60.6 Personal Equipment. Radios, Television Sets, Record Players, Wire or Tape Recorders, Electric Shavers, Lights, Fans, Tools, and Hobby Equipment

a. Personal radios, television sets, record players, and wire or tape recorders. Such equipment having metal cases or metal backs or bottoms are a safety hazard in many cases. In much of such equipment the chassis forms a part of the circuit and the exposed metal parts are energized, thereby creating the danger of shock to personnel touching them. Moreover, grounding these metal parts to the ship's structure would place a ground on the 115-volt lighting system contrary to the safety instructions. Consequently, the use of such equipment on board ship shall not be permitted unless one of the following conditions is satisfied and meets the requirements of Article 60.6(e) below:

(1) The equipment has a built-in power transformer which completely insulates the primary or line side of the transformer from the secondary or equipment side. The isolation of the primary and secondary sides of the transformer must never be inferred merely from the presence of the power transformer but must be checked by measuring the insulation resistance from each line terminal of the transformer to the chassis and exposed metal parts of the equipment. If the insulation resistance is of the order of several megohms, the equipment shall be provided with a grounded plug and suitable cord, the grounding conductor of the cord being connected to the chassis and exposed metal parts of the equipment at one end and to the ground contact of the plug at the other end. This arrangement will ground the chassis and exposed metal parts of the equipment but will not ground the power supply.

(2) If the equipment does not have a power transformer which isolates the primary and secondary sides as described above, an isolation transformer shall be installed (at the owner's expense) to perform this function. A grounded plug and suitable cord shall be used with the grounding conductor of the cord connected to the chassis and the power conductors of the cord connected to the primary of the isolation transformer.

b. Electric shavers. The insulation on the cord, plug, and shell of personally owned electric shavers should be sound; it is the user's protection. An electric shaver is considered defective if molded housing, cord, or plug contains cracks or breaks or if the cord insulation has become embrittled with age to the point where a sharp bend will break it. A defective electric shaver shall never be used on board ship.

DECEMBER 9 FRIDAY

ENGAGEMENTS	MEMORANDA
8:00	
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5:30	

Day of Year—343— FRIDAY, DECEMBER 9, 1966 —22—Days Left

c. Personally owned electric lights, fans and tools. Personally owned or non-Navy standard electric lights, fans, and tools are prohibited. They are generally a shock hazard because of inferior insulation, leakage currents, and flimsy structure. Periodic inspections shall be made to eliminate them from the ship. Adequate numbers and types of Navy lights, fans, and tools are available to meet all needs.

d. Hobby equipment. Personally owned hobby equipment such as hand-held, motor-driven carving tools are frequently found to be of flimsy construction and unsafe for use on board ship. Such equipment may be retained on board ship as an exception to article 60.6c. subject to the following precautions:

(1) Prior to permitting use of portable, electrically operated hobby devices on board ship, they shall be inspected and tested by the electrical gang. Equipments which pass this inspection shall be tagged as safe, giving date of inspection. This equipment shall be reinspected at least once every 6 months.

(2) At any time that the hobby tool is damaged or is obviously defective, that is, if molded housings, cords, or plugs contain cracks or breaks or if the cord insulation breaks when sharply bent, the tool shall not be used until repaired and reinspected by the electrical gang.

e. No personal electrical equipment, such as radios, television sets, record players, wire or tape recorders, or other personal appliances as listed above, shall be used on board ship without the Chief Engineer's tag of approval. Periodic inspection shall be made to enforce this vital safety regulation.

60.7 Grounding Portable Tools and Equipment where Grounded Type Plugs and Receptacles are not Installed.

If the grounded type receptacles have not yet been installed in the spaces where the tool or equipment is to be used, other types of plugs and receptacles may be used if the grounding conductor in the tool or equipment cord is connected to the ship's metal structure by other methods; for example, by means of a spring clip or by securing the grounding conductor to a convenient screw or bolt. In those cases where the tool or equipment cord does not include an extra conductor for grounding, an additional conductor shall be obtained and connected between the metal housing of the tool or equipment and the ship's metal structure. The additional conductor used to ground the case of the equipment shall be of ample cross-sectional area and current-carrying

capacity in order to be effective. It shall have a cross-section at least equal to the cross-section of the power conductors in the tool or equipment cord, and preferably greater. If the tool or equipment housing has two or more metallic parts which are not electrically connected, each shall be connected to the grounding conductor. Care shall be taken to secure a good contact between the grounding conductor and the metal to which it is connected, by scraping any paint away and scratching a clean surface. The ground connection shall be made before inserting the power supply connecting plug, and the plug shall be removed before removing the ground connection. Frequent inspection and check of the connections within portable electric tools and equipment shall be made to insure that the supply cord and its connections are suitably insulated and that the ground connection is intact.

CHAPTER 61

ELECTRIC GENERATORS AND VOLTAGE REGULATORS

61.1 Maintenance of emergency diesel generators.

a. Emergency diesel generators will be kept in full operating condition at all times. Section II, Chapter 41 (operation and care of diesel engines) and Chapter 61 (operational care of generators and voltage regulators) of the BUSHIPS Manual are applicable.

b. Personnel assigned duties in connection with the operation of emergency diesel generaltors shall familiarize themselves with applicable manufacturers' instruotion books and operating manuals as well as the details of operation, adjustment and maintenance of the equipment.

61.2 Inspection.

a. Systematic inspection shall be made of all external working parts of the diesel engine, the generator, the voltage regulating equipment, etc., prior to making an operational test run. The inspection shall include the following items:

1. Diesel engine oil level.
2. Diesel engine cooling water level.
3. Diesel engine lube oil filters.
4. Diesel engine lube and fuel oil strainer cleanliness.

b. Before starting the emergency diesel, the generator shall be checked for the following:

1. Loose or unseated brushes.
2. Commutator and slip rings for scores.
3. Test automatic starting equipment, if installed.

61.3 Tests.

a. The emergency diesel generator shall be given a 30-minute test at least once weekly, under full load when practicable. The results of these test runs shall be entered in the Engineering Log.

b. During operational test runs; oil pressures, temperatures, sparking of commutator and slip rings shall be checked. Undue noises, vibrations or unusual conditions shall be noted for corrective action.

61.4 Brushes and Brush Tension.

a. Brushes in all electrical equipment, both generators and motors, shall be carefully selected and shall be of the proper material and cut to the proper contact angle as recommended by the manufacturer of the motor or generator.

b. Brush spring tensions shall be carefully checked quarterly, but more frequent checking is recommended to assure proper operation of equipment. Such tension checks should be made whenever equipment is taken off the line.

