



DEPARTMENT OF THE NAVY
COMMANDER, NAVAL SURFACE FORCES
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IN REPLY REFER TO

COMNAVSURFORINST 3540.3A

N7

11 Apr 08

COMNAVSURFOR INSTRUCTION 3540.3A

From: Commander, Naval Surface Forces

Subj: ENGINEERING DEPARTMENT ORGANIZATION AND REGULATIONS MANUAL

1. PURPOSE. To provide comprehensive guidance for the safe and effective operation of the Engineering Department. In this effort, the Engineering Department Organization and Regulations Manual (EDORM) stresses the management principles deemed most essential: importance of watch officer overview in departmental operations, importance of management programs, and increasing watchstander level of knowledge of programs and systems.

2. CANCELLATION. COMNAVSURFORINST 3540.3.

3. SCOPE. This manual applies to all conventionally powered surface ships under Commander, Naval Surface Forces (COMNAVSURFOR) cognizance. It addresses engineering operations and administration, and provides amplification and guidance for satisfying requirements of the Fleet Engineering Readiness Process. Due to the variety of experience within the ranks of fleet engineering officers, this document has been expanded to include other than directive material. This non-directive material has been provided to facilitate developing the EDORM as a useful working document, and is based on the collective inputs from Type Commanders, ISIC staffs and the training community. When tailoring the EDORM, ships are authorized to retain as much or as little of the non-directive content of the EDORM as desired, based on individual ship circumstances. Mandatory items are specified with explicit, directive wording such as "will" or "shall." Advisory items are identified by *suggestive* wording such as "may" or "can," "should" or "could." Those sections that are advisory in nature may be deleted at the Commanding Officer (CO) and Engineer Officer's discretion.

4. REVISION. Complete revision; review in its entirety and at least annually there after.

5. ACTION. The EDORM shall be referred to for guidance concerning the organization, management, operation and readiness of conventionally powered ship Engineering Departments. The EDORM establishes minimum standards, but is not intended to restrict the initiative of individual CO. It shall be tailored, to individual ship circumstances to assure safe and effective management of engineering personnel, equipment and systems. Items in the EDORM, which are directive in nature, shall be retained. To facilitate ship tailoring of the EDORM, digital versions of this manual are available from COMNAVSURFOR (N71).

a. This instruction becomes effective as a ship's instruction after completion of the following:

(1) Required ship-specific information is inserted as required in the body of the instruction.

(2) Non-applicable portions of Chapter 2 and Appendix (A) are removed.

(3) All supervisory personnel are made fully aware of the information contained herein, as well as the information included in the Engineer Officer's Standing Orders (Appendix B) which must be written to amplify this instruction.

(4) All Engineering Department personnel are made familiar with their duties as specified in this instruction.

(5) Training on the contents of this instruction is included in the Engineering Department Training Plan.

b. Suggestions and recommendations for improvement of this manual are solicited and should be submitted to COMNAVSURFOR (N71) via the administrative chain of command.



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TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
LETTER OF PROMULGATION	
RECORD OF CHANGES	
TABLE OF CONTENTS	
<u>CHAPTER 1 ENGINEERING FUNDAMENTALS</u>	
SECTION 1 - FUNDAMENTAL PRECEPTS	1-1-1
<u>CHAPTER 2 ENGINEERING DEPARTMENT ORGANIZATION</u>	
SECTION 1 - ENGINEERING DEPARTMENT ORGANIZATION	2-1-1
FIG A - ENGINEERING DEPARTMENT ORGANIZATION	2-1-12
SECTION 2 - UNDERWAY WATCH ORGANIZATION, STEAM SHIPS	2-2-1
FIG A - UNDERWAY WATCH ORGANIZATION (STEAM)	2-2-2
SECTION 3 - UNDERWAY WATCH ORGANIZATION, GAS TURBINE SHIPS	2-3-1
FIG A - UNDERWAY WATCH ORGANIZATION (GS)	2-3-2
SECTION 4 - UNDERWAY WATCH ORGANIZATION, DIESEL SHIPS	2-4-1
FIG A - UNDERWAY WATCH ORGANIZATION (Diesel)	2-4-2
SECTION 5 - INPORT WATCH ORGANIZATION	2-5-1
FIG A - AUXILIARY STEAMING WATCH ORGANIZATION	2-5-3
FIG B - COLD IRON WATCH ORGANIZATION	2-5-4
<u>CHAPTER 3 OPERATIONAL AND TECHNICAL AUTHORITY</u>	
SECTION 1 - ENGINEERING DEPARTMENT POA&M	3-1-1
SECTION 2 - DEPARTMENTAL REPORTS/ORDERS	3-2-1
SECTION 3 - COMMANDING OFFICER/ENGINEER OFFICER APPROVAL REQUIREMENTS	3-3-1
SECTION 4 - DEPARTMENTAL TRAINING	3-4-1
TAB A - TRAINING CRITIQUE FORM	3-4-10
TAB B - ORAL BOARD CRITIQUE FORM	3-4-11
TAB C - EVOLUTION CRITIQUE FORM	3-4-12
TAB D - DRILL CRITIQUE FORM	3-4-14

TAB E - LIST OF STANDARD SIMULATIONS	3-4-16
TAB F - MAIN SPACE FIRE DRILL GRADE SHEET	3-4-17
SECTION 5 - QUALIFICATION PROCEDURES	3-5-1
TAB A - WATCH TEAM REPLACEMENT PLAN	3-5-3
<u>CHAPTER 4 ENGINEERING DEPARTMENT OPERATIONS</u>	
SECTION 1 - GENERAL PLANT SAFETY	4-1-1
SECTION 2 - WATCH STANDING PROCEDURES	4-2-1
SECTION 3 - CASUALTY CONTROL	4-3-1
SECTION 4 - PHYSICAL SECURITY OF VITAL MACHINERY	4-4-1
SECTION 5 - PROPULSION PLANT MATERIAL READINESS, CLEANLINESS AND PRESERVATION	4-5-1
<u>CHAPTER 5 ENGINEERING MANAGEMENT PROGRAMS</u>	
SECTION 1 - GENERAL ENGINEERING MANAGEMENT TENETS	5-1-1
SECTION 2 - ENGINEERING MANAGEMENT PROGRAMS	5-2-1
TAB A - ENGINEERING PROGRAMS LIST	5-2-2
APPENDIX A - MINIMUM WATCH REQUIREMENTS BY SHIP CLASS	A-1
FIG A - ENGINEERING WATCH REQUIREMENT WAIVER REQUEST	A-2
APPENDIX B - ENGINEER OFFICER'S STANDING ORDERS	B-1
APPENDIX C - FLEET ENGINEERING READINESS PROCESS REPORTING REQUIREMENTS AND CERTIFICATION	C-1
APPENDIX D - GUIDANCE FOR DRAFTING TEMPORARY STANDING ORDERS (TSO)	D-1

CHAPTER 1 - ENGINEERING FUNDAMENTALS

SECTION 1 - FUNDAMENTAL PRECEPTS

Ref: (a) OPNAVINST 3120.32C (CH-6)
(b) EOSS Users Guide (EUG)
(c) NAVSEA S0400-AD-URM-010 (TAGOUT USERS MANUAL)

1101. GENERAL. The Engineering Department's primary task is to maintain and operate the engineering plant in a consistently high state of readiness in order to support the ship's primary mission as an instrument of national policy. To that end, all facets of the department's performance (personnel, machinery and operations) must remain focused on achieving this goal and satisfying requirements outlined in reference (a).

1102. MANAGEMENT PRECEPTS. The following are precepts for good engineering management and are the foundation for increasing and sustaining readiness. They should be stressed as part of the departmental daily routine and reinforced often to all levels of responsibility.

a. Stress "Quality" Training/Qualifications. Maintaining a formal properly documented and managed training and qualification program is the cornerstone of a well-run department. To achieve this aim, each departmental evolution should be evaluated for all possible training benefits. Operational training, in the form of drills and evolutions, should be augmented with maintenance and system training. The number of hours spent in dedicated training does not always equate to competency; therefore, it is important to stress that every training opportunity should be tailored and focused to maximize watchstander benefit. Senior officer and senior enlisted involvement is one of the best methods to achieve this end.

b. Adherence to Approved Operational Procedures. Operational procedures are established in technical guidance. Strict adherence to these procedures is critical to success and should be reinforced regularly. Applicable Operational Sequencing System documents (i.e., EOSS, SDOSS, AFOSS, etc.), Planned Maintenance System, Naval Ships Technical Manual, Commanding Officer/Engineer Officer Standing Orders, Restricted Maneuvering Doctrine, and other approved procedures shall be clearly understood, used at all times, and shall be constantly validated and reviewed.

c. Adherence to Approved Maintenance Procedures. Numerous documents exist that provide repair standards such as Quality Maintenance procedures found in the Joint Fleet Maintenance Manual, NSTM's, equipment technical manuals, job specifications, etc. These repair standards establish procedures that have to be understood, enforced, and are to be used as part of the Engineering Department's daily working documents.

d. Clear Communications. As specified in reference (b), verbal and written communications within the department should be accurate, precise, unencumbered and accomplished in accordance with prescribed guidance. Various types of communication are found in all aspects of departmental duties: log keeping, management program execution, internal communications and tracking material assessments and readiness.

e. Increased Level of Knowledge. Successful engineers must know their ship's systems, their interrelationship to other departments, and their role in the ship's mission. Shipboard doctrines, procedures and natural curiosity are foundations for increasing this knowledge. As we continue to increase automation, decrease manning and redundancy, our watchstanders must increase their level of knowledge in both operations and maintenance to sustain an always-ready Engineering Department.

CHAPTER 2 ENGINEERING DEPARTMENT ORGANIZATION

SECTION 1 - ENGINEERING DEPARTMENT ORGANIZATION

- Ref:
- (a) NTPP 3-20.31 (SHIPS SURVIVABILITY)
 - (b) FXP-4 (SHIPBOARD MOBILITY Revision A)
 - (c) OPNAVINST 3120.32C
 - (d) OPNAVINST 5100.19D
 - (e) OPNAVINST 9220.2 (US NAVY BW/FW PRG)
 - (f) COMFLTFORCOMINST 4790.3 Rev A CH-2
 - (g) NAVSEA S0400-AD-URM-010 (TAGOUT USERS MANUAL)
 - (h) EOSS User's Guide (EUG)
 - (i) NSTM 220 (BW & FW CHEMISTRY)
 - (j) NSTM 221 (BOILERS)
 - (k) NSTM 233 (DIESEL ENGINES)
 - (l) NSTM 234 (MARINE GAS TURBINES)
 - (m) NSTM 241 (REDUCTION GEARS)
 - (n) NSTM 245 (PROPELLERS)
 - (o) NSTM 262 (LUBE OIL/GREASES)
 - (p) NSTM 300 (ELECTRIC PLANT GENERAL)
 - (q) NSTM 533 (POTABLE WATER)
 - (r) NSTM 541 (F76 FUEL SYSTEM)
 - (s) NSTM 542 (JP5 FUEL SYSTEM)
 - (t) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

2101. GENERAL. This section provides guidance for the effective organization of the Engineering Department. Because significant physical plant differences exist within the Force, watch standing requirements that accommodate variations in ship classes are provided in this chapter and the specific watch organization for each class of ship is provided in Appendix A.

2102. ACTION. All personnel shall read applicable portions of this manual before they assume any responsibility in the Engineering Department. As a rule, senior personnel in the Engineering Department shall be familiar with references (a) through (t).

2103. PERSONNEL. All officers and enlisted personnel assigned duty in connection with supervision, operation, or maintenance of the engineering plant shall be qualified for such assignment using Personnel Qualification Standards (PQS) or Job Qualification Requirements (JQRs) as implemented per applicable OPNAV, BUPERS and TYCOM instructions.

2104. COMMANDING OFFICER. The CO is assigned by the Chief of Naval Personnel (CNP) and is responsible for the safe and proper supervision, operation, and maintenance of the engineering plant. U.S. Navy Regulations establish the CO's authority and responsibility. Specific items that must have CO's approval are delineated in EDORM Article 3301.

2105. EXECUTIVE OFFICER (XO). The XO will participate actively in evolutions and inspections to determine training effectiveness and readiness of the Engineering Department. The XO is designated as the Integrated Training Team (ITT) Leader and the Damage Control Training Team (DCTT) Leader in accordance with references (a), (c), and (t).

2106. ENGINEER OFFICER. The Engineer Officer is subject to the orders of the CO and is responsible for the proper performance of the department per references (a) through (t). In addition, the Engineer Officer shall:

a. Serve as Damage Control Officer (DCO) for fire fighting and damage control functions.

(1) Provide direction to all repair lockers

(2) Designate appropriate casualty power configuration

b. Upon getting underway, proceeding to anchorage, arriving pier-side and at other times when extra care is required, serve as Plant Control Officer and personally supervise the Engineering Officer Of the Watch (EOOW) in proper operation of the plant. In the absence of the Engineer Officer, the Main Propulsion Assistant will perform this responsibility (See EDORM Article 2108).

c. Satisfy the required Boiler Water/Feed Water course requirements as specified by Type Commander instruction and higher directives (for ships with main, auxiliary, or waste heat boilers).

d. Ensure that the organization, training and qualification of the Engineering and Damage Control Training Teams (ETT/DCTT) are current and effective.

e. Act as the final PQS qualifying authority for all Engineering watch standers, except Engineer Officers of the Watch (EOOW).

f. Be responsible for the performance of all evolutions, assessments, and repair work in the Engineering Department.

g. The Engineer Officer shall personally inspect the following before and during closure:

(1) Main, auxiliary and waste heat boilers

R) (2) Main and generator reduction gears

(3) Main Reduction Gear lube oil sump

(4) Main and auxiliary condensers

- (5) Main engine and ship's service generator lube oil sumps
- (6) Lower and upper (if applicable) diesel engine sumps
- (7) Main engine internals
- (8) Clean side of gas turbine intake/inlet plenums
- (9) All gas turbine modules after major repairs
- (10) Fuel oil tanks
- (11) Controllable Reversible Pitch propeller oil sumps

Note: The results of these inspections shall be reported to the CO and entered in the Engineering Log. In the absence of the Engineer Officer, the CO may authorize via letter of instruction the Main Propulsion Assistant or other qualified person to perform these duties.

h. Supervise the departmental training program. Recommend approval of Monthly Training Plans, and the Watch Team Replacement Plan (WTRP) to the CO. Closely monitor the departmental training program effectiveness, paying special attention to continuing training requirements and opportunities.

i. Ensure those technicians identified as filling a core Battle Force Intermediate Maintenance Activity (BFIMA) billet are allowed opportunity to complete their assigned, skill based Job Qualification Requirements (JQRs) and maintain proficiency as required for their trade.

j. Operate ship's equipment in a fuel-efficient manner as directed by the CO.

k. Prevent unauthorized discharge of pollutants to the air or sea.

l. Develop and promulgate a recall procedure to be used in the event an emergency underway is required.

m. Develop, in agreement with the Supply Officer, an inventory and accountability procedure for spare parts and supplies kept within Engineering Department workspaces.

n. Develop for approval by the CO the following items:

(1) Local procedures necessary to supplement EOSS as provided for in the Engineering Operational Sequencing System User's Guide (EUG).

(2) A ship specific EDORM, which shall be promulgated to the Engineering Department as a ship's instruction.

(3) Engineer Officer's Standing Orders as required in EDORM Appendix B and EDORM Article 3206.

(4) Restricted Maneuvering Doctrine that addresses propulsion plant line-up and casualty control procedures during restricted maneuvering situations.

(5) Special operating orders or temporary standing orders that address procedural changes or operating limitations posed by material or monitoring deficiencies within the plant or supporting auxiliary systems. If feasible, EOSS shall be modified in accordance with EOSS User's Guide.

R o. Review and sign daily, Engineering Log, Department Logs, Operating Logs and Records.

2107. PRINCIPAL ASSISTANTS TO THE ENGINEER OFFICER. Under the Engineer Officer, there will be officers or senior enlisted personnel assigned as principal assistants (Main Propulsion Assistant, Damage Control Assistant, Auxiliaries Officer, Electrical Officer, etc.) or as Engineering Division Officers. Minimum responsibilities for all principal assistants include:

a. Frequent inspections of their assigned spaces to ensure cleanliness, preservation, proper stowage and material readiness.

b. Informing the Engineer Officer of the material condition of systems and equipment under their cognizance.

c. Review daily all operating records and other predictive maintenance documents of assigned equipment (e.g., Boiler Water/Feed Water, Lube Oil and Fuel Oil Logs, equipment operating logs, etc.) for early identification of problems and determine corrective action.

d. Ensure proper operation and maintenance of systems and equipment under their cognizance.

e. Ensure proper administration of applicable programs and the maintenance, accuracy and updating of ship instructions and records under their cognizance.

f. Supervise the training and qualification of propulsion plant watch standers and division personnel.

R) g. Assist the DCA in ensuring the accuracy, periodic validation and revision of the space mechanical and electrical isolation lists resident in the Repair Party Manual.

2108. MAIN PROPULSION ASSISTANT (MPA). The Main Propulsion Assistant shall be responsible, under the Engineer Officer, for satisfying the responsibilities of EDORM Article 2107. In addition, the MPA shall:

a. In the absence of the Engineer Officer, serve as Plant Control Officer, personally supervise the EOOW in proper operation of the plant when getting underway, coming to anchor, and at other times when extra care is required.

b. Satisfy the required Boiler Water/Feed Water Course requirements as specified by Type Commander instruction and higher directives (for ships with main, auxiliary, or waste heat boilers).

c. Be responsible for: the proper care, stowage, and use of fuel and lubricating oils; the operation, maintenance and security of the Fuel and Lubricating Oil Systems; the keeping of Fuel and Lubricating Oil Records; and the daily submission of a Fuel and Water Report and monthly NEURS report to the CO via the Engineer Officer.

R) d. Supervise the preparation and care of the Engineering Log and the Engineer's Bell Book (and Bell Logger printout sheets if applicable). The Engineering Log shall be hand written in black ink utilizing NAVSEA forms 3120/2 A-D. The use of a ship generated addendum form for equipment plant status is authorized. The MPA, or designated representative, shall inspect them daily or as often as required to ensure they are accurate and properly maintained. Supervise the initial qualification and proficiency training of divisional cognizant watchstations.

2109. DAMAGE CONTROL ASSISTANT (DCA). The Damage Control Assistant shall be responsible, under the Engineer Officer, for satisfying the responsibilities of EDORM Article 2107. In addition the DCA shall:

a. Limit the impact of, and control battle damage, including control of stability, list, and trim. The DCA shall supervise placing the ship in the material readiness condition of closure ordered by the Commanding Officer and shall ensure that assigned closure classifications are highly visible.

b. Prepare and maintain bills for the control of damage, stability, CBR defense readiness, and casualty power.

c. Ensure Compartment Check-Off Lists are kept current and properly posted by respective division officers.

d. Review hull, zone, and other inspections and assessments that list deficiencies affecting the material condition of the ship, and initiate corrective action.

e. Administer overall Damage Control PQS programs. In this regard, the DCA shall:

(1) Keep a current file of instructions related to the Damage Control PQS Program, standards, and qualification requirements.

(2) Advise the chain of command concerning Damage Control PQS Program requirements.

(3) Provide training for and supervise the qualification of all personnel who qualify others in Damage Control PQS (including embarked air and marine detachments).

(4) Provide training for and supervise the qualification of Gas Free Petty Officers, Fire Marshals and members of all emergency parties (Flying Squad, Rescue and Assistance, Inport Emergency Team (IET), Core/Flex Teams, Aviation Fire Fighting, etc.).

(5) Provide training for, and supervise the qualification of Damage Control Petty Officers and Damage Control Maintenance personnel.

f. Conduct DCTT training per the Executive Officer's guidance.

g. Supervise ballasting and de-ballasting of the ship, in coordination with the Engineer Officer, EOOW, and ship's Oil and Water King.

h. Submit a schedule of all-hands Damage Control and CBR training requirements, including Battle Problems, Major Conflagration, and/or Total Ship Survivability Exercises (TSSE) to the Planning Board for Training in accordance with reference (a).

i. Serve as the ship's Gas Free Engineer unless otherwise designated by the CO.

j. Implement and tailor the Type Commander (TYCOM) issued Repair Party Manual.

k. Supervise the initial qualification and proficiency training for respective divisional watchstations.

l. Prepare and maintain the ships DC closure log. Conduct daily review of the log to ensure the accuracy and adequacy of all entries affecting the prescribed material condition of readiness.

R) m. Review and initial all tag-out record sheets relating to the isolation of major installed damage control equipment.

2110. AUXILIARY OFFICER (AUXO). The Auxiliary Officer shall be responsible, under the Engineer Officer, for satisfying the responsibilities of EDORM Article 2107. In addition, the Auxiliary Officer shall:

a. Unless otherwise provided for, be responsible for the ship's boats and auxiliary machinery/equipment (i.e., anchor windlass, steering gear, etc.).

b. Supervise the initial qualification and proficiency training for respective divisional watchstations.

2111. ELECTRICAL OFFICER (EO). When assigned, the Electrical Officer is responsible, under the Engineer Officer, for satisfying the responsibilities of EDORM Article 2107. If an Electrical Officer is not assigned these duties may be assigned to another engineering division officer. In addition, the Electrical Officer shall:

R) a. Be designated the Electrical Safety Officer, reporting to ship's Safety Officer via the Engineer Officer for matters concerning electrical safety. For ships with assigned Electronic Maintenance Officers (EMOs), the implementation of Electrical Safety Program may be shared between the EMO and EO, but the overall responsibility for the program resides with the EO.

b. Routinely observe the performance of personnel and equipment assigned to ensure conformance with procedures, and safety of operation.

c. Ensure electrical deficiencies are promptly corrected.

d. Review the results of material, zone and other inspections, which list electrical safety discrepancies, and initiate action and verification to ensure corrections are completed.

e. Supervise the initial qualification and proficiency training for divisional watchstations.

f. Supervise the training and qualifications of Tool Issue custodians per references (d), (p) and (t).

g. Be responsible for the Casualty Power Bill and associated shipboard casualty power training.

2112. OTHER ASSISTANTS TO THE ENGINEER OFFICER. Depending upon ship class, technical assistants such as Oil and Water King, Administrative Assistant, Departmental Training Officer, Ship Maintenance Material Officer (SMMO), Boilers Officer, etc., may be assigned. In such cases, the ship shall insert, as an addendum to this chapter, a full description of the applicable duties and responsibilities of each additional assistant. The following are provided as a guide, and when applicable, should be used as minimum responsibilities for positions covered:

a. Oil and Water Kings. The ship's Oil and Water King shall be a senior Petty Officer (E6 - E9) normally in a machinery

rating (e.g., MM, GSM, and EN). The Oil and Water King is the primary operator, tester and record keeper for all actions involving: F-76/F-44; main, auxiliary and waste heat boilers; and feed, condensate and fresh water. The Oil and Water Kings are responsible for handling, testing and treating fuel oil, lube oil and all types of water per references (e) through (t). In addition, the Oil and Water Kings shall:

(1) Report to the Engineer Officer, via the MPA for administrative matters, and via the EOOW/EDO for operational matters.

(2) Supervise all personnel connected with handling, testing or treating of Water, Fuel or Lube Oil. As such, the Boiler Water/Feed Water King shall be a current graduate of Boiler Water/Feed Water Test and Treatment course (Propulsion or Non-Propulsion as applicable), and all required fuel testing courses as specified by references (e) and (t).

(3) Be responsible to the Lube Oil, Fuel Oil, Aviation Fuel (when applicable) and Water Chemistry Program Manager(s) for all requirements of references (d) through (s).

(4) Supervise the preparation of the Daily Fuel, Oil and Water Report.

(5) Maintain fuel tank levels as directed by the EOOW/EDO.

(6) Coordinate all refueling and fuel transfer evolutions throughout the ship.

(7) Maintain proper list and trim as directed by the EOOW/EDO and DCA.

(8) Maintain and operate the Fuel Transfer and Stripping, Aviation Fuel (when applicable) Systems.

(9) Maintain an adequate supply, and ensure the safe handling, stowage and use of all chemicals and equipment associated with testing or treatment of Boiler, Feed water, fresh water and lube/fuel oils.

(10) Be informed of boiler light off schedules to permit proper Boiler Water testing and treatment.

(11) Promptly report significant evolutions pertaining to Fresh and Feed Water to the EOOW/EDO.

(12) Conduct required training on oil spill response, containment and clean-up procedures as per PQS qualification.

b. Departmental Training Officer. If not assigned as a primary duty, Departmental Training Officer duties will be

assigned as a collateral duty of another Engineering Department Officer or senior enlisted. The Departmental Training Officer shall be responsible for the following items:

(1) Serve as a central point of contact and manage departmental records/software and associated training materials. To include at a minimum departmental training, divisional training, damage control training, ETT training, and DCTT training.

c. Training Team Leaders (ETT/DCTT, etc.). The leader of each of the Training Teams shall be responsible for the following:

(1) Ensure the Training Team is effective and meeting training objectives.

(2) Ensure personnel assigned are qualified in the area(s) they are assigned to train.

(3) Ensure a complete set of drill scenarios are developed, maintained and coordinated with the Departmental Training Officer as required.

(4) Under the direction of the Engineer Officer, ensure training and associated documentation is maintained, as per reference (t).

R) (5) Thoroughly brief and debrief training evolutions, emphasizing safety concerns utilizing Operation Risk Management (ORM), contingency actions, learning objectives, and material and documentation deficiencies. Primary references (e.g., EOSS, RPM) should be used for formal, thorough debriefs.

d. Fire Marshall. The ship's Fire Marshal shall assist the Engineer Officer and DCA in training of personnel and the prevention and fighting of fires. The ship's Fire Marshal shall be responsible for the following:

(1) Make daily inspections of the ship, paying particular attention to the items specified in reference (a).

(2) Prepare, route and follow-up reports of identified fire hazards and their correction.

(3) Under the direction of the DCA and Engineer Officer, conduct training for ship's fire teams, rescue and assistance teams, inport emergency teams and divisional Damage Control Petty Officers stressing fire hazard consciousness.

e. Program Managers: Each Program Manager shall be a senior Petty Officer, Chief Petty Officer or Officer as assigned by the Engineer Officer. The Program Managers are responsible for the following:

(1) Ensure respective programs are effectively meeting their objectives as summarized in Management Program Checklists maintained by the Afloat Training Groups. Management Program Checklists are available on the Afloat Training Group web site.

(2) Ensure all applicable instructions and references are updated and readily available. Also, the Program Manager shall ensure all required logs and records are properly maintained, coordinating outside of the department as necessary.

(3) Ensure qualification of personnel assigned to carry out program functions.

(4) Ensure all required equipment essential to program effectiveness is properly operated, maintained and calibrated.

(5) Develop and maintain training materials to support program objectives, coordinated with the Departmental Training Officer as required.

f. Technical Library Custodian. The Technical Library Custodian should be a knowledgeable, administratively competent person who reports to the Engineer Officer on all matters pertaining to technical documentation and associated systems. The Technical Library Custodian shall:

(1) Supervise all equipment and spaces designated for the stowage and management of technical documentation. If automated, ensure all data files, software and associated materials are properly maintained.

(2) Properly maintain the required publications and documents as specified in EDORM Chapter 5, Section 2.

(3) Update as required all technical documentation and publications held in the technical library.

g. Log Room Yeoman. When provided by the Ship's Manning Document (SMD), the Log Room Yeoman should be assigned solely to the Engineering Department by the Executive Officer. When a dedicated billet is not assigned by the SMD, the Engineer Officer should assign these responsibilities as a primary or collateral duty to a suitable person from the Engineering Department. The Log Room Yeoman may be assigned additional duties as the Technical Library Custodian. The Log Room Yeoman shall:

(1) Supervise the operation of the Engineering Department Administrative Office, including the maintenance of assigned spaces and equipment.

(2) Assist in preparing and issuing Engineering Department Directives.

- (3) Perform such administrative functions as:
- (a) maintenance of Engineering Department Records;
 - (b) maintenance of a tickler file on required reports;
 - (c) maintenance of administrative documentation and publications;
 - (d) maintenance of required operating log files and operating procedures held or issued by the Engineering Department.
- (4) Coordinate the preparation and distribution of Engineering Department Watch Bills.
- (5) Assist in the preparation of regular departmental functions such as performance evaluations, qualification entries, awards packages, trial reports, etc.

2113. ENGINEERING DEPARTMENT ORGANIZATION. The ship shall draw a diagram at Figure A illustrating the administrative organizational relationship for the Engineering Department.

