

OPNAVINST 4700.7M
8 May 2019

MAINTENANCE POLICY FOR NAVY SHIPS



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
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OPNAV INSTRUCTION 4700.7M

From: Chief of Naval Operations

Subj: MAINTENANCE POLICY FOR NAVY SHIPS

Ref: See appendix A

1. Purpose

a. To set policies and establish responsibilities for planning, executing, and evaluating maintenance of United States (U.S.) and foreign navy ships. Significant changes include updates for organizational changes, conversion to manual-type instruction format, and inclusion of all content from OPNAVINST 4700.38B, "Berthing and Messing During CNO Scheduled Maintenance Availabilities."

b. This instruction is being reissued as a complete revision with signature authority to meet Chief of Naval Operations (CNO) age requirement for Office of the Chief of Naval Operations (OPNAV) instructions and should be reviewed in its entirety.

2. Cancellation. OPNAVINST 4700.7L and OPNAVINST 4700.38B.

3. Scope and Applicability. This instruction applies to all United States Navy ships, fleet commanders, type commanders, systems commands, and all afloat and ashore maintenance organizations as noted herein.

4. Records Management

a. Records created as a result of this instruction, regardless of format or media, must be maintained and dispositioned for the standard subject identification codes (SSIC) 1000 through 13000 series per the records disposition schedules located on the Department of the Navy/Assistant for Administration (DON/AA), Directives and Records Management Division (DRMD) portal page at <https://portal.secnav.navy.mil/orgs/DUSNM/DONAA/DRM/Records-and-Information-Management/Approved%20Record%20Schedules/Forms/AllItems.aspx>.

b. For questions concerning the management of records related to this instruction or the records disposition schedules, please contact your local records manager or the DON/AA DRMD program office.

5. Review and Effective Date. Per OPNAVINST 5215.17A, Director, Fleet Readiness (OPNAV N83), will review this instruction annually on the anniversary of its issuance date to ensure applicability, currency, and consistency with Federal, Department of Defense, Secretary of the Navy, and Navy policy and statutory authority using OPNAV 5215/40 Review of Instruction. This instruction will be in effect for 10 years, unless revised or cancelled in the interim, and will be reissued by the 10-year anniversary date if it is still required, unless it meets one of the exceptions in OPNAVINST 5215.17A, paragraph 9. Otherwise, if the instruction is no longer required, it will be processed for cancellation as soon as the cancellation is known following the guidance in OPNAV Manual 5215.1 of May 2016.

6. Information Management Control. Data collection contained in chapter 2 in paragraphs 204 and 306 and in Chapter 3 paragraphs 301 and 302 are exempt from information management control per SECNAV M5214.1 dated December 2005 Part IV, subparagraphs 7g, 7g, and 7k.



JAMES L. MOSER
Director, Fleet Readiness

Releasability and distribution:

This instruction is cleared for public release and is available electronic only via Department of the Navy Issuances Web site, <https://www.secnav.navy.mil/doni/default.aspx>.

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CHAPTER 1
GENERAL INFORMATION

101. Purpose. To set policies and establish responsibilities for planning, executing, and evaluating maintenance of U.S. and foreign navy ships; to establish maintenance policies supporting the optimized fleet response plan, habitability requirements, and to meet ships' operational requirements and expected service life.

102. Applicability

a. This instruction applies to all ships and craft of the U.S. Navy (active and reserve) and those commands responsible for ship and related equipment maintenance, with the exceptions in subparagraphs 102a(1) through 102a(6):

(1) units assigned to the Military Sealift Command and the U.S. Special Operations Command.

(2) units designated as service craft and boats, governed by reference (a).

(3) ships and service craft assigned to the inactivation availability fleet, governed by reference (b).

(4) ships of the U.S. Coast Guard are not covered under this instruction unless operating as a service in the Navy, per section 3 of reference (c).

(5) ballistic missile submarines and associated strategic weapon systems, including missiles and associated equipment, fall under the cognizance of the Director, Strategic Systems Programs (DIRSSP). DIRSSP is responsible for providing material support acquisition, fleet support, and directs the end-to-end effort of the Navy's strategic weapons systems to include training, systems, equipment, facilities and personnel; and fulfills the terms of the United States and United Kingdom Polaris Sales Agreement. Nothing in this instruction detracts in any way from those responsibilities. Accordingly, DIRSSP will be consulted in all matters pertaining to, or affecting, strategic systems.

(6) naval nuclear propulsion systems, equipment and associated nuclear support facilities are covered under the Director, Naval Nuclear Propulsion (CNO N00N), also recognized as Director, Naval Reactors (NAVSEASYSCOM). NAVSEASYSCOM has responsibility for all matters pertaining to the maintenance, repair, and modification of naval nuclear propulsion plants and associated nuclear support facilities. Nothing in this instruction supersedes or changes these responsibilities and authorities. Accordingly, NAVSEASYSCOM will be consulted in all matters pertaining to or affecting the maintenance, repair, or modification

of naval nuclear propulsion plants or their associated nuclear support facilities.

b. This instruction also applies, on a case-by-case basis, to those normally excepted vessels specifically identified by Director, Fleet Readiness (OPNAV N83) in its annual letter of availability intervals, durations, maintenance cycles, and repair man-days for depot-level maintenance availabilities used for scheduling, programming, and budgeting purposes.

c. Throughout this instruction, the term "ship" refers to all surface ships, aircraft carriers, and submarines.

103. Discussion

a. Navy ship maintenance policies and actions are designed to ensure crew and ship safety while achieving desired operational readiness levels within current system capabilities, at the lowest possible total ownership cost, consistent with public law and other directives.

b. The Navy ship is a unique entity in that responsibility for both the operation and maintenance of the ship ultimately rests with the ship itself, through its Commanding Officer (CO). Numerous Navy organizations exist to support the ship CO for all levels of required maintenance. It is incumbent upon the CO and each supporting organization to apply the appropriate rigor and adhere to this instruction to ensure the ship can meet required operational and engineered objectives for the duration of the life of the ship.

c. Guidance provided in the optimized fleet response plan, reference (d) discusses the need to support the long-term sustainability of the force, while maintaining the capability to surge in support of operational requirements. While meeting current operational needs is always a priority, the optimized fleet response plan acknowledges timely completion of required maintenance is vital to achieving expected service life, and it recognizes that deferring maintenance can increase risk in the ability to achieve expected service life for a given ship. Executing required maintenance on time is a vital part of current and future force readiness.

d. The Navy's program for ship material readiness has two separate components: ship maintenance and ship modernization. While maintenance and modernization programs and budgets are distinct, they are closely related in their planning and execution. On occasion, cost-based analysis and operational schedules may identify modernization as the best alternative to restoring capability via corrective maintenance (i.e., modernization in lieu of repair); therefore, modernization policies must also be considered, when applicable, for fiscal responsibility.

(1) maintenance can be either time directed (i.e., performed periodically regardless of equipment condition), or condition-based (i.e., performed when triggered by specific equipment

condition). Time-directed requirements include those that are periodic in nature and are based on elapsed time or recurrent operations. Ship's force or inspection teams usually identify condition-based maintenance requirements, which are based on quantifiable data and the actual physical conditions of the ship. Additional guidance for the maintenance of forces afloat is covered in reference (e).

(2) the ship modernization program is designed to either add new capability or improve reliability and maintainability of existing systems. Navy modernization policy is covered in reference (f).

e. Activities conducting maintenance or modernization on ships must maintain the integrity of ship class configuration and status of programs-of-record and alterations. Maintaining current, accurate records for all installed ship systems and variants is critical to ensuring proper resourcing to ensure continued and sustained readiness.

CHAPTER 2
MAINTENANCE POLICY

201. General. U.S. Navy ships will be maintained:

a. In the highest practical level of material readiness to meet operational availability requirements while minimizing total life cycle costs over the design life of the ship.

b. In a safe material condition.

c. Per shipboard habitability guidance of reference (g).

d. Per environmental readiness program standards of reference (h).

e. To meet expected service life

201.1. Technical Authority. Policy and direction issued by fleet commanders, or their subordinate activities, will comply with technical requirements established by the appropriate technical authority and system commands described in reference (i). Fleet commanders and COMNAVSEASYS COM will establish procedures for addressing deviations to technical requirements which comply with requirements outlined in reference (e). Specific measures must be included to ensure technical authority concerns are adequately resolved when deviations are authorized.

201.2. Reliability-Centered Maintenance (RCM). The command exercising technical authority per reference (i) will employ RCM principles of references (j) and (k) to maximize operational readiness, safety, and equipment reliability in a cost-effective manner. RCM is the engineering discipline that allows for the evaluation of evidence for the purpose of scheduling and executing maintenance. Criteria for objective evidence will be determined using RCM analysis per reference (k).

201.3. Condition-Based Maintenance and Condition-Based Maintenance Plus. All activities will employ the condition-based maintenance and condition-based maintenance plus guidance directed in reference (l) whenever practical in scheduling or developing maintenance procedures for Navy ships and related equipment. The fundamental goal of condition-based maintenance is to perform maintenance only when there is objective evidence of need (actual or predictable failure of a ship's installed systems or components), while ensuring safety, equipment reliability, equipment availability, and reduction of total ownership costs.

201.4. Ship Maintenance Programs. A tailored maintenance program must be developed and maintained for each ship class per the requirements discussed in chapter 7, covering the maintenance tasks and environment or capabilities required to conduct required maintenance. Chapter 7 also addresses requirements for the miniature and micro-miniature module test and

repair program.

202. Maintenance Planning. Maintenance should only be scheduled or executed when there is objective evidence to justify execution. In addition to employing RCM principles, all maintenance for Navy ships and related equipment must be developed, scheduled, planned, and executed per the condition-based maintenance principles defined and described in reference (l).

202.1. Assigning Maintenance Level. Maintenance and modernization should be screened and executed at the level that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, safety, priority, crew impact, capability, capacity, and total cost. Guidance for organizational-level, intermediate-level, and depot-level maintenance is provided in chapters 4, 5, and 6, respectively.