CHAPTER 62

ELECTRIC POWER DISTRIBUTION

62.1 Load distribution.

Whenever the ship is in close waters, hazardous areas or during wartime, the load distribution shall be set for maximum split plant operation. In single-engine room ships, an extra generator will be kept idling ready to take the load during such periods.

62.2 Battery care.

Electrolyte shall not be carried abord ship. Only distilled water will be added to ship batteries. If batteries are received in a dry state, a work request will be submitted to the staff maintenance and repair officer for the initial charge. The maintenance shop is equipped to accomplish this work.

CHAPTER 64

LIGHTING

64.1 Table of lamp sizes. *

The lamp sizes shall not be of greater wattage than those of the fixture design. Vapor proof type fixtures, where installed, shall be maintained in designed order at all times. Installed lamp sizes shall be in accordance with lamp sizes as shown on deck lighting plans.

64.2 Fluorescent lamps. *

New installations of fluorescent fixtures are prohibited, except when specific permission is granted by an approved alteration. Fluorescent tubes require extreme care in handling because of the toxic effects of the interior coating of the tube in case of breakage.

64.3 Daylight lamps.

The use of daylight lamps is restricted to boiler smoke indicating systems.

64.4 Blackout control switches. *

All switches which need to be opened for blackout security shall be distinctively marked and identified. Suitable instructions shall be prepared and posted in the immediate vicinity of switches and switch panels.

64.5 Alteration or extension of circuits. *

Any extension of lighting or power circuits or alteration from original design requires issuance of an approved alteration and shall be accomplished by qualified electricians.

CHAPTER 67

ELECTRONICS

67.1 Applicability of BUSHIPS Manual.

The articles of Chapter 67, BUSHIPS Manual, pertinent to civil service-manned (USNS) ships and the degree of their applicability are shown below:

SECTION I

Part 1, Article 67-3	Applicable for information
Part 2, Article 67-16	Applicable. "Maintenance Activities" shall be interpreted to mean "MSTS administrative commanders" for MSTS USNS ships.
67-18 and 67-19	Applicable
Part 3	Applicable for information
Part 4, Articles 67-51,	67-52 and 67-53 - Applicable
67-54, 67-55 and	67-56 - Applicable for information
Part 5	Applicable

SECTION II

Part I, Article 67-122	Applicable
67-123	Applicable for information
67-124	Applicable
67-125 and 67-126	- Applicable except that BUSHIPS Maintenance Standards, Part I And Part II are not applicable to MSTS USNS ships.

SECTION III

Part 1, Article 67-151	Applicable for information
67-153 and 67-154	- Applicable
Part 4	Applicable

SECTION IV

Part 1, Articles 67-122,	67-123 and 67-124 - Applicable
Part 3, Article 67-241	Applicable except that any reports developed shall be forwarded to the MSTS Administrative Commander
67-243, 67-244,	67-245 and 67-246 - Applicable for information
Part 5	Applicable for information

SECTION V

Part 1	All applicable except Article 67-311

67.2 Applicability of U.S. Coast Guard rules and regulations.

a. The requirements for passing U.S. Coast Guard Certification inspections are fully applicable to civil service-manned (USNS) ships. Coast Guard regulations require that radio installations conform with Federal Communications Commission regulations.

b. The MSTS Equipment Allowances and operational requirements are equal to or in excess of the requirements of Title III, Part II of the Communications Act of 1934 and the FCC Rules Governing Stations and Shipboard Maritime Services. Ships meeting MSTS requirements satisfy those of the FCC.

67.3 Shipboard electronic equipment maintenance.

a. The following work is considered within the scope of shipboard maintenance of electronic equipment:

1. Cleaning of equipment.

2. Tightening bolts, screws, nuts, mountings, terminals, knobs and connections.

3. Lubrication of equipment.

4. Minor adjustments such as tuning of radio transmitters and adjustment of focus, intensity and sweep length of radar and loran equipment.

5. Testing of electron tubes in operational electronic equipment.

6. Thorough visual inspection and operational test of equipment to determine repairs required in port.

7. Maintenance of batteries in fully charged condition, replenishment of water, cycling and cleaning.

8. Maintaining the allowance of required tools, consumable supplies, instruction books, records and spare parts.

b. The radio department has the responsibility for shipboard maintenance of electronic equipment as follows:

1. Radio communication equipment, including radio transmitters, receivers and radio automatic alarm device.

2. Electronic navigation equipment, including radar,

loran, radio direction finder, fathometer and facsimile.

3. Associated parts, units and accessories of the above, including motor-generator, converters, inverters, controllers, batteries, battery chargers, antennas, spare parts, instruction manuals, etc.

4. Test equipment for maintenance of electronic equipment.

5. Emergency repairs to the above equipment when within capabilities of the raio department.

6. Assist the engine department and military department with the maintenance of assigned equipment to the extent of testing electron tubes used in interior communication and entertainment equipment. Electronic equipment, special project service operation: * Care, upkeep and maintenance of all equipment is the responsibility of embarked project sponsored personnel. This includes electric motors, amplidyne's servo systems, mechanical drives, hydraulic systems and other components which are part of project instrumentation equipment, assemblies, systems or sub-systems.

7. CMPI 85-6-9a requires payment of overtime for work performed that is not necessary to the operation, administration, and routine maintenance of the raio station and radio equipment. Preventive maintenance outside of the radio room is specified on pages A-63 and A-64 of this instruction.

67.4 Electronic installation record system.

a. The procedure for activating and maintaining this installation record is as follows:

1. Compile a list of the electronic equipment on board, in accordance with instructions, NAVSHIPS 900,135A.

2. Forward the completed inventory list to the Bureau of Ships, Navy Department, Washington 25, D. C., via the normal chain of command, for machine tabulation and distribution of the Ship Electronic Installation Record form (NAVSHIPS 4110).

3. Upon receipt of the latest copies of NAVSHIPS 4110, correct two copies; retain one copy and forward the other to the Bureau of Ships via the chain of command when:

* (a) An error is noted.

(b) A change is made to installed electronic equipment.

b. In each instance after machine tabulation, the Bureau of Ships furnishes the ship with corrected copies of NAVSHIPS 4110.

CHAPTER 78

AMMUNITION HANDLING AND STOWAGE

78.1 Applicability of U. S. Coast Guard publications.

All sections of the U. S. Coast Guard publication, CG 108, Rules and Regulations for Military Explosives, are applicable to civil service-manned (USNS) ships.