FIG A ENGINEERING DEPARTMENT ORGANIZATION

(Ship insert)

CHAPTER 2 ENGINEERING DEPARTMENT ORGANIZATION

SECTION 2 - UNDERWAY WATCH ORGANIZATION, STEAM SHIPS

- Ref:
- (a) NTPP 3-20.31 (SHIPS SURVIVABILITY)
 - (b) OPNAVINST 3120.32 series (NAVY SORM)
 - (c) OPNAVINST 9220.2 (US NAVY BW/FW PRG)
 - (d) COMFLTFORCOMINST 4790.3 series (JFMM)
 - (e) NAVSEA S0400-AD-URM-010 (TAGOUT USERS MANUAL)
 - (f) EOSS Users Guide (EUG)
 - (g) NSTM 220 (BW & FW CHEMISTRY)
 - (h) NSTM 221 (BOILERS)
 - (i) NSTM 241 (REDUCTION GEARS)
 - (j) NSTM 244 (PROPULSION BEARINGS)
 - (k) NSTM 262 (LUBE OIL/GREASES)
 - (l) NSTM 300 (ELECTRIC PLANT GENERAL)
 - (m) NSTM 320 (ELECTRICAL DISTRIBUTION SYSTEM)
 - (n) NSTM 541 (F76 FUEL SYSTEMS)
 - (o) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

2201. OBJECTIVE. This section establishes a standard underway watch organization to be manned under steaming plant conditions. Minimum watch requirements for cold iron, auxiliary steaming, and condition IV steaming are provided on a class basis in Appendix A.

a. Where manning or training levels limit the ship's ability to comply with the minimum standards in this instruction, the ship shall request a waiver of these requirements from the Type Commander (format in Appendix A, Figure A-1).

b. The EDORM specifies watch station manning requirements for Cold Iron, Auxiliary Steaming and Condition IV only. Other Conditions (I, III) and special evolution requirements have not been included. Ships shall refer to the SMD Program, Part IV (Battle Bill) or other ship instructions for guidance concerning watch conditions other than contained in Appendix A.

2202. UNDERWAY WATCH ORGANIZATION AND DUTIES OF WATCHSTANDERS FOR STEAM SHIPS. The ship may draw a diagram below as Figure A illustrating the operational organization of the Engineering Department's Condition IV Watch Team.

11 Apr 08

FIG A UNDERWAY WATCH ORGANIZATION (STEAM)

(Ship insert)

2203. GENERAL WATCHSTANDING REQUIREMENTS. Propulsion plant watchstanders shall perform all evolutions in a formal, disciplined manner. EOSS shall be used in directing or reporting operation of all propulsion plant equipment. The EUG governs deviations from the Engineering Operational Sequencing System. Equipment without EOSS coverage or with material deficiencies, which precludes operation in accordance with EOSS but which still may be operated safely in a degraded status shall be operated in accordance with a ship generated procedure. The ship generated procedure must be reviewed by the Engineer Officer and authorized by the Commanding Officer per reference (f) and EDORM article 3301.

a. Engineering watchstanders shall use permanently installed instrumentation to ensure the safe operation of the engineering plant. Instrumentation other than that permanently installed as part of the ship's equipment shall not be used for control of the propulsion plant unless specifically authorized by the CO. Authorized Onboard Training (OBT) devices, if installed, shall be used only during periods of authorized training and removed or de-activated promptly upon conclusion of the training period.

b. Propulsion plant operation is inherently dangerous due to the nature of the equipment, complex system inter-relationships, and close proximity to hazardous materials and heat and combustion sources. Watchstanders serve as the operators and caretakers of the plant as well as the first line of defense against catastrophe. Watchstanding requires plant operational experience, systems inter-relationship level of knowledge, maintenance and repair expertise, and clear understanding of watch requirements. As a minimum, each watchstander shall:

(1) Give undivided attention to their operating duties. Tasks, which significantly detract from watchstander's duties, must be assigned to non-watch standers.

(2) Promptly execute all orders issued by the EOOW and carry out the Engineer Officer's Standing Orders, Special Operating Orders, and Night Orders.

(3) Supervise all subordinate personnel on watch and instruct them in assigned duties, as well as operational and casualty control procedures.

(4) Ensure the proper and safe operation of assigned main propulsion, electrical and all associated auxiliary machinery. Keep informed of any change in status of assigned equipment.

(5) Ensure that equipment readings are properly recorded and that all logs and records are properly kept. Review and initial all readings (hourly if applicable) and sign all logs at the end of the watch. Circle all out-of-limit readings in red, monitor for trends and comparability of readings of equipment in

parallel configuration. Record the reason and all corrective action for out-of-limit readings in the Comments section. It is important to review logs and associated comments sections back to the last watch stood.

(a) INTEGRATED CONDITION ASSESSMENT SYSTEM (ICAS) For ships with ICAS installed, the Engineer Officer shall determine a method to ensure periodic equipment log review by the Engineering Officer Of the Watch/Watch Supervisors is accomplished, on screen review is acceptable.

(6) Remain alert to detect any unusual conditions in the plant (e.g., unusual sounds, vibrations, and smell or out-of-limit readings). Promptly report all significant evolutions and abnormalities to the EOOW/Supervisory Personnel. Take positive actions to prevent casualty/emergency situations, keeping the EOOW/Supervisory Personnel informed of intentions.

(7) Ensure lube oil samples are drawn and inspected according to the Lube Oil Quality Management Program.

(8) Maintain the physical security of machinery and assigned spaces.

(9) Carry out applicable provisions of the EOSS, (SDOSS, AFOSS, and CSOSS when applicable), NSTM, SORM, ship instructions and notices, engineering department instructions, notices, and standing orders, machinery operating instructions, and safety precautions found in other pertinent directives.

(10) Immediately investigate odor of fuel oils, burning material, and smoke. In the event of a fire in a main engineering space, execute all immediate actions as prescribed in the applicable EOCC, Repair Party Manual and/or Main Space Fire Doctrine procedures, dependent upon the class of fire. Know how to activate and operate all fire fighting equipment in assigned space(s), and all personal protection devices.

(11) Ensure that all personnel on watch maintain cleanliness of their watch stations. Direct the proper securing of equipment, tools, and loose materials to prevent damage to machinery, injury to personnel, and fire hazards.

(12) Set the specified material condition of readiness when ordered and report compliance to the EOOW and other supervisory watch personnel.

(13) Report to and coordinate with the EOOW all significant evolutions that are anticipated during the course of the watch.

(14) Conduct all required tests of alarms and systems. Report deficiencies promptly.

(15) Carry rags and flashlights as necessary in support of above functions.

2204. ENGINEER OFFICER OF THE WATCH (EOOW)

a. Basic Function. The EOOW is responsible for the safe and proper operation of the ship's entire engineering plant, the Engineering watchteam and for the performance of duties prescribed in this section and by other competent authority.

b. Minimum Duties, Responsibilities, and Authority. In addition to the general duties assigned in EDORM Article 2203, the EOOW shall:

(1) Ensure that all orders received from the OOD are promptly acknowledged and executed.

(2) Obtain permission from the OOD before any of the following:

(a) Permitting the main engines to be turned over.

(b) Stopping main engines or steering gear until the ship is reported properly secured (pier, buoy, anchorage, etc.).

(c) Pumping bilges.

(d) Blowing tubes.

(e) Lighting/securing boilers.

(f) Surface blowing of steaming boilers.

(g) Reconfiguring the electrical plant.

(3) Immediately report to the OOD/CSOOW and when required, TAO, any casualty or disabling of any machinery which affects available propulsion, electrical power, ship control, offensive or defensive capability, or habitability of the ship. Notify the Engineer Officer at earliest opportunity once immediate and controlling actions are accomplished.

(4) Keep informed of the power requirements for present and future operations and determine how the engineering plant will effectively meet these requirements. Advise the OOD and the Engineer Officer when modification of the plant configuration is considered appropriate.

(5) Promptly correct hazardous conditions in the plant and report actions to the OOD and as soon as practical to the Engineer Officer.

(6) As the senior trainer on watch, ensure that all engineering watchstanders are alert and use all available time to train.

(7) Ensure all equipment operating logs are kept properly maintained, and exercise watch officer overview of all programs outlined in EDORM, Chapter 5.

(8) Ensure that the Tag-Out Log is maintained properly. Be aware of the status of equipment/systems that are tagged out and spot check as needed to ensure log accuracy. Particular attention is directed to the absolute requirement for the EOOW, as the authorizing officer, to understand the system and the impact to the plant of hanging or clearing of tags.

(9) Monitor quality and regulate operation of Combat Systems support systems (e.g., chill water, dry air, 400 Hz power, etc.).

(10) Direct the lighting off and securing of the engineering plant in accordance with applicable EOSS and the Engineer Officer's Light Off Orders. The EOOW or designated safety observer shall be present in the firing aisle or appropriate Fireroom control station for the lighting of boilers.

(11) Ensure that the proper material condition of readiness is set within the Engineering Department and ensure prescribed firemain pressure is maintained at all times. Notify the OOD, Engineer Officer and DCA if unable to maintain firemain pressure.

(12) Coordinate with the Engineer Officer and DCA to keep the ship properly trimmed.

(13) Ensure that all fuel transfers are performed strictly according to Clean Water Act, the latest Environmental Protection Agency requirements (EPA), SOPA, EOSS Standard Notes to the Oil King (SNOK), and ship's instructions. Supervise the activities of the Oil King and assistants in operational matters.

(14) Ensure that the Engineering Log, Engineer's Bell Book/Automatic Bell Logger Record Sheets and the prescribed operating records are properly kept. Before being relieved, review and sign the Engineering Log, sign the Engineer's Bell Book/Automatic Bell Logger Record Sheet, and review and sign the Automatic Data Logger printout for the watch. The EOOW shall ensure all out-of-limit readings are circled in red ink and initialed by either the space watch supervisor and/or by himself/herself as specified by ship procedures. Each out-of-limit reading shall note the reason for the condition and corrective actions taken. During periods when the automatic Bell Logger is malfunctioning, the EOOW shall ensure the Engineer's Bell Book is maintained.

(15) Prior to assuming the watch, the EOOW shall make a tour of assigned spaces as directed by the Engineer Officer, and at a minimum, be aware of the following:

(a) Tactical/maneuvering situations, which could impact the engineering watchteam or their casualty control actions (e.g., plane guard, NIXIE/TACTAS status, boat/LCAC ops, etc.).

(b) Specific equipment operating conditions, existence of any non-standard configurations, equipment tag outs or any Special Operating Orders present.

(c) Presence of any heat stress conditions.

(d) Provisions of the Engineer Officer and Captain's Night Orders (if available).

(e) Maintenance being conducted or planned for the watch.

(f) Review logs and records back to the last watch stood, or 24 hours, whichever is less.

(16) When required, inform distilling plant operators of ship position in relationship to other shipping and/or landfall to ensure contaminated water is not sent to potable water holding tanks.

(17) Inform the Oil King or assistants of changes in boiler status that may require water chemistry test or treatment.

R) (18) Ensure all required fuel and lubrication oil samples are taken and properly evaluated. Notify the Engineer Officer immediately of unsatisfactory samples and make recommendations for corrective actions. Ensure all unsatisfactory test results are logged in the engineering log.

(19) Ensure all repair work being accomplished conforms to repair documentation; reference (d) Quality Maintenance guidance pertains.

2205. SPACE SUPERVISOR

a. Basic Function. The Space Supervisor is in charge of the watch in the Engineroom/Fireroom. The Space Supervisor is responsible for operating the main engines, boilers, ship service generators and associated auxiliaries.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Space Supervisor shall:

- R) (1) Ensure the proper and safe operation of the main engines, reduction gears, shafting and bearings, ship's service generators, if located in the Engineeroom, and all associated auxiliary machinery.
- R) (2) Ensure periodic feed bottom soundings are taken, recorded, and accurately reported. If other than hourly, the period is to be directed in the Engineer's Standing Orders.
- R) (3) Ensure lube oil strainers are shifted, inspected and cleaned, as necessary, according to EOSS/PMS requirements.
- R) (4) Coordinate and supervise the lighting off, placing on/off line, paralleling and securing of the boiler(s). Note: A qualified EOOW, or person so designated by the Commanding Officer, shall also observe the lighting of propulsion boilers. They must be positioned to abort the light off if an unsafe condition develops.
- R) (5) Know and comply with the furnace purge requirements and the two-man-rule while lighting fires.
- R) (6) Ensure a proper Smoke Watch is set during boiler light off.
- R) (7) Ensure that the Automatic Boiler Control system control panel (where installed) is manned at all times and that the boiler control system is functioning properly when the boiler is in automatic control.
- R) (8) Ensure that force draft blowers and associated spaces are properly maintained.
- R) (9) Ensure economy in fuel expenditure by proper fuel oil regulation and use of blowers to maintain a clear stack.
- R) (10) Ensure potable water and feedwater soundings are taken, recorded, and accurately reported.
- R) (11) Request permission from EOOW to blow tubes on steaming boiler(s).
- R) (12) Request permission from EOOW to surface or bottom blow any boiler.

2206. ENGINEER ROOM SUPERVISOR

a. Basic Function. The Engineer room Supervisor is in charge of the watch in the Engineer room. The Engineer room Supervisor is responsible for operating the main engines, ship service generators and associated auxiliaries.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Engineer room Supervisor shall:

(1) Ensure the proper and safe operation of the main engines, reduction gears, shafting and bearings, ship's service generators, if located in the Engineer room, and all associated auxiliary machinery.

(2) Ensure periodic feed bottom soundings are taken, recorded, and accurately reported. If other than hourly, the period is to be directed in the Engineer's Standing Orders.

(3) Ensure lube oil strainers are shifted, inspected and cleaned, as necessary, according to EOSS/PMS requirements.

2207. THROTTLEMAN

a. Basic Function. The Engineer room Throttleman is responsible for operating the main engine throttles following orders received from the OOD, and as appropriate the EOOW/Engineer room (Space) Supervisor.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Throttleman shall:

(1) Promptly execute all orders issued by the OOD/EOOW/Engineer room (Space) Supervisor in priority order.

(2) Increase and decrease speed in accordance with the acceleration/deceleration table except as otherwise ordered.

(3) Promptly answer all bells and record time, order, and hourly shaft counter readings in the Bell Book. When special maneuvering situations exist, a separate recorder may be assigned. If an operating Bell Logger is installed, it will be used instead of a hand written log and shall be signed by the EOOW or senior watchstander in the space under the same requirements as handwritten logs. If the Automatic Bell Logger is malfunctioning, an Engineer's Bell Book shall be maintained. Man the 1JV circuit as directed.

(4) Ensure that the EOOW signs the Bell Book at the end of the watch. If the EOOW is not stationed in the same space as the Throttleman, the Space Supervisor will sign the Bell Book.

(5) Ensure proper operation of the guarding valve, ahead and astern throttles, and acknowledge engine orders from the OOD by operating the Engine Order Telegraph and Engine Revolution Indicator for the engine.

(6) Monitor all pressure and temperature gauges on the throttle board and promptly inform the EOOW/Engineer (Space) Supervisor of all significant evolutions and abnormalities.

(7) Indicate the status of the Jacking Gear and throttles with an appropriate sign when the main engines are secured.

(8) Ensure cooling water to the lube oil cooler is adjusted to maintain lube oil temperature at the prescribed temperature.

2208. ENGINEER ROOM UPPER LEVELMAN

a. Basic Function. The Engineer Room Upper Levelman is responsible for the vacuum system and that part of the lube oil system controlled from the upper level and other auxiliary machinery as assigned.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Engineer Room Upper Levelman shall:

(1) If the DFT is located in the space, maintain the level in the DFT between the high and low level marks when not operating automatically. When the DFT is in automatic, monitor the water level to ensure the DFT water level controls are functioning properly.

(2) Monitor all bearing oil sight flow indicators and thermometers. Take immediate action as prescribed in the EOCC to ensure that the temperature rise in any bearing does not exceed established operating parameters.

2209. ENGINEER ROOM LOWER LEVELMAN

a. Basic Function. The Engineer Room Lower Levelman is responsible for those parts of the vacuum and lube oil systems controlled from the lower level, the condensate pumps, circulating pumps, and other auxiliary machinery assigned by the Engineer Room Supervisor.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Engineer Room Lower Levelman shall:

(1) Keep the main circulating pump lined up and ready for use, and monitor for proper operation when started.

2210. ENGINEER ROOM MESSENGER

a. Basic Function. The Engineroom Messenger is responsible for recording hourly readings of operating machinery and for other duties as assigned by the Engineroom (Space) Supervisor.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Engineroom Messenger shall:

(1) Take and record periodic soundings, as directed by the Engineroom (Space) Supervisor.

(2) Serve as Shaft Alley Watch if one is not assigned. Advise the Engineroom (Space) Supervisor of any abnormalities.

2211. DISTILLING PLANT OPERATOR

a. Basic Function. The Distilling Plant Operator is responsible for distilling plant operation, and other duties as assigned by the Space Supervisor.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Distilling Plant Operator shall:

(1) Operate the distilling plant following applicable operating instructions and safety precautions. Notify the Engineroom/Space Supervisor or EOW of any abnormal conditions.

(2) Take special care to ensure that feedwater is not distilled to the tank aligned for make-up feed.

R) (3) Ensure that the salinity indicator system is functioning properly. Notify the Engineroom/Space Supervisor or EOW of any abnormal conditions. Ensure that distillate exceeding prescribed limits is not discharged to the feed or potable water tanks.

(4) Maintain an accurate record of the amount of water distilled.

2212. SHIP'S SERVICE TURBINE GENERATOR (SSTG) WATCH

a. Basic Function. The SSTG Watch is responsible for operating ship service generators, associated auxiliary machinery, and other duties as assigned by the Space Supervisor/EOW.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the SSTG watch shall:

(1) Ensure the proper and safe operation of the SSTG. Monitor all bearing oil sight flow indicators and thermometers. Take immediate action as prescribed in the EOCC to ensure that

the temperature rise in any bearing does not exceed established operating parameters. Keep EOW/Space Supervisor informed of actions and intentions.

(2) Once started, monitor generators for indications of sparking, vibration, or unusual noises, report problems and take action to correct all abnormalities immediately.

2213. FIREROOM SUPERVISOR

a. Basic Function. The Fireroom Supervisor is responsible for the proper operation of the boilers and associated auxiliary equipment, and other duties as assigned by the EOW.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Fireroom Supervisor shall:

(1) Coordinate and supervise the lighting off, placing on/off line, paralleling and securing of the boiler(s). Note: A qualified EOW, or person so designated by the Commanding Officer, shall also observe the lighting of propulsion boilers. They must be positioned to abort the light off if an unsafe condition develops.

(2) Ensure a qualified Smoke Watch is set.

(3) Ensure that the Automatic Boiler Control system control panel (where installed) is manned at all times and that the boiler control system is functioning properly when the boiler is in automatic control. Notify EOW of abnormalities.

(4) Ensure that force draft blowers and associated spaces are properly maintained.

(5) Request permission from EOW to blow tubes on steaming boiler(s).

(6) Request permission from EOW to surface or bottom blow any boiler.

R) (7) Ensure space thermometers are in proper place and readings are being monitored hourly.

2214. BOILER CONSOLE OPERATOR

a. Basic Function. The Boiler Console Operator is responsible for proper operation of the Automatic Boiler Control system control panel (where installed), and is also responsible for observing the operation of boiler console controls during automatic operation and actual operation of boiler control console during remote manual mode of operation.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Boiler Console Operator shall:

- R) (1) Control boiler operation according to EOSS. Advise the Fireroom/Space Supervisor of any abnormalities and take appropriate actions.
- R) (2) Maintain a continuous watch on remote reading water level indicators. Periodically compare these readings with the actual level in the respective gauge glass.
- R) (3) Maintain a clear stack condition.

2215. FIREROOM UPPER LEVELMAN

a. Basic Function. The Fireroom Upper Levelman is responsible for the operation of all auxiliary machinery and equipment on the upper level and shall monitor the water level in the DFT (if located in Fireroom) and the level in the boiler gauge glass.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Fireroom Upper Levelman shall:

- (1) Control the water level in the boiler when the boiler is in local manual operation if there is no Checkman assigned.
- (2) If the DFT is in the Fireroom, maintain the level between the high and low level marks if not operating in automatic mode. When DFT is in automatic mode, monitor the water level to ensure the water level controls are functioning properly.
- R) (3) Monitor equipment for proper operation, all bearing oil sight flow indicators and thermometers.
- R) (4) Surface blow the steaming boiler as directed by Fireroom Supervisor.
- R) (5) Report all water level changes greater than ½ inch.
- R) (6) Inform the Fireroom Supervisor in the event of loss of main feed control, high water, or low water.
- (7) Be stationed at the boiler gauge glass so that boiler water level can be observed and controlled at all times by operating the manual feed check valve.
- (8) Stand a proper watch until properly relieved or secured. The Engineer Officer may secure the Checkman providing the water level alarm and at least one boiler remote water level indicator (RWLI) is functional, (i.e. indicating within 1-inch of

the boiler gauge glass), and the automatic feedwater regulating valve is in operation.

2216. FIREROOM LOWER LEVELMAN

a. Basic Function. The Fireroom Lower Levelman is responsible for the operation of all auxiliary machinery and equipment on the lower level.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Fireroom Lower Levelman shall:

(1) Shift fuel oil service tank suction and returns when directed by the Fireroom/Space Supervisor.

R) (2) Monitor equipment for proper operation, all bearing oil sight flow indicators and thermometers.

(3) Assist the Burnerman when lighting or securing burners, using the two-man-rule.

R) (4) Observe and record the pressure and temperature of boilers and associated operating equipment. Make rounds of the Fireroom, monitoring all equipment for proper operation.

R) (5) If applicable, take and record soundings, and check line shaft bearings at periods directed by Engineer's Standing Orders/Directives.

2217. BURNERMAN

a. Basic Function. The Fireroom Burnerman is assigned at the boiler front and is responsible for maintaining the required steam pressure by the proper use of burners and fuel supply when steaming in manual.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Fireroom Burnerman shall:

(1) Light/secure fires in the boiler, place burners in and out of service as directed by Space/Fireroom Supervisor. Clean and properly assemble atomizers, and maintain a clean boiler front (no collection of boiler fuel in boiler drip pans, etc.), regularly check the condition of fires in the fire box, to prevent sputtering, smoking, panting of air casing or other abnormal conditions. During boiler operations, the Burnerman should not be assigned additional duties that would detract from monitoring of boiler fires.

(2) Know and comply with the furnace purge requirements and the two-man-rule while lighting fires.

2218. FIREROOM MESSENGER

a. Basic Function. The Fireroom Messenger is responsible for recording the periodic readings of all operating machinery and for other duties as assigned.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Fireroom Messenger shall:

- R) (1) Take space temperature readings and report unusual conditions
- R) (2) Ensure potable water and feedwater soundings are taken, recorded, and accurately reported.

2219. SMOKE WATCH

a. Basic Function. The Smoke Watch is responsible for monitoring stack conditions and relief valve escape piping. This watch is assigned when considered necessary by the Engineer Officer or as directed by higher authority. Examples of times when the Smoke Watch needs to be assigned: Lighting boiler fires, adjustment/testing of boiler safeties, or casualties to automatic boiler controls, etc.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Smoke Watch shall:

(1) Inform the main machinery spaces and Central Control of the stack conditions so that efficiency and flight operations will not be impaired by smoke or auxiliary exhaust steam lifting to the atmosphere.

(2) Know the boiler smoke stack and relief valve pipe locations, and be in a safe position to observe them. The Smoke Watch shall at all times stand clear of the stacks while safety valves are being set and tested. Ensure that differences between white smoke/black smoke and steam is recognized and stack conditions are promptly reported.

(3) Man the sound-powered phone on the designated circuit, stay alert at all times.

(4) Not leave the watch station without being properly relieved or secured. When secured, ensure the sound-powered phone is properly stowed.

(5) Promptly report all abnormal stack conditions to the appropriate Fireroom Supervisor and EOOW.

2220. ELECTRICAL SUPERVISOR

a. Basic Function. The Electrical Supervisor is assigned watch at the main ship's service switchboard or location designated for control of the electrical distribution system.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Electrical Supervisor shall:

(1) Ensure that a continuous check of meters, gauges, and fault lights is conducted and report to the EOW any abnormal or erratic readings. Maintain a KW log and direct corrective action as required.

(2) Maintain a status board showing the condition of the ship's service generators, MG sets, and distribution systems.

(3) Keep the EOW informed of the status of the electrical plant.

(4) Advise the EOW when additional generators may be required to support the shipboard electrical requirements.

(5) Coordinate the paralleling of generators and shifting of the electrical load between switchboards/generators.

(6) Use proper judgment and caution when closing circuit breakers after they have tripped automatically or when found in a tripped position. If a circuit breaker trips immediately upon the first closure report to the EOW and investigate before closing again. The circuit breaker may, however, be closed a second time without investigation if immediate restoration of power to the circuit is important as determined by the EOW/OOD and the interrupting disturbance when the breaker was tripped was not excessive, (reference (1)).

2221. ELECTRICAL SWITCHBOARD OPERATOR

a. Basic Function. The Electrical Switchboard Operator is the electrician or IC electrician assigned watch on one of the main or emergency electrical switchboards.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Electrical Switchboard Operator shall:

(1) Promptly obey all orders issued by the Electrical Supervisor/EOW.

(2) Conduct frequent checks of generator current, voltage, kilowatts, and frequency to ensure they remain at desired values and within the rating of the generator. Make adjustments as necessary to prevent overloads, reactive current between generators in parallel, improper division of load, and other abnormal conditions and maintain an hourly KW log.

(3) Conduct ground checks at least hourly, and at a minimum, upon assuming the watch, when a major piece of electrical equipment is energized/started, and when smoke or class "C" fire is reported.

(4) Use proper judgment and caution when closing circuit breakers after they have tripped automatically or when found in a tripped position. If a circuit breaker trips immediately upon the first closure report to the EOOW and investigate before closing again. The circuit breaker may, however, be closed a second time without investigation if the immediate restoration of power to the circuit is important as determined by the EOOW/OOD and the interrupting disturbance when the breaker was tripped was not excessive, (reference (1)).

(5) Ensure that all circuit breakers are in the unlocked position. Do not use the hold-in device or lock circuit breaker unless ordered by the EOOW.

(6) Frequently monitor generator winding temperatures and compare to temperature limits prescribed in reference (c).

(7) Inform Electrical Supervisor when abnormal conditions occur, when the electrical load reaches 75 percent of full rated load of generators in operation, and anytime that additional generators may be needed.

2222. ASSISTANT OIL/WATER KING

a. Basic Function. The Assistant Oil/Water King watch is responsible for oil and water testing and treatment. Report to the EOOW for operational matters and to the Oil/Water King for administrative matters.

b. School Requirements. The Assistant Oil/Water King school requirements are delineated in reference (c) and (o).

c. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Assistant Oil/Water King shall:

(1) Ensure strict compliance with the requirements of reference (c) through (n).

(2) Other duties/responsibilities of the Assistant Oil/Water King shall be inserted as an addendum to this section. This addendum shall contain a full description of the duties and responsibilities of the Assistant Oil/Water King.

R) (3) Distribute water as necessary to keep the ship on an even keel as directed by the EOOW.

2223. DAMAGE CONTROL SUPERVISOR

a. Basic Function. The Damage Control Supervisor (DC-Sup) is responsible for monitoring the ship's fire, flooding and material security and ensuring ship compliance with the effective material condition set by the EOW/OOD.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203 and specified in reference (k), the Damage Control Supervisor shall:

(1) Maintain a written Damage Control Log in accordance with reference (b). However, if Damage Control Central (DCC) is co-located with Main Control and the required information is maintained in the Engineering Log, a separate Damage Control Log is not required.

(2) Supervise the Sounding and Security Watch. Review the sounding sheets, logs and check-off sheets of the Sounding and Security Watch hourly.

(3) Maintain the Damage Control Closure Log, Trouble Call Log and other locally prepared logs required by the Engineer Officer (e.g., Inoperative Fitting, Void Level, and Hot Work Logs).

(4) Report the status of watertight integrity, security of the ship, and firemain pressure hourly to the EOW who will keep the OOD informed.

(5) Upon notification of fire in any main machinery space, immediately notify the EOW and take all immediate actions as prescribed in the applicable EOCC, Repair Party Manual, Main Space Fire Doctrine and/or NSTM, dependent upon the class of fire.

(6) Whenever a flooding alarm sounds, immediately notify the EOW and dispatch the Sounding and Security Watch to the space concerned to investigate and report. If required, secure any fire pumps or saltwater service pumps operating in the affected space, while ensuring that firemain and saltwater service pressures are maintained. Once the rate of flooding is evaluated, take immediate steps to dewater or pump to a designated oily waste tank.

(7) Monitor casualty control in machinery spaces and carry out EOCC actions as required for Major Steam Leak and Main Machinery Room Flooding.

(8) Ensure the necessary steps are taken to check and set material condition Yoke and that divisional representatives make reports to DC Central.

(9) Monitor the alarm panels installed in DC Central and report any alarm condition to the OOD and EOW. Report activation of any of these alarms immediately (if applicable):

- (a) FZ alarm (security).
- (b) Magazine High Temperature alarm.
- (c) Magazine sprinkling system.
- (d) Dry Air alarm.
- (e) Air Flow alarm in the Paint Locker, Flammable Liquid Storeroom, and Gas Cylinder Storeroom.
- (f) HALON Activation and/or Discharge

2224. SOUNDING AND SECURITY WATCH

a. Basic Function. The Sounding and Security Watch is an assigned roving security patrol. The watch is responsible for detection and prevention of fire, fire hazards, flooding, theft, sabotage, and compromise of classified information or other irregularities affecting the physical security of the ship.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2203, the Sounding and Security Watch shall:

(1) Conduct a continuous but irregular patrol, above and below decks following a prescribed check off sheet(s).

