.

e. Non-deferrable defects/indications in the pressure vessel boundary.

f. Ultra-sonic tests on pressure vessel piping that are below minimum requirements, or when visual inspection dictates replacement.

g. Tube leakage or unsatisfactory ECI results.

27.9.3 Completion of Inspection. An oral critique and a preliminary inspection report, including a summary of restrictive deficiencies, will follow the inspection. Paragraph 27.7.2 of this chapter identifies official reporting requirements.

27.10 STEAM REBOILER CONTROL SYSTEMS/ONLINE VERIFICATION GUIDELINES. Control systems which include steam pressure and water level controls have been designed and installed for the purpose of maintaining a steady pressure and volume of low pressure steam throughout the hotel steam piping system.

a. Ships shall use controls at all times while the reboiler is in operation. Manual operation shall be used when the reboiler is lit-off and while securing. When the Automatic Boiler Control system cannot be operated in automatic, this fact shall be reported by a Casualty Report message. Prior to operating the reboiler, all applicable testing shall be completed.

b. Maintenance and calibration of the Automatic Boiler Control systems shall be accomplished by qualified technicians in accordance with the direction provided in applicable PMS and the manufacturer's technical manual.

## APPENDIX A

## SAMPLE STEAM REBOILER INSPECTION REQUEST

FM USS (SHIP'S NAME AND HULL NO)//
TO: RMC//
INFO//
COMNAVAIRPAC/COMNAVAIRLANT//
NSWCCD//
COMNAVSEASYCOM WASHINGTON DC//05Z11//
PEO CARRIERS WASHINGTON DC//PMS312//
BT
UNCLAS//
MSGID/GENADMIN/USS (SHIP'S NAME HULL NO)//
SUBJ/REQUEST FOR ROUTINE REBOILER INSPECTION//
REF/A/DOC/COMUSFLTFORCOMINST 4790.3//
AMPN/REF A IS THE JOINT FLEET MAINTENANCE MANUAL//
GENTEXT/REMARKS/1. PER REF A REQUEST RMC PROVIDE A CERTIFIED SGPI TO ACCOMPLISH ROUTINE REBOILER INSPECTION OF (NUMBER) REBOILER.
2. REQUEST PRIMARY INSPECTION START DATE OF (PROVIDE DATE) AND AN ALTERNATE START DATE OF (PROVIDE DATE).//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAIN LANGUAGE ADDRESS DIRECTORY (PLAD) IS UTILIZED.**

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## APPENDIX B

## SAMPLE INSPECTION CONFIRMATION MESSAGE

FM RMC (COMMAND)//
TO USS (SHIP'S NAME HULL NUMBER)//
INFO COMNAVSURFFOR//N434//
COMNAVAIRPAC/COMNAVAIRLANT(CLASSRON)//N4/N43//
ISIC//N4//
COMNAVSEASYSCOM WASHINGTON DC//O5Z11//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
BT
MSGID/GENADMIN/
SUBJ/INSPECTION DATE CONFIRMATION//
REF/A/MSG/USS (SHIPS NAME HULL NUMBER)/DTG REQUEST//
REF/B/DOC/COMUSFLTFORINST 4790.3//
NARR/REF A IS REQUESTING REBOILER INSPECTION. REF B IS COMUSFLTFORCOMINST 4790.3 VOL IV, CHAP 27 DEFINING JOINT FLEET REBOILER INSPECTION CRITERIA AND PROCEDURES.//
POC/SENIOR SGPI/RATE/UIC/LOC:CITY /TEL:/DSN//
RMKS/1. IN RESPONSE TO REF A, AN (TYPE) REBOILER INSPECTION WILL BE CONDUCTED IAW REF B BEGINNING (DATE ) ON NUMBER ( ) REBOILER. ONE OR MORE OF THE FOLLOWING CERTIFIED INSPECTORS ARE ASSIGNED TO CONDUCT THE INSPECTIONS:
INSPECTOR NAME/RATE//LAST 4//CLEARANCE.
2. POC E-MAIL ADDRESS IS: SENIOR SGPI//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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## APPENDIX C

## SAMPLE STEAM REBOILER INSPECTION REPORT COVER LETTER

From: Commander, (Regional Maintenance Center)
To: Commanding Officer, USS (Ship's name and Hull No.)