78.2 Pyrotechnics.

a. Allowance. NAVORD List No. 23716 of 4 May 1959, Rev. C., Shts 1 & 2, is the pyrotechnic allowance applicable to USNS ships. This allowance meets the U. S. Coast Guard requirements.

b. Ordering. Pyrotechnic material shall be requisitioned on DD Form 1149, in accordance with NAVSANDA Publication 236.

c. Inspection. All lots shall be inspected annually. This includes the examination of packing boxes and containers and their contents. One or more containers shall be opened and the individual rounds examined. Rounds found to be in satisfactory condition shall be repacked carefully.

d. Training allowance and testing.

1. The training allowance expenditure shall serve as a quality evaluation test. One round per lifeboat of the MK13 distress signals shall be used with the Red Star Parachute Signals (or the Red Star Pistol Rocket Signals) and the Orange Distress Signals. A random selection of rounds shall be made from the oldest stocks on hand for this purpose. Pyrotechnics found in an unserviceable condition shall be jettisoned at sea and the remainder of the lot turned into the nearest naval ammunition depot.

2. A letter request itemizing the material to be turned in shall be forwarded to the administrative commander who will make arrangements for any transportation required.

e. Crating. Pyrotechnics being returned to the naval depot or magazine shall be crated in wooden boxes designed to withstand all conditions ordinarily encountered in handling and shipping. The crates shall be marked to show the following information:

1. "Fireworks" shall be stencilled on the crate.
2. Complete identification of contents.

3. Addresses of consignor and consignee.

78.3 Small arms and line throwing equipment.

a. NAVORD List No. 23693 Rev. F as modified by COMSTS Notice 8370 of 1 June 1960 is the authorized allowance list for small arms and line throwing equipment for MSTS civil service-manned (USNS) ships.

b. Ships having ordnance material on board in excess of the authorized NAVORD list will prepare and process an expenditure invoice, DD Form 1148, in accordance with appropriate instructions.

c. Strict accountability, in compliance with NAVSANDA Publication 236, Article 1405, is required of all ordnance material on board.

CHAPTER 81

MINE PROTECTION

81.1 Applicability of the BUSHIPS Manual.

Section III, Chapter 81, BUSHIPS Manual (Shipboard Degaussing Installations), is applicable to civil service-manned (USNS) ships.

81.2 Degaussing folder.

Degaussing folders (NAVORD Form 1547-4-45) contain information vital to the particular installation calibration, setting and other information of classified nature. The navigator or chief engineer or the degaussing engineer must have access to the folders; however, because of their classified nature, they must be kept under lock and key. The degaussing folder shall be locked in the Chart Room chart desk and the key made available only to cognizant personnel.

81.3 COMSTS Policy.

COMSTS INSTRUCTION 8950.1C (Shipboard degaussing installations, maintenance and operation of) shall be used for guidance. Ship's force shall comply with applicable instructions pertaining to operation and maintenance of degaussing systems.

CHAPTER 82

BOATS AND LIFE FLOATS

82.1 References.

Chapter 82, BUSHIPS Manual, is applicable except as indicated in this chapter. The U.S. Coast Guard Rules and Regulations, CG 256, 257 and 123; COMSTSINST P3120.2B (Operating Instructions), MSTSPACINST 3550.1B (Fire and Boat Drills) and Article 1013, U.S. Navy Regulations, have applicable sections which shall be followed.

82.2 Life boats in passenger ships.

The life boats in passenger ships are overhauled and reconditioned on an annual rotation basis as outlined in COMSTSINST P4710.5A. All work is accomplished by contract and in accordance with U. S. Coast Guard requirements. The Coast Guard has agreed that the inspection dates for lifeboats will be recorded as the date the boats are received on board. During the ship's annual inspection, an operational test of all boat gear will be conducted.

82.3 Crew maintenance of boats.

Life boat covers are not authorized except when ships are employed on special projects. The corrosive action of soot and salt spray is responsible for most life boat deterioration. In order to reduce this to a minimum, the deck department will wash out the boats with fresh water as frequently as availability of water and operating conditions permit.

82.4 Motor boats.

a. At sea, motor boat engines shall be tested as follows:

1. Daily, before noon, run for one (1) minute and make log entry.
2. Concurrently with each abandon ship drill, whether boats are swung or not, but not less than once a week, run for five minutes as prescribed by CG 256, par 78.17 - 50 (b) (4), Passenger ships and CG 257, Par. 97.15-35 (b) (4), and make log entries
3. The hand propelling gear of each life boat, where fitted shall be operated in the same manner during all abandon ship drills.

In port, motor boat engines shall be operated at least every third day and make appropriate log entries.

82.5 Life boat electrical equipment.

a. In accordance with Article 78.17-55, U. S. Coast Guard Regulations for Passenger Vessels, and Article 97.15-40 of U.S. Coast Guard Regulations for Cargo Vessels, life boat electrical equipment shall be examined at least once every three months. The examination shall include removal of drain plugs to insure that equipment is free of water. The date and condition found shall be entered in the log.

b. More frequent inspections shall be made after severe weather conditions have been encountered.

82.6 Boat tools.

The following tools are considered essential to effect motor boat maintenance and shall be kept in a kit to be provided by the machinist or utility man at abandon ship:

1 ball peen hammer
1 6" crescent
1 6" stillson
1 roll scotch electrical tape
1 pair pipe pliers
1 spark plug and wrench
1 6" screw driver

CHAPTER 83

ELEVATORS

83.1 Applicable publications.

a. The American Standard Practice for the Inspection of Elevators. This publication, issued by the American Society of Mechanical Engineers, shall be used as a guide in the inspection and servicing of elevators (freight and passenger) and dumbwaiters. Copies of this publication may be obtained through regular requisition channels.

b. The manufacturer's instruction manual. The instruction manual furnished by the manufacturer shall be consulted for lubrication and periodic maintenance requirements.

c. BUSHIPS Manual, Chapters 60, 63 and 83. Maintenance and inspection of electrical components of elevators and allied equipment shall be made in accordance with Chapters 60, 63 and 83 of the BUSHIPS Manual.

83.2 Inspections.

A complete inspection of elevators and allied equipment shall coincide with the annual U. S. Coast Guard Inspection. This inspection shall be conducted by qualified elevator inspectors. A certificate of inspection shall be posted in the elevator cab showing the date of and the name and title of the person making the inspection.

83.3 Cable replacement.

Elevator cables shall be renewed when meat hooks (broken strands) are observed. In all cases cables shall be renewed at the end of five years.

83.4 Servicing.

Servicing of cables, sheaves, guides and electric equipment in the elevator or dumbwaiter shaft shall be accomplished normally through access openings. Where such openings do not exist, they shall be made by the ship's force and shall be covered by a bolted or hinged plate.

83.5 Instructions for personnel.

A definite instruction program to acquaint appropriate crew members with the safe operation of elevators and dumbwaiters shall be established.