(2) Check the security of unmanned Engineering spaces.

(3) Periodically inspect all designated locked spaces.

(4) Be continuously alert for evidence of sabotage, theft, fire and flooding.

(5) Take soundings of all tanks/voids listed on the check off sheet and report the results to Damage Control Supervisor/EOOW.

(6) Make periodic inspections of damage control fittings for compliance with the damage control material condition of readiness in effect and report any discrepancies.

(7) Report the results of all required security inspections to DC Central and EOOW at a periodicity directed by the Engineer Officer Standing Orders/Directives.

(8) Monitor designated equipment in the absence of a dedicated watch.

2225. ADDITIONAL UNDERWAY WATCHES. Depending upon ship class, the Engineer Officer may assign additional watches. In such cases, the ship shall insert as an addendum to this chapter a

11 Apr 08

full description of the applicable duties and responsibilities of each additional watch.

CHAPTER 2 ENGINEERING DEPARTMENT ORGANIZATION

SECTION 3 - UNDERWAY WATCH ORGANIZATION, GAS TURBINE SHIPS

- Ref:
- (a) NTPPP 3-20.31 (SHIPS SURVIVABILITY)
 - (b) OPNAVINST 3120.32series (NAVY SORM)
 - (c) OPNAVINST 9220.2 (US NAVY BW/FW PROGRAM)
 - (d) COMFLTFORCOMINST 4790.3series 4790.3 (JFMM)
 - (e) NAVSEA S0400-AD-URM-010 (TAGOUT USERS MANUAL)
 - (f) EOSS Users Guide (EUG)
 - (g) NSTM 220 (BW/FW CHEMISTRY)
 - (h) NSTM 221 (NAVY BOILERS)
 - (i) NSTM 234 (MARINE GAS TURBINES)
 - (j) NSTM 241 (REDUCTION GEARS)
 - (k) NSTM 244 (PROPULSION BEARINGS)
 - (l) NSTM 300 (ELECTRIC PLANT GENERAL)
 - (m) NSTM 320 (ELECTRICAL DISTRIBUTION SYSTEM)
 - (n) NSTM 262 (LUBE OIL/GREASES)
 - (o) NSTM 541 (F76 FUEL SYSTEMS)
 - (p) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

2301. OBJECTIVE. This section establishes a standard underway watch organization to be manned under operating plant conditions. Minimum watch requirements for cold iron, auxiliary steaming, and condition IV steaming are provided on a class basis in Appendix A.

a. Where manning or training levels limit the ship's ability to comply with the minimum standards in this instruction, the ship shall request a waiver of these requirements from the Type Commander (format in Appendix A, Figure A-1).

b. CG-47 class cruisers equipped with Smart Ship technology including SHIPALT CG 47-0586K (SMART SHIP) and SHIPALT CG 47-0588K (all electric conversion) installed will adjust Engineering watch requirements as contained in Appendix A with the Commanding Officer's approval. No waiver request is required once installation of above SHIPALT is completed.

c. The EDORM specifies watchstation manning requirements for Cold Iron, Auxiliary Steaming and Condition IV only. Other Conditions (I, III) and special evolution requirements have not been included. Ships shall refer to the SMD document, Part IV (Battle Bill) or other ship instructions for guidance concerning watch conditions other than contained in Appendix A.

2302. UNDERWAY WATCH ORGANIZATION AND DUTIES OF WATCH STANDERS FOR GAS TURBINE SHIPS. The ship may draw a diagram in Figure A illustrating the operational organization of the Engineering Department's Condition IV Watch Team.

FIG A UNDERWAY WATCH ORGANIZATION (GS)

(Ship insert)

2303. GENERAL WATCHSTANDER REQUIREMENTS. Propulsion plant watchstanders shall perform all evolutions in a formal and disciplined manner. EOSS shall be used in directing or reporting operation of all propulsion plant equipment. The EOSS User's Guide (EUG) governs deviations from the Engineering Operational Sequencing System. Equipment without EOSS coverage or with material deficiencies which precludes operation in accordance with EOSS but which still may be operated safely in a degraded status shall be operated in accordance with a ship generated Standard Operating procedure. The procedure must be reviewed by the Engineer Officer and authorized by the Commanding Officer per reference (f).

a. Engineering watchstanders shall use permanently installed instrumentation to ensure the safe operation of the engineering plant. Instrumentation other than that permanently installed as part of the ship's equipment shall not be used for control of the propulsion plant unless specifically authorized by the Commanding Officer. Authorized Onboard Training (OBT) devices, if installed, shall be used only during periods of authorized training and removed or de-activated promptly upon conclusion of the training period.

b. Propulsion plant operation is inherently dangerous due to the nature of the equipment, complex system inter-relationships and close proximity to hazardous materials, heat and combustion sources. Watchstanders serve as the operators and caretakers of the plant as well as the first line of defense against catastrophe. Watchstanding requires plant operational experience, knowledge of systems inter-relationship, maintenance and repair expertise, and clear understanding of watch requirements. As a minimum, each watchstanders shall:

(1) Maintain spaces in a manner that is safe for training and ready for turnover using the safe plant operating guidelines contained in the MLOC safety walkthrough and any ship's generated guidance. Tasks, which significantly detract from Watchstanders performance, must be assigned to non-watch standers.

R) (2) Promptly execute all orders issued by the EOOW and carry out the Engineer Officer's Standing Orders, and Night orders.

(3) Supervise all subordinate personnel on watch and instruct them in assigned duties, operational and casualty control procedures.

(4) Ensure the proper and safe operation of assigned main propulsion, electrical and all associated auxiliary machinery. Keep informed of any change in status of assigned equipment.

(5) Ensure that equipment readings are properly recorded and that all logs and records are properly kept. Review and initial all readings (hourly if applicable) and sign all logs at

the end of the watch. Circle all out-of-limit readings in red, monitor for trends and comparability of readings of equipment in parallel configuration. Record the reason and all corrective action for "out-of-limit readings" in the Comments section. All individual operating logs will be reviewed and validated to it's associated comments sections back to the last watch stood where these logs are available.

(a) INTEGRATED CONDITION ASSESSMENT SYSTEM (ICAS). For ships with ICAS installed, the Engineer Officer shall determine a method to ensure periodic equipment log review by the Engineering Officer Of the Watch/Watch Supervisors is accomplished, on screen review is acceptable.

(6) Remain alert to detect any unusual conditions in the plant (e.g., unusual sounds, vibrations, smells, or out-of-limit readings). Promptly report all significant evolutions and abnormalities to the EOOW/Supervisory personnel. Take positive actions to prevent casualty/emergency situations, keeping the EOOW/Supervisory personnel informed of intentions.

(7) Ensure lube oil samples are drawn and inspected according to the Lube Oil Quality Management Program.

(8) Maintain the physical security of machinery and assigned spaces.

(9) Carry out applicable provisions of the EOSS, (SDOSS, AFOSS, and CSOSS when applicable), NSTM, SORM, ship instructions and notices, engineering department instructions, notices, and standing orders; machinery operating instructions, safety precautions found in other pertinent directives.

(10) Immediately investigate odor of fuel oils, burning material, and smoke. In the event of a fire in a main engineering space, execute all immediate actions as prescribed in the applicable EOCC, Repair Party Manual and/or Main Space Fire Doctrine procedures. Know how to activate and operate all fire fighting equipment in assigned space(s), and all personal protection devices.

(11) Ensure that all personnel on watch maintain cleanliness of their watch stations. Direct the proper securing of equipment, tools, and loose materials to prevent damage to machinery, injury to personnel, and fire hazards.

(12) Set the specified material condition of readiness when ordered and report compliance to the EOOW and other supervisory watch personnel.

(13) Report and coordinate all significant evolutions that are anticipated on watch with the EOOW.

(14) Conduct all required tests of alarms and systems. Report deficiencies promptly to the EOOW.

(15) If applicable, check the bilges at least hourly for flooding and presence of oil.

(16) Carry rags and flashlights as necessary in support of above functions.

2304. ENGINEER OFFICER OF THE WATCH (EOOW)

a. Basic Function. The EOOW is responsible for the safe and proper operation of the ship's entire engineering plant, the engineering watchteam and for the performance of duties prescribed in this section and by other competent authority.

b. Minimum Duties, Responsibilities, and Authority. In addition to the general duties assigned in EDORM Article 2303, the EOOW shall:

(1) Ensure that all orders received from the OOD are promptly acknowledged and executed.

R) (2) Obtain permission from the OOD before any of the following:

(a) Starting Main Gas Turbines Engines.

(b) Stopping the Main Gas Turbines Engines or Steering Gear.

(c) Prior to pumping bilges.

(d) Prior to bottom/surface/soot blow of boilers.

(e) Starting/stopping generators or reconfiguring the electrical plant.

R) (3) Immediately report to the OOD (CSOOW and TAO as required) any casualty or disabling of any machinery which affects available propulsion, electrical power, ship control, offensive or defensive capability, or habitability of the ship. Notify the Engineer Officer at earliest opportunity once controlling and/or immediate actions are accomplished.

(4) Keep informed of the power requirements for present and future operations and determine how the engineering plant will effectively meet these requirements. Advise the OOD and the Engineer Officer when modification of the plant configuration is considered appropriate.

(5) Promptly correct hazardous conditions in the engineering plant and report actions to the OOD and as soon as practical to the Engineer Officer.

(6) As the senior trainer on watch, ensure that all engineering watches are alert and use all available time to train.

(7) Ensure all equipment operating logs are properly maintained, and exercise Watch Officer overview of all programs outlined in EDORM, Chapter 5.

(8) Ensure that the Tag-Out Log is maintained properly. Be aware of the status of equipment/systems that are tagged out and spot check as needed to ensure log accuracy. The EOOW, as the Authorizing Officer, must thoroughly understand the systems/equipment and the impact to the plant of hanging or clearing of tags.

(9) Monitor quality and regulate operation of Combat Systems Support Systems (e.g., Chill Water, Dry Air, and 400 Hz power, etc.).

(10) Direct the lighting off and securing of the engineering plant in accordance with applicable EOSS and the Engineer Officer's Light Off Orders.

(11) Ensure that the proper material condition of readiness is set within the Engineering Department and ensure prescribed firemain pressure is maintained at all times. Notify the OOD, Engineer Officer and DCA if unable to maintain firemain pressure.

(12) Coordinate with the Engineer Officer and DCA to keep the ship properly trimmed.

(13) Ensure that all fuel transfers are performed strictly according to Clean Water Act, the latest Environmental Protection Agency requirements (EPA), SOPA, EOSS Standard Notes to the Oil King (SNOK), and ship's instructions. Supervise the activities of the Oil King and assistants in operational matters.

(14) Ensure that the Engineering Log, Engineer's Bell Book/Automatic Bell Logger record sheets and the prescribed operating records are properly kept. Before being relieved, review and sign the Engineering Log, sign the Engineer's Bell Book/Automatic Bell Logger record sheet, and review and sign the Automatic Data Logger printout for the watch. The EOOW shall ensure all out-of-limit readings are circled in red ink and initialed by either the Space Watch Supervisor and/or himself as specified by ship procedures. Each out-of-limit reading shall note the reason for the condition and actions taken. During periods when the Automatic Bell Logger is malfunctioning, the EOOW shall ensure the Engineer's Bell Book is maintained. For DDG 51 class ships, the Engineer Officer shall determine a method to ensure periodic data/alarm review by the EOOW is accomplished. Either periodic on screen or hard copy review is acceptable.

(15) Prior to assuming the watch, the EOOW shall make a tour of assigned spaces as directed by the Engineer Officer, and be aware of, at a minimum, the following:

(a) Tactical/maneuvering situations that could impact the engineering watchteam or their casualty control actions (e.g., plane guard, NIXIE/TACTAS status, boat/LCAC ops, etc.).

(b) Specific equipment operating conditions, existence of any non-standard configurations, equipment tag outs or any Special Operating Orders present.

(c) Presence of any heat stress conditions.

(d) Provisions of the Engineer Officer and Captain's Night Orders.

(e) Maintenance being conducted or planned for the watch.

(f) Review logs and records back to the last watch stood or 24 hrs, whichever is less.

(16) When required, inform distilling plant operators of ship position in relationship to other shipping and/or landfall to ensure contaminated water is not sent to potable water holding tanks.

(17) Inform the Oil King or assistants of changes in boiler status that may require water chemistry test or treatment.

(18) Ensure all required fuel and lube oil samples are taken and properly evaluated. Notify the Engineer Officer immediately of unsatisfactory samples and make recommendations for corrective actions. Ensure all unsatisfactory test results are logged in the engineering log.

(19) Ensure all repair work being accomplished conforms to repair documentation; reference (d) Quality Maintenance guidance pertains.

2305. PROPULSION AND AUXILIARY CONTROL CONSOLE OPERATOR (PACCO)/
PROPULSION CONTROL CONSOLE OPERATOR (PCCO).

a. Basic Function. The Propulsion and Auxiliary Control Console Operator is responsible for operating and maintaining surveillance over the propulsion system and the auxiliary machinery systems following orders received from the EOOW/OOD.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the PACCO/PCCO shall:

(1) Provide throttle control at the bridge, CCS or in the Enginerooms, as ordered by the EOW/OOD, or required by EOCC.

(2) Operate the throttles so that shaft speed and propeller pitch are as ordered by the OOD, when throttle control is at CCS.

R) (3) Ensure the Bell and Data Loggers are working properly. Before being relieved, check and sign the Automatic Data Logger print out for the watch (as applicable). Ensure that all out-of-limit readings are circled in red and initialed, noting reason and actions taken. When jacking the shaft, controlling the shaft/engines in the Engineroom, or if failure of the loggers should occur, ensure that all readings are entered in appropriate logs. When Engineer's Bell Book keeping is required, make manual entries in the Bell Book. Review and sign the Bell Log at the end of the watch. For DDG 51 class ships, the Engineer Officer shall determine a method to ensure periodic data/alarm review by the EOW is accomplished; either on screen or hard copy review is acceptable.

(4) Acknowledge all PCC/PACC alarms, notify EOW and coordinate corrective action with appropriate Engineroom Operators/Space Monitors. Keep informed as to the status of all propulsion and auxiliary plant equipment and keep the EOW so informed.

2306. ELECTRIC PLANT CONTROL CONSOLE (EPCC) OPERATOR

a. Basic Function. The Electric Plant Control Console (EPCC) Operator is responsible for operating and maintaining surveillance over the electrical distribution system.

b. Minimum Duties and Responsibilities: In addition to the general duties assigned in EDORM Article 2303, the EPCC operator shall:

R) (1) Conduct ground checks upon assuming the watch and periodically thereafter (as applicable). If the period exceeds one hour, it should be noted in the Engineer Officer's Standing Orders. Also conduct a ground check when any major piece of electrical equipment is started, and when a class "C" fire is reported. Inform the EOW the status of grounds and ground checks.

R) (2) Supervise the control and operation of ship's service 60 Hz and 400 Hz (if applicable) power generation and distribution system. Keeping the EOW/ CSOW or IC central, as appropriate, informed of the status of 400 Hz Switchboard(s).

(3) Advise the EOW when additional generators may be required to support the shipboard electrical requirements. Start, stop, and parallel/unload generators as directed by the EOW.

(4) Use proper judgment and caution when closing circuit breakers after they have tripped automatically or when found in a tripped position. If a circuit breaker trips immediately upon the first closure report to the EOOW and investigate before closing again. The circuit breaker may, however, be closed a second time without investigation if the immediate restoration of power to the circuit is important as determined by the EOOW/OOD and the interrupting disturbance when the breaker was tripped was not excessive, (reference (m)).

R) (5) Obtain permission of EOOW prior to placing any switchboard in local control. Maintain direct communications (via IVCS or emergency phone circuit) with applicable switchboard operator(s) when in local control.

(6) Acknowledge all EPCC alarms, notify EOOW and coordinate corrective action with appropriate Equipment Monitors/Space Supervisors.

(7) When ordered by the EOOW, initiate the EPCC Logic Long Test (if applicable). For the daily (Mid-watch) Long Test, inform EOOW before initiation. Report the results of all EPCC Long Tests to the EOOW.

(8) Keep informed as to the status of all electrical plant equipment and keep the EOOW so informed.

(9) Direct performance of Switchboard Operators when assigned.

2307. DAMAGE CONTROL CONSOLE (DCC) OPERATOR

a. Basic Function. The Damage Control Console (DCC) Operator is responsible for monitoring the ship's fire, flooding and material security and ensuring ship compliance with the effective material condition set by the EOOW/OOD.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303 and reference (a), the Damage Control Console Operator shall:

(1) Maintain a written Damage Control Log in accordance with reference (b). However, if Damage Control Central is co-located with Central Control and the required information is maintained in the Engineering Log, a separate Damage Control Log is not required.

(2) Supervise the conduct and performance of the Sounding and Security Watch. Review the sounding sheets, logs and check off sheets of the Sounding and Security Watch hourly.

(3) Maintain the Damage Control Closure Log, Trouble Call Log and other locally prepared logs required by the Engineer

Officer (e.g., Inoperative Fitting, Void Level, and Hot Work Logs).

(4) Upon notification of fire in any main machinery space, immediately notify the EOW and take all immediate actions as prescribed in the applicable EOCC, Repair Party Manual, Main Space Fire Doctrine and/or NSTM, dependent upon the class of fire.

(5) Report the status of watertight integrity, security of the ship, and firemain pressure hourly to the EOW who will inform the OOD.

(6) Ensure the necessary steps are taken to set and check the required material condition after normal working hours.

(7) Monitor the DC Console noting any alarm conditions and report those to the EOW.

(8) Whenever a flooding alarm sounds, immediately notify the EOW and dispatch the Sounding and Security Watch to the space concerned to investigate and report. If required, secure any fire pumps and request EOW/PACCO to secure any seawater service pumps operating in the affected space, ensuring that firemain and seawater service pressures are maintained.

(9) Maintain prescribed firemain pressure. Request permission from EOW prior to starting additional fire pumps or closing primary firemain valves.

(10) Whenever a fire alarm sounds, notify the EOW, giving location of the fire and proximity to fuel or explosive material, and dispatch the Sounding and Security Watch to the scene to investigate and report.

(11) Monitor the alarm panels installed in DCC and report any alarm condition to the OOD and EOW. Report activation of any of these alarms immediately (if applicable):

(a) FZ alarm (security).

(b) Magazine High Temperature alarm.

(c) Magazine Sprinkling System.

(d) Dry Air alarm.

(e) Air flow alarm in the Paint Locker, Flammable Liquid Storeroom, and Gas Cylinder Storeroom.

(f) HALON Activation and/or Discharge.

(13) Monitor the Fuel Control Console (as applicable). Report any abnormal or alarm conditions to the EOW.

2308. ENGINEER ROOM SUPERVISOR (OPERATOR/PSM)

a. Basic Function. The Engineer room Supervisor/Operator is in charge of the watch in the Engineer room. The Engineer room Supervisor is responsible for operating the main propulsion and all auxiliary machinery located in assigned spaces.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the Engineer room Supervisor/Operator/PSM shall:

(1) Be responsible for the proper and safe operation of the main engines, reduction gears, shafting and bearings, ship's service generators, if installed in the Engineer room, and all associated auxiliary machinery.

(2) Stay informed of the status of all equipment in the Engineer room and associated shafting and shaft alley(s).

(3) Know the normal main engine, reduction gear and line shaft bearing operating temperatures throughout the range of ship's speed. Ensure cooling water to the lube oil cooler is adjusted to maintain lube oil temperature at the prescribed temperature.

(4) Be continually aware of the location of plant control; i.e., CCS/SCC or Local.

(5) When ordered by the EOOW, take control of the propulsion turbines from the PACC Operator. When local plant controls are used, the Engineer room Operator/PSM is responsible for control of the throttles and acknowledges OOD engine orders via the Engine Order Telegraph (EOT), and shall:

R) (a) Use the PLCC/SCU/LOP to monitor the operation of the propulsion turbines. Maintain direct communications (via IVCS or emergency phone circuit) with the PACC/PCC operator all times when engine/throttle control is in local.

(b) Answer all bells and record the time, order, and shaft counter readings in the Engineer's Bell Book, if manual log taking is required. Sign the Engineer's Bell Book on the line below the last entry upon being relieved.

(c) Continuously monitor all pressure and temperature gauges on the PLCC/SCU/LOP and promptly inform the EOOW of any abnormal readings. Act as phone talker for the space when directed.

2309. AUXILIARY MACHINERY ROOM (AMR) SUPERVISOR/OPERATOR

a. Basic Function. The Auxiliary Machinery Room Supervisor/Operator is in charge of the watch and responsible for operating the machinery in the Auxiliary Machinery Room(s).

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the AMR Supervisor/Operator shall:

(1) When required, operate the distilling plant following applicable operating instructions and safety precautions. Notify the EOW/Engineer Supervisor/Operator of any abnormal conditions.

(3) Ensure that the Salinity Indicator System is functioning properly. Ensure that distillate exceeding prescribed limits is not discharged to the feed or potable water tanks.

(4) Distribute water as necessary to keep the ship on an even keel as directed by the EOW.

(5) Maintain an accurate record of the amount of water distilled.

(6) Coordinate with the EOW and Space Supervisor to ensure water is not discharged to the potable tanks when operating in contaminated waters.

(7) Ensure the proper operation of the AC&R and Refrigeration Systems. Keep EOW informed of the system demands and chill water temperatures.

2310. EQUIPMENT MONITOR

a. Basic Function. An Equipment Monitor may be assigned to assist the Engineer or Auxiliary Machinery Room Supervisor/Operator in the performance of their duties.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the Equipment Monitor shall:

(1) Monitor all bearing oil sight flow indicators and thermometers. Inform the Space Supervisor/Operator, and EOW of any unusual conditions. Take immediate actions to ensure that the temperature rise in any bearing does not exceed established operating parameters.

(2) Check the bilges periodically for flooding and presence of oil.

(3) Take and record periodic soundings, assigned equipment readings as directed by the Engineer Officer.

(4) Serve as Shaft Alley Monitor if one is not assigned. Advise the EOW and Space Supervisor/Operator of any abnormalities.

2311. ELECTRICAL SWITCHBOARD OPERATOR

a. Basic Function. The Electrical Switchboard Operator is responsible for monitoring and if placed in local mode, controlling the main electrical switchboard under direction of the EPCC operator.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the Electrical Switchboard Operator shall:

(1) Inform EPCC operator when load reaches 75 percent of full load on generators in operation or anytime more generators may be needed.

(2) Conduct frequent checks of generator current, voltage, kilowatts, and frequency to ensure they remain at desired values and within the rating of the generator. The Switchboard Operator shall make adjustments when ordered, keeping EPCC operator informed of their actions/intentions. Report all abnormal conditions to the EPCC operator.

(3) Observe all safety precautions per references (l) and (m).

(4) Use proper judgment and caution when closing circuit breakers after they have tripped automatically or when found in a tripped position. If a circuit breaker trips immediately upon the first closure report to the EOW and investigate before closing again. The circuit breaker may, however, be closed a second time without investigation if the immediate restoration of power to the circuit is important as determined by the EOW/OOD and the interrupting disturbance when the breaker was tripped was not excessive, (reference (m)).

(5) Ensure that the generator circuit breakers have been tripped before restoring power after a generator failure.

(6) Ensure that all circuit breakers are in the unlocked position. Do not use the Hold-In Device or lock circuit breaker unless ordered to do so by the EOW.

2312. ASSISTANT OIL KING

a. Basic Function. The Assistant Oil/Water King watch is responsible for oil and water testing and treatment. They report to the EOW for operational matters and to the Oil/Water King for administrative matters.

b. School Requirements. The Assistant Oil/Water King school requirements are described in references (c) and (p).

c. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the Assistant Oil/Water King shall:

(1) Comply strictly with the requirements of references (c) through (p).

(2) Other duties and responsibilities as directed by the Engineer Officer. In such cases, the ship shall insert an addendum to this chapter a full description of the duties and responsibilities of the Assistant Oil King.

2313. SOUNDING AND SECURITY

a. Basic Function. The Sounding and Security Watch is an assigned roving security patrol. The watch is responsible for detection and prevention of fire, fire hazards, flooding, theft, sabotage, compromise of classified information or other irregularities affecting the physical security of the ship.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2303, the Sounding and Security Watch shall:

(1) Maintain a continuous but irregular patrol, above and below decks following a check off sheet.

(2) Periodically inspect all designated locked spaces for security.

(3) Check the security of unmanned Engineering spaces.

(4) Be continuously alert for evidence of sabotage, theft, fire and flooding.

(5) Take and record soundings of all compartments listed on the check off sheet and report the results to the DCC Operator or EOOW in CCS.

(6) Make periodic inspections of damage control fittings for compliance with current damage control material condition in effect and report any discrepancies.

(7) Report the results of security inspections to the DCC Operator and EOOW at a periodicity directed by the Engineer's Standing Orders/Directives.

(8) Monitor designated equipment in the absence of a dedicated watch.

11 Apr 08

2314. ADDITIONAL UNDERWAY WATCHES. Depending upon ship class, the Engineer Officer may assign additional watches. In such cases, the ship shall insert, as an addendum to this chapter, a full description of the applicable duties and responsibilities of each additional watch.

CHAPTER 2 ENGINEERING DEPARTMENT ORGANIZATION

SECTION 4 - UNDERWAY WATCH ORGANIZATION, DIESEL SHIPS

- Ref:
- (a) NTPP 3-20.31 (SHIPS SURVIVABILITY)
 - (b) OPNAVINST 3120.32 series (NAVY SORM)
 - (c) OPNAVINST 9220.2 (US NAVY BW/FW PROGRAM)
 - (d) COMFLTFORCOMINST 4790.3series (JFMM)
 - (e) NAVSEA S0400-AD-URM-010 (TAGOUT USERS MANUAL)
 - (f) EOSS Users Guide (EUG)
 - (g) NSTM 220 (BW/FW CHEMISTRY)
 - (h) NSTM 221 (BOILERS)
 - (i) NSTM 233 (DIESEL ENGINES)
 - (j) NSTM 241 (REDUCTION GEARS)
 - (k) NSTM 244 (JP5 FUEL SYSTEMS)
 - (l) NSTM 262 (LUBE OIL/GREASES)
 - (m) NSTM 300 (ELECTRICAL PLANT GENERAL)
 - (n) NSTM 320 (ELECTRICAL DISTRIBUTION SYSTEM)
 - (o) NSTM 541 (F76 FUEL SYSTEMS)
 - (p) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

2401. OBJECTIVE. This section establishes a standard underway watch organization to be manned under steaming plant conditions. Minimum watch requirements for cold iron, auxiliary steaming, and condition IV steaming are provided on a class basis at Appendix A.

a. Where manning or training levels limit the ship's ability to comply with the minimum standards in this instruction, the ship shall request a waiver of these requirements from the Type Commander (format in Appendix A, Figure A-1).

b. The EDORM specifies watch station manning requirements for Cold Iron, Auxiliary Steaming and Condition IV only. Other Conditions (I, III) and special evolution requirements have not been included. Ships shall refer to the SMD Program, Part IV (Battle Bill) or other ship instructions for guidance concerning watch conditions other than contained in Appendix A .

2402. UNDERWAY WATCH ORGANIZATION AND DUTIES OF WATCHSTANDERS FOR DIESEL SHIPS. The ship shall draw a diagram below as Figure A illustrating the operational organization of the Engineering Department's Condition IV Watch Team.

FIG A UNDERWAY WATCH ORGANIZATION (Diesel)

(ship insert)

2403. GENERAL WATCHSTANDER REQUIREMENTS. Propulsion plant watchstanders shall perform all evolutions in a formal, disciplined manner. EOSS shall be used in directing or reporting operation of all propulsion plant equipment. The EOSS User's Guide (EUG) governs deviations from the Engineering Operational Sequencing System. Equipment without EOSS coverage or with material deficiencies that precludes operation in accordance with EOSS but which still may be operated safely in a degraded status shall be operated in accordance with a ship generated procedure. The ship generated procedure must be reviewed by the Engineer Officer and authorized by the Commanding Officer per reference (f).

a. Engineering watchstanders shall use permanently installed instrumentation to ensure the safe operation of the engineering plant. Instrumentation other than that permanently installed as part of the ship's equipment shall not be used for control of the propulsion plant unless specifically authorized by the CO. Authorized Onboard Training (OBT) devices, if installed, shall be used only during periods of authorized training and removed or de-activated promptly upon conclusion of the training period.

b. Propulsion plant operation is inherently dangerous due to the nature of the equipment, complex system inter-relationships and close proximity to hazardous materials, heat and combustion sources. Watchstanders serve as the operators and caretakers of the plant as well as the first line of defense against catastrophe. Watchstanding requires plant operational experience, knowledge of systems inter-relationship, maintenance and repair expertise, and clear understanding of watch requirements. As a minimum, each watchstander shall:

(1) Give undivided attention to operating duties. Tasks that significantly detract from watchstander duties must be assigned to non-watch standers.

(2) Promptly execute all orders issued by the EOOW and carry out the Engineer Officer's Standing Orders, Special Operating Orders, and Night Orders.

(3) Supervise all subordinate personnel on watch and instruct in duties, operational and casualty control procedures.