202.2. Assignment to Maintenance Facility. Ship availability assignment must consider the complexity of the required work and maintenance along with the capability and capacity of the public and private sector facilities, while ensuring these levels are commensurate with the Navy's requirements for current and future maintenance, modernization, and emergency ship repair per references (m), (n), and (o). See paragraph 202.8 for assigning maintenance outside of the U.S. and its territories.

a. "Short-term work" for CNO scheduled private sector depot-level availabilities will normally be accomplished in the ship's homeport area, per reference (p) section 7299a.

b. CNO availabilities solicited coast-wide, which may be awarded for out-of-homeport accomplishment, will be planned and solicited with sufficient lead time to support contract award no less than 120 days prior to scheduled start.

202.3. Maintenance Scheduling. Ship maintenance validation, screening, brokering, scheduling, planning, and execution are to be accomplished per the milestones defined in reference (e) volumes 2 and 6 using common processes across all extended refit period rises, as applicable. Fleet commanders and systems commands (SYSCOMs) will develop standard procedures to implement these processes. Changes to existing and future management information systems that provide metrics on maintenance costs for contractor, number of man-hours, and costs for organic maintenance must facilitate timely retrieval of depot level cost data to support the annual public and private 50/50 workload distribution data call required by reference (p) section 2466.

202.4. Work Prioritization

a. To ensure flexible yet consistent application of priorities for intermediate-level and depot-level work, maintenance organizations must prioritize work in descending order per

subparagraphs 202 4a(1) through 202 4a(10).

- assets
 - (1) emergent and refit work associated with ballistic missile submarine strategic
 - (2) voyage repair work on deployed or deploying units
 - (3) work on ships being prepared for deployment
 - (4) CNO scheduled depot maintenance availabilities
 - (5) modernization and restricted and technical availabilities
 - (6) other U.S. Navy ship availabilities, except for inactivation availability or disposal
 - (7) refurbishment of repairable equipment
 - (8) work on other U.S. government ships
 - (9) inactivation availability and disposal availabilities
 - (10) work on foreign ships

b. Additional guidance specific to depot maintenance availabilities is described in paragraph 602.6.

202.5. Planning Documents. Navy maintenance planning activities will invoke and promote standard and reusable planning documents where possible. Leveraging previously-used effective planning products can streamline the planning process. As such, these tools should be used as a starting point and formally updated as needed to further develop and improve upon standardized planning tools and processes.

202.6. Current Ship's Maintenance Project. The current ship's maintenance project is the primary repository of information concerning the current material condition of the ship. It must be maintained in a complete and current status, accurately reflecting the material condition of the ship at all times per reference (o).

202.7. Dry-docking. Dry-dockings will be planned and scheduled to meet the interval requirements as issued annually by OPNAV N83.

a. In the event dry-docking maintenance actions are required before the next scheduled docking, the responsible repair activity will review current underwater ship husbandry capabilities to determine if an acceptable cost-effective repair can be accomplished without dry-

docking, using qualified divers and approved procedures. Underwater ship husbandry inspection, maintenance, or repair actions will be planned and accomplished per reference (q).

b. Whenever feasible, underwater ship husbandry maintenance actions should provide permanent repairs to save subsequent dry-dock rework costs. When permanent repairs are not feasible, temporary repairs must be accomplished within technical and cost constraints, to support ship operations until the next regularly scheduled dry-docking.

c. Repairs that will require an unprogrammed docking must be reported to OPNAV per Surface Maintenance Engineering Planning Program (SURFMEPP), Submarine Maintenance, Engineering, Planning and Procurement (SUBMEPP), or Carrier Planning Activity (CPA) guidance.

202.8. Overseas Maintenance. Depot-level maintenance, in support of deployed ships, may be performed within the theater of deployed operations when necessary per reference (r). Depot maintenance performed overseas must be cost-effective, must not adversely impact the U.S. industrial base (public or private) core logistics capabilities, per reference (p) section 2464, and must comply with existing statutes. The policies in subparagraphs 202 8a and 202 8b apply, as discussed in reference (p) section 7310.

a. U.S. or U.S. territory home-ported ships. Only voyage repair, as defined in volume 3, paragraph 3.4 of reference (e), may be performed on U.S. or U.S. territory home-ported ships by shipyards or ship repair facilities located outside of the U.S. or its territories. For the purposes of this prohibition, a shipyard is any facility that repairs naval vessels and is located outside the U.S. or its territories.

b. Overseas home-ported ships and forward-deployed Naval Forces. Depot maintenance for ships being prepared for, or returning from, home-porting overseas (assignment to forward-deployed naval forces) will be scheduled to maximize the use of the industrial capacity of the U.S. Specific limitations for conducting overseas maintenance must be followed, as detailed in reference (p) section 7310.

202.9. Maintenance on Foreign Ships. Maintenance may be performed on ships of foreign navies by fleet maintenance activities if similar supplies and services are furnished on a like basis to naval vessels and military aircraft of the U.S. by the foreign country concerned.

a. Maintenance of foreign vessels must be on a not-to-interfere and cost-reimbursable basis, and must be approved in each instance by OPNAV N83 prior to the commencement of work.

b. Foreign ship repair work that would either interfere with future planned work or restrict an afloat fleet maintenance activities from meeting its readiness requirement for getting

underway must not be undertaken.

203. Maintenance Execution. Navy commands responsible for ship and related equipment maintenance will promote, develop, and use existing and emerging technologies to increase maintenance efficiencies and quality assurance; promote shipboard safety and habitability; enhance environmental protection; and reduce costs.

a. Maintenance of ship systems and equipment must be:

(1) performed by qualified personnel using correct procedures and material per the technical requirements issued by the appropriate technical authority.

(2) conducted based on objective evidence of need, in a cost-effective manner, to meet applicable specifications per quality assurance standards. Quality maintenance is discussed in chapter 8.

(3) accomplished as scheduled. In cases when resource availability or operational requirements preclude the timely completion of planned maintenance, activities must document per reference (o) and, if required by reference (e), obtain an approved maintenance deferral.

b. Preventive and other planned maintenance actions must be:

(1) defined in class maintenance plans for organizational-level, intermediate-level and depot-level maintenance requirements.

(2) scheduled per the maintenance and material management (3M) system planned maintenance system scheduling application for organizational-level accomplishment and class maintenance plans scheduling applications for intermediate-level and depot-level accomplishment.

c. Corrective maintenance actions may be required to restore systems or equipment to full operation, to bring operation within specified parameters or to ensure safe operation.

203.1. 3M System. The ship's maintenance and material management system is the Navy's primary management program for organizational-level non-nuclear maintenance aboard all U.S. Navy ships per reference (s). Other non-nuclear maintenance management programs may not be used without prior approval from OPNAV N83.

a. Safety-related corrective maintenance is mandatory and must be conducted at the earliest opportunity.

b. The corrective maintenance action selected (i.e., repair, replacement, or alteration) must be based on optimizing reliability and total ownership cost considerations. Execution must

be per applicable repair or installation standards and specific technical documentation.

203.2. Nuclear Propulsion Plant Maintenance. Repairs, maintenance, and modernization of the propulsion plants in nuclear-powered ships involve unique considerations for technical specifications and quality control, ship safety, radiological controls for occupational health and safety, and information security.

a. Reactor plant maintenance, repair, and modernization beyond the capability or capacity of the organizational-level must be assigned only to nuclear-capable fleet maintenance activities or private sector shipyards and performed per the requirements established by CNO N00N and COMNAVSEASYSKOM.

b. Depot-level repair, maintenance, and modernization for steam plant systems, electric plant systems, and those auxiliary ship systems that support the reactor plant and associated reactor safety systems in nuclear-powered ships must only be assigned to nuclear-capable shipyards and performed per requirements established by COMNAVSEASYSKOM concurrence.

c. Changes, repairs, and maintenance in the nuclear propulsion plants of nuclear-powered ships will be in strict accordance with reference (t).

d. Changes, repairs and maintenance in the nuclear support facilities of nuclear-capable tenders will be in strict accordance with reference (u).

e. Nuclear reactor plant and support facilities' preventive maintenance will be administered by ship's force per reference (s).

f. Class maintenance plans must incorporate administration of nuclear reactor plant and associated support facility preventive maintenance per reference (v).

203.3. Configuration Control. Ship configuration must be controlled through a formal change process which fully documents any alterations to existing systems and programs of record.

a. Any changes to existing systems must be updated in each ship's configuration and logistics support information system data. The configuration data manager's database-open architecture is the authoritative data source of ship's configuration and logistics support information system data for all Navy ships and shore sites. The command responsible for conducting the installation or change must fully document the newly installed equipment and systems in the ship's configuration record and ensure that government-contracted operating and maintenance training is conducted, and ensure that integrated logistic support is fully in place at system initial operational capability. The ship's CO must ensure the configuration is validated

and recorded.

b. All changes to ship configuration will be per specified requirements as approved by the appropriate technical authority.

203.4. Equipment and Component Standardization. Navy engineering, acquisition, maintenance activities, fleets, and operational commands must actively promote standardization of equipment and components installed in Navy ships to the maximum extent practicable to minimize life cycle logistic support costs. Maintenance and modernization changes, as well as complex overhauls, refueling complex overhauls, and new construction changes should emphasize the use of equipment and components already supported by the federal supply system to the maximum extent practicable, with due consideration to life cycle cost, reliability, and maintainability.

203.5. Contract Management. Repairs or modernization under COMNAVSEASYSCOM cognizance that are executed by the private sector will be contracted under COMNAVSEASYSCOM headquarters' contracting authority. These contracts will be exercised through COMNAVSEASYSCOM directly or through regional maintenance centers.

a. RMCs will provide contract administration and technical oversight.

b. Supervisors of shipbuilding, conversion and repair are COMNAVSEASYSCOMs principal on-site contracting activity and will manage maintenance for efficient and effective work, resolution of technical issues, and assurance of delivery of work meeting Navy quality standards.

c. Availabilities awarded in the private sector will be accomplished in such a manner to ensure quality performance, promote vigorous and healthy competition, support the nation's industrial base, include quality of life considerations for ship's force and provide full support for the tenets of the optimized fleet response plan.

d. Availability contracts must have the flexibility to add and delete work during availability execution without placing the Government at a negotiating disadvantage. Condition-directed repair makes it impractical to fully scope all work required prior to the start of the availability, making flexibility a necessary component in all contracts.