Each person so instructed shall be required to demonstrate his ability to operate the equipment correctly before he is permitted to operate it without supervision.

83.6 Precautionary measures.

a. By-passing or making inoperative safety devices (interlocks, controllers, etc.) is prohibited.

b. If safety devices or interlocks are inoperative, the dumbwaiter or elevator shall be put out of service until such time as repairs are effected.

c. Repairs to elevators and dumbwaiters will be made by authorized personnel only.

d. No person will be permitted to ride on or in dumbwaiters, nor on any part of a passenger elevator other than the compartment designed to carry the load.

e. When it is necessary for personnel to enter the shaft of an elevator or dumbwaiter to effect repairs, the car shall first be placed in its lowest position and the power turned off. Men working in shafts shall be equipped with a safety belt and line.

f. A warning sign: "DOOR SHALL BE CLOSED COMPLETELY BEFORE OPERATING," shall be placed adjacent to dumbwaiter and elevator doors.

g. Dumbwaiters shall have the capacity stenciled at each door or opening and also a sign reading, "NO PASSENGERS PERMITTED."

h. The load limit of each elevator shall be posted in a conspicuous location.

CHAPTER 87

MECHANICAL MEASURING INSTRUMENTS

87.1 Applicability of the BUSHIPS Manual.

All articles of Chapter 87, BUSHIPS Manual, are applicable to civil service-manned (USNS) ships with the exception of Articles 87-14, 87-15 and all articles of Section VIII.

87.2 Testing of gages.

All pressure and vacuum gages shall be tested annually and when they are suspected of being inaccurate. After each test a certificate shall be placed on the inside of the glass face showing the date tested.

87.3 Apparatus for analyzing combustion gases.

"Fyrite" combustion gas analyzers will be provided on requisition as an allowance. Orsats that are inoperative shall not be serviced.

87.4 Thermometers.

Wherever practicable Navy Standard thermometers shall be used in lieu of non-standard thermometers.

CHAPTER 88

DAMAGE CONTROL

88.1 Applicable publications.

Chapter 88, BUSHIPS Manual, is applicable to civil service-manned (USNS) ships, except as specified below. COMSTSINST P3120.2B (Operating Instructions) and CMPI 410 set forth damage control policies and responsibilities for in-service (USNS) MSTS ships.

88.2 Station bills.

Standard station bills are issued to all MSTS ships. These bills contain the proper nomenclature and markings in accordance with the basic Navy system and with the U. S. Coast Guard concurrence.

88.3 Markings.

All markings shall be in accordance with Appendix 10 to be General Specifications for Building Vessels of the U. S. Navy and COMSTSINST 9280.3A(Designation and Marking of Hull Structure).

88.4 Communications.

Since communication is a vital link in the damage control program, sound powered systems are planned for each type ship. These circuits will be located entirely above the water line with outlets at repair lockers and in access ways. (For details see COMSTS INST P3120.2B)

88.5 Handy Billy and P-500 Pumps.

Handy Billy and P-500 pumps will not be carried in USNS ships.

CHAPTER 91

WORKSHOP EQUIPMENT IN SHIPS

91.1 Applicability of the BUSHIPS Manual.

Chapter 91, BUSHIPS Manual, is applicable to civil service-manned (USNS) ships.

91.2 Grinders.

a. Safety eye shields shall be installed on all grinding and buffing wheels. To be acceptable, eye shields must meet the following requirements:

1. They shall be fixed in such a way that they cannot be turned away from the work without complete dismantling.

2. Safety glass shall be used. A removable clear glass window shall be placed under the safety glass so that it can be replaced when it becomes scarred to the extent that visibility is impaired.

3. A light shall be installed within the shield so that the light will go on and off when the grinding wheel is turned on and off. The Stanley Safety Eye Shield No. 600 is acceptable for use in MSTS ships.

4. Eye shields not meeting the above requirements shall be replaced.

b. Safety eye shields in sufficient number for installation on all grinding and buffing wheels on board shall be requisitioned.

91.3 Burning equipment.

Acetylene or prestolite gases shall not be kept in shops unless adequate natural ventilation is assured at all times.

CHAPTER 92

WELDING AND ALLIED PROCESSES

92.1 Applicability of the BUSHIPS Manual.

Chapter 92, BUSHIPS Manual, is applicable to civil service-manned (USNS) ships.

92.2 Safety precautions.

Masters shall ensure that shop personnel handling welding equipment are fully cognizant of all safety precautions contained in Chapter 92, BUSHIPS Manual.

CHAPTER 93

FIRE FIGHTING

93.1 Applicability of the BUSHIPS Manual.

Chapter 93, BUSHIPS Manual, is applicable to civil service-manned (USNS) ships, except as noted below.

93.2 Fire-fighting equipment not provided.

Continuous-type foam generators, high capacity fog foam systems and portable pumps (gasoline) are three types of fire-fighting equipment not provided in civil service-manned (USNS) ships.

93.3 Inspection and maintenance.

a. Hydrostatic testing of fire hoses shall be conducted annually during the U. S. Coast Guard Inspection.

b. Extinguishers found in discharged condition at times other than during the annual inspection shall be recharged in accordance with current supply instructions. Recharging of CO_2 extinguishers is an administrative commander's responsibility. During periods of annual inspection, CO_2 extinguishers will be recharged by the repair activity undertaking the annual inspection.

c. Applicator and all-purpose nozzle velocity heads shall be kept free of paint, dust and other foreign matter, to permit their proper use in emergencies. Only graphite shall be used as a lubricant for hose fittings.

93.4 Fire hose fittings.

a. Fire hose fittings shall have uniform thread dimensions (Navy Specification 34F3-E). All fire hose fittings shall be inspected to determine the thread dimensions and those found to be of other than the Navy specification shall be surveyed and standard fittings with uniform thread dimensions shall be requisitioned, subject to the restrictions set forth in paragraph b, below:

b. In the interest of economy, every effort shall be made to alter existing fire hydrants and self-cleaning strainer outlets found to be of non-standard thread dimensions by the use of adapters with final outlets of approved thread dimensions. Adapters shall be permanently welded or brazed to prevent removal. The manufacture of adapters to comply with the above paragraph shall be entered as an item on the

ship repair request as an emergency, if found to be beyond the capacity of the ship's force.