(4) Ensure the proper and safe operation of assigned main propulsion, electrical and all associated auxiliary machinery. Keep informed of any change in status of assigned equipment.

(5) Ensure that equipment readings are properly recorded and that all logs and records are properly kept. Review and initial all readings (hourly if applicable) and sign all logs at the end of the watch. Circle all out-of-limit readings in red, monitor for trends and comparability of readings of equipment in parallel configuration. Record the reason and all corrective action for out-of-limits readings in the comments section. It is

important to review logs and associated comments sections back to the last watch stood where these logs are available.

(a) INTEGRATED CONDITION ASSESSMENT SYSTEM (ICAS) For ships with ICAS installed, the Engineer Officer shall determine a method to ensure periodic equipment log review by the Engineering Officer Of the Watch/Watch Supervisors is accomplished, on screen review is acceptable.

(6) Remain alert to detect any unusual conditions in the plant (e.g., unusual sounds, vibrations, smell or out of parameter readings). Promptly report all significant evolutions and abnormalities to the EOOW/Supervisory personnel. Take positive actions to prevent casualty/emergency situations, keeping the EOOW/Supervisory personnel informed of intentions.

(7) Ensure lube oil samples are drawn, inspected and recorded according to the Lube Oil Quality Management Program.

(8) Maintain the physical security of machinery and assigned spaces.

(9) Carry out applicable provisions of the EOSS, (SDOSS, AFOSS, and CSOSS when applicable), NSTM, SORM, ship instructions and notices, engineering department instructions, notices, and standing orders; machinery operating instructions, safety precautions found in other pertinent directives.

(10) Immediately investigate odor of fuel oils, burning material, and smoke. In the event of fire in a main engineering space, execute all immediate actions as prescribed in the applicable EOCC, Repair Party Manual and/or Main Space Fire Doctrine. Know how to activate and operate all fire fighting equipment in assigned space(s), and all personal protection devices.

(11) Ensure that all personnel on watch maintain cleanliness of watch stations. Direct the proper securing of equipment, tools, and loose materials to prevent damage to machinery, injury to personnel, and fire hazards.

(12) Set the specified material condition of readiness when ordered and report compliance to the EOOW and other supervisory watch personnel.

(13) Report and coordinate all significant evolutions that are anticipated on watch with the EOOW.

(14) Conduct all required tests of alarms and systems. Report deficiencies promptly.

(15) If applicable, check the bilges at least hourly for flooding and presence of oil.

(16) Carry rags and flashlights as necessary in support of above functions.

2404. ENGINEER OFFICER OF THE WATCH (EOOW)

a. Basic Function. The EOOW is responsible for the safe and proper operation of the ship's entire engineering plant, the engineering watchteam and for the performance of the duties prescribed in this section and by other competent authority.

b. Minimum Duties, Responsibilities, and Authority. In addition to the general duties assigned in EDORM Article 2403, the EOOW shall:

(1) Ensure that all orders received from the OOD are promptly acknowledged and executed.

(2) Obtain permission from the OOD before any of the following:

(a) Starting/stopping main engines.

(b) Stopping the main engines or steering gear.

(c) Prior to pumping bilges.

(d) Starting/stopping generators or reconfiguring the electrical plant.

(3) Immediately report to the OOD (CSOOW and TAO when required) any casualty or disabling of any machinery that affects available propulsion, electrical power, ship control, offensive or defensive capability, or habitability of the ship. Notify the Engineer Officer at earliest opportunity once immediate and controlling actions are accomplished.

(4) Keep informed of the power requirements for present and future operations and determine how the engineering plant will effectively meet these requirements. Advise the OOD and the Engineer Officer when modification of the plant configuration is considered appropriate.

(5) Promptly correct hazardous conditions in the engineering plant and report actions to the OOD and as soon as practical to the Engineer Officer.

(6) As the senior trainer on watch, ensure that all engineering watchstanders are alert and use all available time to train.

(7) Ensure all equipment operating logs are kept properly maintained, and exercise watch officer overview of all programs outlined in EDORM, Chapter 5.

(8) Ensure that the Tag-Out Log is maintained properly. Be aware of the status of equipment/systems that are tagged out and spot check as needed to ensure log accuracy. The EOW, as the Authorizing Officer, must clearly understand the system and the impact to the plant of hanging or clearing of tags.

(9) Monitor quality and regulate operation of Combat Systems support systems (e.g., chill water, dry air, 400 Hz power, etc.).

(10) Direct the lighting off and securing of the engineering plant in accordance with applicable EOSS and the Engineer Officer's Light Off Orders.

(11) Ensure that the proper material condition of readiness is set within the Engineering Department and ensure prescribed firemain pressure is maintained at all times. Notify the OOD, Engineer Officer and DCA if unable to maintain firemain pressure.

(12) Coordinate with the Engineer Officer and DCA to keep the ship properly trimmed.

(13) Ensure that all fuel transfers are performed strictly according to Clean Water Act, the latest Environmental Protection Agency requirements (EPA), SOPA, EOSS Standard Notes to the Oil King (SNOK), and ship's instructions. Supervise the activities of the Oil King and assistants in operational matters.

(14) Ensure that the Engineering Log, Engineer's Bell Book/Automatic Bell Logger record sheets and the prescribed operating records are properly kept. Before being relieved, review and sign the Engineering Log, sign the Engineer's Bell Book/Automatic Bell Logger record sheet, and review and sign the Automatic Data Logger printout for the watch. The EOW shall ensure all out-of-limit readings are circled in red ink and initialed by either the Space Watch Supervisor and/or himself as specified by ship procedures. Each out-of-limit reading shall note the reason for the condition and corrective actions taken. During periods when the Automatic Bell Logger is malfunctioning, the EOW shall ensure the Engineer's Bell Book is maintained.

(15) Prior to assuming the watch, the EOW shall make a tour of assigned spaces as directed by the Engineer Officer, and be aware of, at a minimum, the following:

(a) Tactical/maneuvering situations that could impact the Engineering watchteam or modify casualty control actions (e.g., plane guard, NIXIE/TACTAS status, boat/LCAC ops, etc.).

(b) Specific equipment operating conditions, existence of any non-standard configurations, equipment tag outs or any Special Operating Orders present.

(c) Presence of any heat stress conditions.

(d) Provisions of the Engineer Officer and Captain's Night Orders (if available).

(e) Maintenance being conducted or planned for the watch.

R) (f) Reviewing logs and records back to the last watch stood, or 24 hours, whichever is less.

(16) When required, inform distilling plant operators of ship position in relationship to other shipping and/or landfall to ensure contaminated water is not sent to the potable water holding tanks.

(17) Inform the Oil King or assistants of changes in boiler status, which may require water chemistry test or treatment.

R) (18) Ensure all required fuel and lube oil samples are taken and properly evaluated. Notify the Engineer Officer immediately of unsatisfactory samples and make recommendations for corrective actions. Ensure all unsatisfactory test results are logged in the engineering log.

(19) Ensure all repair work being accomplished conforms to repair documentation; reference (d) Quality Maintenance guidance pertains.

2405. ENGINEEROOM SUPERVISOR/ENGINEMAN OF THE WATCH (ENOW)

a. Basic Function. The Engineroom Supervisor/ENOW is responsible for operating the main engines and associated auxiliaries, as directed by the EOOW.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Engineroom Supervisor shall:

(1) Obtain permission from EOOW before starting a main engine(s).

(2) Ensure that instrument readings are properly recorded and that all logs and records associated with Engineroom watch-stations are properly kept. For those operating logs not reviewed by the EOOW, review and initial all readings (hourly if applicable) and sign all logs at the end of the watch. Circle all out-of-limit readings in red and record the reason and all corrective action taken in the comment section. Ensure that the EOOW is informed of out-of-limit readings.

(3) Ensure lube oil strainers are cleaned and inspected according to EOSS/PMS requirements.

(4) Ensure periodic water storage tank soundings are taken, recorded, and accurately reported to the Assistant Oil King. If greater than hourly, the periodicity interval should be specified in the Engineer's Standing Orders.

(5) Know the normal main engine, reduction gear and line shaft bearing operating temperatures throughout the range of ship's speed.

R) 2406. PROPULSION AND AUXILIARY CONTROL CONSOLE OPERATOR (PACC)/
ENCLOSED OPERATING STATION CONSOLE OPERATOR (EOSC).

R) a. Basic Function. The PACC and EOSC Operators are responsible for operating and maintaining surveillance over the propulsion system and the auxiliary machinery systems following orders received from the EOOW/OOD.

R) b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the PACCO/PCCO shall:

R) (1) Provide throttle control at the bridge, CCS, EOSC or in the Enginerooms, as ordered by the EOOW/OOD, or as required by EOCC.

R) (2) Operate the throttles so that shaft speed and propeller pitch are as ordered by the OOD, when throttle control is at CCS or EOSC.

R) (3) Obtain permission from EOOW before starting a Main Engine.

R) (4) Ensure the Bell and Data Loggers are working properly. When jacking the shaft, controlling the shaft/engines in the Engineroom, or if failure of the loggers should occur, ensure that all readings are entered in appropriate logs. Review and sign the Bell Log at the end of the watch. When Engineer's Bell Book keeping is required, make manual entries in the Bell Book.

R) (5) Acknowledge all PACC/EOSC alarms, notify EOOW and coordinate corrective action with appropriate Engineroom Operators/Space Monitors. Keep informed as to the status of all propulsion and auxiliary plant equipment and keep the EOOW so informed.

(6) Know the normal main engine, reduction gear and line shaft bearing operating temperatures throughout the range of ship's speed.

(7) When the main engine is secured, indicate the status of the jacking gear. A sign should be placed on the PACC/EOSC operator's console and the console in the affected engineroom.

(8) Ensure prescribed operating records are properly kept. Before being relieved, check and sign the Automatic Data Logger print out for the watch. Ensure that all out-of-limit readings are circled in red and initialed, noting reason and actions taken. During periods when manual logs are required, ensure an Engineer's Book is maintained if throttle control is in CCS/EOSC.

R) 2407. EQUIPMENT/Auxiliary MONITOR

R) a. Basic Function. The Equipment/Auxiliary Monitor is responsible for the lube oil systems of all operating machinery and for all other auxiliary machinery that may be assigned.

R) b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Equipment/Auxiliary Monitor shall:

R) (1) Ensure proper and safe operation of all assigned main and auxiliary machinery.

R) (2) Check the level of lube oil in all sumps hourly and maintain them at the required level. Monitor all bearing oil sight flow indicators and thermometers. Inform the EOOW and Space Supervisor/Operator of any unusual conditions. Take immediate actions to ensure that the temperature rise in any bearing does not exceed established operating parameters.

R) (3) Check and record line shaft bearing temperatures every hour or when ordered by higher authority.

R) (4) Inspect the shaft alleys periodically as directed by Engineroom Supervisor. Monitor for flooding and for bearing oil level and temperature. Report conditions to the Engineroom Supervisor.

R) 2408. DIESEL ENGINE OPERATOR

R) a. Basic Function. The Diesel Engine Operator is responsible for operating the Main Propulsion Diesel Engine's (MPDE), associated auxiliary machinery, and other duties as assigned by the Engineroom/Space Supervisor or EOOW.

R) b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Diesel Engine Operator shall:

R) (1) Inspect MPDE mechanical and free ends for obstructions before turning over.

R) (2) Once started, monitor MPDE's for indications of unusual vibration or noises. Report problems and take immediate action to correct abnormalities. Keep the EOOW/Space Supervisor informed of actions and intentions.

- R) (3) Ensure the proper and safe operation of the MPDE. Monitor all bearing oil sight flow indicators and thermometers. Take immediate action to ensure that the temperature rise in any bearing does not exceed established operating parameters. Keep EOOW/Space Supervisor informed of intentions and actions taken.
- R) (4) Continuously monitor all indicators on the Local Operating Panel. Promptly inform the Engineerroom/Space Supervisor and EOOW of any abnormal readings.
- R) 2409. UNDERWAY ROVERS
- R) a. Basic Function. Rovers are responsible for all operating main propulsion and auxiliary machinery that may be assigned in the Main Machinery Rooms (MMR), Auxiliary Machinery Rooms (AMR) and Shaft Alleys.
- R) b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Rover shall:
- R) (1) Ensure the proper and safe operation of all assigned main and auxiliary machinery.
- R) (2) Check the level of lube oil in all sumps hourly and maintain IAW applicable PMS and EOSS procedures. Notify the EOOW when a sump is low or below the normal level. Monitor all bearing oil sight flow indicators once a watch. Inform the PACC of any unusual conditions.
- R) (3) Inspect the shaft alleys once a watch. Check and record line shaft bearing lube oil temperatures once a watch or when ordered.
- R) (4) Inspect generators before starting, in accordance with EOSS. Once started, monitor generators for indications of sparking, unusual vibration or noises. Monitor all parameters on the Local Operation Control Panel (LOCP). Report problems and take immediate action IAW EOCC to correct abnormalities. Keep the EOOW informed of actions and intentions. Assist Casualty Response Team (CRT) as required by CRT Leader.
- R) (5) Ensure the proper and safe operation of the SSDG.
- R) (6) Inspect main engine before starting, in accordance with EOSS. Once started, monitor main engines for indications of unusual vibration or noises. Monitor all parameters on the LCOP. Report problems and take immediate action IAW EOCC to correct abnormalities. Keep the EOOW informed of actions and intentions. Assist Casualty Response Team (CRT) as required by CRT Leader.
- R) (7) The Rover shall ensure that the offline MPDE's under their charge are maintained in a standby mode while underway or in any other situation as deemed necessary by the EOOW. To

ensure immediate availability, the engine shall be pre-lubed and blown down IAW EOP.

2410. DISTILLING PLANT OPERATOR

a. Basic Function. When assigned, the Distilling Plant Operator is responsible for distilling plant operation, recording hourly readings of assigned operating machinery and other duties as directed by supervisory watch personnel.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Distilling Plant Operator shall:

(1) Operate the distilling plant in accordance with applicable operating instructions and adhere to specified safety precautions. Notify the Engineroom Supervisor or EOOW of any abnormal conditions.

(2) Take special care to ensure that Feedwater is not discharged to the same tank from which make-up feed is being taken.

(3) Ensure that the salinity indicator system is functioning properly.

(4) Ensure that distillate exceeding prescribed limits is not discharged to the feed or potable water tanks.

(5) Distribute water as necessary to keep the ship on an even keel as ordered by the EOOW.

(6) Maintain an accurate record of the amount of water distilled each hour.

(7) Coordinate with the EOOW to ensure that water is not discharged to the potable tanks when operating in contaminated waters.

2411. SHIP'S SERVICE DIESEL GENERATOR (SSDG) WATCH

a. Basic Function. The SSDG watch is responsible for operating ship service diesel generators, associated auxiliary machinery, and other duties as assigned by the Engineroom/Space Supervisor or EOOW.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the SSDG Watch shall:

(1) Inspect generator mechanical and electrical ends for obstructions before turning over.

(2) Once started, monitor generators for indications of sparking, unusual vibration or noises. Report problems and take immediate action to correct abnormalities. Keep the EOOW/Space Supervisor informed of actions and intentions.

(3) Ensure the proper and safe operation of the SSDG. Monitor all bearing oil sight flow indicators and thermometers. Take immediate action to ensure that the temperature rise in any bearing does not exceed established operating parameters. Keep EOOW/Space Supervisor informed of intentions and actions taken.

(4) Continuously monitor all indicators on the Local Operating Panel. Promptly inform the Engineroom/Space Supervisor and EOOW of any abnormal readings.

2412. AUXILIARY BOILER WATCH

a. Basic Function. The Auxiliary Boiler Watch is responsible for the operation of the ship's auxiliary boilers and evaporators if a separate Distilling Plant Operator is not assigned.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Articles 2403 and 2409, the Auxiliary Boiler Watch shall:

(1) Operate auxiliary boilers and the distilling plants following applicable operating instructions and safety precautions. Notify the Engineroom Supervisor and EOOW of any abnormal conditions.

R) 2413. ELECTRIC PLANT CONTROL CONSOLE (EPCC) OPERATOR / ELECTRICAL SUPERVISOR

a. Basic Function. Assigned watch at the ship's main switchboard or Electrical Plant Control Console. Responsible for ship service 60Hz and if assigned, 400Hz power systems.

- R) b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Electrical Supervisor shall:
- R) (1) Conduct ground checks upon assuming the watch and periodically thereafter. If the period exceeds one hour, it should be noted in the Engineer Officer's Standing Orders. Also conduct a ground check when any major piece of electrical equipment is started, and when a class "C" fire is reported. Inform the EOW the status of grounds and ground checks.
- R) (2) Ensure that a continuous check of meters, gauges, and fault lights is conducted and report to the EOW any abnormal or erratic readings. Direct corrective action as required.
- R) (3) Allow no personnel around the EPCC other than assigned watch standers.
- R) (4) Maintain a status board showing the condition of the ship's service generators, MG sets, and distribution systems.
- R) (5) Supervise the control and operation of ship's service 60 Hz and 400 Hz power generation and distribution system. Keep the EOW informed of the status of the electrical plant.
- R) (6) Advise the EOW when additional generators may be required to support the shipboard electrical requirements. Start, stop, and parallel/unload generators as directed by the EOW and EOSS procedures.
- R) (7) Use proper judgment and caution when closing circuit breakers after they have tripped automatically or when found in a tripped position. If a circuit breaker trips immediately upon the first closure report to the EOW and investigate before closing again. The circuit breaker may, however, be closed a second time without investigation if the immediate restoration of power to the circuit is important as determined by the EOW/OOD and the interrupting disturbance when the breaker was tripped was not excessive, (reference (m)).
- R) (8) Keep an hourly Electrical Log that documents all conditions of the ship's service 60Hz and 400Hz generation and distribution systems.
- R) (9) Ensure that applicable safety and operating instructions are observed at all times.
- R) (10) Obtain permission of EOW prior to placing any switchboard in local control.
- R) (11) Acknowledge all EPCC alarms, notify EOW and coordinate corrective action with appropriate Equipment Monitors/Space Supervisors.

- R) (12) Direct performance of Switchboard Operators when assigned.
- R) (13) Ensure that generators are inspected for indications of sparking, dirt, and unusual noises periodically by the appropriate watch or other personnel as designated.

2414. ELECTRICAL SWITCHBOARD OPERATOR

a. Basic Function. The Electrical Switchboard Operator is the Electrician or IC electrician assigned watch on one of the main or emergency electrical switchboards.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Electrical Switchboard Operator shall:

(1) Promptly execute all orders issued by the Electrical Supervisor.

(2) Inform Electrical Supervisor when electrical load reaches 75 percent of full load on generators in operation and anytime more generators may be needed.

(3) Conduct frequent checks of generator current, voltage, kilowatts, and frequency to ensure they remain at required values and within the rating of the generator. The Switchboard Operator shall make adjustments as necessary, when ordered, to prevent overloads, reactive current between generators in parallel, improper division of load, and other abnormal conditions and keep logs of specified parameters.

(4) Observe all safety precautions that apply to the watch station.

(5) Conduct ground checks at least hourly, upon assuming the watch, when a major piece of electrical equipment is energized/started, and at a report of Class "C" fire.

(6) Use proper judgment and caution when closing circuit breakers after they have tripped automatically or when found in a tripped position. If a circuit breaker trips immediately upon the first closure report to the EOOW and investigate before closing again. The circuit breaker may, however, be closed a second time without investigation if the immediate restoration of power to the circuit is important as determined by the EOOW/OOD and the interrupting disturbance when the breaker was tripped was not excessive, (reference (m)).

(7) Ensure that all circuit breakers are in the unlocked position. Do not use the Hold-In Device or lock circuit breaker unless ordered to do so by the EOOW.

(8) Obtain permission from EOOW/Electrical Supervisor before placing any switchboard in local control.

2415. ASSISTANT OIL KING

a. Basic Function. The Assistant Oil/Water King watch is responsible for oil and water testing and treatment. They report to the EOOW for operational matters and to the Oil/Water King for administrative matters.

b. School Requirements. The Assistant Oil/Water King school requirements are described in references (c) and (p).

c. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Assistant Oil/Water King shall:

(1) Ensure strict compliance with the requirements of references (c) through (o).

(2) Other duties/responsibilities of the Assistant Oil/Water King shall be inserted as an addendum to this section. This addendum shall contain a full description of the duties and responsibilities of the Assistant Oil/Water King.

2416. DAMAGE CONTROL SUPERVISOR

a. Basic Function. The Damage Control Supervisor/Damage Control Console (DCC) Operator is responsible for monitoring the ship's fire, flooding and material security and ensuring ship compliance with the effective material condition set by the EOOW/OOD.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403 and reference (a), the Damage Control Supervisor/DC Console Operator shall:

(1) Maintain a written Damage Control Log in accordance with reference (b). However, if Damage Control Central is co-located with Main Control and the required information is maintained in the Engineering Log, a separate Damage Control Log is not required.

(2) Supervise the conduct and performance of the Sounding and Security Watch. Review the sounding sheets, logs and check off sheets of the Sounding and Security Watch hourly.

(3) Maintain the Damage Control Closure Log, Trouble Call Log and other locally prepared logs required by the Engineer Officer (e.g., Inoperative Fitting, Void Level, and Hot Work Logs).

(4) Review and initial all Tag Out record sheets that pertain to firefighting, firemain or other damage control related

systems per reference (e). In the event the Damage Control Central/Console is not manned, the EOW shall perform the reviewing and initialing functions.

(5) Upon notification of fire in any main machinery space, immediately notify the EOW and take all immediate actions as prescribed in the applicable EOCC, Repair Party Manual, Main Space Fire Doctrine and/or NSTM, dependent upon the class of fire.

(6) Report the status of watertight integrity, security of the ship, and firemain pressure hourly to the EOW who will inform the OOD.

(7) Ensure the necessary steps are taken to set and check the required material condition after normal working hours. Ensure appointed divisional representatives make reports to CCS in person.

(8) Monitor the DC Console noting any alarm/unusual conditions and report those to the EOW.

(9) Whenever a flooding alarm sounds, immediately notify the EOW and dispatch the Sounding and Security Watch to the space concerned to investigate and report. Upon notification of flooding, immediately notify the EOW and take all immediate actions as prescribed in the EOCC and Repair Party Manual, once the rate of flooding is evaluated, take immediate steps to dewater or pump to a designated oily waste tank.

(10) Maintain prescribed firemain pressure. Request permission from EOW prior to starting additional fire pumps or closing primary firemain valves.

(11) Whenever a fire alarm sounds, notify the EOW, giving location of the fire and proximity to fuel or explosive material, and dispatch the Sounding and Security Watch to the scene to investigate and report.

(12) Monitor the alarm panels installed in DCC and report any alarm condition to the OOD and EOW. Report activation of any of these alarms immediately (if applicable):

(a) FZ alarm (security).

(b) Magazine High Temperature alarm.

(c) Magazine Sprinkling System.

(d) Dry Air alarm.

(e) Air Flow alarm in the Paint Locker, Flammable Liquid Storeroom, and Gas Cylinder Storeroom.

(f) HALON Activation and/or Discharge

(13) Monitor the Fuel Control Console (when unmanned). Report any alarm conditions to the EOW.

(14) Direct dewatering by means of installed equipment in any engineering space where bilge levels are high. Obtain permission from the EOW before any dewatering operation.

2417. SOUNDING AND SECURITY WATCH

a. Basic Function. The Sounding and Security Watch is responsible for detection and prevention of fire, fire hazards, flooding, theft, sabotage, compromise of classified information or other irregularities affecting the physical security of the ship.

b. Minimum Duties and Responsibilities. In addition to the general duties assigned in EDORM Article 2403, the Sounding and Security Watch shall:

(1) Maintain a continuous but irregular patrol above and below decks following prescribed check off sheet(s).

(2) Check the security of unmanned Engineering spaces.

(3) Periodically inspect all designated locked spaces.

(4) Be continuously alert for evidence of sabotage, theft, fire and flooding.

(5) Take and record soundings of all compartments listed on the check off sheet and report the results to the DCC or EOW in CCS.

(6) Make periodic inspections of damage control fittings for compliance with the damage control material condition of readiness in effect and report any discrepancies.

(7) Report the results of security inspections to DCC and the EOW at a periodicity directed by Engineer's Standing Orders.

(8) Monitor assigned equipment.

(9) Ensure all watch reliefs are ready and able to relieve the watch at the times specified in Engineer Officer's Standing Orders.

11 Apr 08

2418. ADDITIONAL UNDERWAY WATCHES. Depending upon ship class the Engineer Officer may assign additional watches. In such cases, the ship shall insert as a tab to this chapter a full description of the applicable duties and responsibilities of each additional watch.

CHAPTER 2 ENGINEERING DEPARTMENT ORGANIZATION

SECTION 5 - INPORT WATCH ORGANIZATION

- Ref: (a) NTPP 3-20.31 (SHIPS SURVIVABILITY)
(b) OPNAVINST 3120.32 series (NAVY SORM)
(c) COMFLTFORCOMINST 4790.3series (JFMM)
(d) EOSS Users Guide (EUG)
(e) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

2501. OBJECTIVE. This section establishes a standard inport watch organization to be used while Cold Iron or Auxiliary Steaming in homeport or where support conditions are similar such as visiting another comparable naval facility. When out of homeport where conditions warrant increased attention to plant control, a qualified EOOW should augment the Engineering Duty Officer (EDO). For the purposes of establishing EDORM requirements, Cold Iron is defined as not operating any ship generators, propulsion boilers or main engines. Auxiliary Steaming (gas turbine and diesel plants only) is defined as operating any ship service generators regardless of whether or not the generators are providing ship's electrical power. For steam plants, Auxiliary Steaming is defined as operating the main boilers to provide hotel services and/or steam to the ship service turbine generators, normally using the auxiliary condenser vice main condenser. Operation of ship emergency diesel generators does not constitute Auxiliary Steaming but may require augmented Cold Iron watches at the discretion of the Engineer Officer. For ships capable of operating main engines independent of generators or boilers, operation of main engines constitutes a condition beyond Auxiliary Steaming.

a. A qualified EOOW is not required during conditions of Cold Iron or Auxiliary Steaming for diesel or gas turbine propulsion ships as long as a qualified EDO is on station. Similarly, a qualified EOOW is not required during conditions of Cold Iron for steam propulsion ships as long as a qualified EDO is on station; however, due to the increased complexity and interrelationship of steam propulsion systems, an EOOW is required before lighting off any propulsion boiler for conditions of Auxiliary Steaming.

(1) Where manning or training levels limit the ship's ability to comply with the minimum standards in this instruction, the ship shall request a waiver of these requirements from the Type Commander (format in Appendix A, Figure A-1).

(2) The EDORM specifies watch station manning requirements for Cold Iron, Auxiliary Steaming and Condition IV only. Other Conditions (I, III) and special evolution requirements have not been included. Ships shall refer to the SMD Program, Part IV (Battle Bill) or other ship instructions for guidance concerning watch conditions other than contained in Appendix A.

11 Apr 08

2502. INPORT WATCH ORGANIZATION AND DUTIES OF WATCH STANDERS.

The ship shall draw diagrams below as Figure A and B illustrating the organizational relationships of the Engineering Department Inport Watch while Auxiliary Steaming and in Cold Iron status.

Note: Watch Supervisors and Departmental Duty Petty Officer shall report to the EDO for all matters.

FIG A AUXILIARY STEAMING WATCH ORGANIZATION

(Ship insert)

FIG B COLD IRON WATCH ORGANIZATION

(Ship insert)

2503. GENERAL WATCHSTANDING REQUIREMENTS. Propulsion plant watch standers shall perform all evolutions in a formal, disciplined manner. EOSS shall be used in directing or reporting operation of all propulsion plant equipment. The EOSS User's Guide (EUG) governs deviations from EOSS. Equipment without EOSS coverage or with material deficiencies which precludes operation in accordance with EOSS, but which still may be operated safely in a degraded status, shall be operated in accordance with a Standard Operating Procedure. This procedure must be reviewed by the Engineer Officer and authorized by the Commanding Officer as per reference (d).

a. Engineering watchstanders shall use permanently installed instrumentation in Main/Central Control to ensure the safe operation of the engineering plant. Instrumentation other than that permanently installed as part of the ship's equipment shall not be used for control of the propulsion plant unless specifically authorized by the Commanding Officer. Authorized Onboard Training (OBT) Devices, if installed, shall be used only during periods of authorized training and removed or de-activated promptly upon conclusion of the training period.

b. Propulsion plant operation is inherently dangerous due the nature of the equipment, complex system inter-relationships and close proximity to hazardous materials, heat and combustion sources. Watchstanders serve as the operators and caretakers of the plant as well as the first line of defense against catastrophe. Watchstanding requires plant operational experience, systems inter-relationship level of knowledge, maintenance and repair expertise, and clear understanding of watch requirements. As a minimum, each watchstander shall:

(1) Give their undivided attention to their operating duties. Tasks that significantly detract from Watchstanders duties must be assigned to non-watch standers.

(2) Promptly execute all orders issued by the EDO and carry out the Engineer Officer's Standing Orders, Special Operating Orders, and Night Orders.

(3) Supervise all subordinate personnel on watch and instruct in assigned duties and inport casualty control procedures.