204. Maintenance Evaluation

204.1. Material Condition Metrics. The Navy's ship maintenance and technical communities will, where practical, develop and maintain comprehensive metrics capable of providing an

objective measure of material condition of ships to OPNAV N83 and fleet commanders.

a. The metrics will be agreed upon by OPNAV N83, COMNAVSEASYSCOM, and fleet commanders before implementation. The metrics should provide resource sponsors and maintenance managers the ability to use material condition information to support planning and execution of maintenance programs.

b. The objectives of this effort are to ensure approved maintenance plans are adequately implemented, to identify potential improvements to the maintenance plan, to provide a means of predicting the impact of various levels of maintenance funding on future ship material condition and readiness, and to ensure that ships are maintained in the highest achievable level of material readiness commensurate with supporting the ship's mission and availability for operations.

204.2. Maintenance Issues of Concern. Ship maintenance programs and technical issues that have the largest impact on fleet readiness and require senior Navy leadership attention for resolution will be identified, managed and tracked to satisfactory completion. One such program is COMNAVSEASYSCOM's Top Management Attention and Top Management Issues program which is defined in volume 6, chapter 32 of reference (e). COMNAVSEASYSCOM will coordinate the top management attention and top management issues program for all SYSCOMs and program offices, with fleet maintenance personnel prioritization and participation.

204.3. Coordination with the Board of Inspection and Survey (INSURV). The Navy's ship maintenance and technical communities will collaborate with INSURV to develop and maintain fleet-wide standardized assessment procedures and criteria to determine the ship system and equipment material readiness metrics discussed in paragraph 204.1. OPNAV N83, COMNAVSEASYSCOM, fleet commanders, and type commanders (TYCOMs) will use the results of these inspections for readiness assessment and for maintenance planning and budgeting purposes.

CHAPTER 3
RESPONSIBILITIES

301. CNO. The CNO is responsible for maintaining the overall readiness of naval ships. This includes the responsibility for planning and programming resources required for the acquisition, life cycle management, maintenance, and modernization of Navy ships.

301.1. Director, Naval Nuclear Propulsion (CNO N00N). CNO N00N also serves as the Deputy Administrator for Naval Reactors, Department of Energy National Nuclear Security Administration. CNO N00N has responsibility for and directs all aspects of all facilities and activities that comprise the naval nuclear propulsion program, a joint Department of Energy and Department of the Navy organization.

301.2. Deputy Chief of Naval Operations, Manpower, Training, and Education (CNO N1) will provide trained, qualified military personnel to perform maintenance at organizational-level, intermediate-level, and depot-level maintenance.

301.3. Deputy Chief of Naval Operations, Integration of Capabilities and Resources (CNO N8) is the principal advisor to the CNO for the assessment of Navy readiness issues, including the assessment and oversight of ship maintenance. CNO N8 will:

- a. Serve as the ship maintenance assessment sponsor.
- b. Source Navy-wide ship maintenance policy and goals in coordination with platform sponsors, fleet commanders, and SYSCOMs.
- c. Coordinate preparation, presentation, and defense of all ship maintenance requirements and resources through all phases of the Navy's planning, programming, budgeting, and execution system (PPBES) process.

301.4. OPNAV N83 is the CNO staff point of contact for all ship maintenance and fleet readiness issues. OPNAV N83 will:

- a. Serve as lead on the CNO N8 staff for ship maintenance responsibilities.
- b. Coordinate ship maintenance programs with fleet commanders, SYSCOMs, program executive offices (PEO)s, warfare and provider enterprises, direct reporting program managers, and OPNAV resource sponsors as required:

Deputy CNO, Manpower, Personnel, Training, and Education (CNO N1)
Director, Strategic Mobility and Combat Logistics (OPNAV N42)
Director, Expeditionary Warfare (OPNAV N95)
Director, Surface Warfare (OPNAV N96)

Director, Undersea Warfare (OPNAV N97)
Director, Air Warfare (OPNAV N98)
Director, Integrated Warfare (OPNAV N9I)

- c. Review, approve, and monitor maintenance programs for all platforms, including Commander, Navy Reserve Force (COMNAVRESFOR) ships.
- d. Coordinate and approve fleet depot-level availability schedules, working with fleet commanders, SYSCOMs, their affiliated PEO, warfare enterprises, and sponsors.
- e. Assess ship maintenance requirements, identify funding and other program deficiencies, and recommend resolutions to properly execute ship maintenance. Plan and program the resources required to support the maintenance and modernization plans per Navy PPBES guidance.
- f. Issue annually the approved representative intervals, durations, maintenance cycles, and repair man-days for depot-level maintenance availabilities to be used for scheduling, programming, and budgeting purposes, using input from COMNAVSEASYSKOM, PEOs, fleet commanders and TYCOMs.
- g. Approve the location and dates of all CNO scheduled depot maintenance availabilities. Reviews assigned work to ensure core logistics capabilities (i.e., core depot maintenance and repair capability) per reference (p) section 2464 are maintained.
- h. Establish ship material condition metrics discussed in paragraph 204.1. Plan and program the resources required to develop and maintain these metrics.
- i. Approve requests for maintenance on foreign ships.
- j. Approve monthly CNO Gold Disk award submissions for the Miniature and Micro-miniature Module Test and Repair Program, described in paragraph 702.4.

301.5. Resource Sponsors. OPNAV N42, OPNAV N95, OPNAV N96, OPNAV N97, OPNAV N98, and OPNAV N9I serve as resource sponsors and principal advisors to the CNO for the readiness and logistics resource requirements of their assigned assets. This includes the funding

of ship modernization. OPNAV resource sponsors will:

- a. Review, monitor and fund maintenance programs for their respective platforms, including COMNAVRESFOR ships, to ensure both near-term and long-term funding health.
- b. Plan and program the resources required to support modernization to resolve equipment obsolescence issues per Navy PPBES guidance.
- c. Review all CNO-scheduled depot availability changes for viability or funding impact and provide OPNAV N83 with approval recommendations.

302. Fleet Commanders

302.1. Commander, US Fleet Forces Command (COMUSFLTFORCOM) will serve as the lead for collection and consolidation of resource requirements, and act as the single fleet voice and point of submission of resource requirements to CNO N8. COMUSFLTFORCOM has primary responsibility for identifying, consolidating, and prioritizing fleet maintenance and modernization requirements in conjunction with Commander, Pacific Fleet (COMPACFLT) and the warfare enterprises with support from the lead technical authority, COMNAVSEASYSKOM, which establishes the technical requirements.

302.2. Specific duties. Fleet commanders are responsible for the material condition of their assigned ships per Navy regulations. Fleet commanders will:

- a. Identify and authorize required corrective maintenance and modernization actions using condition, cost, schedule, and mission trade-offs, as required.
- b. Approve those changes to CNO scheduled depot maintenance availabilities authorized by the procedures outlined in paragraph 602.5.
- c. Implement standard maintenance policies and processes between the two fleet commanders per reference (e).
- d. Participate in the development and implementation of the maintenance program for each ship class.
- e. Promote self-sufficiency of fleet ships and activities.
- f. Provide feedback of resource expenditures and as-found material condition to the 3M system. Resource expenditure feedback is required in detail sufficient for continuous improvement of depot-level planning, programming, and budgeting. As found material condition feedback is required in detail sufficient to support refinement and validation of technical requirements, to perform engineering analysis and to schedule subsequent maintenance

actions.

g. Provide berthing barges for other than scheduled CNO maintenance availabilities when available. Guidance in paragraph 602 7.c applies. Barge support will be cost reimbursable and provided only on a not-to-interfere basis with scheduled CNO maintenance availabilities.

h. Establish and manage procedures to approve and track the maintenance of foreign vessels as discussed in paragraph 202.9.

303. TYCOMs. Fleet TYCOMs are responsible to their fleet commander for the material condition of their assigned ships. TYCOMs will:

a. Ensure assigned ships are mission-ready to meet operational commander requirements.

b. Manage emergent and scheduled maintenance, including the identification and prioritization of corrective maintenance actions and alterations on assigned ships.

c. Advise fleet commanders, PEOs, ship program managers, direct reporting program managers, and COMNAVSEASYSYSCOM on standardization of maintenance and modernization processes and products.

d. Manage maintenance resources to meet reference (d) requirements and expected service life (ESL).

304. SYSCOMs

304.1. COMNAVSEASYSYSCOM. COMNAVSEASYSYSCOM is the lead SYSCOM for ship in-service support. COMNAVSEASYSYSCOM will:

a. Exercise engineering and technical authority per the policy set forth in reference (i).

b. Oversee the core processes required to support in-service ships. Be the lead technical authority, along with the affiliated PEOs, in the development and management of maintenance programs for each ship class and to ensure that U.S. Navy ships are maintained in the highest possible state of material readiness and safety. COMNAVSEASYSYSCOM will ensure maintenance programs are updated as changes occur.

c. Establish hull, mechanical, and electrical (HM&E) and combat systems technical requirements and provide the technical support necessary to maintain the material condition of

all ships.

d. Oversee and manage standardization of maintenance and modernization processes, procedures, and products in support of the Navy's drive toward "one way of doing business" for ship maintenance. This includes ensuring the use of Condition-Based Maintenance and Condition-Based Maintenance Plus, use of the standard COMNAVSEASYS COM approved RCM methodology specified in reference (j) in the development and update of maintenance programs, approval of any RCM methodology variations proposed by PEOs, direct reporting program managers, or ship program managers, and coordinating efforts of the warfare Extended Refit Period rises to ensure efficient maintenance processes; and identify and implement maintenance and maintenance management best practices.

e. Establish standard policy and procedures to maintain configuration documentation on all U.S. Navy ships. Ensure coordination in configuration documentation with other SYSCOMs and PEOs for equipment and materiel under their cognizance.

f. Ensure naval supervising activities integrate all maintenance providers involved in the execution of CNO scheduled availabilities to ensure that ship maintenance and modernization are performed within the scope of work authorized, employing prescribed technical and quality standards, specifications, and requirements in an efficient and cost-effective manner.