93.5 Thread chart.

The following thread chart for couplings has been adopted for use in the U. S. Navy:

	COUPLING THREADS:		NIPPLE THREADS:	
Nominal size:	1½"	2½"	1½"	2½"
Threads per inch:	11½	7½	11½	7½
Pitch:	0.08696"	.13333"	0.08696"	.13333"
Depth of threads:	0.05648"	.08660"	0.05648"	.08660"
Pitch diameter:				
Maximum	1.8408"	3.0130"	1.8223"	2.9820"
Tolerance	0.0085"	.0160"	0.0085"	.0160"
Minimum	1.8323"	2.9970"	1.8138"	2.9660"
Minor diameter:				
Maximum	1.7928"	2.9424"	1.8788"	3.0686"
Tolerance	0.0170"	.0320"	0.0170"	.0320"
Minimum	1.7758"	2.9104"	1.8618"	3.0366"

CHAPTER 95

GASKETS AND PACKING

95.1 Applicability of the BUSHIPS Manual.

Chapter 95, BUSHIPS Manual, is applicable to civil service-manned (USNS) ships.

95.2 Packing chart.

The chief engineer shall prepare a packing chart for his ship in accordance with the instructions contained in Article 95-96 of the BUSHIPS Manual. Copies of the chart shall be posted in the packing locker and in other suitable locations. All engineers shall be instructed and have knowledge of its proper use.

95.3 High pressure flange gaskets.

a. Casualties have been experienced with steam joints as a result of spiral wound gaskets installed without reinforcing compression rings. A complete section of the gasket blew out and the remaining portion showed rupture and fatigue due to over compression. The reinforcing compression rings provides the needed strength to back up the gasket.

b. Cognizant personnel shall acquaint themselves with Article 48-48 of the BUSHIPS Manual which outlines the correct installation procedures. Spiral wound gaskets shall not be used without reinforcing compression rings.

*

APPENDIX A

ROUTINE DUTIES AND RESPONSIBILITIES OF

OFFICERS AND KEY PERSONNEL

The routine duties and responsibilities of officers and key personnel in a typical in-service, civil service-manned (USNS) ship are shown in this appendix.

The department head shall use the sample lists as guides in establishing the duties and responsibilities of personnel under his cognizance to meet the maintenance requirements of his particular ship. He shall adjust the periodic schedules for maintenance and inspection and add or delete duties as he deems appropriate, based on his operating experience. He is further responsible for checking work books weekly and for making routine inspections of the equipment.

SECOND OFFICER - RESPONSIBILITIES

Navigation Equipment:

Index No.	Name of Unit
S-24	Compass, magnetic
S-24	Compass, gyro
S-24	Recorder, gyro compass
S-24	Repeaters, gyro
S-67	Radio direction finder (P-2)
S-67	Fathometer
	Sounding machine, mechanical
S-17	Booms, mechanical sounding machine
S-67	Radar
S-67	Loran
S-64	Lights, navigating (special lights, signaling, speed control, convoy, breakdown, fuel loading, aircraft (electrical and emergency))
S-65	Counters, revolution indicators
S-65	Annunciators, bridge to engine room
S-65	Annunciators, bridge to after docking
S-81	Degaussing, light indicators and bridge course and latitude indicators
S-24	Barometers, including barographs
S-24	Anemometers, wind speed indicators
S-24	Thermometers, including wet bulbs
S-92	Instruments, navigating, including drafting machine (chart work)
S-94	Sextants, azimuth circles, bearing circles
S-94	Stadimeters, azimuth mirrors and alidades
S-65	Whistle controls, including pulleys, wire pulls
S-65	Telephone (bridge and docking)
S-65	Tubes, talking bridge
S-22	Steering, bridge control
S-22	Steering, emergency control
S-22	Steering, flying bridge control
S-70	Flags, bag stowage
S-65	Rudder indicators
S-12	Ports, wheelhouse, including Keerfoot windows
S-12	Windshields (port light) wipers
S-16	Doors, including sliding doors and fittings
	Lyle and shoulder guns

SECOND OFFICER - RESPONSIBILITIES Cont'd

Daily:

1. Check gyro compass and power failure alarm - per mfr. instructions.
2. Inspect all magnetic compasses for proper operation.
3. Maintain gyro course recorder - per mfr. instructions.
4. Inspect and compare repeaters - per mfr. instructions.
5. Make daily check of RDF, fathometer, radar and/or loran - per mfr. instructions.
6. Inspect sounding machines - per mfr. instructions.
7. Test operate all navigation lights prior to use.
8. Compare revolution counters for proper operation.
*9. Test operate engine order telegraph.
10. Check barograph for proper operation.
*11. Test operate whistle and siren controls.
12. Check rudder angle indicator for proper operation.
13. Shift to electric hand steering for at least one hour daily when practicable.

Weekly:

*1. Test operate emergency steering station equipment.
2. Inspect and service - per mfr. instructions and BUSHIPS Manual:
   Gyro compass and associated equipment
   Special lights
   Degaussing course, latitude indicator and degaussing pilot light
   Barographs,
   Power failure alarm to gyro compass
   Azimuth circles, bearing circles, azimuth mirrors alidades
3. Test run degaussing coil for four hours in conjunction with chief electrician.

Monthly:

1. Inspect and oil anemometer wind direction and intensity transmitters.
2. Check sounding boom and lubricate fittings.
3. Test operate all special navigation and signal lights and maintain as required.
4. Inspect and service the degaussing system, including correction of deviation (compass) with power on-per mfr. instructions.

Quarterly: Drain water from voice tubes when necessary, using drain cocks in lowest level.

Semi-annually: Inspect anemometer (wind direction and intensity transmitter) and oil all moving parts.

*Log entry required.

THIRD OFFICER - RESPONSIBILITIES

The third officer is responsible for maintenance of life saving and abandon ship equipment, including stenciling and periodic testing, as follows:

Weekly:

1. Lifeboats, as provided in Chapter 82.
2. Life floats.
3. Floater nets - lashings and stowages.
4. Debarkation nets - fastenings, corrosion defects.
5. Debarkation ladders - fastenings, corrosion defects (during fire drills).
6. Life preservers - completeness and stowage.
7. Ring life buoys - stowage and condition.
8. Pyrotechnics, bridge and lifeboat.
9. Lifeboat station indicator arrows and station markings.

Monthly:

1. Lifeboats.
2. Life floats.

Quarterly:

*1. Lyle gun, test fire.
*2. Shoulder gun, test fire.

*Log entry required.

FOURTH OFFICER - RESPONSIBILITIES

The fourth officer, as fire fighting officer, is responsible for the maintenance of fire fighting and damage control equipment, including the marking, stenciling and periodic testing, as follows:

Index No.	Name of Unit
S-93	Fire hydrant stations
S-93	CO_2, fixed and portable system.
S-93	Smoke detector
S-93	Fire extinguishers
S-65	High temperature alarm system
S-65	General alarms
S-65	CO_2 alarms
S-88	Emergency lockers

Daily:

1. Shift blower motors to smoke detector.
2. Test operate zonit and smoke detector in accordance with MSTSPACINST 10470.3.