(4) Ensure the proper and safe operation of all machinery in operation. Keep informed of any change in status of assigned equipment.

(5) Ensure that instrument readings are properly recorded and that all logs and records are properly kept. Review and initial all readings (hourly if applicable) and sign all logs at the end of the watch. Circle all out-of-limit readings in red and monitor for trends and comparability of readings of equipment

in parallel configuration. Record the reason and corrective action for out-of-limit readings in the Comments section. It is important to review logs and associated comments sections from the previous day where these logs are available.

(6) Remain alert to detect any unusual conditions in the plant (e.g., unusual sounds or vibrations, out-of-limit readings). Promptly report all significant evolutions and abnormalities to the EDO/Watch Supervisor. Whenever possible, take positive actions to prevent casualty/emergency situations, keeping the EDO/Watch Supervisor informed of conditions, actions and intentions.

(7) Ensure lube oil samples are drawn and inspected according to the Lube Oil Quality Management Program.

(8) Maintain the physical security of machinery and assigned spaces. In industrial environments especially, ensure space and system integrity (e.g., open tanks and voids, piping, etc.) is rigorously monitored.

(9) Carry out applicable provisions of the EOSS, (SDOSS, AFOSS, and CSOSS when applicable), NSTM, SORM, ship instructions and notices, engineering department instructions, notices, and standing orders; machinery operating instructions, safety precautions found in other pertinent directives.

(10) Immediately investigate odor of fuel oils, burning material, and smoke. In the event of a fire in a main engineering space, execute all immediate actions as prescribed in the applicable EOCC, Repair Party Manual and/or Main Space Fire Doctrine. Know how to activate and operate all fire fighting equipment in assigned spaces, and all personal protection devices.

(11) Ensure that all personnel on watch maintain cleanliness of their watch stations. Direct the proper securing of equipment, tools, and loose materials to prevent damage to machinery, injury to personnel, and fire hazards, paying special attention to areas where intermediate/depot level work is being accomplished.

(12) Set the specified material condition of readiness when ordered and report compliance to the EDO/Watch Supervisor. Ensure open fittings impacted by repair work are annotated in the DC Closure Log.

(13) Report and coordinate all significant evolutions that are anticipated on watch with the EDO.

(14) Conduct all required tests of alarms and systems. Report deficiencies promptly.

(15) If applicable, check the bilges at least hourly for flooding and presence of oil.

(16) If assigned as a production supervisor or in any quality assurance capacity, be critically alert when interfacing with Fleet Maintenance Activities (FMA), private contractors, etc., to ensure that repair work are being accomplished per job specifications/requirements prescribed in reference (c), NAVSEA standard items and other governing directives.

(17) Carry rags and flashlights as necessary in support of above functions.

2504. ENGINEERING DUTY OFFICER (EDO)

- R) a. Basic Function. The Engineering Duty Officer (EDO) represents the Engineer Officer when absent. The Engineering Duty Officer is charged with the same duties and responsibilities inport as the EOOW/ performs underway; however, inport concerns such as managing the duty section, maintenance, refueling, heightened concern for the environment, etc., require the leadership, management and dedicated oversight by an experienced and mature engineer. Further, the Engineering Duty Officer must be ready at all times to place the electrical plant into operation and/or commence preparations to place the propulsion plant into operation in event of emergency or for unscheduled movements of the ship.
- R) b. Qualification Requirements. The EDO will be a petty officer first class or above. (An EOOW/ qualified petty Officer Second Class is authorized at CO discretion) The EDO is not required to be a qualified EOOW(with above exception). However, because of the responsibilities involved, the EDO must have the technical knowledge and leadership to effectively and safely manage the propulsion, auxiliary and electrical plant during all inport conditions and be able to commence preparations to transition to underway conditions using assigned duty section personnel. In order to ensure this level of knowledge, all EDO's shall complete the EDO PQS NAVEDTRA 43702. A qualified EOOW is required to be onboard and in a position to provide direct supervision, and if needed, direct control of the propulsion, auxiliary and/or electrical plant during any and all special evolutions as outlined in EDORM Article 3206 and Appendix B.
- c. Minimum Duties, Responsibilities and Authority. In addition to the general duties assigned in EDORM Article 2503, the EDO shall:
- (1) Execute all standing orders, special operating orders and night orders from the Engineer Officer.
 - (2) Prepare or review the required departmental daily 12 and 8 o'clock reports (e.g., draft report, boat report etc.).

(3) Ensure the alertness, training and presence on station of all personnel on watch in the engineering department.

(4) When ordered by the Engineer Officer/CDO or higher authority, place the electrical plant and/or commence preparations to place the main propulsion plant into operation for unscheduled ship movements or emergency situations. As necessary, the EDO must be able to commence recall of designated personnel needed to put the propulsion plant in operation within a 24-hour period of the initial notification of an emergent underway requirement. For gas turbine and diesel ships this entails preparations to start main engines, and for steam ships, this entails preparations to light off any main propulsion boiler.

(5) In the event of a loss of shore electrical services, ensure the ship re-establishes the electrical load using ship's emergency diesel or gas turbine generators. If it appears that the disruption of electrical power will be for a prolonged period of time, the Engineer Officer shall make arrangements to augment the duty sections until normal shore electrical power can be re-established.

(6) Safeguard the watertight integrity and physical security of all engineering spaces.

(7) Ensure all machinery is operated safely and economically and all pertinent safety precautions are observed.

(8) Ensure the engineering log is maintained accurately. This includes regular review and the review of any/all line outs. The EDO is the person granted signature authority for the Engineering Log during the inport duty period.

(9) Inspect department spaces prior to 8 o'clock reports (using check off sheets if prescribed by the Engineer Officer), to ensure that:

(a) All watchstanders are alert, performing prescribed duties, and accomplishing assigned work.

(b) Adequate precautions have been taken to guard against fire, flooding, sabotage, etc.

(c) All machinery is operating normally.

(d) All systems are aligned properly.

(e) Correct material condition of readiness is set.

(f) All storerooms are locked.

(g) All unnecessary lights are out and designated standing lights are on.

(10) Report security and status of the department to the Engineer Officer if present, and to the officer receiving 8 o'clock reports. This report will contain the following information:

(a) Plant status, including machinery and boilers in operation.

(b) Machinery out of commission or degraded.

(c) Statement that flooding and fire hazards have been eliminated in engineering spaces.

(d) After hours work or testing in progress.

(e) Any abnormal conditions.

(11) Supervise all departmental training conducted after hours.

(12) Immediately notify the OOD (inport) and CDO of any abnormal conditions. Notify the Engineer Officer and principal assistants as necessary.

(13) See that Engineering Department personnel required for working parties are promptly supplied.

(14) Assemble reports of muster of the department and report results to the Command Duty Officer when quarters are not held in the morning.

(16) At least 15 minutes before Officers Call each morning, meet with the Engineer Officer or the oncoming Engineering Duty Officer (when the Engineer Officer is not on board) and brief the status of the department, including a review of all logs and pertinent documents.

(17) Report to the Engineer Officer before the end of the day to receive the night orders and any amplifying information.

R) (18) Ensure that the Tag-Out Log is maintained properly. Be aware of status of equipment and systems that are tagged out. Spot check as needed to ensure log accuracy. Be familiar with special approval guidance for Tag-outs on major propulsion equipment or firefighting equipment as specified in Engineers Standing Orders. Tag outs associated with evolutions as specified in EDORM Article 3203 require written approval of the Engineer Officer and/or Commanding Officer. This written approval may be indicated as a separate form, entered in the Engineering Log or may be indicated on the Tag Out Documents.

(19) Ensure all equipment operating logs are properly maintained and exercise Watch Officer overview of all programs outlined in EDORM Chapter 5.

(20) Monitor quality and regulate operation of Combat Systems Support Systems (e.g., Chill Water, Dry Air, 400 Hz power, etc.).

(21) Monitor proper operation of the Collection Holding and Transfer (CHT) systems.

(22) Monitor proper operation of the Cathodic Protection System.

(23) Serve as the ship's Duty Fire Marshal (if a Fire Marshal is not separately assigned) and carry out Fire Marshal duties as prescribed in reference (a). Plan and conduct the duty section fire drill and other emergency drills or training, with CDO and Fire Marshal.

(24) Ensure applicable provisions of EOSS, SDOSS, NSTM, SORM, ship instructions and notices, engineering department instructions, notices, and standing orders, machinery operating instructions and safety precautions, and other pertinent directives are carried out by the duty section personnel.

(25) Coordinate with Fleet Maintenance Activities (FMA), private contractors, etc., to ensure that repair work being accomplished is in accordance with job specifications and requirements prescribed in reference (c), NAVSEA standard items and other governing directives.

2505. AUXILIARY STEAMING WATCHES. The Basic Function and Minimum Duties and Responsibilities for all Auxiliary Steaming Watches shall be developed by the ship and described in this section. Use Appendix A and applicable underway watch descriptions as a general guide for developing Auxiliary Steaming watchstander descriptions in addition to other inport specific duties, resulting from inport equipment configurations and interface with shore maintenance and support organizations. Special attention should be given to the additional Inport Watch Supervisor requirements contained in the Repair Party Manual. In cases where Auxiliary Steaming Watches are combined, assigned watchstanders shall be PQS qualified for combined watchstations and shall assume all applicable duties for respective watchstations. Special attention should be exercised in watch assignments due to the nature of inport operations that rely heavily on duty section skills and manning levels. This ship-developed section shall be formatted and numbered consistent with previous sections.

Note: The Auxiliary Steaming Watches should be augmented as necessary to support evolutions such as machinery testing or shifting major auxiliary machinery. Personnel assigned to the

Auxiliary Steaming Watches described in subsequent paragraphs, will be qualified according to PQS.

2506. COLD IRON WATCHES. The Basic Function and Minimum Duties and Responsibilities for all Cold Iron Watches shall be described in this section. Use Appendix A and applicable underway watch descriptions as a general guide for developing Cold Iron Watchstations' descriptions in addition to other inport specific duties, resulting from inport equipment configurations and interface with shore maintenance and support organizations. Attention must be given to the need for Electrical Plant operations in the event of loss of shore power. In cases where Cold Iron Watches are combined, assigned watchstanders shall be PQS qualified for combined watchstations and shall assume all applicable duties for respective watchstations. Special attention should be exercised in watch assignments due to the nature of inport operations that rely heavily on duty section skills and manning levels. This ship-developed section shall be formatted and numbered consistent with previous sections.

CHAPTER 3 OPERATIONAL AND TECHNICAL AUTHORITY

SECTION 1 - ENGINEERING DEPARTMENT POA&M

3101. GENERAL. All good management involves planning, execution and an adequate mechanism for providing in process evaluation/feedback. It includes monitoring of progress, actions, and modifications to the original plan to maintain progress toward clearly established and achievable objectives. The process also requires the establishment of a system of priorities to ensure that problems that have the most detrimental effect on readiness are addressed first. A generalized management procedure applicable to all types of programs, projects, and tasks is provided below:

a. Define Objectives. Objectives should be clear, concise and understandable to all. An individual ship's operating schedule, personnel, funding, material resources, etc will determine the scope of objectives. However, the objectives should support the long-term readiness and ability to sustain the engineering department vice a specific goal such as an assessment or inspection.

b. Plan of Action and Milestones. A departmental Plan of Action and Milestones (POA&M) is an excellent instrument to achieve desired objectives. A well developed, monitored and updated POA&M outlining required actions needed to attain the objectives and associated target dates by which these actions are to be completed is highly recommended. Through regular review, the POA&M may be revised to meet changing circumstances; however, steady progress toward the completion of the objectives outlined in the plan should be demonstrated.

c. Monitoring of Progress. Review the plan regularly to ascertain progress, and formulate realistic and achievable actions to keep the department progressing toward the milestones of the POA&M.

CHAPTER 3 OPERATIONAL AND TECHNICAL AUTHORITY

SECTION 2 - DEPARTMENTAL REPORTS/ORDERS

Ref: (a) OPNAVINST 3120.32 series (NAVY SORM)
(b) EOSS User's Guide (EUG)

3201. PURPOSE. To provide guidance on establishing Engineer's Night Orders, Special Operating Orders, Light Off Orders, 8 O'clock Reports, Engineer Officer's Standing Orders and Temporary Standing Orders.

3202. NIGHT ORDERS. Night Orders are used by the Engineer Officer to issue instructions for conduct of routine and special evolutions planned for the evening and night watches, and to provide guidance on plant operations. Night Orders are required daily for both underway and inport. The EDO may prepare inport Night Orders, and the Main Propulsion Assistant may prepare Underway Night Orders.

3203. SPECIAL OPERATING ORDERS. Special Operating Orders are used by the Engineer Officer and approved by the Commanding Officer to modify the Engineer Officer's Standing Orders, for operating guidance or to address temporary situations that demand deviations from normal procedures. Also, Special Operating Orders may be used in conjunction with caution tags and should be clearly disseminated to supervisors and operators as applicable. Examples of where Special Operating Orders may be useful are to authorize manual operation of regulators/valves during repair to their automatic functions or to use back-up power sources until the normal source is replaced or repaired. Additionally, prolonged employment of the ship in special circumstances (e.g., quiet ship, mine countermeasures, etc.) may warrant Special Operating Orders that are not pertinent to EOSS deviations specified in reference (b). The Engineer Officer shall determine whether individual Temporary Standing Orders require Commanding Officer authorization using guidance provided in EDORM Article 3301.

3204. LIGHT OFF ORDERS. Light Off Orders (Start-up Orders) are used by the Engineer Officer to issue specific instructions and timeline for bringing the plant into operation and supplement EOP. Light Off Orders should be used whenever the plant is placed in operation for a scheduled underway, significant equipment testing, or for planned periods of auxiliary steaming. Light Off Orders are designed to give the EDO and/or EOWW a specific sequence and amplifying guidance required when bringing the plant into operation and should be easily tailored to special circumstances. The Engineer Officer and Commanding Officer shall sign all Light Off Orders.

a. Recommended features for light off orders:

- (1) Time line for evolution.
- (2) Positional, divisional or workcenter responsibility for each step (e.g., EDO, B Division, Duty Electrician, EM01, etc.).
- (3) Cross reference to MLOC/PMS guidance for individual steps.
- (4) Signature/initial blocks for accomplishment/accountability.
- (5) Caution/Warning notes as appropriate (including cross-reference to Special Operating Orders currently in effect).
- (6) Routing blocks for completed Light Off Order form.

3205. 8 O'CLOCK REPORT. The Engineer Officer underway, EDO inport shall prepare a nightly status report of the department. Although used primarily as a way to inform the chain of command of departmental status, it serves as a very useful management tool for tracking repairs, etc. Underway, this report shall be provided to the Executive Officer and inport to the Command Duty Officer.

a. The 8 o'clock report should be formatted to allow ease in determining plant status and shall contain, at a minimum, the following information:

- (1) Plant Status.
- (2) List of equipment degraded/OOC (list should be organized by system and generally reflect the Tag Out log, including:
 - (a) When discovered date.
 - (b) CASREP Number (if applicable)
 - (c) JSN (if applicable).
 - (d) Repair status/ETR.
 - (e) Operational impact (should group by system).
 - (f) When applicable, supply requisition number/status.
- (3) Additional remarks.
- (4) Fresh and Feed water percentage.

b. Possible additional entries for 8 O'clock reports:

- (1) Hot work in progress.
- (2) Tanks/Void presently open.
- (3) Tag-outs in effect that require Commanding Officer or Engineer Officer approval.
- (4) Propulsion/DC drills planned/accomplished.
- (5) Fire Marshal safety walkthroughs.
- (6) Alarms in cutout.
- (7) S/Y or IMA work status (if applicable).

3206. ENGINEER OFFICER'S STANDING ORDERS. The Engineer Officer shall issue Standing Orders as Appendix B of this manual. Standing Orders should be reviewed monthly for accuracy and applicability. Engineer Officer's Standing Orders should be used to amplify procedures, policies, and practices issued by higher authority, and provide guidance in those instances where specific procedures and policies are not stated. The Commanding Officer shall approve all standing orders before issue.

a. Required topics for Engineer Officer's Standing Orders:

(1) Operational log taking intervals: Equipment reading periodicity if greater than one hour and specified in governing technical guidance (see EDORM Chapter 5).

(2) Log review and signature procedures to include which individual logs require EOOW/EDO review and at what level watchstanders initial and review each general type of log. Log keeping policy for drills and special evolutions are also useful topics.

(3) Physical Security: A complete listing of valves, etc., requiring locks and locking devices. The interval for non-manned space monitoring shall also be specified, as well as any additional space/equipment access restrictions.

(4) Explicit actions and policy regarding watchstander actions either not covered by or requiring modification to EOSS which are not addressed in other ship instructions (e.g., mine operations, blowing tubes, surface blowing, specific EOSS modifications for tactical considerations such as use of Nixie/SQQ 89, etc.).

(5) Use of Battle Override/emergency bells as applicable.

(6) Casualty steering policy if not incorporated as a separate ship instruction.

(7) Notification policy for Engineer Officer, Command Duty Officer and/or Engineering Duty Officer.

(8) Recall procedures/short notice light off procedures for an emergency underway.

(9) If not listed in other ship instructions such as the Captain's Battle Orders, any special plant configurations used for specific tactical/maneuvering situations (e.g., Condition I, III, plane guard, etc.), or fuel economy.

b. Other possible additional topics for Engineer Officer's Standing Orders:

(1) General Watchstanding/Operations

(a) Specific Good Engineering Practices/General Guidance.

(b) Watch standing etiquette/routine/relief and communication policies (should address relief priority/order, and procedures in the event of sick or absent watch relief's).

(c) General watch guidance for EOOW while on watch (e.g., whether permitted to roam, limits of travel, etc.).

(d) Specific policy for developing authorized deviations from EOSS or other standard operating procedures (e.g., where strict adherence to EOSS would endanger personnel or damage equipment, adherence to Class Advisory or In Service Engineer (ISE) guidance, etc.).

(e) Specific procedures for Tag Outs requiring either Commanding Officer or Engineer Officer authority per EDORM Articles 3301 and 3303.

(f) Relationships/interaction with embarked detachments (e.g., Helicopter, Marines, EOD/SEAL, etc.).

(h) EOOW relationships to the OOD/TAO/CSOOW.

(2) Equipment Configuration/Rotation Policy

(a) Specific equipment combinations to be avoided for reasons such as electrical distribution system configuration, controller type, space location, system interrelationship, etc.).

(b) Desired equipment shifting plan in event of Main Space Fire (best if organized by affected space with systems prioritized by importance to overall plant operations).

(c) Equipment rotation policies (based on technical guidance/good engineering practices and should include equipment often neglected such as seawater strainers).

(3) Damage Control

(a) Policy for designation of equipment/systems considered to be firefighting, firemain or other damage control related systems for the purposes of CCS review of related Tag-Out sheets.

(b) Duty section drill procedures/responsibilities/expectations.

(c) Casualty Response Team and Rapid Response Team employment policy and procedures.

(d) Prohibition of the use of damage control equipment for other than damage control related evolutions (e.g., use of fire hoses, battle lanterns, etc.).

(e) Relationship of the EDO, fire marshal and duty section fire party to the DCA (if onboard) in the event of a fire/flooding.

(4) Shore Services/Logistics

(a) Expanded guidance on shifting to/from shore services (may want separate sections for out of homeport, anchorage, nested situations, etc.).

(b) CHT procedures/responsibilities.

(c) Specific logistics procedures (taking on fuel, lube oil, stores, etc.).

(d) List/notebook containing important shore support numbers (PWC, pier services, port services, etc.).

(5) Liquid Management Procedures

(a) Evaporator line up to preclude distilling to a feed tank on suction.

(b) Reserve feed inventory minimums.

(c) Potable water inventory minimums and corresponding EOOW/EDO actions.

(d) Policy for shifting F/O service suction for multi-plant ships (e.g., opposite sides, minimum time separations, etc.).

(e) Oil settling tank procedures.

(6) Environmental Protection

(a) Specific oil spill response procedures/responsibilities.

(7) Electrical Plant Operations

(a) Ground check/isolation policy.

(b) Standby generator configuration policy.

(c) Emergency generator starting policy.

(d) Specific electrical isolation priority and guidance.

(e) Load shedding policies.

(8) Shaft Control Issues

(a) EOT/ROT/verbal order hierarchy.

(b) Emergency bell procedures (indicating/answering).

(c) Restricted Maneuvering impact on plant and watchstander actions that are not addressed in a separate ship document.

(9) Maintenance

(a) Interface procedures for weekend work from Intermediate/Regional Maintenance Activities.

(b) Duty section/weekend work procedures.

(c) Deployment maintenance practices.

(d) Shipyard maintenance/repair guidance.

(10) General

(a) Required reading list.

(b) Equipment responsibility by workcenter (e.g., switchboard maintenance).

(c) Departmental check in/orientation procedures.

(d) Test equipment loan policy (SIMA, other ships, etc.).

(e) Equipment cannibalization policy (organizational parts only).

CHAPTER 3 OPERATIONAL AND TECHNICAL AUTHORITY

SECTION 3 - COMMANDING OFFICER/ENGINEER OFFICER APPROVAL
REQUIREMENTS

- Ref: (a) OPNAV 3120.32 series (NAVY SORM)
(b) OPNAVINST 5090.1 series (Environmental and Natural Resource Program)
(c) COMFLTFORCOMINST 4790.3 (JFMM)
(d) NAVSEA S0400-AD-URM-010 (TAGOUT USERS MANUAL)
(e) NSTM 300 (ELECTRICAL PLANT GENERAL)

3301. MATTERS REQUIRING THE COMMANDING OFFICER'S APPROVAL. The Commanding Officer's approval shall be obtained prior to taking any of the following actions. In his absence, this authority may be delegated to subordinate personnel in accordance with Articles 0802 and 1022 of United States Navy Regulations.

a. Equipment Light off

(1) Commencing the main propulsion start up/light off procedure.

Note: When an emergency propulsion plant start up/light off is required, the EDO shall notify the Commanding Officer (via the Command Duty Officer) and Engineer Officer immediately, commence recall procedures and begin preparations for underway. Inability to notify the Commanding Officer and/or Engineer Officer does not preclude underway preparations; however, these preparations should not proceed beyond a point where a qualified EOW is required to be present as specified in EDORM Article 2501.

(2) Major change in plant configuration. This does not include routine shifting of auxiliary machinery, but does include the disablement/operation of machinery and equipment when such action may adversely affect the safety or operation of the ship.

(3) Designation of safety observer (if other than qualified EOW) to observe propulsion boiler light off.

b. Equipment Procedures/Testing/Repairs

(1) Use of the battle override feature of the gas turbine control system, if other than as stated in the Commanding Officer's Battle Orders, Restricted Maneuvering Doctrine, or as specified in the Planned Maintenance System (PMS).

(2) Recommencing equipment operation after suspected tampering is discovered per EDORM Article 4410.

(3) Operational testing of main engines.

(4) By-passing of interlocks or safety devices on any systems or portion thereof, if for other than PMS.

(5) Plans and procedures submitted by the Engineer Officer for the conduct of trials, tests, casualty control drills and training evolutions that affect the propulsion plant or vital machinery.

(6) Any deviation from EOSS. This authorization may be via the Commanding Officer's Battle Orders, Restricted Maneuvering Doctrine, or Special Operating Orders, as necessitated by plant design or other circumstance.

c. Fuels/Oils/Ballasting

(1) On-loading/off-loading of Propulsion Fuels/Lube Oils.

(2) Ballasting/de-ballasting.

d. Environmental Protection

(1) Authorize the discharge or disposal of liquid or solid waste or any hazardous substances (e.g., fuel, AFFF, etc.) within prohibited areas per reference (b).

e. Safety

(1) Approval of Special Operating Orders pertaining to any system that may affect the safe operation of the propulsion or electrical plant or the safety of personnel.

(2) Entering any tank/void. Commanding Officer approval shall be obtained prior to the initial opening and gas freeing of the tank/void.

Note: Once a tank/void is opened and certified safe for personnel, CO authorization is valid for repeated entry as long as the tank/void remains open and meets gas free certification requirements.

(3) Authorization of selected single valve Tag-Outs (per EDORM Article 3303).

(4) Placing any alarm or safety device in a Cut Out status, except for PMS:

(a) If an alarm is placed in any condition/position that renders it inoperative, it is considered to be in Cut Out.

(b) Ships may desire to define vital and non-vital alarms in the Commanding Officer's or Engineer Officer's Standing Orders. If non-vital alarms are defined in either Standing Orders, the requirement to notify the CO for Cut Out non-vital alarms may be satisfied by listing them on the Engineer Officer's Eight O'clock report.

(5) Setting of, or securing from, Restricted Maneuvering (this does not prevent the OOD from setting Restricted Maneuvering in accordance with the CO's Standing Orders).

f. Watchstanding/Qualifications

(1) Qualifications of Engineer Officers of the Watch.

(2) Extending stay times for watch standers during heat stress conditions.

(3) Approval of all drill packages (ETT/DCTT/ITT).

(4) Approval of Engineering Department watchbills and WTRP (at Commanding officer's discretion, this authority may be delegated to the Engineer Officer by a letter of designation).

(5) Approval of changes to Standard Operating Procedures where no EOSS coverage is available.

3302. MATTERS REQUIRING THE ENGINEER OFFICER'S APPROVAL.

Approval of the Engineer Officer is required for the following:

a. Equipment Light off

(1) Prepared Light Off Orders for propulsion plant start up, which must be provided to the Commanding Officer for approval.

(2) Changing plant status or placing major plant equipment out of commission.

b. Equipment Procedures/Testing/Repairs

(1) Tag-Out isolation lists developed for routine use on major equipment.

(2) Deletion/modifications of departmental PMS manuals and approval of PMS scheduling boards.

(3) Development of changes to maintenance procedures.

(4) Final close out authority of the following:

(a) All gas turbine intakes/inlet plenums (clean sides).

(b) All tanks/voids.

(c) Main reduction gear sumps and access covers.

(d) Steam, diesel and gas turbine generator reduction gear sumps and access covers.

(e) Line shaft bearing sumps and access covers.

(f) Strut/waterborne bearings (shipyard).

(g) Rudder stock bearings (shipyard).

(h) Main/auxiliary or waste heat boiler steam/water sides, and fireboxes.

c. Watchstanding/Qualifications

(1) Approve final qualification of all departmental watchstanders (except EOOW).

(2) Approve Watch Team Replacement Plan in accordance with EDORM chapter 3, section 5.

d. Administrative Matters

(1) Approve the daily Fuel, Oil and Water Reports.

e. Drills/Training

R) (1) Engineering Training Team (ETT)/Damage Control Training Team (DCTT) drill plans before CO's approval and up-to-date list of personnel designated as qualified ETT/DCTT members.

(2) Approval of all personnel designated to conduct engineering training.

(3) Locally prepared training lesson topic guides (LTG's) approved before first use.

(4) Training schedules.

(5) Modifications to departmental training plan.

R) 3303. SPECIAL EVOLUTIONS. Special evolutions, due to the operational risk, require additional planning, supervision and safety precautions. No special evolutions shall be conducted in the propulsion plant without the knowledge of the Engineer Officer and the approval of the Commanding Officer. Before beginning any special evolution, the Engineer Officer or a qualified Engineering Officer of the Watch designated by the Engineer Officer, will brief respective personnel involved in the evolution. The briefing will consist of proper procedures, safety precautions, risk assessment (ORM) and important parameters to be monitored. Also, check sheets and walk through should be considered as part of the preparation for complex or involved special evolutions. The Engineer Officer will make sure that the CO is kept informed of all progress and performance of each special evolution.

a. Inport special evolutions normally should not be accomplished outside of normal working hours, and if Tag Out sheets are required, the Engineer Officer shall personally review

them. The CO, XO, Engineer Officer or a qualified EOOW designated by the Engineer Officer will be on board whenever any of the following special evolutions are performed:

(1) Main reduction gear cover removal and re-installation (including inspection ports) and attached pump drive gear accesses.

(2) Opening and closing of main engine(s).

(3) Waterborne removal of any valve, piping, or fitting which could subject the ship to major flooding.

(4) Maintenance requiring any one of the following hazardous conditions:

(a) Work on live electrical switchboards, load centers, power panels, circuit breakers, or electrical circuits except where approved instructions issued by higher authority (equipment technical manuals, PMS, or an established troubleshooting procedure) permit opening and inspecting equipment in the course of performing maintenance, routine testing, taking measurements or making adjustments that require equipment to be energized as prescribed in reference (e).

(b) There shall be at least two pressure barriers between the maintenance area and any system or condition listed below in accordance with reference (d).

(1) High temperature systems (200 deg F or greater).

(2) High pressure systems (1000 PSI or greater).

(3) Any in-service steam system.

(4) All sea connected systems (except lines less than ½ inch IPS inboard of the backup valves.

(5) All hull penetrations below the maximum anticipated waterline (except mechanical and electrical penetrations designed for single closure, i.e., shaft or cable penetrations, etc.).

(6) Fluids with flashpoint below 200 deg F.

(7) Oxygen systems.

(8) Toxic fume systems (CHT, dry cleaning fluid, photo chemicals, phosphate, or hydraulic fluid.