g. Furnish timely information on the prospective workloads of public and private shipyards to the respective fleet commanders for their guidance, recommending changes to scheduled availabilities to balance workload and avoid excessive cost to the Navy.

h. Issue and maintain current Navy drawings, job qualification requirements, technical manuals, repair standards, maintenance and test requirements, calibration procedures, and process controls as required for ship, system, and equipment operation, maintenance, and calibration.

i. Serve as lead SYSCOM for Condition Based Maintenance for applicable systems and equipment. Assist and advise fleet commanders and TYCOMs in Condition Based Maintenance and Condition Based Maintenance Plus policy implementation.

j. Develop RCM based material condition diagnostic systems needed for more effective maintenance decision making, ensure sensors are placed based on RCM analysis, and develop or integrate information systems required to support increased maintenance self-sufficiency of ships

and other fleet activities.

k. Manage and provide technical oversight for the Navy ships' 3M system and Miniature and Micro-miniature Module Test and Repair Program discussed in paragraph 702.4.

l. Provide ship system direct fleet support services as requested by the fleet commanders. Direct fleet support includes technical assistance, advice, instruction, and training of fleet personnel under the operational control of fleet commanders. Direct fleet support also includes readiness assessments, reviews, tests, and inspections to evaluate the effectiveness and material condition of ship equipment and systems.

m. Identify, through close contact with the fleet commanders and the other SYSCOMs, maintenance-training requirements. Work with the Commander, Naval Education and Training Command (NETC) to develop training courses and material as required. Work with Commander, Navy Regional Maintenance Center (COMNAVRMC) to assist with Navy afloat maintenance training strategy.

n. Support OPNAV and fleet commanders in the development and maintenance of comprehensive material condition metrics capable of providing an objective measure of ship's true material condition as prescribed by OPNAV N83 and resource sponsors, per paragraph 204.1. This includes responsibility to obtain an appropriate amount of as-found condition, completion, and cost data for the development of lessons learned.

o. Develop, manage, and maintain a program (e.g. top management attention and top management issues) with the fleets to track the resolution of critical fleet maintenance and technical issues that require attention of senior Navy leadership for resolution as discussed in paragraph 204.2.

p. Analyze maintenance feedback to determine design and process improvements in order to refine maintenance requirements.

q. Define and maintain shore industrial activity baseline capabilities and capacity. Ensure naval shipyard capability meets national requirements per reference (p) section 7315. This includes assessment of the health of the ship repair industrial base as it pertains to CNO availability execution performance and emergent mission requirements.

r. Provide fleet commanders and OPNAV analytic support in development and justification of PPBES future years defense program (FYDP) for ship maintenance.

s. COMNAVSEASYSCOM must submit to OPNAV N83, OPNAV N95, and OPNAV N96, the Surface Ship Engineered Operating Cycle Deferred Tasks Annual Report per reference (m). The ship sheets maintained by surface maintenance engineering planning program (SURFMEPP) must also capture these deferrals to accurately update depot maintenance

requirements in support of the PPBE process.

304.2. Commander, Naval Air Systems Command (COMNAVAIRESYSCOM); Commander, Space and Naval Warfare Systems Command (COMSPAWARSYSCOM); DIRSSP; and Commander, Marine Corps Systems Command. These SYSCOMs will coordinate with COMNAVSEASYSYSCOM in the performance of the assigned duties in subparagraphs 304 2a through 304 2g for the maintenance and modernization of ships and related equipment:

- a. Maintain their assigned systems and associated equipment in the highest state of material condition.
- b. Provide naval shipyards, supervisors of shipbuilding, conversion and repairs, RMCs and fleet commanders the technical support necessary to perform quality maintenance.
- c. Analyze maintenance feedback to determine design and process improvements in order to refine maintenance requirements.
- d. Provide direct fleet support services as requested by fleet commanders.
- e. Provide, manage, and maintain configuration documentation for all U.S. Navy ships.
- f. Provide technical assistance to COMNAVSEASYSYSCOM in the development of comprehensive material condition metrics capable of providing an objective measure of ship's true material condition as discussed in paragraph 204.1.
- g. Coordinate changes to CNO scheduled depot maintenance availabilities per paragraph 602.5.

304.3. Commander, Naval Supply Systems Command (COMNAVSUPSYSCOM) is responsible to provide and position material per approved planning data and a logistically supported maintenance concept to achieve operational readiness goals. COMNAVSUPSYSCOM will utilize configuration and technical information provided by the other SYSCOMs when

determining material requirements. COMNAVSUPSYSCOM will:

- a. Issue supply management policy and procedures as required to support material procurement and control.
- b. Determine, or consolidate from applicable stakeholders, supply allowances and requirements at all echelons of supply, which address readiness-based sparing policy.
- c. Provide a system and procedures to support spare parts accountability.
- d. Ensure standard stock materials are procured and available to support intermediate and depot maintenance availability schedules.

305. PEOs, Direct Reporting Program Managers, and Ship Program Managers. PEOs, direct reporting program managers, and ship program managers are responsible for all aspects of life cycle management of their assigned programs. Per reference (r), they will report to CNO through COMNAVSEASYSYSCOM for all matters pertaining to in-service support. PEOs, direct reporting program managers and ship program managers will:

- a. Develop and maintain the class maintenance plan for assigned ship classes and ensure suitable support is provided to all systems, equipment, and components installed in or on those hulls until the last unit has been removed from service. This includes the development of the detailed class maintenance plan per reference (l).
- b. Ensure class maintenance plan requirements are executed during maintenance periods or properly reprogrammed. Implement a COMNAVSEASYSYSCOM process to evaluate life cycle impacts and authorize non-accomplishment of class maintenance plan requirements in conjunction with technical authorities.
- c. Issue and maintain current selected record data, ship drawings, and ship class-specific technical manuals.
- d. Analyze in-service operational data and maintenance feedback through 3M maintenance data, casualty reports (CASREP), repair activity discrepancy reports, guarantee and warranty deficiencies, and other reporting sources to determine design and process improvements and to refine maintenance requirements.
- e. Identify, program, and plan for modernization that is considered a mandatory safety alteration. Ensure the program of record is maintained and updated to allow for identification of

mandatory safety alterations.

f. Notify NETC of new training requirements resulting from any system or equipment modifications due to maintenance or modernization.

306. Board of INSURV. INSURV is responsible for identifying and reporting ship material conditions that substantially reduce a ship's fitness for naval service, its ability to perform its primary and secondary missions, and to reach its ESL. In performance of these duties, INSURV will:

a. Collaborate with COMNAVSEASYSCOM to develop common assessment procedures.

b. Perform maintenance process audits that validate reported material condition metrics. Based on inspection and audit findings, INSURV may:

(1) recommend a ship's equipment, systems, or programs be decertified or operations suspended until repaired.

(2) report maintenance processes as ineffective (non-conforming).

(3) submit technical feedback reports to appropriate SYSCOMs.

307. NETC. NETC is responsible for providing effective training in maintenance skills for military personnel and modifying training programs to enhance quality maintenance. NETC will:

a. Include RCM, Condition Based Maintenance, Condition Based Maintenance Plus, and quality maintenance concepts and methods in shipboard watch stander, equipment operator, maintainer, supervisor, planner, and engineering training programs.

b. Coordinate with COMNAVSEASYSCOM and the fleet commanders, to provide training facilities, curricula, and instructors for the Miniature and Micro-miniature Module Test

and Repair Program.

c. Emphasize quality maintenance principles in all leadership, management, and maintenance courses.

d. Develop new quality-oriented leadership, management, and maintenance courses as required by fleet commanders and SYSCOMs.

e. Ensure appropriate shipboard quality assurance fundamentals are included in rate advancement examinations.

308. COMNAVRESFOR. Will coordinate efforts with the fleet commanders to optimize the productivity and contribution of the selected reserve (SELRES) to the fleet's maintenance requirements.

309. Forces Afloat. Individual ships are responsible for their own proper self-assessment, preservation, repair, maintenance, and operation and for cost-effective management of required maintenance actions. Ships' COs will ensure proper inspections, readiness reporting and documentation of all maintenance and modernization conducted onboard their ships.

CHAPTER 4
ORGANIZATIONAL-LEVEL MAINTENANCE

401. Definition. Organizational-level maintenance is the lowest maintenance echelon. It consists of all maintenance actions within the capability and resources provided to the organization that routinely oversees equipment operation (e.g., ship's force). It is the first defense against allowing small defects to become major material problems, which could impact ship operations and mission capability.

402. Policy

a. Maintenance will be performed at the maintenance level that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, safety, crew impact, capability, capacity, and total cost. Accordingly, organizational-level maintenance may be assigned to intermediate- or depot-level maintenance facilities for completion, as appropriate.

b. Typical organizational-level maintenance actions include, but are not limited to, such items as listed in subparagraphs 402.b(1) through 402 b(6).

(1) facilities maintenance, such as cleaning and proper preservation.

(2) routine systems and component planned maintenance, such as inspections, systems operability tests and diagnostics, lubrication, calibration, and cleaning.

(3) corrective maintenance, such as HM&E and electronic troubleshooting down to the lowest replaceable unit level, miniature and micro-miniature electronic repair, component change-out, and in some cases, complete disassembly and repair in-place, in order to restore components to operation.

(4) assistance to higher (intermediate- or depot-) level maintenance activities.

(5) verification and quality assurance of maintenance accomplished by other activities.

(6) ensuring documentation of all deferred and completed maintenance actions, whether accomplished by ship's force or by other activities.

403. Responsibilities. The ship's CO is responsible for the proper self-assessment, preservation, repair, maintenance, and operation of the ship; and for cost-effective management of required maintenance actions at the organizational-level. Within resource limitations, ship COs should strive to improve self-sufficiency and self-assessment capabilities. Self-assessment involves recognizing, identifying, and reporting equipment or systems' evident failure modes or symptoms of operation below standard parameters or out-of-specification during zone

inspections, planned maintenance systems (PMS) execution, or watch standing. The ship's CO will:

- a. Ensure ship's force accomplishment of organizational-level maintenance actions.
- b. Ensure that quality maintenance is performed by other activities by providing assistance and oversight, as necessary, to ensure that published quality assurance standards are adhered to per reference (e).
- c. Ensure documentation of all maintenance actions per reference (o), whether accomplished by ship's force or by other activities.
- d. Ensure the current ship's maintenance project is maintained in a complete and up-to-date status, and accurately reflects the material condition of the ship.
- e. Ensure ship's force is adequately trained and qualified to perform required maintenance.