Weekly:

1. Test operate zonite test station.
2. Check fire stations for completeness and condition.
3. Check emergency locker and emergency equipment for readiness and condition.
4. Test operate smoke exhaust to wheel house valve.

Monthly:

1. Record CO_2 portable extinguisher weight.
2. Inspect all fire extinguisher condition and markings.
3. Check all fire stations for completeness, condition, marking and stenciling.
4. Check general alarm system for condition.
5. Check emergency locker and equipment for completeness, condition, marking and stenciling.
6. Inspect movie booths for fire protection adequacy.
7. Inspect fire screen door operation, marking and numbering.
8. Inspect CO_2 valve control and bottle release pulls.
9. Inspect ventilation dampers.

NOTE: See Chapter 19 of this manual and COMSTSINST 9280.3A(Designation and marking of hull structure, MSTS ships in service).

BOATSWAIN - RESPONSIBILITIES

The boatswain is responsible for the maintenance of the following items and shall accomplish periodic tests and jobs as outlined:

Index No.	Name of Unit
S-12	Chocks, bitts
S-16	Side ports, hatches, W.T. doors, accommodation ladders
S-17	Booms, masts, kingposts
S-18	Rigging (standing and running)
S-19	Cleaning, painting and upkeep
S-20	Winches, capstans, windlass
S-25	Towing gear, insurance cable preservation
S-26	Moorings and appliances
S-82	Life boats, life floats, boat davits, life boat rigging
S-88	Damage control gear
S-92	Fire fighting equipment.

Daily:

*1. Check all cargo gear stowage.
2. Check stowage of all life boats, floats and secured gear.
3. Supervise cleaning of weather decks.
4. Inspect all cargo runners when working cargo, apply slushing where required.
5. Lay out and supervise work of day workers.
6. Continually watch operation of rigging and gear to detect weakness from deterioration or excessive strain. See that equipment is being used correctly.
7. Inspect cargo hatch cover stowage during cargo operations to prevent damage.
8. Inspect all canvas covers on life boats, boat winches, etc.

Weekly:

*1. Inspect all booms, rigging and associated fittings.
2. Inspect all bridles for strongbacks and pontoons.
3. Shackle pins on topping lifts and cargo blocks.
4. Lubricate all cargo hook swivels and fittings.

Monthly: Slush all lifeboat falls with shield filler #2 or equal.

*Log entry required.

BOATSWAIN - RESPONSIBILITIES Cont'd

Quarterly:

1. Slush insurance cable with raw linseed oil (only).
2. Slush all towing gear with linseed oil.
3. Overhaul accommodation ladder and fittings.
4. Remove, overhaul and lubricate all topping lift blocks, gin blocks, heel blocks, snatch blocks and cargo block swivels (except self-lubricated bearings).

Semi-annually:

1. Lift all boom goosenecks, inspect and lubricate.
2. Replace cargo boom guys and preventers where necessary.

CARPENTER - RESPONSIBILITIES

The carpenter's maintenance responsibilities in the ship cover the following items:

Item No.	Name of Unit
S-12.....	Chocks, bitts, airports, padlocks, screens
S-14.	Deck coverings - cement and linoleum patching, wood and magnesite decks, tile decking, deck treads and abrasive treads.
S-16.....	Side ports, all doors, hatches, W.T. doors, accommodation ladders
S-20.	Capstan, windlass - everything but electrical and enclosed self-lubricated gear boxes.
S-24.....	Ship control - after steering station, pedestal and universal reach rod connections
S-25.	Towing gear (insurance cable reel)
S-26.....	Moorings and appliances, roller chocks, fairlead rollers, stowage reels.
S-33.	Living and berthing areas Furniture and all interior doors. Shelving, buffets, dressers, including fittings. Replacement of mirrors in troop, passenger, crew quarters.
S-38.....	Ventilation Cowl ventilators and remote controls (except engine room) Vent dampers, fusible and manual throughout ship. Dogs, hinges and gaskets on all vent covers. Vent trunk fittings screens.
S-48.	Piping Cargo hold drains, including strainers, roseboxes, troop compartments Reach rods to hold bilge valves. Chain locker, pump valves and piping. Storm oil tank and valves. Superstructure deck drains. Bilge sounding plugs. Fire main packing glands and gaskets on deck. Steam smothering and CO_2 hold smothering valves - except master valve (maintenance). Wooden deck plugs for scuppers during fueling.

CARPENTER - RESPONSIBILITIES Cont'd

S-64 . . . . . Lighting
Debarkation light fixtures, lubrication and maintenance of moving arms and lock screws.

S-82 ..... Life boats
Release hooks, universals, rowing mechanism.
Flemming gear, load release hooks, sheaves, gripe hooks, McCluney hooks and davit rollers.

S-88 . . . . . Damage control gear - all except OBA.

S-91 ..... Shop upkeep equipment - maintenance of all carpenter tools, except electrical end.

S-93 . . . . . Fire fighting.
Maintenance of fog nozzles and applicators weighing CO_2 bottles.
Checking portable extinguishers, fire hydrant strainers, fire screen doors.
Control valve and bottle release valves to fixed CO_2 systems.

Daily:

*1. Sound all bilges and peak tanks.
2. Inspect windlass and chain locker.
*3. Test operate all W.T. doors.
*4. Inspect all portholes and sideports. Those below main deck to be closed at sea.
5. Inspect hatch covers and fastenings.
6. Inspect all ventilation covers and cowls.

Weekly:

1. Lubricate the following, operate if practicable:
All rolling chocks and fairleads.
Boat winches and davits.
Fender and special davits for accommodation ladders, etc.
Warping winch and capstan, boom fittings.
Vent cowls and rods.
Stanchion bases and guard rail turnbuckles.
Weather door hinges and fittings; dogs, hinges on W.T. doors.
*Gear, gear tracks, fittings on power W.T. doors (universals) and reach rods.

*2. Test operate all manual fire dampers in ventilation.
3. Service all fire stations; valves in fire main system outside of engineering spaces, as necessary.
4. Inspect and service all emergency locker gear.
5. Clean and lubricate shop tools and machinery.
6. Do not oil electric motors.

*Log entry required.

CARPENTER - RESPONSIBILITIES Cont'd.

Monthly:

*1. Check oil level in lifeboat Flemming gear box.
*2. Lubricate CO_2 and steam-smothering valves, arms.
3. Inspect storm oil tank and fittings.
*4. Inspect and clean cargo hold drains, strainers and rose boxes (or when cargo is discharged).
*5. Inspect and test operate chain locker bilge pump.
6. Operate and lubricate all fire main valves not normally used.
7. Inspect all access ladders to holds and escape trunks.
8. Check all sweat battens when cargo is discharged.
9. Inspect and repair faulty chains and stanchions.
10. Lubricate and operate all exterior hinged housings, fire stations, smothering stations, etc.