(c) Tag out of Firemain to sprinklers for magazines containing live ammunition or deluge systems.

11 Apr 08

(d) Tag out of installed firefighting systems for one or more main spaces.

(e) Installation/removal of cofferdams for which failure could result in major flooding conditions.

(f) Dewatering/de-fueling for seawater compensated fuel storage tanks.

CHAPTER 3 OPERATIONAL AND TECHNICAL AUTHORITY

SECTION 4 - DEPARTMENTAL TRAINING

- Ref: (a) OPNAVINST 3120.32 (NAVY SORM)
(b) EOSS Users Guide (EUG)
(c) NSTM 079 (Vol. 2) (DC PRACTICAL DC)
(d) NSTM 079 (Vol. 3) (DC ENGINEERING CASUALTY CONTROL)
(e) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

3401. GENERAL. The Engineering Department training program shall be administered per references (a) through (e). Ships that employ good engineering practices, conduct watchteam training (evolutions/drills) inport and underway, and follow strict compliance with the OSS program should always be ready. The following will help maintain that readiness:

a. Frequent review of technical directives, Afloat Training Group (ATG) Bulletins and checksheets. ATG website contains many self-assessment tools.

b. Frequent validation of the Operational Sequencing Systems (OSS). This includes:

- (1) Engineering Operational Sequencing System (EOSS)
- (2) Sewage Disposal Operational Sequencing System (SDOSS)
- (3) Cargo Fuel Operational Sequencing System (CFOSS)
- (4) Aviation Fuel Operational Sequencing System (AFOSS)
- (5) Combat System Operational Sequencing System (CSOSS)

c. Quality casualty control drill scenarios with impositions that stimulate the watchstander to identify the casualty and take appropriate corrective measures to include controlling actions. More importantly, conducting evolutions that preclude personnel caused casualties.

d. A thoughtful engineering training program that provides adequate level of knowledge for all watchstanders, especially supervisory personnel, ETT, and DCTT. Conducting formal training a minimum of three times a week, including oral boards and, written examination to reinforce and increase watchstanders' level of knowledge. TAB A and, TAB B can be used to critique training.

e. Honest and frequent self-assessment of watchstanders, ETT, and Engineering programs along with critical feedback will help sustain engineering readiness. Frequent, meaningful zone

inspections with prompt follow-up for correction or CSMP documentation cannot be over emphasized.

f. Supervisory review of previous assessments to ensure corrective action has been taken or is completely closed out.

g. Work space inspection directly after morning muster by supervisory personnel documenting conditions of equipment and overall preservation, stowage, and cleanliness of the propulsion plant.

R) h. Continuous Certification Requirements (CCR) outlined in reference (e) should be treated like critical equipment maintenance in that CCR's are constantly reviewed and tracked. Negative deviations should be corrected via most expeditious means.

3402. OPERATIONS. Engineering team training, to include evolution and qualification training, shall be conducted according to references (b) through (d). Drill sets containing both evolutions and casualties should be practiced inport as well as underway. TAB C and TAB D can be utilized to assess watchstanders proficiency. The purpose of operations is threefold:

a. To evaluate a watch section's ability to conduct routine evolutions.

b. To evaluate a watchstanders ability to control casualties and restore from the casualty in a timely manner.

c. To evaluate the ETT's ability to conduct effective training through:

(1) Realistic imposition of drills

(2) Effective monitoring and control of drills

(3) Suitable evaluation of drills

3403. CONDUCT OF TRAINING. All ships will develop and promulgate a list of standard simulations (TAB E) to be utilized during every training session. Standard props will be used to initiate all drills. Reference (c) provides initial guidance.

a. For Smart Ships equipped with Onboard Training (OBT) consoles. Drills will be initiated utilizing standard simulations resident in the simulator whenever possible.

b. Drills will be initiated and terminated by training team members. Watchstanders will carry out applicable Engineering Casualty Control (EOCC) procedures unless otherwise instructed by assigned training team member. Training team members will impose

all drill simulations. TAB E shall be ship specific and will list all simulations used by the ship.

c. Training tips for watchstanders and ETT:

(1) FOLLOW APPROVED PROCEDURES (EOP, PMS, Ship's Procedure, etc.)

(2) IAW the EOSS User's Guide, the watchstander will utilize the procedure as a check off sheet, ensuring that all required actions are completed in the correct sequence. The EOP should be reviewed prior to accomplishing the required procedure and it should be reviewed again after the procedure is accomplished. Use of a grease pencil is recommended to ensure all steps are completed and no steps are missed.

(3) Make sure watchstanders demonstrate the accomplishment of each step (i.e. checking valve position, pointing to a parameter on a gage, writing down temperatures/pressures in grease pencil, pointing to switch position, lights illuminated/extinguished, etc).

(4) If valve labels are missing and the watchstander knows the proper valve label by the EOP diagram and system knowledge, the watchstander should apply a temporary label and will report the discrepancy to EOOW after completion of the procedure. If the watchstander is unsure of the valve number, report discrepancy to EOOW immediately.

(5) After each evolution the watchstander must report noted procedural or material discrepancies to the EOOW.

(6) Verify alignment of a system prior to startup and during operations. Place all systems in proper shutdown or pre-startup alignment per instruction. If a valve, switch, control device, etc. is discovered in the wrong position for the present plant condition, notify the EOOW immediately and request permission to place it in the correct position.

(7) Verifying valve position: Open valves - turn slightly in the closed direction and then back off. Closed valves - attempt to turn the valve in the closed direction IAW Tag Out User's Manual (TUM). Rising stem, butterfly valves and any other valves that have local position indicators can be verified visually.

(8) Ensure equipment is within operating parameters IAW procedure. If equipment is out of parameters, stop and report to EOOW and request permission to continue.

(9) Complete understanding, adherence to, and the difference of all WARNINGS and CAUTIONS.

(10) L/O sampling - check sump level as required by PMS or local procedure (i.e. 2000 series L/O sample requires sump level to be checked BEFORE AND AFTER obtaining the sample).

(12) Do MLOCs as required and frequently as a plant evolution whenever possible.

(13) Be ready, willing, and able to demonstrate to watchstanders, whenever necessary, to assist them maintaining proficiency.

3404. TRAINING TEAMS. The Engineer Officer shall designate Engineering Training Team (ETT) members in writing.

a. ETT members shall:

(1) Be PQS qualified in the watch station they are assigned to train and evaluate. In addition, the ETT will be composed of sufficient numbers to safely monitor the progress of drills being conducted.

(2) Conduct a formal briefing of planned drill sets and evolutions. Insure the brief states whether ETT will be in the training or evaluation mode. The ETT Leader/Drill Coordinator shall emphasize safety throughout the course of the training evolution. Normally, ETT shall not deviate from briefed scenarios and simulations.

(3) Conduct a safety walk-through of engineering spaces prior to or after completion of the drill brief and be willing to assist in correction of the discrepancies. Ensure all safety related discrepancies are corrected prior to commencement of training and that all other discrepancies are properly documented for correction.

R) b. Each ETT member shall have a binder that contains:

R) (1) Drill Cards/Scenarios

R) (2) Drill Imposition Sheets

R) (3) Drill Critique/Grading Sheets

R) (4) Evolution Critique/Grading Sheets

R) c. Immediately call Training or Safety Time Out when an unsafe condition is noted or becomes imminent. Re-commence drills when unsafe condition is corrected. Only the ETT leader can re-commence the drills. CO concurrence is required for any Safety Time Out.

d. Conduct a thorough and objective assessment of the watchstanders' performance/deckplate proficiency. Deckplate proficiency can be ascertained by the following:

(1) Watchstanders' demonstrated hands-on operation of equipment and systems in the space.

(2) Familiarity with material safety checks required for demonstration, including use of written procedures such as EOSS, PMS, Standard Operating Procedures, Temporary Standing orders.

(3) Familiarity with standard plant configurations, interrelationships and non-standard plant configurations.

(4) In the event of an actual casualty, allow the watchstander to carry out casualty control procedures in accordance with EOCC, and evaluate watchstanders accordingly. ETT will assist as necessary, and will immediately step in if a safety violation is about to occur. Watchstanders will be promptly debriefed upon conclusion of the training session.

(5) Debrief the training evolution and provide a summary of the watch team's overall performance to the Engineer Officer. Also provide a summary for the Engineer's Night Orders for all watchstanders to review.

(6) Track and validate correction of material discrepancies discovered during the conduct of drills and evolutions.

(7) Conduct watchstander training at every opportunity.

e. Assessment of an effective ETT:

R) (1) ETT member's qualification level is equal to or greater than that for the watch station he/she is training/evaluating.

(2) Sufficient number of personnel assigned to the ETT to conduct effective training.

(3) ETT formally designated in writing and composed of knowledgeable personnel.

(4) Ability of the ETT to recognize unsafe conditions and take appropriate actions.

(5) ETT demonstrates knowledge of systems and familiarity with EOP/EOCC procedures.

R) (6) ETT team leader must be a qualified EOOW.

(7) ETT level of knowledge is adequate to provide necessary symptoms, indications and appropriate responses to watchstander actions.

(8) ETT impositions are standardized, safe, realistic, and imposed exactly as briefed.

(9) Ability of ETT to monitor actual parameters of equipment/system being drilled.

(10) Ability of ETT to identify unsafe plant conditions during the safety walk-through.

(11) Ability of ETT to orchestrate the imposition at multiple locations (as required), simulating indications, readings, or system responses that the watch team would expect to see while still monitoring the actual parameters of the equipment/system.

(12) Typically, ETT is comprised of the most experienced and knowledgeable watchstanders.

3405. TRAINING PROGRAM

a. All ships shall establish a viable and comprehensive training program using guidance provided in references (a) through (e). It is recommended that ships utilize all available training assets (i.e., ATGPAC/LANT) in addition to references (a) through (e) in developing a ship specific training instruction.

R) (1) TAB F (ATG Main Space Fire Drill Grade Sheet) is provided as a sample grading criteria for the determination of an effective, partially effective, and not effective MSFD. This grade sheet is a management tool to Assessors and ships training team in objectively evaluating a MSFD.

b. Training conducted as per approved Engineering department training plan. All casualty control drills specified in ref (e) will be conducted in accordance with required periodicity, reported as specified.

(1) The Engineering Training Officer using training tools and materials tailored to meet ships specific configuration administers the training program.

c. Lesson Topic Guides (LTGs) used when conducting training in a classroom environment. Locally prepared LTGs approved by the Engineer Officer shall be utilized.

d. Training shall be supervised by senior personnel such as CPOs, Division Officers, EOOW/EDO, DH, XO, CO.

(1) Many engineering casualties are due to operator error, rather than the result of specific system or component failure. Watch section evolution training is the first step in causality prevention. The time and effort expended in evolution training significantly enhances engineering readiness.

(2) Nearly all evolutions training requirements can be conducted inport, and, particularly in the case of gas turbine and diesel powered ships, almost all can be done with the plant in cold iron. Evolution training can generally be accomplished underway at any time the ship is not in a restricted maneuvering status regardless of the ship's tactical employment.

(3) Evolution training shall be conducted based on watch station specific tasks covered by Engineering Operational Sequencing System (EOSS), PMS requirements, and general propulsion plant operating requirements.

R) e. Per reference (e), training records will be maintained. These records will be reviewed at ULTRA C/E & ULTRA S and may be reviewed on request at any phase during the basic phase. This will allow ships to perform self-assessment of training deficiencies.

R) f. Training and Operational Readiness Information Service (TORIS)/Training Figure of Merit (TFOM). The implementation of TORIS/TFOM facilitates effective tracking and proper documentation of individual watch station evolution training, and to standardize the process across the fleet. TORIS/TFOM is intended to form the nerve center for managing shipboard training, maintaining proficiency and readiness, and for providing selected data to other end users (ISIC, CNSF, NPDC, NAVSEA, etc.). TFOM, an application/lens, integrated with TORIS, provides afloat users with a diagnostic/prescriptive (sense and respond) tool for maintaining proficiency in all warfare areas. TFOM (Training Figure of Merit). TFOM is the Commanding Officer's tool for directing and monitoring continuous self-training and sustainment of warfighting proficiency in all applicable certification areas. The TFOM application directly supports the transition to a continuous training/certification culture and process by implementing a common set standards and tracking quantifiable metrics. TFOM displays current proficiency and enables more efficient planning/application of training resources when and where needed.

g. The minimum requirement for the frequency of Engineering Casualty Control training shall be in accordance with reference (e). Drills and/or evolutions should be conducted a minimum of two times a week. Completion of training shall be reported in accordance with reference (e).

h. Assess Watch Team Replacement Plan procedures, with emphasis in the following areas:

(1) Long range planning to ensure required replacement personnel are identified and fully qualified prior to assignment to a watchbill.

(2) Definitive ties between Watch Team Replacement Plan and PQS program management to ensure PQS goal assignment and actual goal attainment supports watch replacement requirements.

i. Assess the Long Range Training Plan and short-range training schedule, with emphasis in the following areas:

(1) Full integration of classroom training events, operations training events and watch team replacement qualification/training events into the Long Range Training Plan.

(2) Realistic, short-range scheduling of training events, including planned events from the Long Range Training Plan and accommodation of situational, unplanned training events.

j. Assess the department's procedures for maintaining the proficiency of qualified watchstanders, including:

(1) Pre-light off training specified for watch personnel following long periods of maintenance/cold iron status.

(2) Compare results of oral interviews, written examinations and deckplate operations to determine whether department training program is producing the intended results.

k. Representative deficiencies, which may degrade training effectiveness, include:

(1) Significant deficiencies in formal schools requirements with no effective plan to correct.

(2) Ineffective classroom training procedures or ineffective operations training as evidenced by poorly defined target training groups, inadequately defined training requirements, topic frequency not defined, lesson topic guides not available, required topics not scheduled, or low accomplishment rate of scheduled classroom training events.

(3) Ineffective operations training, including casualty control drills and evolutions not conducted, drill or evolution training results not recorded, ETT/DCTT training not conducted, or low accomplishment rate for scheduled operations training events.

(4) Ineffective Watch Team Replacement Plan, including unstable watch teams, non-identification of replacement requirements, no procedures for tracking qualification progress of replacement candidates, or low qualification attainment rates for designated replacement candidates.

R)

TAB A TRAINING CRITIQUE FORM

INSTRUCTOR: _____

DIVISION: _____

DATE: _____

TOPIC: _____

EVALUATOR: _____

COMMENTS:

A: INSTRUCTOR PREPAREDNESS:

B: QUALITY OF PRESENTATION (Were the major points clear?
Drawings used? etc.):

C. QUALITY AND USE OF TRAINING AIDS:

D. INSTRUCTOR LEVEL OF KNOWLEDGE (Was the instructor
familiar with the material? etc.):

E. RECOMMENDATIONS FOR IMPROVEMENT:

R)

TAB B ORAL BOARD CRITIQUE FORM

DATE: _____

SENIOR EXAMINER: _____

1. WATCHSTATION: _____

2. WATCHSTANDERS:

3. TOPIC/SYSTEMS DISCUSSED:

4. AREAS OF WEAKNESS:

5. SPECIFIC COMMENTS:

6. RECOMMENDATIONS:

R)

TAB C EVOLUTION CRITIQUE FORM

EVOLUTION EVALUATION FORM

EVOLUTION NR: _____ SPACE: _____ W/S:

W-S NAME: _____ ASSESSOR:

EVOLUTION DESCRIPTION:

W/S: EFFECTIVE / NOT EFFECTIVE ETT: EFFECTIVE / NOT EFFECTIVE

THE FOLLOWING DEFICIENCIES WERE NOTED:

DOCUMENTATION:

PERSONNEL:

ETT:

MATERIAL:

FAILURE CRITERIA:WATCHSTANDER FAILED TO

1. STEPS WERE CONDUCTED OUT OF SEQUENCE.
2. STEPS WERE MISSED.
3. DID NOT USE PROCEDURE.
4. STEPS WERE PERFORMED IMPROPERLY.
5. KNOWLEDGE WAS INSUFFICIENT TO CONDUCT EVOLUTION.
6. DID NOT OBTAIN PERMISSION FROM SUPERVISOR TO CONDUCT EV.
7. W/S ACTIONS CAUSED A LOSS OF PLANT CONTROL.
8. W/S FAILED TO REPORT/TAKE ACTION ON ALARM CONDITION.
9. W/S FAILED TO RECOGNIZE MATERIAL DISCREPANCY.
10. W/S FAILED TO RECOGNIZE DOCUMENTATION DISCREPANCY
11. W/S FAILED TO REPORT MATERIAL DISCREPANCY TO SUPERVISOR.
12. W/S FAILED TO REPORT DOCUMENTATION DISCREPANCY TO SUP
13. W/S SELF-SIMULATED ACTIONS.
14. INORDINATE DELAY OF ACCOMPLISHMENT OF ACTION.
15. W/S DID NOT WEAR PROPER PPE.
16. W/S DID NOT RECOGNIZE UNSAFE CONDITION.
17. W/S COMMITTED GENERAL SAFETY VIOLATION.
18. IMPROPER SAFETY WALKTHROUGH.
19. ETT DID NOT RECOGNIZE W/S ERROR.
20. ETT DID NOT STOP SAFETY VIOLATION.
21. ETT DID NOT PROPERLY IMPOSE PROPS.
22. ETT DID NOT STEP IN AT STEP IN POINT.
23. EVOLUTION/DRILL CANCELLED DUE TO POOR ETT ORGANIZATION

R)

TAB D DRILL CRITIQUE FORM

DRILL EVALUATION FORM

DRILL NR: _____ SPACE: _____ WATCHSTATION:

DRILL DESCRIPTION:

W/S: EFFECTIVE / NOT EFFECTIVE ETT: EFFECTIVE / NOT
EFFECTIVE

THE FOLLOWING DEFICIENCIES WERE NOTED:

SAFETY:

IMMEDIATE/CONTROLLING ACTIONS:

SUPPLEMENTARY ACTIONS:

RESTORATION & PLANT CONTROL:

ETT PERFORMANCE:

MATERIAL:

Potential Failure Criteria:

1. W/S did not recognize unsafe condition.
2. W/S committed general safety violation.
3. W/S performed steps out of sequence.
4. W/S omitted steps.
5. Steps completed improperly.
6. Incorrect action was performed.
7. W/S made incomplete/incorrect report/order.
8. Immediate/Controlling actions were not committed to memory.
9. W/S failed to use EOCC when required.
10. W/S failed to use other supporting documentation when required (EOP/MRC).
11. W/S actions lead to loss of plant control (Ack/report alarms, etc).
12. W/S took actions w/o order when order was required.
13. Inordinate delay of accomplishment of controlling/immediate actions.
14. W/S self-simulated required actions.
15. W/S demonstrated inadequate knowledge.
16. W/S failed to recognize casualty.
17. ETT performed incomplete safety walkthrough.
18. ETT did not recognize W/S error.
19. ETT did not stop safety violation.
20. ETT did not properly impose props.
21. ETT did not step in at step in point.
22. Evolution/drill cancelled due to poor ETT organization.

11 Apr 08

R)

TAB E LIST OF STANDARD SIMULATIONS

Note: Ships shall use reference (c) Appendix C for list of standard simulations.

USS (SHIP'S NAME)

Example:

<u>Simulation</u>	<u>Simulated condition</u>
Black rag	Black smoke
Yellowish liquid spray	Fuel/Lube oil leak
White powder	PKP

R)

TAB F MAIN SPACE FIRE DRILL GRADE SHEET

MAIN SPACE FIRE DRILL GRADE SHEET

Feb-08
Revision 6

Note: This gradesheet is provided as a tool to support assessment of a MSF Drill by ATG and support training by Ship's ETT and DCTT. In grading the watchstander initial actions for Major Oil Leak and Class B Fire, an effective drill will require that all EOCC controlling and immediate actions are met with verbatim compliance.

Single Point of Failure: (*) in text area denotes a single point of failure for MSFD. Grade is either full points or "NO", indicating that criteria was not satisfactorily met.

Safety Violations: A significant safety violation is a single point of failure.

INITIAL ACTIONS - MAJOR OIL LEAK (MFOL, MLOL, MHOL)

	<u>LEAK</u>	MAX PTS	PTS KEPT	COMMENTS
1	Watchstanders take all Controlling and Immediate Actions correctly IAW EOCC. *	4		
2	Leak reported to EOOW IAW EOCC.	2		
3	EOOW makes report to OOD IAW EOCC.	2		
4	Flying Squad called away IAW EOCC.	2		
5	Foam proportioning station manned IAW EOCC.	2		
6	Watch takes effective action to isolate and/or deflect the leak IAW EOCC.	4		
7	Affected machinery properly secured. (Time permitting) IAW EOCC.	2		
8	EEBD's shouldered by in-space watchstanders IAW EOCC.	2		
9	Flammable liquids washed to bilge with installed AFFF system IAW EOCC.	3		
10	PKP bottles brought to the scene IAW EOCC.	2		
11	Activate bilge sprinkling IAW EOCC.	3		
12	Space request permission to remove fire hazard IAW EOCC.	2		
	<u>FIRE</u>			
13	Watchstanders take all Controlling and Immediate Actions correctly IAW EOCC. *	4		
14	Activate bilge sprinkling IAW EOCC.	2		

4				
1	Class "B" Fire reported to EOW and EOW reports to OOD IAW EOCC.	2		
5				
1	EOW set/request OOD to set Condition II DC (or GQ) IAW EOCC.	2		
6				
1	Watch takes appropriate action to combat fire with AFFF hose reel and PKP IAW EOCC.	2		
7				
1	Ventilation properly set. Positive ventilation adjacent spaces, negative ventilation in affected IAW EOCC.	2		
8				
1	When fire determined out of control, space evacuation ordered by the space supervisor or EOW IAW EOCC.	2		
9				
2	All watchstanders evacuate with EEBD's. Capable of donning and activating them.*	3		
0				
2	Upon evacuation watch/supervisor activates HALON / Watermist and bilge sprinkling IAW EOCC.	3		
1				
2	EOW and Fire Marshal/Repair Party Leader notified following actions were taken: lighting in space remained on, ventilation shut down, HALON/Watermist activated, AFFF bilge sprinkling activated, space evacuated, status of watchstanders, location of fire.	2		
2				
2				
		52	0	TOTAL POINTS

REPAIR 5 MANNING

		MAX POI NTS	PTS KEPT	COMMENTS
1	Locker Condition II DC manned IAW EOCC. (Setting General Quarters is always a command prerogative)	1		
2	Assessment and Fire team manned with properly operating firefighting equipment.	2		
3	Repair 5 used RPM Checklist to manage and control the casualty.	1		
		4	0	TOTAL POINTS

ISOLATE SPACE, ESTABLISH SMOKE AND FIRE BOUNDARIES

		MAX POI NTS	PTS KEPT	COMMENTS
1	OSL/ Rep Locker leader receive a turnover (location of fire, status of evacuees, status of in-space isolation, recommended reentry route).	2		
2	Mechanical isolation conducted and reported by repair party personnel using the EOCC or RPM checklist.*	2		

3	Electrical isolation conducted and reported by repair locker personnel. Complete electrical isolation not required prior to space access. It must, however, be ongoing. OSL aware of systems not isolated.	1		
4	Fire boundaries set/maintained where conditions warrant IAW EOCC.	2		
5	Primary and secondary smoke boundaries set/maintained IAW EOCC.	1		
6	All personnel within the primary smoke boundaries wearing OBAs/SCBAs.	1		
7	HALON / Watermist effectiveness checked at multiple locations (If all HALON / Watermist ineffective drill is ineffective and discontinued)	2		
8	Investigators dispatched by repair locker.	1		
9	Investigators knowledgeable of ship's configuration and their assigned area. Verified that fire and smoke boundaries established. Checked vertical spread. Capable of entering all spaces, even if locked, and aware of the space contents. Investigators properly dressed with all required equipment. NFTI and firefinder knowledgeable.	2		
		14	0	TOTAL POINTS

	SPACE RE-ENTRY	MAX POI NTS	PTS KEPT	COMMENTS
1	Assessment team personnel (including the investigators) used and were capable of activating OBAs/SCBAs.	2		
2	Smoke Control Zone maintained to the maximum extent possible.	1		
3	Exhaust ventilation operated (if available) for 15 minutes following 15-minute halon soak period.	2		
4	AFFF bilge sprinkling activated prior to re-entry IAW RPM Checklist.	2		
5	AFFF Hose charged and manned.	2		
6	Assessment team adequately located and extinguished fires.	2		
7	Assessment team reported fire out and reflash watch set.	2		
8	Assessment team, Attack team and boundary personnel properly dressed out.	1		
		14	0	TOTAL POINTS

	ACCESS	VERTICAL	MAX POI NTS	PTS KEPT	COMMENTS
1	Were all Firefighter Carrier Sleeve attached to the rail with the green "GO" label facing up. *		1		
2	Was there an independent safety check of Carrier Sleeve and waist belt for proper fit and closure of the buckle and snap hook. *		1		
3	All waist belts left in the escape trunk to avoid weakening the belt from heat of flame.		1		
4	If applicable, was rail extension attached above the deck so that firefighter could attach the carrier sleeve prior to climbing onto the ladder.		1		
5	Was vertical re-entry approved by CO/DCO and discussed by OSL/RLI/DCA.		1		
			5	0	TOTAL POINTS

	COMMAND AND CONTROL		MAX POI NTS	PTS KEPT	COMMENTS
1	Formal turnover of firefighting responsibility from EOOW to DCA.		2		
2	Repair locker and DCC maintained a plot reflecting machinery and fire status.		2		
3	Effective communications between scene/repair locker/DCC.		1		
4	Supervisory personnel maintain effective control of the assessment effort. Knowledgeable of the RPM Checklist (Team Leader, OSL, Repair Locker Supervisor, EOOW, DCA)		2		
5	OBA/SCBA (as applicable) management effective.		2		
6	If relocation required, was an effective, temporary repair locker/DCC established in a safe location.		1		
7	All required reports received at the repair locker and DCC.		1		
8	DCA evaluate halon / watermist effectiveness based on reports from multiple locations.		2		
			13	0	TOTAL POINTS

MAIN SPACE FIRE EVALUATION

**MAX
 POI PTS
 NTS KEPT**

INITIAL ACTIONS

52	0
	0%

GRADE
 NOT EFFECTIVE

**NOT
 EFFE
 CTIV
 E
 FALS
 E
 TRUE**

FIRE FIGHTING ACTIONS

- 1 Repair 5 Manning
- 2 Isolate space. Establish Smoke and Fire Boundaries
- 3 Space Reentry
- 4 Vertical Reentry
- 5 Command and Control

4	0
14	0
14	0
5	0
13	0
TOTAL POINTS	50
	0
	0%

GRADE
 NOT EFFECTIVE

**NOT
 EFFE
 CTIV
 E
 FALS
 E
 TRUE**

Provide feedback to LCDR MORRELL (mark.morrell@navy.mil; Tel:619- 556-0940) regarding the use or grading criteria of this form.

CHAPTER 3 OPERATIONAL AND TECHNICAL AUTHORITY

SECTION 5 - QUALIFICATION PROCEDURES

Ref: (a) OPNAVINST 3500.34 series (PQS PROGRAM)
(b) NAVEDTRA 43100-5 series (PQS CATALOG)

3501. GENERAL. To provide policy and guidance on establishment of Engineering Department qualification programs.

3502. DISCUSSION. The Engineering Department qualification program consists of many dynamic components such as PQS, Job Qualification Requirement (JQR), and operational/maintenance experience. The purpose of the qualification program is to ensure assigned watch standers have the knowledge, skill and experience necessary to properly operate and maintain the equipment under all circumstances.

3503. PQS PROGRAM. An effective PQS program is one that provides for orderly watchstation qualification and consequent control of the watchbill. The Engineering Departmental PQS program shall be developed and administered per references (a) and (b). The Engineer Officer is responsible for the departmental PQS program and ensuring all requirements are met.

a. An effective PQS program, in conjunction with a functional Watch Team Replacement plan (WTRP) will ensure continuity in maintaining fully qualified watch teams and support watch team replacement requirements. Each ship shall develop a WTRP. A sample is provided in TAB A. The objective of the WTRP is to establish stable, PQS qualified watch teams and proficient training teams, and thus the focus on anticipated personnel losses and gains. The WTRP shall be constructed and maintained by the Main Propulsion Assistant and approved by the Engineer Officer. The WTRP will provide timely, realistic feedback to the PQS program manager regarding anticipated watch qualification requirements, and the basis for assigning PQS completion goals to individual watch personnel. The WTRP shall be updated quarterly at a minimum, and shall incorporate anticipated changes for at least one year ahead.

R) b. The PQS coordinator must ensure to match the applicable PQS from the engineering NAVEDTRA PQS to the shipboard watchstation. All applicable PQS must be accomplished for watchstation qualification.