CHAPTER 5
INTERMEDIATE-LEVEL MAINTENANCE

501. Definitions

a. Intermediate-Level Maintenance. Maintenance that requires a higher skill, capability, or capacity than organizational-level maintenance. Intermediate-level maintenance is normally accomplished by centralized repair facility personnel such as:

- Navy fleet maintenance activities
- submarine refit and support facilities
- RMC
- battle group maintenance activities
- intermediate maintenance activities (IMA)

b. Non-CNO Availability. Maintenance availabilities assigned by the fleet commander or authorized representative. When not assigned operational commitments, ships may be made available to intermediate-level maintenance activities for the accomplishment of maintenance and alterations. These availability periods may be scheduled or emergent, and may be further categorized based on scope, location, and type. During these non-CNO availabilities, the ship may be rendered incapable of fully performing its assigned mission and tasks due to the nature of the repair work.

c. Fleet Maintenance Activity. All government waterfront ship maintenance and modernization activities (e.g., RMCs, naval ship repair facilities, naval submarine support facilities, naval intermediate maintenance facilities, TRIDENT refit facilities, weapons repair facilities, naval shipyards, and tenders) responsible for the processing, screening and brokering, and execution of work candidates. Fleet maintenance activities typically perform those maintenance functions on HM&E and combat systems and equipment that are beyond the organizational capability or capacity of ship's force.

502. Policy

a. In keeping with the policy of performing maintenance at the echelon level that can best ensure proper accomplishment, taking into consideration applicable laws, urgency, priority, safety, crew impact, capability, capacity, and total cost, fleet maintenance activities should be utilized to the maximum extent practicable. All fleet maintenance activities are authorized, within the limits of capability and capacity, to perform work that is classified as organizational-level, but is not feasible or practicable for ship's force to accomplish because of time or

personnel constraints.

b. Work that is within fleet maintenance activities capability, but in excess of local fleet maintenance activities capacity, may be assigned to the private sector industrial base or to an appropriate depot-level activity.

c. Fleet maintenance activities work may be conducted during CNO scheduled depot availabilities. In these cases, a formal agreement must be obtained between the fleet maintenance activities or outside maintenance organization and the appropriate naval shipyard, or supervisors of shipbuilding, conversion and repair, specifying each organization's responsibilities.

d. Authorized work includes, but is not limited to:

(1) preventive maintenance.

(2) corrective maintenance.

(3) tests and inspections.

(4) provision of services such as electrical power, water, gas, and air replenishment, and tool issue.

(5) installation of alterations.

(6) work on electronic circuit boards, components, modules, subassemblies, and other equipment coded for intermediate-level repair.

(7) calibration and repair services for electrical and electronic test and monitoring equipment; pressure, vacuum, and temperature measuring devices; and mechanical measuring

instruments.

(8) technical assistance to ship's force in diagnosing system or equipment problems and assistance in repairs, as necessary.

(9) assistance in the emergency repair and manufacture of unavailable replacement parts or assemblies.

e. Work on equipment held in storage as rotational assets (e.g., missiles, torpedoes) will be accountable to the item's life cycle manager and not to the activity storing or testing the equipment.

f. Fleet maintenance activities will use Navy standard maintenance information technology systems for identification, assignment, and tracking of work items, schedules, and resources.

g. Fleet maintenance activities may perform work on foreign ships if authorized by OPNAV N83. See paragraph 202.9.

h. Fleet maintenance activities are assigned the missions in subparagraphs 502 h(1) through 502 h(3):

(1) screen ship maintenance requests to determine when and where maintenance will be performed, based on availability of resources.

(2) perform, direct, and monitor the accomplishment of assigned emergent organizational-level, intermediate-level, and depot-level repairs.

(3) when military personnel are assigned:

a. Provide in-rate training and experience for enlisted ratings that repair and maintain shipboard systems. This training and experience will be focused on acquisition of journeyman skills and those skills required by the activity to perform its mission. Military personnel should also be provided training and experience opportunities that develop skills

useful in afloat assignments.

- b. Provide a mobilization option for wartime maintenance and battle damage repair.
- c. Provide billets co-located with COMNAVRESFOR ships to support Full-Time Support sea and shore rotation and retention. Provide in-rate training and experience for assigned SELRES units.

i. Submarine Tenders. In addition to the missions assigned to all fleet maintenance activities tenders will also, because of their mobility:

(1) Provide capability for repair of battle damage and other emergent repairs to forward-deployed naval force.

(2) Provide redeployment capability between theaters to complement the movement of operating forces.

503. Responsibilities

503.1. CNO

a. OPNAV N83 will establish general policy and guidance concerning accomplishment of intermediate-level maintenance.

b. CNO ships' resource sponsors (OPNAV N42, OPNAV N95, OPNAV N96, OPNAV N97, OPNAV N98, will establish the number of afloat and ashore RMCs and fleet maintenance activities required to support fleet needs.

503.2. Fleet commanders will

- a. Plan and schedule non-CNO availabilities.
- b. Determine fleet maintenance activities manpower, contracting, and funding requirements for the preparation of budgets and act as the budget submitting office for fleet

maintenance activities.

c. Manage fleet maintenance activities resources allocated for intermediate-level maintenance.

503.3. COMNAVSEASYSCOM will

a. As lead technical authority, provide technical direction and support to fleet maintenance activities.

b. With fleet commanders assistance, define and maintain fleet maintenance activities baseline capability descriptions. At a minimum, the baseline will describe, by fleet maintenance activities type, work center functions, billets, industrial plant equipment, and maintenance responsibilities.

c. Manage and operate the naval shipyards and RMCs performing intermediate-level maintenance.

503.4. COMNAVRESFOR will coordinate efforts with the fleet commanders to optimize the productivity and contribution of the SELRES to the fleet's maintenance requirement.

CHAPTER 6
DEPOT-LEVEL MAINTENANCE

601. Definition. Depot-level maintenance is the highest maintenance echelon. It consists of maintenance tasks that focus on repair, fabrication, manufacture, assembly, overhaul, modification, refurbishment, rebuilding, test, analysis, design, upgrade, painting, assemblies, subassemblies, software, components, or end items that require specialized facilities, tooling, support equipment, personnel with higher technical skill, or processes beyond the scope or capacity of the intermediate maintenance actions (IMA). Depot availability types and strategies are listed in Appendix B and defined in Appendix C.

602. Policy

602.1. CNO-Scheduled Availabilities. Ships will undergo CNO-scheduled depot maintenance availabilities at the intervals and durations set forth in the notional schedule issued annually by OPNAV N83. Adherence to the notional schedule is essential to minimize degradation of a ship's material condition and to ensure orderly workload planning at depot-level maintenance activities. In the event it becomes necessary to revise planned availability schedules, the requirements of paragraph 602.5 must be followed.

602.2. Continuous Maintenance Availabilities. Continuous maintenance availabilities are used between CNO-scheduled availabilities to accomplish planned depot work that can be executed outside of a CNO availability. Per reference (d) Navy maintenance processes must ensure continuous availability of manned, maintained, equipped, and trained Navy forces capable of surging forward on short notice while also maintaining long-term sustainability of the force. As such, every ship completing a CNO-scheduled depot availability must maintain a satisfactory condition of readiness until the next CNO-scheduled depot availability.

602.3. Private Sector Availabilities. Private sector availabilities will be solicited, competed, and awarded using the Federal Acquisition Regulation (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS). Additionally, reference (p) section 2466 establishes a percentage limit on funds made available in a fiscal year for depot-level maintenance and repair workload for contracted performance by non-federal government sources.

602.4. Scheduling Guidance

a. OPNAV N83 will coordinate among OPNAV staff, warfare enterprises, fleets, PEOs, direct reporting program managers, and COMNAVSEASCOM, as required, to ensure the effective assignment and scheduling of all CNO-scheduled depot availabilities. Consideration of shipyard capabilities (e.g., workload and skills mix) should be included in the coordination

process.

b. OPNAV N9I will determine the fiscal year that activation and inactivation availability availabilities are to be scheduled.

c. Maintenance Cycle. Maintenance cycles will commence on the next day after completion of a ship's post-shakedown availability (PSA).

(1) Allowable deviations from surface ship, submarine, and aircraft carrier maintenance cycles will be specified annually by OPNAV N83.

(2) For maintenance cycle deviations that exceed OPNAV N83 notional guidelines, fleet commanders will provide COMNAVSEASYSKOM an assessment of the ship's material condition and impact of proposed deviations. Reasons for these deviations, along with any impact identified, must be included on the fleet's schedule change request. Changes that exceed reference (d) must be reported to OPNAV per references (m) and (n).

d. Durations. The annually published nominal availability durations must be used in long range planning. To support PPBES, the nominal availability durations will be updated annually based on known deviations from the notional package and review of ship sheets. When the scope of the work package is defined, the accomplishing activity will evaluate the work package, assess the activity's capacity and capability to perform the work in the allotted time, and recommend adjustments to availability durations.

e. Maintenance and repair work essential for safe and reliable nuclear propulsion plant operations will not be deferred from one depot-level maintenance period to the next.