Quarterly: *Chalk test watertight doors, porthole and gaskets.

Semi-annually: Inspect all voids with the first officer and engineer.

*Log entry required.

SECOND ENGINEER (W) - RESPONSIBILITIES

Index No.	Name of Unit
S-47	Pumps: ballast pumps**
S-48	Piping and valves: steam piping in fire room, exhaust piping in fire room. Ballast system**. Fuel system filling lines. H.P. feed piping, fuel oil service piping.
S-49	Air compressors (Victory ships only)
S-51	Boilers, boiler mountings and fittings. Soot blowers, gages, combustion control equipment.
S-53	Blowers.
S-55	Fuel oil stowage and equipment**. fuel transfer pumps, fuel oil heaters, fuel oil vents**, fuel oil sounding apparatus**, fuel oil alarm systems**.
S-56	Feed water apparatus: feed pumps, H.P. feed heaters, chemical testing equipment.
S-93	Fire room fire fighting gear.

Daily:

1. Test and treat all boiler water in steaming and idle boilers - per current instructions of company under contract.
2. Test distilled water tanks and feed bottoms for salinity, and record.
3. Blow tubes of all steaming boilers at least twice daily at sea.
*4. Visually inspect all visible parts of boiler casing and brick work for warping, cracking and other signs of trouble or mal-operation.
5. Drain water off oil sumps of pumps or blowers so fitted.
*6. Inspect and clean all drain holes of fuel oil registers.
7. Inspect and adjust packing glands of all operating pumps.
8. Inspect all visible piping and set up on small leaks immediately.
9. Examine and test all methods of boiler water level indication proper operation of gage glasses.
10. Examine automatic feed checks and if possible put them through a cycle and watch them operate.
*11. Take CO_2 reading of stack gases.
12. Drain water from air lines to combustion control equipment.
13. Turn over all idle machinery $1\frac{1}{4}$ turn.
14. Blow gage glass column and columns for automatic feed checks.
15. Observe contaminated drains for indications of oil.

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*Log entry required.
**Not applicable to P-2s.

SECOND ENGINEER (W) - RESPONSIBILITIES Cont'd.

Weekly:

*1. Inspect, clean and test operate all safety devices, as practicable, including remote controls for fuel, oil valves, pumps, oil, air interlocks, turbine pump governors and trips, relief valves. Lift all relief valves by hand.
2. Inspect and clean all fire room fire fighting equipment.
*3. Inspect all parts of soot blower mechanism and lubricate and adjust - per mfr. instructions.
4. Blow boilers one gage glass (BUSHIPS Manual, Article 51-545) (only when possible to secure fires).
*5. Inspect and lubricate swing vent covers of all fuel oil tanks.
6. Lubricate all gear type couplings - per mfr. instructions.
7. Add packing to pumps, as necessary (Chapter 95, BUSHIPS Manual).
8. Change over all duplicate machinery, clean and inspect unit secured and make ready for immediate operation. Operate relief valves by hand, if practicable.
*9. Inspect all burner sprayer plates, nozzle body, etc. for damage.
10. Check end play float of all turbine equipment.
11. Inspect fuel oil service strainers for damage and serviceability.
*12. Service combustion control equipment - per mfr. instructions.
13. Clean air strainers to combustion control equipment.
14. Test lube oil coolers on feed pumps for leaks.
15. Operate all idle pumps under load conditions for 30 minutes.
16. Change over duplicate machinery to equalize running time.

Monthly:

1. Thoroughly inspect and check all combustion control equipment, damper regulators and pilot control equipment. Lubricate as necessary.
2. Inspect Hays Draft Indicators and pyrometers for proper operation and service.
3. Lubricate all reach rod controls for dampers and remote controlled valves, wheels, pulleys and threads for safety-valve releasing gear.
4. Remove pilot valves from Simplex pumps, for examination and spot in or renew.
5. Completely clean firesides of boilers, including air registers. (Article 51.2 of this manual)

*Log entry required.

SECOND ENGINEER (W) - RESPONSIBILITIES Cont'd.

Monthly:

*6. Test main feed pump overspeed trip, if installed.
*7. Check operation of discharge check valves.
8. Clean all ball bearings and housings on pumps and forced draft blowers (not on motor end). (BUSHIPS Manual, Article 45-165 and 166)
9. The packing in pump stuffing boxes shall be examined and, if found to be hard, renew to avoid scoring the shaft.
10. On fuel oil service pumps check wear of internal pump parts by closing suction valve at pump and noting vacuum pulled by pump. A vacuum of at least 12" Hg. should be developed by fuel oil service pumps, 15" Hg. by fuel oil booster and transfer pumps. If pump will not pull the required vacuum, open up, measure clearances and correct the deficiencies. In making this test, be certain that the pump is filled with oil before closing the suction valve.
11. Open scavenging air lines on all soot blowers, make certain that lines are clear and ball checks are in good condition.

Semi-annually:

1. Clean feed pump lubricating system and renew oil or grease.
2. Make inspection of all boiler firesides, watersides and brickwork as required by the "Boiler Inspection Record"(MSTS Form and Report 4730-2) each time the boiler has cooled down sufficiently to permit examination.
3. On reciprocating pumps, inspect steam valve gear for wear. Remove steam valve and valve gear and clean with kerosene. Check pump stroke with stroke indicator and adjust if necessary. Inspect liquid end valves, valve stems and springs. Replace work springs, correct excessively worn valve discs. Check plunger and rod packing and renew if necessary. Check relief valve setting.
4. Test all pressure and vacuum gages for accuracy.

Annually: Clean fuel oil heaters by circulation method, if required.

*Log entry required.

SECOND ENGINEER (DW) - RESPONSIBILITIES
(P2 Ships Only)

Index No.	Name of Unit	
S-46	Main condensers	*
	Main circulators and piping	
	Main air ejectors	
	Gland exhauster condensers	
	L.P. feed heaters	
S-48	Piping and valves	
	Ballast system	
S-51	Clean firesides of boilers, including registers (51.2 of this Manual)	*
S-55	Fuel oil stowage and equipment	
	Fuel oil transfer pumps	
	Fuel oil vents	
	Fuel oil sounding apparatus	
	Fuel oil alarm systems	
	Fuel oil heaters	*

Daily: Lay out work for and supervise all day workers and engine department repair.