3504. WATCH QUALIFICATION. The level of qualification authority and requisite verification process is established as follows:

WATCH STATION

MINIMUM QUALIFICATION BOARD MEMBERS

EOW

CO/CHENG

All other watch stations

Engineer Officer/Department
Qualification Board

a. Qualification Boards shall consist of selected engineering department officers, CPOs and Petty Officers as appointed by the Engineer Officer. Board members shall be PQS qualified for the watch station on which they are conducting boards. Boards may be at a length deemed appropriate by the Senior Member and may consist of any of the following: oral interview, written test, skill demonstration, documentation review and if appropriate, an engineering plant tour. Upon completion of a board a report to the Engineer Officer will be generated by the Senior Member, stating: Board Members, Topics reviewed and Level of Knowledge, Areas of Concern, and board's recommendation for qualification. The Engineer Officer and/or designated representatives may participate in Battle Force Intermediate Maintenance Activity (BFIMA) Core Skill qualifications.

b. Maintenance qualifications, especially BFIMA core skill qualifications, are generally via the JQR process. The Engineer Officer should participate in the qualification process of all engineering department personnel expected to perform critical maintenance including maintenance performed on other ships under the BFIMA concept.

c. Some maintenance skills require a periodic proficiency demonstration for the retention of the qualifications (e.g., NEC 4954/5/6 welders). If the qualification is required onboard or by the battle force (i.e., Battle Force Intermediate Maintenance Activity), the Engineer Officer must ensure actions are taken to maintain proficiency and the resulting certification retention.

TAB A WATCH TEAM REPLACEMENT PLAN

USS Ship's Name (Hull Number)

Date _____

Watch Station	CY02 Q1		CY02 Q2		CY02 Q3		CY02 Q4	
	Rank/Rate Name (Q,U/I)	PRD (MMYY)	Rank/Rate Name (Q,U/I)	PRD (MMYY)	Rank/Rate Name (Q,U/I)	PRD (MMYY)	Rank/Rate Name (Q,U/I)	PRD (MMYY)
EOW	MMC Jones (Q)	0802	MMC Jones (Q)	0802	MMC Jones (Q)	0802	MMC Renn (Q)	0604
	MMC Renn (Q)	0604	MMC Renn (Q)	0604	MMC Renn (Q)	0604	ENC Smith (Q)	1006
	ENC Smith (Q)	1006	ENC Smith (Q)	1006	ENC Smith (Q)	1006	GSMC James (Q)	1208
	GSMC James (U/I)	1208	GSMC James (U/I)	1208	GSMC James (Q)	1208	ENC Jane (U/I)	1007
	ENC Jane (PG 1002)		ENC Jane (PG 1002)		ENC Jane (PG 1002)			
Watch Supervisor	MM1 Dirk (Q)	1002	MM1 Dirk (Q)	1002	MM1 Dirk (Q)	1002	EN1 Hill (Q)	0504
	EN1 Hill (Q)	0504	EN1 Hill (Q)	0504	EN1Hill (Q)	0504	EN1 Dirt (Q)	1107
	GS1 Li (Q)	0203	EN1 Dirt (Q)	1107	EN1 Dirt (Q)	1107	GS1 Swabb (Q)	1106
	EN1 Dirt (U/I)	1107	GS1 Swabb (U/I)	1106	GS1 Swabb (U/I)	1106		
PAC	GS1 Swabb (Q)	1106	GS2 Hubble (Q)	0203	GS2 Hubble (Q)	0203	GS2 Hubble (Q)	0203
	GS2 Hubble (Q)	0203	GS2 Mason (Q)	0808	GS2 Mason (Q)	0808	GS2 Mason (Q)	0808
	GS2 Mason (Q)	0808	GS2 Muffin (Q)	1209	GS2 Muffin (Q)	1209	GS2 Muffin (Q)	1209
	GS3 Muffin (U/I)	1209			GS3 Shipp (U/I)	1105	GS3 Shipp (U/I)	1105

Submitted by _____

Approved by _____ Date _____

CHAPTER 4 ENGINEERING DEPARTMENT OPERATIONS

SECTION 1 - GENERAL PLANT SAFETY

Ref: (a) OPNAVINST 5100.19D (SAFETY PRECAUTIONS FORCES AFLOAT)
(b) COMNAVSURFORINST 5100.1 (NAVOSH PROGRAMS AFLOAT)

4101. OBJECTIVE. To establish basic requirements for the safe operation of the propulsion plant.

4102. PROPULSION PLANT SAFETY

a. Reference (a) serves as the authoritative document for all afloat safety issues and all engineering personnel should be made aware of its contents and requirements. Reference (b) provides amplification for reference (a) and outlines specific TYCOM safety requirements. Special attention should be given to hazardous material usage and disposal.

b. Before starting any significant machinery, the appropriate Space Supervisor shall inspect the space and equipment to ensure that the equipment is safe to operate and the space condition supports safe operation. Special attention should be paid to installed firefighting systems, physical security and ancillary support system alignments. Space Supervisors shall ensure watchstanders under their responsibility are directed in safety procedures, including the proper wearing of Personal Protective Equipment and adherence to established safety procedures during the maintenance, and repair of machinery and electrical gear. All unsafe and abnormal conditions shall be promptly reported to the EOOW/EDO and operations and/or maintenance shall be suspended until the unsafe condition is corrected. The EOOW/EDO will ensure all applicable conditions are entered in the Engineering Log.

c. Only qualified personnel shall be assigned to operate, repair, or adjust machinery in the engineering spaces.

R) d. All personnel working in or standing watch in machinery spaces when the plant is auxiliary steaming or underway shall wear fire retardant coveralls.

4103. SHIP SPECIFIC GUIDANCE. Ships are encouraged to expand this section to include specific guidance on the safety issues such as integrity of installed safety devices, departmental HAZMAT procedures, personnel injury response, environmental hazards, etc.

CHAPTER 4 ENGINEERING DEPARTMENT OPERATIONS

SECTION 2 - WATCH STANDING PROCEDURES

- Ref: (a) OPNAVINST 5100.19 series (SAFETY PRECAUTION FORCES AFLOAT)
(b) NSTM 077 (PERSONAL PROTECTIVE EQUIPMENT)
(c) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

4201. GENERAL. Basic watchstanding procedures need to be clearly understood by all Engineering Department personnel to allow a safe, organized watch turnover. Routine engineering evolutions will be accomplished to the standards contained in Chapter 2 of reference (c). Also, each member of the Engineering Department must know their individual responsibilities and limitations with respect to their watch.

4202. LENGTH OF WATCHES AND ROTATION

a. Underway watches will normally be four or five hours, and in no case longer than six hours in length without specific permission of the Engineer Officer. Watches shall not normally be longer than the safe stay time as defined by reference (a). In a heat stress emergency, the Commanding Officer must approve any watches longer than the safe stay time. Extension of safe stay time shall be entered in the Engineering Log.

b. Underway watch rotation shall be nominally on a 1-to-2 on/off cycle. For example, when a watchstander has completed a four hour watch, the next watch should not be assigned for a period of at least eight hours. Permission of the Engineer Officer is required if watch rotation off cycle is less than twice the on cycle.

c. With the exception of heat stress conditions, the above restrictions do not apply for evolutions such as General Quarters, Sea and Anchor Detail, UNREP, etc.

4203. WATCH RELIEF PROCEDURES

a. General. The following procedures apply to the conduct of all watch reliefs. A watchstander is considered properly relieved when the following requirements are fulfilled:

(1) Oncoming watchstanders shall make a tour of designated spaces to observe the status of all machinery, repairs in progress, tagged out equipment and evolutions in progress.

(2) Conduct a "talk-through" of watch station status with the watchstander on watch noting, at a minimum:

- R) (a) Significant items noted during review of logs for the period since last on watch, or 24 hours, whichever is less.

(b) Action being taken on equipment out of commission, and any maintenance in progress.

(c) Understand any abnormal equipment conditions, lineups or possible problem areas reported during previous watches including any special operating orders or caution tags in effect.

(d) Tests being conducted.

(e) Discrepancies noted during the pre-relief "walk through".

(3) Watch relief will not be permitted when plant conditions are changing significantly or when other unusual conditions exist (e. g. plant restoration from a casualty or necessary corrective action is immediately pending). Under such circumstances, the oncoming watch will either delay turnover or assist in the correction of abnormal conditions under the direction of the present watchstander.

(4) Subordinate watchstanders shall request permission from the immediate senior watchstander to be relieved and whenever possible, the EOWW should be relieved last. This sequence ensures accountability and maximum plant control.

(5) When satisfied with the knowledge of plant and/or watchstation conditions, each watchstander shall effect a formal relief by stating, "I relieve you" and reporting the watch relief to the immediate supervisor. The off-going watchstander shall acknowledge the watch relief stating "I stand relieved" and make an appropriate entry in the watch station logs, noting the time of relief and the name of the relieving watchstander. Off going supervisors for each space shall inform the EOWW that their watchstation has been relieved.

4204. ENGINEERING WATCHBILLS. A watchbill approved by the Commanding Officer (or Engineer Officer when watchbill approval authority is delegated) shall be kept in Main/Central Control. Subsequent changes to this watchbill are not authorized without the approval of the Commanding Officer (or Engineer Officer when watchbill approval authority is delegated). Special evolutions such as Sea & Anchor Detail, UNREP, etc., will be indicated either on the watchbill, Watch Quarter and Station Bill (WQSB) or as a separate document.

4205. PHYSICAL CONDITION OF THE WATCHSTANDERS. No one shall relieve a watch unless physically and mentally able to stand an alert and effective watch. A watchstander whose abilities are impaired by sickness or exhaustion will relate this condition to the senior person in the watch organization (EOWW/EDO/Watch Supervisor) and request relief. Before relinquishing the watch, the off-going watchstander and their watch relief will report to the senior person on watch for a proper watch turnover brief.

The EOOW/EDO shall make an entry in the Engineering Log explaining the reason and cause of the watch turnover. The Engineer Officer, Commanding Officer and Medical Department Representative shall be informed of the situation.

4206. MAIN CONTROL/CENTRAL CONTROL STATION. Only personnel necessary to carry out the safe and proper control of the engineering plant should be allowed in Main Control/CCS. Watchstanders whose duties require them to rove will not congregate in Main Control/CCS. They should come to Main Control/CCS only when reporting conditions to the Watch Supervisor or when otherwise directed by the EOOW or EDO. Ship's personnel not on watch, and visitors, will not be allowed in Main Control/CCS except with permission of the EOOW or EDO. When official business must be conducted in Main Control/CCS, the EOOW/EDO shall be informed and should make sure that this official business does not distract their watchteams responsibilities.

4207. BRIEFINGS. When tests, drills, or significant unusual operations are to be performed during a watch period, a briefing of the watchsection should be conducted before assuming the watch, if possible, but as the minimum, before beginning the event. The briefing should be conducted by the EOOW/EDO/ETT Leader for that section and will include such items as a description and reason for the special evolution, how it will be initiated, which parameters will vary, which watchstanders will be involved and what conditions the watchstanders should observe, and expected length of event. If any operational tests are to occur, EOOW/EDO will ensure all appropriate entries to the Engineering Log are made. If appropriate, a debriefing will be conducted after the section is relieved.

4208. TRAINING WATCHES. Personnel not qualified for a particular watchstation shall be assigned under-instruction (U/I) watch with a qualified watchstander. The U/I watch shall be under constant and direct supervision of the qualified watchstander. U/I watchstanders will not operate any equipment without direct supervision of a qualified watchstander and the express permission of the EOOW/EDO. All qualified watchstanders with U/I personnel assigned to their watchstation will initiate a thorough training program with the U/I watchstander. Applicable PQS and JQR shall be required watchstanding material.

4209. EMERGENCY ESCAPE BREATHING DEVICE. Following guidance supplements reference (c). Only one type of EEBD may be installed in engineering spaces and engineering personnel must be trained in its use. In no case shall two different types of EEBD's be used in the engineering spaces.

(Ship shall retain the note that is applicable below)

- R) a. USS WARSHIP has SCOTT EEBD's in the engineering spaces. As the SCOTT EEBD's approach shelf life expiration and the ship no longer has enough SCOTT EEBD's for all engineering spaces,

11 Apr 08

they shall all be replaced with OCENCO EEBD's so as to comply with Para 4209 above. SEED's shall then be turned in to the DCA. SEED's are no longer required for use with SCOTT EEBD's.

OR

- R) b. USS WARSHIP has OCENCO EEBD's in the engineering spaces. OCENCO EEBD's are not authorized for belt-worn use. SEED's are not required and are not to be used.

CHAPTER 4 ENGINEERING DEPARTMENT OPERATIONS

SECTION 3 - CASUALTY CONTROL

Ref: (a) OPNAVINST 3120.32 series (NAVY SORM)
(b) EOSS User's Guide (EUG)
(c) NSTM 079, Vol. 2 (DC PRACTICAL DC)
(d) NSTM 079, Vol. 3 (DC ENGINEERING CASUALTY CONTROL)
(e) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

4301. GENERAL. Routine operations are governed by the procedures of the Engineering Operational Sequencing System (EOSS). The Engineering Operational Casualty Control (EOCC) portion of EOSS governs general procedures for casualty control. EOSS is further explained in EOSS Users Guide (EUG). EDORM chapter 2 provides operational watchstander duties. Reference (e) outlines the list of TYCOM required ECC drills and in Chapter 2 describes the standard to which a watchstander will perform in order to be assessed as effective. References (c) and (d) identifies other casualty situations, not covered by EOSS, which should be addressed by the engineering department's training program.

4302. POLICY. The Engineer Officer should use the references above to develop procedures for conducting ECC drills. Specific guidance for conducting non-standard casualties, and drills not covered by EOSS or other ship's documents, should be developed and understood by both the Engineering Training Team and watchstanders. Guidance for the Engineering Training Team (ETT) and the conduct of drills (briefs/debriefs, documentation, simulations, etc.) is included in references (b) through(e).

4303. RESTRICTED MANEUVERING DOCTRINE. The ship's Restricted Maneuvering Doctrine provides a medium for Commanding Officers to modify standard casualty control procedures for restricted maneuvering situations and communicate guidance to watchstanders. The doctrine should promote a desired and predictable response from watchstanders to a wide range of unusual circumstances and casualties. The Restricted Maneuvering Doctrine shall provide clear guidance for when it applies, circumstances that require deviation from EOP and EOCC procedures, specific procedures and watchstanders authorized to initiate these deviations. A complete and current ship's Restricted Maneuvering Doctrine, which addresses steering casualties and configurations for restricted maneuvering, satisfies reference (a) requirement for an Emergency Steering Bill.

a. These minimum requirements for the Restricted Maneuvering Doctrine do not prevent Commanding Officers from expanding the scope of their doctrines to address additional engineering or ship control considerations. The doctrine can be extremely useful in establishing pre-planned responses to a wide variety of potentially dangerous situations and casualties including those

not directly related to main propulsion engineering. The doctrine can be highly effective in establishing conditions to prevent casualties altogether. Commanding Officers will apply the principles of Operational Risk Management in their doctrine. Additionally, Commanding Officers are encouraged to use the Bridge Resource Management course in the development of their doctrines.

Additional topics that may be addressed in the doctrine:

- Additional watch stations to man, qualifications of watchstanders and watch bill approval authority.
- Specific engineering and ship control equipment configurations.
- Procedures for fire and flooding outside of main propulsion spaces and casualties to critical ship control equipment.
- Actions to be taken in event of collision, battle or grounding.
- Modification to visitors, maintenance and training policies to engineering and ship control spaces while in restricted maneuvering.
- Specific duties and authority of the Plant Control Officer.
- Modification of EOCC and EOP for combat operations.

CHAPTER 4 ENGINEERING DEPARTMENT OPERATIONS

SECTION 4 - PHYSICAL SECURITY OF VITAL MACHINERY

Ref: (a) NSTM 241 (MRG/COUPLINGS/CLUTCHES)
(b) NSTM 604 (LOCKS KEYS AND HASPS)

4401. GENERAL. This chapter outlines the responsibilities and delineates the procedures for providing physical security to vital shipboard machinery.

4402. BACKGROUND. Physical security of ship's machinery is essential in maintaining operational readiness. The ship's mission is placed at risk when vital machinery is vulnerable to negligent or malicious damage. Main reduction gears have long been subject to elaborate security measures. Similar, but less elaborate measures, are directed for other equipment which if damaged would severely impact primary mission area readiness. The physical security program depends on three ingredients: teamwork; deterrence of unauthorized access by use of locks and locking devices; and vigorous and thorough inspection and watch standing procedures, which enhance vigilance against tampering. All three aspects must be fully functional for security to be maintained.

4403. DEFINITIONS. For the purposes of this section, the following definitions shall apply:

a. Main propulsion space: Shipboard spaces containing a prime mover for ship propulsion. Included are Firerooms, Enginerooms, Main Motor Rooms, and spaces containing reduction gears and Propeller Pitch Control Systems.

b. Engineering auxiliary spaces: Shipboard spaces containing auxiliary equipment vital for support of main propulsion spaces or vital to individual primary ship mission areas. The following are examples: Main or Emergency Generator Rooms, Switchboard Rooms, Fuels, Firemain, and CHT Pump Rooms, Shaft Alleys containing shaft bearings or stern tubes, Air Conditioning and Refrigeration Spaces, HP, MP, LP, or De-ballast Air Compressor Rooms, Evaporator Rooms, Steering Gear and Ram Rooms, IC/Gyro Rooms, and Special Frequency MG and Static Converter Rooms.

R) c. Locked: Entry or manipulation positively prevented by a device requiring an external key or combination. Labels indicating the locked position, e.g., "Locked Open" or "Locked Closed", shall be attached.

R) d. Locking device: Any device, such as lock wire or keeper, which serves as a positive stop to prevent inadvertent manipulation. Valves requiring locking devices and their normal position are generally shown on EOSS piping diagrams. Labels

that indicate this normal position, e.g., "Open" or "Closed" shall be attached.

4404. APPLICABILITY. The contents of this Section apply to all main propulsion and auxiliary spaces on board ship regardless of the parent department maintaining cognizance. This section does not apply to security for the following classes of spaces that are covered by separate directives:

- a. Communications, Crypto, or Operations spaces.
- b. Accountable stores, Storerooms, and Financial Offices.
- c. Weapon Spaces or Magazines.

4405. POLICY. All ships shall take reasonable and sufficient precautions to prevent disruptions to primary mission area readiness by malicious or accidental damage to vital main and auxiliary machinery. These precautions must include, as a minimum, the direction in the following paragraphs.

4406. LOCKED SPACES. All shipboard main propulsion and auxiliary spaces must be locked or manned at all times both inport and underway. Spaces shall be considered manned if a roving patrol or system monitor enters the spaces at least every 60 minutes and inspects the space for fire, flooding or sabotage. If locked, all accesses must be physically checked at intervals not to exceed 60 minutes. See EDORM Article 4408 for amplifying guidance for escape trunks designed with quick acting doors. Roving patrols may be required to modify their rounds to support unusual material conditions, repair efforts or special evolutions such as the ballasting or de-ballasting at the discretion of the Engineer Officer.

4407. EQUIPMENT REQUIRING LOCKS/LOCKING DEVICES. In addition to protection afforded by locking or manning spaces, the following minimum specific equipment shall have either locks or locking devices. The Engineer Officer shall identify in a standing order any additional valves, operators etc., which shall be locked or equipped with locking devices.

a. Equipment requiring locks:

(1) Main shaft reduction gear access covers to include de-humidifiers and vent fog precipitators (medium security locks as required by references (a) and (b)).

(2) Ship Service or emergency generator reduction gear inspection covers (unless generator is contained in module/enclosure that is normally locked and a minimum of two bolts per access cover is lockwired).

(3) Main/auxiliary/waste heat boiler safety valves.

(4) Gas turbine module access doors when inport and secured. The designated standby generator may be left unlocked provided the space is manned per section 4406.

b. Equipment requiring locking devices

(1) Line shaft bearing access covers. (A minimum of two opposing bolts shall be lockwired per access cover).

(2) Main Reduction Gear sight flow indicators shall be secured in accordance with reference (a).

(3) All main lubricating oil pump suction and discharge cutout valves (open) per applicable EOSS procedure/diagrams.

(4) Systems where EOSS procedures/diagrams call for components to be "locked" in a specific position.

(5) All ballast/de-ballast valves whose operation would allow interconnection of oil or oily waste with the sea or allow sea flooding of operating spaces.

(6) All Potable Water and Feedwater Tank sounding tubes (closed).

(7) CHT system vent valves (open).

(8) Stripping pump discharge valves to the fuel transfer system (closed).

(9) Stripping pump suction valves from the fuel service pump suction headers (closed).

(10) Any lubricating oil drain, rundown, or isolation valve, which by its operation could starve, limit or interrupt lubrication to any main engine, reduction gear, generator or line shaft bearings shall have a device indicating the position for normal operation. The need for locking devices for smaller valves (i.e. sampling connections less than one quarter inch in diameter) may be promulgated in the Engineer Officer Standing Orders.

(11) Line shaft bearing (LSB) sampling valve piping shall have an anti-rotation device or tack weld to prevent separation from bearing housing. Also, LSB sampling valves shall have a locking device at the valve itself, regardless of whether or not the sampling pipe has a removable cap.

4408. SPACE LOCKING PROCEDURES. When a space is designated to be locked, entry via all accesses to that space must be restricted. Machinery spaces frequently have emergency escape trunks, hatches and scuttles. Locks installed on emergency egress hatches, doors and scuttles must not impede exit from within the space under any conditions, manned or unmanned. All

locks shall be removed when spaces are manned to facilitate watch stander egress and entry for damage control and rescue purposes. The following measures allow egress from a locked space while increasing security:

a. For scuttles and hatches with permanently installed quick-acting double (top and bottom) handwheels, a hinged box may be attached covering the upper handwheel without impeding the ability to open the scuttle from within the space.

b. For scuttles and hatches with removable handwheels, the external handwheel may be removed and the attachment point covered with a smaller lockable box.

c. Quick Acting Doors (QAD) for escape trunks should be configured to deter unauthorized exterior access without preventing authorized access for firefighting, personnel recovery, etc. Therefore, ships should not completely remove the exterior door handle. Acceptable deterrence schemes include the manufacture of a lockable cover for the external door handle, use of a tamper seal to indicate unauthorized access or shortening the exterior door handle. If the exterior handle is shortened, a dogging wrench should be available in the vicinity of the QAD to allow external access to the escape trunk in case of an emergency.

4409. WATCH STANDER AND SUPERVISOR INSPECTIONS. Any lock can be defeated, given enough time. The locks prescribed in this section will be ineffective without the additional protection of alert, conscientious watch standers and supervisors. Standard light-off procedures such as those in EOSS direct that external visual inspection preceding any light-off attempt. Personnel Qualification Standards for all ship classes include monitoring security of engineering spaces and machinery. For all ships, component procedure "MLOC" requires verification of locks and locking devices prior to plant light off. Thorough supervisory review of both physical devices and watch standers' attention to security is absolutely necessary.

4410. BREACH OF SECURITY. When a breach of the security measures described in this section is detected or suspected, the EOOW/EDO shall notify the Engineer Officer immediately. Any further operations, involving that equipment or that space, shall be delayed until a thorough investigation can be completed. If evidence of tampering is discovered during the investigation, resumption of normal operations may begin only after approval of the Commanding Officer. An entry in the Engineering Log shall be made, describing the space, form of breach, and measures taken to secure the breach upon it's discovery, with brief follow-on entries describing the results of any investigation.

CHAPTER 4 ENGINEERING DEPARTMENT OPERATIONS

SECTION 5 - PROPULSION PLANT MATERIAL READINESS, CLEANLINESS AND PRESERVATION

Ref: (a) U. S. Naval Regulations Art 834 (CARE OF SHIPS)
(b) COMFLTFORCOMINST 4790.3series (JFMM)
(c) NSTM 631 V1-3 (PRESERVATION OF SHIPS GENERAL)
(d) NSTM 555 V1 (SURFACE SHIPS FIREFIGHTING)

4501. PURPOSE. This chapter establishes guidelines to ensure satisfactory propulsion plant material readiness, cleanliness and preservation.

4502. DISCUSSION. Critical elements of "good engineering practice" are the awareness and enforcement of high material readiness, cleanliness and preservation standards in all engineering spaces. Enforcing high standards in these crucial areas results in sustained readiness improvements by optimizing equipment operation, the elimination of fire hazards created by accumulation of trash, debris and the presence of flammable fluids, and extends machinery and space life span. As specified in references (a) through (d), cleanliness and preservation are direct reflections of the care and precision with which professional engineers operate their machinery. Clean, well-preserved propulsion spaces not only foster pride on the part of the crew, but also make the early identification and correction of engineering equipment deficiencies easier.

a. The standard for flammable liquid systems shall be no leaks. Lube and hydraulic oil leaks shall be corrected or controlled such that oil shall not be allowed to pool or collect on machinery, foundations, and deck plates or in the bilges. Do not tolerate Fuel Oil Leaks. Fuel oil leaks, exceeding what may be authorized in various sections of NSTM or equipment technical manuals are to be corrected immediately. Flammable liquids should be removed from bilges as soon as possible in accordance with environmental regulations and safety concerns.

4503. MATERIAL SELF ASSESSMENT. The Commanding Officer is charged by references (a) and (b) with the responsibility for conducting periodic material inspections and to institute procedures to find existing material deficiencies and effect corrective action.

a. Material self assessment is a troublesome area in which to train, but should be central to departmental routine and training evolutions. An accurate material self assessment is possible from a review of Departmental Tag Out Logs, CSMP, Equipment Status Logs (Equipment Deficiency Log (EDL) and Ship's Force Work List (SFWL)), Departure From Specifications (DFS) Log, Equipment Calibration Status Reports, and 8 O'clock Reports. However, discovery is only half of the battle. The management

documents above, when properly used, provide necessary tools to track, prioritize and correct material deficiencies to optimize engineering readiness. As a direct result, this increase in engineering material readiness serves as a basis for increasing the ship's overall battle readiness. All supervisory personnel shall emphasize the importance of clear communication up and down the chain of command concerning the disposition of material deficiencies.

b. Ship specific material readiness policies and guidelines shall be amplified as part of the Engineer Officer's Standing Orders. Additional general practices are offered below:

(1) An aggressive Zone Inspection program is an excellent tool to constantly evaluate material readiness.

(2) MLOC/light-off orders can be more than a checklist; it is also a thorough, well-conceived material assessment.

(3) EOP training reveals many material deficiencies that need to be aggressively tracked and resolved.

(4) Standards for equipment performance have to be based on sound technical guidance only.

(5) Encourage "new eyes" to look at your spaces/equipment.

(6) Use all available evolutions to assess material status (PMS, drill debriefs, pre-watch and on-watch tours, etc.).

(7) Calibration Readiness Policy.

c. Ships may provide specific guidelines as to cleanliness/preservation requirements for the following:

(1) Bilges inspection/cleaning guidance.

(2) Space cleaning responsibility and a procedure to address "community areas".

(3) Boiler tube blowing policy.

(4) Steam leak correction policy.

(5) Flammable liquid leak correction policy.

(6) Use of unauthorized cleaners/degreasers.

(7) Cleanliness standards in a shipyard environment.

(8) Valve maintenance policy.

11 Apr 08

(9) Policy for watchstanders to carry flashlights and rags to assist in the inspection of equipment.

d. Deficiencies that require outside assistance, or which cannot be readily corrected (e.g., longer than 30 days) shall be transferred to the Current Ship's Maintenance Project (CSMP). This does not preclude the early documentation of any material deficiency in the CSMP. There shall be linkage with the ship developed tracking system and the Engineering department 8 o'clock reports.

CHAPTER 5 ENGINEERING MANAGEMENT PROGRAMS

SECTION 1 - GENERAL ENGINEERING MANAGEMENT TENETS

Ref: (a) COMNAVSURFORINST 3502.1 series (SFTM)

5101. GENERAL. Engineering management programs are inseparable from good engineering practice and their inception was the result of much experience and in some cases, sobering tragedy. There is no greater watchstanding prerogative for Engineering Officers, Watch Officers, Program Managers and watchstanders than to ensure the tenets and spirit of engineering management are properly implemented and administered on a daily basis. To this end, all engineers should be familiar with the guiding references, and fully comprehend and appreciate their deckplate level of responsibility for each engineering management program.

5102. BEST PRACTICES. Most management programs have material, level of knowledge, operational and administrative components - all of which must be in place for the program to be effective in minimizing risk and maximizing readiness. Afloat Training Group program check sheets provide the tools to effectively self-assess all engineering programs. Regular and objective use of these checklists will identify program weaknesses and areas that may require additional training focus. The best Program Managers and the best run Engineering Departments are exceptionally adept at tailoring their training to address identified program deficiencies. Another hallmark consistently found in effectively managed programs is a commitment to consistent and constant enforcement of high standards from all, for deckplate knowledge and performance. Lastly, a thorough and meaningful review of the program's products (logs, reports, readouts, and LTG) has to be a priority for all levels of supervisory personnel.

5103. ADMINISTRATION. All program responsibilities and objectives are clearly outlined in the baseline reference documents, and these program responsibilities must be familiar to all levels of the chain of command. The role of the Program Manager is to administer the program, but it is the task of the Watch Officer/EDO and other Supervisors to ensure that program objectives are met by a critical review of program products and that program standards are maintained by a day-to-day, watch-to-watch enforcement of deckplate performance. Program Managers may include these checklists as part of EDORM Chapter 5, TAB A.