Subj: (Routine, etc.) Inspection of Catapult(s) Number(s)

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

Encl: (1) RIRMIS Report (Number Steam Reboiler)

1. (Parent Command) Steam Generating Plant Inspector(s) (Inspector's Name) inspected Steam Reboiler(s) Number(s) in USS (Ships Name and Hull No) on (date) while (ship's location).

2. Discrepancies, which require corrective action, are outlined in enclosures (Number of Enclosures).

3. Advance copies of Enclosure(s) have been delivered to the Ship's Commanding Officer

4. (Command) point of contact is (Senior Inspector), Code (Number), commercial telephone, (Number), DSN (Number) e-mail address is: (Address)

COPY TO (W/ENCL):
COMNAVAIRPAC
COMNAVAIRLANT
USS (Name Hull Number)

COPY TO (W/O ENCL):
NSWCCD-SSES (C922)
COMNAVSEASYSCOM WASHINGTON DC (O5Z11)

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# APPENDIX D

## SAMPLE REBOILER INSPECTION

## RBO/ SEVERELY DEGRADED DEFICIENCIES MESSAGE

FM COMMANDING OFFICER, REGIONAL MAINTENANCE CENTER//
TO USS (SHIP'S NAME AND HULL NO.)//
INFO TYCOM//(AS APPROPRIATE)//
ISIC//(AS APPROPRIATE)//
COMNAVSEASYSCOM WASHINGTON DC//05Z11//
NAVSURFWARCEN SHIPSYSENGSTA PHILADELPHIA PA//922//
BT
UNCLAS//N09221//
MSGID/GENADMIN/COMMANDING OFFICER, REGIONAL MAINTENANCE CENTER//
SUBJ/USS (SHIP'S NAME AND HULL NO.) NR (1, 2) ROUTINE/STRENGTH AND INTEGRITY INSPECTION (AS APPROPRIATE)//
REF/A/DOC/COMUSFLTFORCOMINST 4790.3//
REF/B/DOC/NAVSEAINST 4790.8/OPNAVINST 4790.4//
NARR/REF A IS JOINT FLEET MAINTENANCE MANUAL VOL IV CH 27 AND PROVIDES GUIDANCE FOR REBOILER INSPECTIONS. REF B IS 3-M MANUAL AND PROVIDES GUIDANCE FOR CSMP DOCUMENTATION//
RMKS/1. REBOILER NUMBER (1, 2) ROUTINE/STRENGTH AND INTEGRITY (AS APPROPRIATE). INSPECTION CONDUCTED (DATE) BY (INSPECTOR'S NAME) WHILE (SHIP'S LOCATION). RBO DEFICIENCIES AND PROPOSED CORRECTIVE ACTIONS ARE REPORTED IAW REF A AS FOLLOWS:

A. (RIRMIS ITEM NO, DEFICIENCY, REPAIR, ETC.)
B.
C.

2. REBOILER NUMBER (1, 2) SHALL NOT BE STEAMED UNTIL ABOVE LISTED DEFICIENCIES ARE CORRECTED AND A REINSPECTION IS CONDUCTED IAW REF A.
3. SEVERELY DEGRADED DEFICIENCIES AND PROPOSED CORRECTIVE ACTION ARE REPORTED IAW REF A AS FOLLOWS:

A.
B.
C.

4. SEVERELY DEGRADED DEFICIENCIES ARE REQUIRED TO BE CORRECTED PRIOR TO STEAMING OR MUST BE SUBMITTED FOR MAJOR DEPARTURE FROM SPECIFICATION (DFS).
5. IAW REF A, DEFICIENCIES COMPLETED SHALL BE REPORTED EVERY 30 DAYS USING THE GUIDANCE PROVIDED IN VOLUME 4, CHAPTER 3, APPENDIX F. ALL DEFICIENCIES HAVE BEEN DOCUMENTED IN THE SHIPS CSMP FOR CORRECTIVE ACTION IAW REF B.//
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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