602.5. Changes to Schedule or Workload. Changes to CNO-scheduled availabilities may become necessary for a variety of reasons, such as port loading, availability of resources, or for operational needs. If such changes are required the policies in subparagraphs 602 5a through 602 5c apply:

a. OPNAV N83 must approve all changes to CNO availabilities with the exception that TYCOMs may initiate, and fleet commanders are authorized to approve record changes to

approved CNO availabilities, provided the changes:

- (1) do not change the accomplishing activity;
- (2) do not constitute a major workload adjustment (e.g., change in availability type, or significant change in required man-days);
- (3) do not change the start or end date that would extend the currently approved availability duration by greater than 35 days;
- (4) do not change the fiscal year of execution; or
- (5) do not deviate from the maintenance cycle beyond the allowable deviations specified in the OPNAV N83 annual letter of representative intervals, durations and repair man-days; and
- (6) are coordinated with COMNAVSEASYSKOM, the PEO or direct reporting program manager, and the accomplishing activity, and reported to OPNAV N83 and the cognizant operational forces resource sponsor.

b. Issuance of changes to the CNO depot maintenance schedule and requests for changes will normally be accomplished by naval message. Messages must be addressed to OPNAV N83, the cognizant operational forces resource sponsor (e.g., OPNAV N95, OPNAV N96, OPNAV N97, or OPNAV N98, and COMNAVSEASYSKOM for nuclear-powered ships and tenders with nuclear support facilities, with an information copy to the cognizant COMNAVSEASYSKOM codes, PEO, direct reporting program manager, ship program manager, planning yard, supervisors of shipbuilding, conversion and repair, RMC, or naval shipyard, and other interested activities.

c. Activities executing CNO-scheduled depot availabilities that will extend beyond the currently approved completion date must formally propose a new completion date in sufficient time to obtain approval of the request prior to the expiration of the currently approved completion date.

602.6. Work Prioritization. CNO-scheduled depot-level maintenance is priority number four as listed in paragraph 202 4.a, but comprises the majority of naval shipyard and RMC work. To assist planners in prioritizing work within this category, the fleet maintenance board of directors and local board of directors' governance processes will provide additional guidance. Examples

of prioritization guidance may include, but are not limited to:

- Ships necessary to meet minimum combatant commanders' requirements
- Ships completing or nearing completion of an availability
- Shorter availabilities already in execution in order of duration
- Longer availabilities already in execution in order of duration.

602.7. Messing and Berthing. Adequate messing and berthing facilities are significant quality of life issues during CNO-scheduled maintenance availabilities. Ships deemed uninhabitable lose the ability to berth and mess the crew and may not be able to provide adequate training and administrative facilities to support various shipboard functions.

a. Declaration as Uninhabitable. The considerations in subparagraphs 602 7a(1) through 602 7a(5) will be applied in determining that the ship, or specific areas of the ship, are uninhabitable:

(1) Declaration will be based upon the judgment of the expected physical condition of the ship, guided by the shipboard habitability criteria stated in reference (g) and prevailing Bureau of Medicine and Surgery U.S. Navy (BUMED) directives.

(2) Personnel safety must not be compromised.

(3) Ships may be wholly or partially uninhabitable during the availability. A ship is not uninhabitable based solely on being in an industrial facility.

(4) A ship can be simultaneously habitable in some spaces and uninhabitable in others.

(5) Partial crew relocation may satisfy requirements vice total crew relocation.

b. Alternate Quarters. Adequate off-ship quarters and transportation will normally be used to accommodate displaced crewmembers. Subparagraphs 602 7b(1) through 602 7b(4) provide the priority for off-ship berthing for a ship declared uninhabitable during ship

availabilities:

(1) Government quarters when available within a reasonable commute.

(2) Contractor-provided or Navy-leased quarters within a reasonable commute.

Lodging accommodations may be obtained for personnel deprived of quarters on board ship, regardless of whether such personnel are entitled to basic allowance for housing.

(3) Other quarters not included in 602 7b(1) and (2) must meet criteria of reference (p) section 7572.

(4) Duty crew barges for the berthing of the entire crew will be considered only as a last resort.

c. Duty Crew Barges. Duty crew barges, or “berthing barges,” will be used to primarily berth the ship’s duty section when the ship is declared uninhabitable.

(1) Duty crew barges must be placed in close proximity to ships to provide for duty section emergency response to fire, flooding, engineering casualty control, and security breaches.

(2) Duty crew barges will have facilities necessary to mess the entire crew. Ships may elect to issue COMRATS in lieu of operating the galley on the duty crew barge.

(3) Duty crew barges may provide for administrative offices and training facilities.

d. Budget Policy. Budget policy and procedures for berthing and messing during scheduled CNO availabilities will be per reference (w).

602.8. Tenders. Depot availabilities of tenders with nuclear support facilities may be assigned to non-nuclear capable shipyards provided the requirements of reference (x) are met. Changes, repairs, and maintenance in the nuclear support facilities of nuclear-capable tenders must comply

with reference (u).

603. Responsibilities

603.1. CNO

a. CNO operational forces resource sponsors (OPNAV N42, OPNAV N95, OPNAV N96, OPNAV N97, and OPNAV N98) will:

(1) Approve maintenance program master plans for their respective platforms, including COMNAVRESFOR ships if applicable, identified annually by OPNAV N83.

(2) Monitor maintenance program master plan compliance.

(3) Review all CNO-scheduled depot availability change requests with OPNAV N83 prior to approval.

(4) Program requirements for off-ship berthing and messing discussed in paragraph 602.7 in support of availabilities for which they serve as resource sponsor.

(5) OPNAV N97 will program funding to support Operations and Maintenance, Navy (O&MN) requirements with respect to barge maintenance and operations.

b. OPNAV N83 will:

(1) On an annual basis, issue the notional depot-level maintenance availability intervals, durations, and repair man-days approved by the operational forces resource sponsors for each ship class.

(2) Control schedules for CNO-scheduled availabilities per paragraph 602.4.

(3) Coordinate all CNO-scheduled depot maintenance availability schedule change requests with the appropriate operational forces resource sponsors, COMNAVSEASYSKOM, the appropriate PEOs or direct reporting program managers, and, for nuclear-powered ships or ships with nuclear support facilities, CNO N00N.

603.2. Fleet commanders will

a. Maintain the depot maintenance intervals and cycles, issued annually by OPNAV N83 to the maximum extent practical within operational requirements.

b. Plan for and monitor availability execution to achieve a balance of cost and schedule for the scope of work authorized. Ensure that any growth in the scope of work authorized is

necessary to reasonably assure safe, reliable operation of the ship during the subsequent operating cycle.

c. Inform the Deputy Chief of Naval Personnel (PERS-4) of any significant changes that would affect ship manning requirements during an extended depot availability.

d. Ensure that any required testing of systems or equipment installed or repaired during the availability is conducted prior to availability completion.

e. Coordinate with the PEO, direct reporting program manager, or ship program manager, as applicable, in the accomplishment of depot availability planning.

f. Plan for and provide offices, classrooms, equipment stowage space, ship's force repair shop space, and berthing and messing per paragraph 602.7 when shipboard facilities are expected to become unusable or uninhabitable. This requirement pertains to all private and public shipyard availabilities when the shipyard is unable to provide adequate facilities.

g. Provide management and execution oversight of duty crew barges including budgeting, funding, administrative requirements, assignment, repair and overhaul.

h. Assign and schedule non-CNO availabilities. This may be delegated to subordinate commands for accomplishment.

i. Ensure completion data for availabilities conducted by SRFs is forwarded to COMNAVSEASYSCOM for analysis and refinement of maintenance requirements.

j. Execute approval authority for changes to CNO-scheduled availabilities authorized in paragraph 602.5.

603.3. COMNAVSEASYSCOM. As the lead technical authority, COMNAVSEASYSCOM will:

a. Establish naval shipyard and RMC operating policies.

b. Furnish timely information on the prospective workloads of public and private shipyards to the respective fleet commanders for their guidance, recommending changes to scheduled availabilities to balance workload, and avoid excessive cost to the Navy.

c. Establish performance standards for the accomplishment of maintenance, modernization, and all other ship work scheduled for accomplishment by depot-level

maintenance activities.

d. Ensure that naval shipyards, supervisors of shipbuilding, conversion and repairs, and RMCs execute ship repair and modernization within the scope of work authorized, employing prescribed technical methods, specifications, and quality assurance requirements in the most cost-effective manner.

e. Establish and implement minimum requirements for qualification and certification of docking officers and observers for floating dry-docks, graving docks, and marine railways.

f. Ensure that management information systems used for the collection and analysis of post-availability completion and as-found condition data are compatible with the 3M system, and report this information to the 3M database.

g. Conduct system and equipment engineering analysis to eliminate or refine maintenance periodicities.

h. Assist PEOs or direct reporting program managers and fleet commanders or TYCOMs in coordinating private-sector, CNO-scheduled, depot availability assignment and contracting within established FAR and DFARS guidelines.

i. Develop and implement processes to continuously review ship class maintenance plans to incorporate lessons learned, refine the balance between confidence and risk, and identify areas where technological development can be brought to bear to reduce cost or increase operational availability.

j. Develop contract specifications to be invoked when contractors are required to provide messing and berthing support during CNO-scheduled availabilities.

k. Function as ship program manager and life cycle manager for duty crew barges.

l. Reimburse fleet commanders for any berthing barge support on COMNAVSEASYSYSCOM funded projects. Reimbursable costs will include all aspects of barge

towing, operations, and maintenance.

603.4. PEOs, Direct Reporting Program Managers, and Ship Program Managers will:

- a. Issue availability planning milestones that maximize the probability of successful execution and are in compliance with the milestones outlined in reference (e).
- b. Conduct a post-availability evaluation and review with the fleet or TYCOM within 60 days of a CNO-scheduled availability completion.
- c. Analyze post-availability completion data and refine maintenance requirements data for fleet commanders and OPNAV N83, OPNAV N95, OPNAV N96, OPNAV N97, OPNAV N98, and OPNAV N9I use.
- d. Ensure system and equipment engineering analysis is conducted to refine maintenance periodicities.
- e. Coordinate with the fleet commanders or TYCOMs all private-sector, CNO-scheduled, depot availability assignment and contracting within established FAR and DFARS guidelines.
- f. Conduct a combined alteration and repair verification conference with the fleet prior to a CNO-scheduled availability start per enterprises milestones.
- g. Provide OPNAV N83 with concurrence or non-concurrence regarding change requests to CNO-scheduled availabilities addressed in paragraph 602.5.