Weekly:

1. Check machinist and engine utilitymen work books for machinery history data.
2. Check alarm systems for proper operation.

Monthly:

1. Service fuel oil sounding apparatus.
2. Check all fuel oil vent covers for proper operation.

Semi-annually:

1. Inspect steam ends of all reciprocating pumps.
2. Inspect liquid end valves, stems and springs on all ballast and transfer pumps.

THIRD ENGINEER - RESPONSIBILITIES

Index No.	Name of Unit
S-41	Main propulsion
	H.P. turbine
	L.P. turbine
	Diesel engines
	Pump, cooling water, main motor
	Cooler, air surface, main generator and motor
S-42	Main reduction gears
	Thrust bearing
	Turning gear
S-43	Main shafting
	Shaft bearings
S-45	Lube oil pumps
	Lube oil purifier
	Lube oil storage tanks
	Lube oil piping and valves
	Alarms and governor control regulators
	Lube oil gravity tanks
	Lube oil coolers.
S-46	Main condenser
	Main circulators and piping
	Main air ejectors
	Gland exhauster condenser
	L.P. feed heaters
S-47	Sanitary pumps
	Fire pumps
S-48	Piping and valves
	L.P. feed piping to feed pump suction
	Heading and galley drains in engine room
	Main condensate system
	Lube oil piping
	All H.P. piping in engine room
	Exhaust steam system
S-49	Air compressor (except for tube blowing)
S-56	Deaerating heater and vent condenser

THIRD ENGINEER - RESPONSIBILITIES (Cont'd)

Daily:

*1. Test lube oil alarms where practicable.
*2. Test main unit governor for proper operation when practicable.
*3. Inspect deaerating vent condenser for proper operation.
*4. Operate purifier each day underway, clean and inspect when run is completed.
5. Observe thrust position of all operating units by visual means.
6. Test low points of lube oil system for water and drain it off.
7. Inspect and adjust packing glands at pumps as necessary.
8. Inspect all ring oiled bearings for proper operation of oil rings.
9. Inspect and clean all main unit lube oil strainers and note any defects in strainer or magnets or unusual accumulation of foreign particles.
10. Turn all idle machinery $1\frac{1}{4}$ turn.
11. In diesel driven ship, switch over duplex filters on fuel and lubrication system, when fitted.

Weekly:

*1. Test safety devices, operate where practicable.
Low lube oil trip.
Hand actuate overspeed trip to insure proper operating condition.
Relief valves on turbines, air ejectors, feed heaters and deaerating tank.
2. Oil all gear type couplings - per mfr. instructions.
3. Add packing to pump glands as necessary.
4. Check height of purifier bowl.
5. Change over-all duplicate pumps.
6. Change over lubricating oil coolers and check for leaks.
7. Operate the valves that are not normally moved throughout the week, lubricate the stems and threads.
8. Test main lube oil coolers for leaks.

*Log entry required.

THIRD ENGINEER - RESPONSIBILITIES Cont'd

Monthly:

1. Batch centrifuge all lube oil in system (BUSHIPS, Article 45-104, when practicable).
*2. Check amount of end play on all pumps and record.
3. Check speed of all pumps under operating conditions and record.
4. Add packing to pumps as required.
*5. Check total float of main turbines.
*6. Check total float of main shaft when maneuvering.
7. Check operation of all discharge check valves.
8. Test all overspeed trips by over speeding unit, when practicable.
9. Examine main reduction gears at end of voyage.

Quarterly:

1. Clean and inspect all salt water heat exchangers (lube oil cooler and condensers). Replace zinc plates as necessary. Wire brush and paint interiors with Apexior or equal.
2. Inspect and clean all sprays in reduction gear lube oil system.
3. Inspect the couplings of all pumps thoroughly and replace any deteriorated coupling buffers or bushings.
4. Lubricate all other couplings - per mfr. instructions.
5. Inspect and clean flexible couplings of main unit.
6. Clean all pump oil reservoirs, clean sumps and refill.
7. Clean all main shaft bearing sumps and refill with fresh oil.
8. Inspect all adjustable steam pipe hangers, free up linkage, lubricate and set - per mfr. instructions.
9. The shaft packing in pump stuffing boxes shall be examined and if found to be hard, renew to avoid scoring the shaft.
10. Check wear of internal rotary pump parts by closing suction valve at pump and noting vacuum pulled by pump: a vacuum of at six inches mercury by lubricating oil service pumps. If pump will not pull the required vacuum, open up measure clearances and correct deficiencies. In making this test be sure that pump is filled with oil before closing the suction valve. Note the above in the machinery history.

Semi-annually:

1. Open deaerating heater, thoroughly clean and inspect interior. Clean and replace deteriorated spray valves. Paint interior with Apexior or equal.
2. Remove all air ejector nozzles and clean - per mfr. instructions.
3. Clean air ejector steam strainers.
4. Pump all oil from main lube oil sump, thoroughly clean and inspect.

*Log entry required.

THIRD ENGINEER - RESPONSIBILITIES Cont'd

5. Test gland seal condenser and first stage feed heaters for leakage.

6. Test all pressure and vacuum gages for accuracy.

7. Open and inspect both turbine HP and LP radial bearings. At alternate inspections (approximately one year intervals) rotor will be jacked and bottom half of each bearing rolled out for visual inspection.

8. Inspect air ejectors and condensate lines, valves and condenser shell joints for leaks.

9. Open, clean air ejector nozzles, and check nozzles for wire drawing.

10. On reciprocating pumps, inspect steam valve gear for wear. Remove steam valve and valve gear and clean with kerosene, check pump stroke with stroke indicator and adjust if necessary. Inspect liquid end valves, valve stems and springs. Replace worn springs, correct excessively worn valve discs. On salt water service remove all foreign matter. Check plunger and rod packing and renew if necessary. Check relief valve setting.

Annually:

1. Open all pumps and speed reducers, inspect and clean. Check clearance of all wearing parts, rotors, liners, casing throat bushings, worn wheels, impellers, casing wearing rings, etc. Renew parts as necessary.

2. Open and inspect all main engine packing glands.

3. Submit samples of lube oil for analysis.

4. In diesel driven ships:

a. At each annual overhaul, one third of the cylinders on main engines will be opened for thorough examination, lead lifted, pistons jumped, liners removed, connecting rod and main bearings examined and measured. This work shall be scheduled so that at three-year intervals all running gear of the main engine is examined and clearances measured.

b. Thrust bearings will be opened annually, thoroughly examined and clearances measured.

c. Valve gears shall be examined to the extent possible without complete dismantling annually and shall be examined thoroughly with complete dismantling every three years.

d. Scavenger pumps and/or supercharges shall be examined in the same manner annually and once every three years.