5104. LEVEL OF KNOWLEDGE. Naval propulsion systems continue to modernize, and equipment and system interrelationships become more automated with increasing safeguards, monitors and control functions. As a consequence, the watchstanders' need for more technical knowledge, as opposed to manual skills, increases. A net effect is that in this environment, fewer watchstanders will be required to maintain and operate increasingly more complex equipment. In the face of budget constraints and rigorous repair philosophy, there is a need for increased watchstander knowledge

of their systems, capabilities and program responsibilities (e.g., QA, OLV, water chemistry, calibration, etc.).

5105. SPECIAL CONSIDERATIONS. Naval Occupational Safety Hazard (NAVOSH) Programs are designated as safety related (Electrical Safety, Hearing Conservation, Heat Stress, and Tag Out) and are of particular importance due to the risk of injury to personnel and/or damage to equipment. Consequently, these four programs will be assessed by ATG during the ULTRA C/E/S with results applying to eligibility for the Safety Award as outlined in reference (a).

5106. MANAGEMENT IN AN INDUSTRIAL ENVIRONMENT. The industrial environment has many unique challenges to program management, and requires increased emphasis, especially on the NAVOSH programs and in repair intensive programs such as Quality Assurance. It is highly recommended that in the period before the industrial availability begin, all crewmembers become accustomed to the additional challenges and modifications required to maintain program integrity in the industrial environment.

5107. RESPONSIBILITIES. The EOOW (underway) or EDO (inport) is responsible to the Engineer Officer for ensuring that program requirements are met while executing the daily operation of the department. Watchstanders shall be instructed in program requirements and are responsible to notify the EOOW/EDO when observing program deficiencies. The EOOW/EDO shall then notify the Engineer Officer so corrective action can be determined, promptly initiated and, if required, appropriate remarks can be entered in program documents or the Engineering Log. Per EDORM Chapter 2, Program Managers are responsible for meeting program objectives, maintaining required equipment, logs, records, instructions, and references for their assigned program. Each engineering program should be periodically self-assessed for effectiveness using the Afloat Training Group checklists.

CHAPTER 5 ENGINEERING MANAGEMENT PROGRAMS

SECTION 2 - ENGINEERING MANAGEMENT PROGRAMS

Ref: (a) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

5201. OBJECTIVES. The objective of program management is to establish a standardized system that aids departmental personnel to properly execute and administer the department's responsibility. To achieve this objective, all departmental personnel (watchstanders, supervisors and program managers) need to understand the rules and expectations for the programs in question.

5202. PROGRAM RESPONSIBILITIES. The Chief Engineer shall ensure each Program Manager is an Engineering Department officer or senior enlisted. Special cases can occur where manning limits the Program Manager to a Second or First Class Petty Officer; in these cases the Chief Engineer shall ensure they fully understand the duties and responsibilities.

5203. POLICY. TAB A is a list of Engineering Programs with references. The Program Manager will ensure that each program contains all required documentation as to not be dependant upon another programs references for validation (maintained in a stand alone format).

5204. OTHER SOURCES OF ASSISTANCE. Other information sources have proven valuable for ensuring that engineering programs are kept current and program managers are informed of current changes and trends in engineering administrative programs. Some possible sources for useful program information can be found in the following:

- a. TYCOM Information Bulletins
- b. ATG Newsletters
- c. Professional Publications
- d. NAVSAFECEN Bulletins

TAB A ENGINEERING PROGRAMS LIST

Bearing Records

Ref: (a) NSTM's 231, 241, 244
(b) PMS

Boiler Water/ Feed Water and Potable Water Test and Treatment

Ref: (a) NSTM's 220,221, 233, 533
(b) OPNAVINST 9220.2
(c) NAVMED P-5010-6

Electrical Safety

Ref: (a) OPNAVINST 5100.19 series
(b) NSTM 300

Engineering Department PQS

Ref: (a) OPNAVINST 3500.34 series PERSONNEL QUALIFICATION (PQS) PROGRAM
(b) CINCPACFLTINST 3500.16 series (PQS STANDARDS)
(c) NAVEDTRA 43100.1 series (PQS MANAGER'S GUIDE)
(d) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

Engineering Department Training

Ref: (a) OPNAVINST 3120.32 SERIES, CHAPTER 8 (SORM)
(b) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)
(c) COMNAVAIRPACINST 3500.20 (CARRIER TRAINING AND READINESS MANUAL)

Engineering Operational Sequencing System (EOSS)

Ref: (a) EOSS Users Guide (EUG)
(b) Program Manager must be in writing

Fuel Oil Quality Management

Ref: (a) NSTM's 541, 542
(b) OPNAVINST 5090.1 series

Hearing Conservation

Ref: (a) OPNAVINST 5100.19 series

Heat Stress

Ref: (a) OPNAVINST 5100.19 series

Legal Records and Reports

Ref: (a) U.S. Navy Regulations
(b) NAVSEA 3120/2D (Rev 10-81)
(c) NAVSEA 3120/1 (Rev 8-85)
(d) SECNAVINST 5212.5 series
(e) OPNAVINST 3120.32 series
(f) OPNAVINST 9094.1 series
(g) NSTM 090
(h) NSTM 079V3

Lubricating/Hydraulic Oil Quality Management

Ref: (a) NSTM's 262, 233, 556, 244, 245
(b) OPNAVINST 5090.1 series

Marine Gas Turbine Equipment Service Records

Ref: (a) NSTM 234
(b) GGTB 0
(c) GGTB 3 (Logbooks and Service Records)

On-Line Verification (Steam Propulsion Only)

Ref: (a) On Line Verification Tech Manual (Ship Specific)
(b) COMFLTFORCOMINST 4790.3
(c) NSTM 225
(d) Planned Maintenance System

Operating Logs

Ref: (a) U.S. Navy Regulations
(b) NSTM 079 (V3)
(c) EOSS Users Guide (EUG)
(d) COMNAVSURFOR SAN DIEGO CA 291751Z JAN03 (ICAS)

Quality Assurance

Ref: (a) CINCLANTFLTINST/CINCPACFLTINST 4790.3
(b) NAVSEA 0948-LP-045-7010
(c) NAVSEA Standard Items
(d) NSTM's 074, 075, 221, 503, 504, 505

Tag-Out

Ref: (a) OPNAVINST 3120.32 series
(b) CINCLANTFLTINST/CINCPACFLTINST 4790.3
(c) OPNAVINST 4790.4
(d) S0400-AD-URM-010 NAVSEA Tag Out Users Manual (TUM)

APPENDIX A MINIMUM WATCH REQUIREMENTS BY SHIP CLASS

Ref: (a) OPNAVINST 3500.39 (Operational Risk Management)

1. GENERAL. Where manning or training levels limit the ship's ability to follow minimum standards in this instruction, the ship shall request a waiver of these requirements from the Type Commander via the chain of command (Format in Figure A-1 below). If applicable, the ship shall submit a request for permanent changes to the EDORM watchstanding minimum for the class. Specific watch station manning requirements for Conditions I and III have not been addressed. Refer to the effective Ship Manning Document for Condition I and III requirements.

a. Optimal Manning. Personnel assigned to combined watches must be qualified at both watch stations. Ships desiring other changes shall submit a waiver request to the TYCOM via the ship's ISIC using format provided in figure A-1.

b. Casualty Response Team (CRT) Concept. EOCC controlling and immediate actions are designed to be adequately accomplished using a minimum number of watchstanders to render the affected system(s) to a safe and stable condition. The CRT concept has been proven effective as a method to augment minimum, routine deckplate watchstanding levels and to assist in the repair/restoration of affected system(s) to normal operation in the event of casualties. The best practice seems to be to tailor the Casualty Response Team (CRT) to ensure adequate expertise exists to respond to a majority of expected casualties (electrical, auxiliary, propulsion, firefighting, etc.). The CRT is normally in an "on call" status, deployed via the 1MC with the CRT leader reporting directly to the EOOW for direction.

c. Operational Risk Management (ORM). As specified in ref (a) ORM applies both to day-to-day operations and during crisis periods. Engineering department personnel have a fundamental responsibility to safeguard highly valued personnel and material resources, and to accept only the minimal level of risk necessary to accomplish assigned tasks. Enclosure (1) of ref (a) provides the methodology and a practical example for using ORM as a decision making tool. Ships are encouraged to combine watches where permitted after weighing individual watchstander/watch section strengths, material readiness conditions, and the operational environmental considerations.

FIG A ENGINEERING WATCH REQUIREMENT WAIVER REQUEST

FROM (ISIC)

TO COMNAVSURFOR SAN DIEGO CA//N7/N71//

INFO COMNAVSURFOR SAN DIEGO CA//N7/N71//
COMNAVSURFLANT NORFOLK VA//N7/N71//
(Applicable CLASSRON)
(SHIP)

UNCLAS //N03540//

SUBJ/ (SHIP CLASS) WATCH REQUIREMENT WAIVER (CHANGE) REQUEST

REF/ / (AS REQUIRED)

AMPN/NARR (AS REQUIRED)

RMKS/1. REQ WAIVER (CHANGE) FOR (WATCH NAME AS DEF IN APP A).

A. CHANGE AFFECTS: (EXPLAIN IF CLASS OR INDIVIDUAL SHIP)

B. CONDITIONS: (EXPLAIN FOR WHICH CONDITIONS WATCH WAIVER
(CHANGE) IS APPLICABLE)

C. DURATION OF WAIVER: (N/A FOR CHANGE. FOR WAIVER, MAY BE
BASED ON TIME, EVENT OR PERSONNEL)

D. RATIONALE FOR REQUESTING WAIVER (CHANGE): (EXPLAIN SPECIAL
CIRCUMSTANCES FOR GRANTING WAIVER OR RATIONALE FOR CLASS CHANGE).

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
AGF 3/11 and LPD 4 CLASS

C A S C
 O U T O
 L X E N
 D I A D
 L M
 I I I
 R A N IV
 O R G
 N Y

Watch Station

	1	1	(1) EOOW
	1	2	(2) ER SUPERVISOR (MMOW)
		2	(3) ER THROTTLEMAN
	1	2	(4) ER UPPER LEVEL
	1	2	(5) ER LOWER LEVEL
	1	2	(6) ER MESSENGER
1	1		(7) ER COLD IRON
	1 (4)	2 (4)	(8) DIST PLANT OPER
	1 (4)	2 (4)	(9) SSTG WATCH
		2 (6)	(10) SHAFT ALLEY WATCH
R)	1	1	(11) DAMAGE CONTROL SUPER
R)	1	1	(12) SOUNDING AND SECURITY
	1%	2	(13) FR SUPERVISOR (BTOW)
	1% (13)	1%	(14) FR BURNERMAN
	1%	2	(15) FR UPPER LEVEL
	1% (5)	2	(16) FR LOWER LEVEL
	1 (6)	2 (6)	(17) FR MESSENGER
1 (7)	1 (7)		(18) FR COLD IRON
	1	1	(19) EM SUPERVISOR/EPCC
		1	(20) IC & GYRO SUPERVISOR
	1#	1	(21) OIL KING ASSISTANT
1 (12)	1 (12)	1 (12)	(22) AC&R
	1 (13)	2 (13)	(23) Boiler Console Operator

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. % = PER BOILER
3. # = OIL KING REQUIRED IN DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
ARS 50 CLASS

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
	L	M		
I	I	I	IV	Watch Station
R	A	N		
O	R	G		
N	Y			

		1	(1) EOOW/PROP CONSOLE OPER
	1	1	(2) ELECT CONSOLE OPER
	1	1	(3) ROVING EQUIP MONITOR (MMR)
	1	1	(4) ROVING EQUIP MONITOR (AMR)
1	1 (3)	1	(5) SOUNDING AND SECURITY
1 (5)			(6) COLD IRON WATCH
	1#	1	(7) OIL KING ASSISTANT

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. # = OIL KING REQUIRED IN DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
CG 47

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I	IV	Watch Station
R	A	N		
O	R	G		
N	Y			

			1*	(1) EOOW
			1(1)*	(2) PACC OPERATOR
			1(1)*	(3) EPCC OPERATOR
			1(1)*	(4) DCC OPERATOR
R)	1	1		(5) CCS WATCH
			2	(6) ER EQUIPMENT OPERATOR
		1	1(9)	(7) ER EQUIPMENT MONITOR
		1(7)	1	(8) AUX ROOM OPERATOR
			1	(9) AUX ROOM MONITOR
	1	1	1(9)	(10) SOUNDING AND SECURITY
		1(7)	1(7)	(11) GTG OPERATOR
	1(10)			(12) COLD IRON E/M
		1#	1	(13) OIL KING ASSISTANT

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. * = THE EOOW WATCH STATION MAY BE COMBINED WITH THE DCC OPERATOR AND THE EPCC OPERATOR OR WITH THE DCC OPERATOR AND THE PACC OPERATOR. IF THE EOOW IS ACTING AS THE PACC OPERATOR, A SEPARATE EPCC WATCHSTANDER IS REQUIRED. IF THE EOOW IS ACTING AS THE EPCC OPERATOR THEN A SEPARATE PACC OPERATOR IS REQUIRED.
3. # = OIL KING REQUIRED IN DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
CG 47 VLS SMART CLASS

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I		
R	A	N	IV	Watch Station
O	R	G		
N	Y			

			1*	(1) EOOW
			1(1)*	(2) PACC OPERATOR
			1(1)*	(3) EPCC OPERATOR
R)	1	1		(4) CCS Watch
			2	(5) ER OPERATOR
			1	(6) AUX MACH OPERATOR
	1(9)	1	1(6)	(7) SOUNDING AND SECURITY
		1#	1	(8) OIL KING ASSISTANT
	1			(9) COLD IRON

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH WATCH STATION SO NUMERICALLY DESIGNATED.

2. * = THE EOOW WATCH STATION MAY BE COMBINED WITH THE DCC OPERATOR AND THE EPCC OPERATOR OR WITH THE DCC OPERATOR AND THE PACC OPERATOR. IF THE EOOW IS ACTING AS THE PACC OPERATOR, A SEPARATE EPCC WATCHSTANDER IS REQUIRED. IF THE EOOW IS ACTING AS THE EPCC OPERATOR THEN A SEPARATE PACC OPERATOR IS REQUIRED.

3. # OIL KING REQUIRED PER DUTY SECTION

11 Apr 08

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
CG 47 VLS SMART CLASS (ALL ELECTRIC CONVERSION)

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I		
R	A	N	IV	Watch Station
O	R	G		
N	Y			

			1	(1) EOOW/PACC OPERATOR
			1	(2) EPCC OPERATOR
R)	1	1		(3) CCS watch
			2	(4) ER OPERATOR
			1	(5) AUX MACH OPERATOR
	1 (8)	1 (5)	1 (5)	(6) SOUNDING AND SECURITY
		1#	1	(7) OIL KING ASSISTANT
	1			(8) COLD IRON

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH WATCH STATION SO NUMERICALLY DESIGNATED.
2. # OIL KING REQUIRED PER DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
DDG 51 CLASS

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I	IV	Watch Station
R	A	N		
O	R	G		
N	Y			

			1*	(1) EOOW
			1(1)*	(2) PACC OPERATOR
			1(1)*	(3) EPCC OPERATOR
			1(1)*	(4) DCC OPERATOR
R)	1	1		(5) CCS WATCH
			2	(6) ENGINE RM OPERATOR
		1	1(8)	(7) PROPULSION SYS MONITOR
		1(7)	1	(8) AUXILIARY SYS MONITOR
	1	1	1(8)	(9) SOUNDING AND SECURITY
	1(9)			(10) COLD IRON
		1#	1	(11) OIL KING ASSISTANT

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.

2. * = THE EOOW WATCH STATION MAY BE COMBINED WITH THE DCC OPERATOR AND THE EPCC OPERATOR OR WITH THE DCC OPERATOR AND THE PACC OPERATOR. IF THE EOOW IS ACTING AS THE PACC OPERATOR, A SEPARATE EPCC WATCHSTANDER IS REQUIRED. IF THE EOOW IS ACTING AS THE EPCC OPERATOR THEN A SEPARATE PACC OPERATOR IS REQUIRED.

3. # = OIL KING REQUIRED IN DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
FFG 7 CLASS

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I	IV	Watch Station
R	A	N		
O	R	G		
N	Y			

			1*	(1) EOOW
			1(1)*	(2) PCC OPERATOR
			1(1)*	(3) EPCC OPERATOR
			1(1)*	(4) DCC OPERATOR
1	1			(5) CCS WATCH
			1	(6) PROP SYS MONITOR
		1	1	(7) AUX SYS MONITOR
1				(8) COLD IRON
1(8)	1		1(7)	(9) SOUNDING AND SECURITY
	1#		1	(10) OIL KING ASSISTANT

NOTES:

- NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
- * = THE EOOW WATCH STATION MAY BE COMBINED WITH THE DCC OPERATOR AND THE EPCC OPERATOR OR WITH THE DCC OPERATOR AND THE PACC OPERATOR. IF THE EOOW IS ACTING AS THE PACC OPERATOR, A SEPARATE EPCC WATCHSTANDER IS REQUIRED. IF THE EOOW IS ACTING AS THE EPCC OPERATOR THEN A SEPARATE PACC OPERATOR IS REQUIRED.
- # = OIL KING REQUIRED IN DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
LCC 19 CLASS

C A S C
O U T O
L X E N
D I A D
L M
I I I
R A N IV
O R G
N Y

Watch Station

	1	1	(1) EOOW
	1	1	(2) ER SUPERVISOR (MMOW)
		1	(3) ER THROTTLEMAN
	1	1	(4) ER UPPER LEVEL
	1	1	(5) ER LOWER LEVEL
	1	1 (18)	(6) ER MESSENGER
1 (19)	1	1 (4)	(7) ER COLD IRON
	1 (4)	1 (4) *	(8) DIST PLANT OPER
		1 (6)	(9) SSTG WATCH
R) 1	1	1	(10) SHAFT ALLEY WATCH
1	1	1	(11) DAMAGE CONTROL SUPER
	1	1	(12) SOUNDING AND SECURITY
	1 (13)	1 (13)	(13) FR SUPERVISOR (BTOW)
	1%	1%	(14) FR CONSOLE OPERATOR
	1 (4)	1 (4)	(15) FR BURNERMAN
		1	(16) FR UPPER LEVEL
	1	1 (6)	(17) FR LOWER LEVEL
1 (7)			(18) FR MESSENGER
	1	1	(19) FR COLD IRON
		1	(20) EM SWBD OPERATOR
	1#	1	(21) IC & GYRO SUPERVISOR
1 (12)	1 (12)	1 (12)	(22) OIL KING ASSISTANT
			(23) AC+R

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. % = PER BOILER
3. # = OIL KING REQUIRED IN DUTY SECTION
4. * = PER SPACE WHERE SSTG IS OPERATING

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
LHA 1 CLASS

C A S C
O U T O
L X E N
D I A D
L M
I I I
R A N IV
O R G
N Y

Watch Station

	1	1	(1) EOOW
	1	2	(2) SPACE SUPERVISOR
	1	2	(3) BOILER CONSOLE OPERATOR
		2	(4) ER THROTTLEMAN
	1	2 (9)	(5) ER UPPER LEVEL
		2	(6) ER LOWER LEVEL
	1	2	(7) ER MESSENGER
R)	1		(8) COLD IRON
	1	2	(9) DIST PLANT OPER
	1 (5)	2 (5)	(10) SSTG WATCH
		2 (7)	(11) SHAFT ALLEY WATCH
	1	1	(12) DAMAGE CONTROL SUPER
	2	2	(13) SOUNDING AND SECURITY
	1%	1%	(14) FR BURNERMAN
	1 (9)	2 (9)	(15) FR UPPER LEVEL
	1	2	(16) FR LOWER LEVEL
	1 (7)	2 (7)	(17) FR MESSENGER
		1	(18) EM SUPERVISOR/EPCC FWD
	1	1	(19) EM EPCC AFT
		1	(20) IC & GYRO SUPERVISOR
	1#	1	(21) OIL KING ASSISTANT
	1	1 (13) 2 (13)	(22) AC&R

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. % = PER BOILER
3. # = OIL KING REQUIRED IN DUTY SECTION

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
LHD 1 CLASS

C A S C
O U T O
L X E N
D I A D
L M
I I I
R A N IV
O R G
N Y

Watch Station

	1	1	(1) EOWW
	1	2	(2) SPACE SUPERVISOR
	1(2)	2	(3) BOILER CONSOLE OPERATOR
		2	(4) ER THROTTLEMAN
	1	2(9)	(5) ER UPPER LEVEL
		2	(6) ER LOWER LEVEL
	1	2	(7) ER MESSENGER
R)	1		(8) ER COLD IRON
	1	2	(9) DIST PLANT OPER
	1(5)	2(5)	(10) ER SSTG WATCH
	1*	1*	(11) NR 3 SSTG U/L WATCH
	1*	1*	(12) NR 3 SSTG L/L WATCH
		2(7)	(13) SHAFT ALLEY WATCH
	1	1	(14) DAMAGE CONTROL SUPER
	2	2	(15) S&S WATCH
	1%	1%	(16) FR BURNERMAN
	1(9)	2(9)	(17) FR UPPER LEVEL
	1(16)	2	(18) FR LOWER LEVEL
	1(7)	2(7)	(19) FR MESSENGER
	1(8)		(20) FR COLD IRON
		1	(21) EM SUPERVISOR/EPCC FWD
	1	1	(22) EM EPCC AFT
		1	(23) IC & GYRO SUPERVISOR
	1#	1	(24) OIL KING ASSISTANT
	1(15)	1(15) 2(15)	(25) AC&R

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. % = PER BOILER
3. # = OIL KING REQUIRED IN DUTY SECTION
4. * = WHEN NR 3 SSTG IS OPERATING

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
LPD 17 CLASS

C A S C
 O U T O
 L X E N
 D I A D
 L M
 I I I IV
 R A N
 O R G
 N Y

Watch Station

	1#	1	(1) EOOW
	1	1	(2) ENOW/PACC OPERATOR
	1#	1	(3) EPCC OPERATOR
R)	1	1	(4) ROVING PATROL (PORT)
	1^	1	(5) ROVING PATROL (STBD)
	1	1	(6) DCC SUPERVISOR
	1	1	(7) SOUNDING & SECURITY
	1#	1	(8) OIL KING ASSISTANT
		*	(9) CASUALTY RESPONSE TEAM

R) NOTES:

1. ^ = MAIN & AUX ROVING PATROLS MAY BE COMBINED COLD IRON
2. # = ONE REQUIRED IN DUTY SECTION ON CALL AS REQUIRED
3. * = CASUALTY RESPONSE TEAM: RESPONDS TO ALL AMR AND MMR U/W CASUALTIES 24/7 AND CONSISTS OF QUALIFIED PERSONNEL AS ASSIGNED BY THE COMMANDING OFFICER.

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
LSD 41&49 CLASS

C A S C
 O U T O
 L X E N
 D I A D
 L M
 I I I IV Watch Station
 R A N
 O R G
 N Y

		1	(1) EOOW
	1	2	(2) ENOW
		2	(3) EOSC OPERATOR
		2	(4) ENGINE OPERATOR
	1	2	(5) MER EQUIP MONITOR
	1%	(2) 1% (2)	(6) AUX BOILER/EVAP OPERATOR
1			(7) COLD IRON
	1	2	(8) AUX MONITOR
	1	2	(9) GENERATOR OPERATOR
	1	1	(10) EPCC/SWBD OPERATOR
1	1	1	(11) DCC SUPERVISOR
1	1	1	(12) SOUNDING & SECURITY
1 (12)	1 (12)	1 (12)	(13) AC&R WATCH
	1#	1	(14) OIL KING ASSISTANT

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.
2. % = PER SPACE WITH OPERATING BOILER/EVAP
3. # = OIL KING REQUIRED IN DUTY SECTION

R)

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
LSD 47 SMART CLASS

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I	IV	Watch Station
R	A	N		
O	R	G		
N	Y			

	1	1*	(1)	EOW
		1(1)*	(2)	PACC OPERATOR
	1	1(1)*	(3)	EPCC OPERATOR
	1@	1@	(4)	PORT ROVER
	1@	1@	(5)	STBD ROVER
	1%	1%	(6)	BOILER/EVAP OPERATOR
1	1		(7)	CCS SUPERVISOR
1(9)			(8)	COLD IRON
1(8)	1	1	(9)	SOUNDING & SECURITY
	1#	1	(10)	OIL KING ASSISTANT
		^	(11)	CASUALTY RESPONSE TEAM (CRT)

NOTES:

1. * = THE EOW WATCH STATION MAY BE COMBINED WITH THE PACC OPERATOR OR WITH THE EPCC OPERATOR. IF THE EOW IS ACTING AS THE PACC OPERATOR, A SEPARATE EPCC WATCHSTANDER IS REQUIRED. IF THE EOW IS ACTING AS THE EPCC OPERATOR THEN A SEPARATE PACC OPERATOR IS REQUIRED.
2. @ = PORT ROVER IS RESPONSIBLE FOR AMR 1, MMR 2, and PORT SHAFT ALLEY. STBD ROVER IS RESPONSIBLE FOR MMR 1, AMR 2, and STBD SHAFT ALLEY. PORT AND STBD ROVERS COMBINE INTO ONE ROVER WATCH DURING AUX STEAMING.
3. % = PER MMR SPACE WITH OPERATING BOILER/EVAP.
4. # = OIL KING REQUIRED PER DUTY SECTION.
5. ^ = CASUALTY RESPONSE TEAM: RESPONDS TO ALL AMR AND MMR U/W CASUALTIES 24/7 AND CONSISTS OF QUALIFIED PERSONNEL AS ASSIGNED BY THE COMMANDING OFFICER.

ENGINEERING WATCH REQUIREMENTS/WATCH STATION MANNING
 MCM CLASS

C	A	S	C	
O	U	T	O	
L	X	E	N	
D	I	A	D	
		L	M	
I	I	I	IV	Watch Station
R	A	N		
O	R	G		
N	Y			

		1	(1) EOOW
		1 (1)	(2) PROPULSION CONSOLE OPER
	1	1	(3) ELEC CONSOLE OPER
1		1	(4) AMR / MONITOR
	1	1	(5) MMR / MONITOR
1 (4)	1 (5)	1 (5)	(6) SOUNDING AND SECURITY
1 (6)			(7) COLD IRON

NOTES:

1. NUMBERS IN PARENTHESIS INDICATE THIS WATCH CAN BE COMBINED WITH THE WATCH STATION SO NUMERICALLY DESIGNATED.

APPENDIX B ENGINEER OFFICER'S STANDING ORDERS

USS (SHIP'S NAME)

(Insert Engineer Officer's Standing orders here)

Note: Guidance can be found in EDORM Article 3206.

APPENDIX C FLEET ENGINEERING READINESS PROCESS REPORTING
REQUIREMENTS AND CERTIFICATION

Ref: (a) COMNAVSURFORINST 3502.1 series (SURFORTRAMAN)

R) 1. DISCUSSION. Detailed information and guidance for the Engineering Readiness Process, certification, reporting requirements, and periodicity are provided in reference (a). Items discussed in references (a) include:

- Readiness for LOA/EOC
- LOA/EOC completion message
- ULTRA C
- ULTRA E
- ULTRA S
- Engineering Operations Certification
- Restricted Operations.
- Removal from Restricted Operations
- Items of Priority

APPENDIX D GUIDANCE FOR DRAFTING TEMPORARY STANDING ORDERS

1. Purpose. The EOSS User's Guide (EUG) allows for the operation of engineering equipment in a non-standard configuration and provides guidance for locally-developed deviations from current operating procedures. This section is designed to provide further guidance on the requirements for and use of Temporary Standing Orders (TSO).

2. Guidance. A TSO should be considered as formal guidance to operate the plant in a non-standard, but safe condition. The presence of a TSO does not prevent or exempt a ship from adhering to other requirements, such as Departure From Specification (DFS) or Casualty Reporting (CASREP) criteria. A TSO should not be submitted just because it is easier to submit than make repairs/replace the affected equipment or system component. A TSO should only be submitted when all possibilities have been exhausted and deviation to operate the equipment or system is necessary for plant operation. The decision to operate individual equipment or systems as a whole, outside of normal configuration, is a serious one. Operational Risk Management must be considered in the decision to place a TSO in effect and resides at the Commanding Officer level. As a result, a TSO should contain the following items at a minimum:

(a) Cancellation Date: A TSO may not be in effect for more than six months past its effective date. If the TSO is required past six months, the Engineer Officer is to re-submit the TSO to the Commanding Officer for approval, provided it is beyond the ship's capability to correct the problem. When prompted, the Engineer Officer should be able to provide documentation on what is being done to correct the problem.

(b) References: A list of relevant references, such as drawings, advisories, EOSS procedures, and technical specifications used to generate the TSO.

(c) Problem Discussion/Degree of Non-Compliance: A concise and accurate statement of the condition preventing operation in a standard configuration, to include all specific symptoms, indications and readings individual operators and supervisors may observe related to the equipment or system in its affected condition.

(d) Affected Watch Stations: Listing of the specific watch stations affected by the TSO (at Conditions I - IV), to include the supervisory watch position.

(e) Required Actions: A specific listing, step by step, of the expected operator actions required for given condition. If applicable, EOP or EOCC steps should be listed. For example: When operating Prairie Masker Air, FM-V-127A should be shut prior to executing Step 7a of EOSS Procedure FPM.