CHAPTER 7
SHIP MAINTENANCE PROGRAMS

701. Discussion

a. The goal of Navy ship maintenance is to maintain the highest practical level of material readiness and safety to meet operational availability requirements, while minimizing total life cycle cost over the expected life of the ship.

b. The maintenance program established for a class of ships identifies all maintenance requirements developed with engineered periodicities using the RCM methodology per reference (j) and executed per the Condition-Based Maintenance and Condition-Based Maintenance Plus guidance in references (j) and (l) in order to maintain or restore ship material condition at the level needed to achieve the required degree of readiness and to achieve expected service life.

c. The fundamental CNO-approved approach places the emphasis on ensuring that the ship is ready for prompt and sustained combat operations at sea on a continuing basis. This requires timely and accurate reporting and maintenance of the ship's material condition.

d. The class maintenance plan is the principal component of a maintenance program needed to support the unit CO in properly maintaining their ship. The class maintenance plan includes requirements for organizational-level (including maintenance requirement cards (MRC)), intermediate-level and depot-level planned maintenance tasks. These comprehensive class maintenance plans tasks are developed by responsible technical authority, using RCM per reference (j) and will include or refer to fully-detailed procedures for accomplishment of organizational-level, intermediate-level and depot-level maintenance actions, such as MRCs or

other task-standard documents.

e. Performance of class maintenance plan provides

(1) Assurance that systems are operating within technical specifications.

(2) Assurance that necessary maintenance actions (e.g., lubrication, greasing, inspections, and adjustments) are performed.

(3) Technical information that indicates system condition and can be used as the basis for determining required corrective maintenance.

f. Data and feedback gained while executing class maintenance plans can provide:

(1) Information useful to the technical community for determining process or technical changes in operating or maintaining systems and equipment.

(2) Technical information for use as the basis for sustaining material certification.

(3) Information to help refine maintenance actions which are used to obtain objective evidence of equipment performance or condition trends.

g. This chapter includes policies and responsibilities for the Miniature and Micro-miniature Module Test and Repair Program.

702. Policy. Each CNO-designated ship class will have an approved maintenance program consisting of a minimum of two parts: the overall maintenance environment (including how and where the maintenance is best accomplished), and the class maintenance plans, which identifies the required schedule of maintenance tasks required to best meet the goals stated in paragraph 701.a.

702.1. Maintenance Environment. The maintenance environment component of a maintenance program will identify the necessary capabilities, authorities, and support requirements for each ship class, over the service life of the ship. The maintenance environment will:

a. Assign acquisition and life cycle responsibilities over the entire acquisition and in-service life of all ships in the class, including PEOs, and direct reporting program managers or

ship program managers.

b. Describe and provide for the minimum organizational-level repair capabilities needed to satisfy operational requirements and self-sufficiency objectives.

c. Identify unique or unusual capabilities required for intermediate-level and depot-level activities associated with unique aspects of ship design and anticipated operations.

d. Identify intermediate-level and depot-level requirements (e.g., number, type, duration, interval between, and man-day size of availabilities) and technical foundation papers supporting requirements.

e. Identify required support features, including facilities requirements, specific turnaround programs, insurance material programs, special diagnostic systems, husbandry agents (e.g., port engineers, or maintenance managers), qualification, and maintenance management requirements.

f. Provide for use of dedicated organizations for supporting aspects of the class (such as propulsion systems) or reliance on organizations dedicated to supporting multi-class systems.

g. Provide policy guidance for reliance on specialized contractor support or key original equipment manufacturers (OEM).

h. Provide guidance on the use of husbandry agents (e.g., port engineers, maintenance planning managers).

i. Promote class self-sufficiency objectives.

j. Identify continuous maintenance objectives and methods required to support those objectives.

k. Identify and provide for repair capabilities meant to extend battle force self-sufficiency.

l. Provide for documentation of critical material condition parameters required for successful sustainment of Required Operational Capability/Projected Operational Environment (ROC/POE) and minimizing total life cycle cost over a ship's life and the associated strategies

for monitoring these criteria.

m. Account for displacement margins and associated support equipment required to accommodate anticipated modernization.

n. Identify and provide for ILS elements.

702.2. Class Maintenance Plan. The class maintenance plan is the principal document for executing the approved maintenance tasks for all ships in a class. Class maintenance plans will:

a. To the maximum practical extent, be condition-based and developed using RCM methodologies; and all tasks must be approved by the designated technical authority for that equipment.

b. Be developed taking into consideration the overall maintenance environment discussed in paragraph 702.1.

c. Describe all preventive maintenance actions and maintenance support requirements, including material condition assessment requirements (i.e., diagnostics, tests, inspections, and selected acceptance criteria), approved modernization, and shipyard routines. The class maintenance plan may also include standard repairs required based on commonly expected assessment results.

d. Specify optimal maintenance intervals.

e. Identify the maintenance echelon that best assures proper accomplishment, taking into consideration applicable laws, urgency, priority, safety, crew impact, capability, capacity, and total cost.

f. Be periodically reviewed and revised using RCM.

g. Include all requirements developed for organizational-level maintenance accomplishment and managed under the 3M system.

h. Ensure that pre-depot availability tests and inspections are developed and scheduled to support optimum work identification.

i. Execute as scheduled.

702.3. Scheduling and Execution. Execution of class maintenance plan maintenance requirements will often result in the need for additional maintenance, which should all be planned and executed via the ship's 3M system per references (o) and (s). Class maintenance plan scheduled maintenance is a ship specification and failure to perform scheduled class

maintenance plan maintenance may require adjudication as a departure from specification, requiring review by the appropriate technical authority.

a. Repair Determination. Fleet commanders, acting through their TYCOM or other designated subordinates, will determine the repair actions required to maintain or restore equipment to its intended condition based on technical requirements defined by the responsible technical and programmatic authority. Repair determination must employ RCM principles established in reference (j) and described in reference (k). Repair determination assistance is available through various programs, organizations, and information systems within the fleet SYSCOMs.

b. Repair Authorization. Fleet commanders, acting through their TYCOMs or other designated subordinates, will authorize required maintenance actions based on safety considerations, on cost, schedule, and mission trade-offs, as required within technical and programmatic authority. The choice of required maintenance actions to be authorized must be based on evaluation of risk to personnel safety and ship mission readiness imposed as a result of those maintenance requirements deferred. Acceptance of risk is unavoidable; proper management of risk is essential.

c. Repair Execution. Repairs must be executed per the appropriate technical requirements and, in keeping with the policy that maintenance be performed at the most appropriate level for accomplishment, taking into consideration applicable laws, urgency, priority, safety, crew impact, capability, capacity, and total cost. If funding constraints exist, priority must be placed on providing ships that can safely and reliably perform their missions.

702.4. Miniature and Micro-Miniature Module Test and Repair Program. The increased use of sophisticated circuit card assemblies'/electronics modules (CCA/EM) in Navy systems and equipment, and the limited amount of shipboard spare CCA/EMs and maintenance assist modules calls for expanded fleet electronics repair and diagnostics capabilities at all maintenance levels. The Miniature and Micro-Miniature Module Test and Repair Program provides the miniature and micro-miniature repair equipment and associated accessories, tools, materials, module test and repair test equipment, and ILS, including training plans, curriculum material, and training aids for the Miniature and Micro-Miniature Module Test and Repair Program courses.

a. COMNAVSEASYSYSCOM, as the program manager of the Miniature and Micro-Miniature Module Test and Repair Program, provides a manual for standard miniature and micro-miniature electronics maintenance practices, and technician qualifications as reference (y), a Navy Miniature and Micro-miniature Module Test and Repair Program certification process in reference (z), and test and repair procedures for the repair of specific CCA/EMs. The program also develops and maintains piece part allowances for ship classes, fleet maintenance activities,

and other designated shore activities that support the fleet.

b. The module test and repair test equipment supplements the miniature and micro-miniature electronics repair capabilities and provides the fleet and authorized shore activities with portable, cost-effective, manually-operated test equipment, semi-automatic controller-aided test systems (AN/USM-646, AN/USM-674, AN/USM-676), associated operating software, module test and repair test procedures (i.e., Gold Disks and Pinpoint test routines), test accessories, and module test and repair test equipment ILS. The program also develops module test and repair test procedure candidate lists periodically from COMNAVSUPSYSCOM and Defense Logistics Agency CCA/EM requisition data in order to facilitate the selection and development of module test and repair test procedures that will provide the most return on investment and have the highest probability to improve system and equipment readiness.

c. The Miniature and Micro-Miniature Module Test and Repair Program does not allow for internal repairs to integrated circuits. Other exclusions include repairs to assemblies that are critically sensitive to frequency, voltage or temperature; repairs that require special calibration equipment; plated-through hole (i.e. eyeing) repair on multilayer CCAs; and repairs requiring equipment beyond that defined in appendix F of reference (z). Shipboard and selected shore activities' miniature and micro-miniature electronics repairs are to be performed by certified technicians per policy and procedures in volume 6, chapter 8 of reference (e), and in reference (y).

703. Responsibilities

703.1. CNO

a. The CNO operational forces requirement sponsor, OPNAV N83 and resource sponsors (OPNAV N9I, OPNAV N95, OPNAV N96, OPNAV N97, and OPNAV N98 will:

(1) Approve all tailored maintenance programs and any modifications to these plans for their respective platforms.

(2) Plan and program the resources required to fully support their tailored maintenance programs, including resources for organizational-level, intermediate-level, and depot-level maintenance.

(3) Monitor tailored maintenance program compliance.

(4) OPNAV N96 will serve as resource sponsor for the Miniature and Micro-

miniature Module Test and Repair Program.

b. CNO N00N. CNO (N00N) is responsible for establishing nuclear-powered warship reactor plant maintenance, repair, and modernization requirements and policies.

703.2. Fleet commanders will

a. Participate with PEOs, direct reporting program managers, and ship program managers in the development of the maintenance program for each ship class.

b. Execute each program in strict accordance with this instruction and specific guidance provided in the ships' class maintenance plan.

c. Manage risks inherent in making maintenance decisions, recognizing that prudent risk is acceptable and no maintenance decision is risk-free.

d. Assist the PEO, direct reporting program manager, or ship program manager in determining husbandry agent qualifications and maintenance management requirements.

e. Operationally administer and promote optimum use of the Miniature and Micro-Miniature Module Test and Repair Program at the organizational level and intermediate level and ensure that miniature and micro-miniature electronics repairs are conducted at the lowest feasible maintenance level, per Miniature and Micro-miniature Module Test and Repair Program policy and responsibilities in volume 6, chapter 8 of reference (e).

(1) Assist the Miniature and Micro-Miniature Module Test and Repair Program in-service engineering agents (ISEA) in initial fleet evaluations of new Miniature and Micro-miniature Module Test and Repair Program equipment and associated software. Identify outfitting requirements and priorities and assist Miniature and Micro-Miniature Module Test and Repair Program ISEAs in the delivery of Miniature and Micro-miniature Module Test and Repair Program equipment to authorized Miniature and Micro-miniature Module Test and Repair Program facilities. Assist Miniature and Micro-miniature Module Test and Repair Program ISEAs to obtain reusable Miniature and Micro-miniature Module Test and Repair Program equipment and miniature and micro-miniature electronics repair piece parts from decommissioned ships and disestablished shore commands.

(2) Inspect and certify miniature and micro-miniature electronics repair facilities and technicians per established COMNAVSEASYS COM certification procedures.

(3) Ensure that miniature and micro-miniature electronics repair and module test and repair test equipment training is scheduled and provided to personnel as required to continuously maintain Miniature and Micro-miniature Module Test and Repair Program station certification

requirements and minimize gaps in Miniature and Micro-miniature Module Test and Repair Program capability and capacity caused by technician sea shore rotation, end of enlistment, or other change of duty assignments.

(4) Designate ships and shore activities as Gold Disk developer commands. Assist the module test and repair test equipment ISEA in the selection of high priority Gold Disk test procedure candidates. Assist the module test and repair test equipment ISEA to obtain access to CCA/EMs for test procedure development when CCA/EM assets are not available from other sources.

703.3. COMNAVSEASYSCOM will

a. Oversee the RCM development and continuous improvement of ship, system, and equipment maintenance programs per reference (j) and as described in reference (k).

b. Develop, review, and validate maintenance requirements. Develop, issue, and maintain organizational-level requirements (including MRCs), and intermediate-level and depot-level class maintenance plans tasks.

c. Establish and administer policy for development, management and content of class maintenance plan.

d. Assist PEOs and direct reporting program managers in developing tailored maintenance programs and class maintenance plans.

e. Review and approve class maintenance plans, including those developed by PEOs and direct reporting program managers, ensuring that they satisfy the requirements of this instruction and references (j) and (l), are technically correct, and are best suited to individual ship classes.

f. Recommend changes to existing maintenance programs and class maintenance plans in order to ensure they: support Navy's continued drive toward integration, standardization, and fleet self-sufficiency; are based on RCM principles documented in references (j) and (k); and are cost-effective.

g. Ensure effective support of maintenance determination, planning, and execution by field activities, and continuously improve maintenance procedures and technology, as applicable and effective.

h. Coordinate overall efforts of the multiple organizations required to effectively improve maintenance programs and class maintenance plans, including RCM analysis,

standardization across Extended Refit Period rises, and in identification and implementation of best practices.

i. Serve as program manager for the Miniature and Micro-miniature Module Test and Repair Program; establish procedures and policy for orderly program execution.

(1) Establish standard repair practices and certification procedures for Miniature and Micro-miniature Module Test and Repair Program personnel and facilities, to support repair of shipboard equipment that contains electronic circuitry.

(2) Conduct initial system evaluations in conjunction with the fleet; acquire and deploy Miniature and Micro-miniature Module Test and Repair Program equipment and ILS, including semi-automatic and manual test equipment to support CCA/EM tests, diagnostics and repair.

(3) Coordinate the selection, development, and distribution of CCA/EM test and repair procedures.

(4) Develop, maintain, and acquire consolidated piece part allowances for each ship class and shore commands authorized Miniature and Micro-miniature Module Test and Repair Program capabilities.

(5) Submit monthly nominations and the associated letter of commendation to OPNAV N83 for the CNO Gold Disk Developers Award and coordinate the associated military cash award per reference (aa) for each awardee.

703.4. PEOs, direct reporting program managers and ship program managers will:

a. Develop a tailored maintenance program for CNO approval that is best suited to an individual ship class, which supports fleet mission and material readiness, and is cost-effective.

b. Develop class maintenance plan for COMNAVSEASYSCOM approval, issue, and periodic review and update based on approved tailored maintenance programs and the requirements of this instruction. The class maintenance plan must be issued by delivery of the first ship of the class. Ensure class maintenance plan requirements are executed during maintenance periods or properly reprogrammed. Implement COMNAVSEASYSCOM processes to evaluate life cycle impacts and authorize non-accomplishment of class maintenance plan

requirements in conjunction with technical authorities.

- c. Ensure adequate logistics support for their maintenance programs.
- d. Ensure adequate training support is available for personnel executing the maintenance program. Work with NETC to update or create courses as required.
- e. Comply with test and diagnostics policy in volume 6, chapter 8 of reference (e), and to the maximum extent feasible incorporate utilization of organizational-level and intermediate-level Miniature and Micro-miniature Module Test and Repair Program capabilities into ILS planning and into system and ship class maintenance and training plans.

(1) Coordinate with the Miniature and Micro-Miniature Module Test and Repair Program and determine the need to have test and repair analysis done by Miniature and Micro-miniature Module Test and Repair Program ISEAs on systems and equipment with CCA/EMs or other electronic circuitry. Ensure that level of repair analysis done for new or modified systems do not include costs to outfit and train existing organizational-level and intermediate-level Miniature and Micro-miniature Module Test and Repair Program facilities and personnel.

(2) When economically and technically feasible, fund for tests, diagnostics, and repair procedures that will utilize fleet Miniature and Micro-Miniature Module Test and Repair Program capabilities and coordinate with fleet commanders and the Miniature and Micro-miniature Module Test and Repair Program manager to determine any required additional organizational-level and intermediate-level Miniature and Micro-miniature Module Test and Repair Program capabilities and capacity.

(3) Ensure effective depot planning is conducted on new systems or equipment and that the progressive repair concept is applied to all CCA/EMs that can be supported with fleet organizational-level and intermediate-level Miniature and Micro-Miniature Module Test and Repair Program capabilities.

(4) Ensure that all Miniature and Micro-miniature Module Test and Repair Program maintenance actions are documented in the module test and repair tracking system and aggregate reports provided each quarter per direction in reference (e).

703.5. NETC. Coordinate with COMNAVSEASYS COM and the fleet commanders, to provide training facilities, curricula, and instructors for the Miniature and Micro-Miniature Module Test and Repair Program.

703.6. COMNAVSUPSYSCOM. COMNAVSUPSYSCOM must support the use of fleet organizational-level and intermediate-level Miniature and Micro-Miniature Module Test and

Repair Program capabilities by ensuring that COMNAVSUPSYCOM instructions, guidance, procedures, and training are consistent with OPNAV and fleet Miniature and Micro-Miniature Module Test and Repair Program policy.

a. Direct the distribution of stock for rotatable CCA/EM pools as requested by the fleet commanders.

b. Assist the Miniature and Micro-miniature Module Test and Repair Program in selecting CCA/EMs candidates for test procedure development.

c. Assist the Miniature and Micro-Miniature Module Test and Repair Program ISEAs in the development and revisions to miniature and micro-miniature electronics piece part allowance parts lists for ship classes and shore activities that are authorized Miniature and Micro-Miniature Module Test and Repair Program capabilities.

CHAPTER 8
QUALITY MAINTENANCE

801. Discussion

a. Ship maintenance will be performed in strict accordance with published technical and quality assurance requirements. Quality assurance requirements carry equal weight with the technical requirements in the overall objective of quality maintenance. The technical complexity of present day ships reinforces the need for strict compliance with administrative and technical direction to ensure conformance to technical requirements during maintenance. Seemingly trivial or minor deviations from requirements have resulted in the loss of life and degradation of ships' readiness.

b. Quality maintenance requires the proper execution of responsibilities by each individual involved in the planning, logistics support, and execution of the maintenance process. Workers and planners must be provided adequate tools, guidance, training, resources, and time to perform quality maintenance. Failure to consistently accomplish first-time quality maintenance should be viewed as a weakness or breakdown in the process. Reasons for failure must be identified and the process examined for modification, as appropriate, to ensure deficiencies are corrected.

802. Policy

802.1. Maintenance Processes. The Navy's quality ship maintenance function must have a quality management system in place.

- a. Maintenance management processes must be documented.
- b. The maintenance processes must be consistently and expertly executed.
- c. Maintenance process documentation and execution must be audited both internally and externally.
- d. Class maintenance plans and processes must be continuously improved.

802.2. Personnel and Procedures. Maintenance of ship systems and equipment will be performed by qualified personnel using correct procedures and material per the technical requirements issued by the appropriate technical authority. Policy and direction issued by the fleet commanders, COMNAVSEASYSCOM, or their subordinate activities must comply with such technical requirements.

802.3. Deviation from Procedures. fleet commanders and COMNAVSEASYSCOM must ensure procedures addressing deviations to technical requirements are established. Procedures

that deviate from requirements will:

- a. Ensure the activity, when unable to comply with technical requirements, recommends to the appropriate technical authority a repair that the activity considers achievable and will ensure the needs of the fleet are satisfied.
- b. Differentiate between categories of repair and identify, by each category, the appropriate technical authority that can authorize deviation from technical requirements.
- c. Ensure work does not proceed until concurrence from appropriate technical authority is received.
- d. Ensure cognizant technical authority revises applicable technical requirements, or documents a deviation from technical requirements, to reflect resolution of the repair.

802.4. Compliance. Compliance with quality maintenance requirements will be validated by independent oversight in the form of audits and inspections.

803. Responsibilities

803.1. Fleet commanders. Fleet commanders are responsible for safe and effective maintenance of their assigned ships. Fleet commanders will:

- a. Ensure their TYCOMs or other designated subordinate commands utilize approved processes for maintenance.
- b. Ensure all organizational-level and intermediate-level maintenance is accomplished per the cognizant SYSCOMs technical specifications and requirements. When this requirement

cannot be satisfied, action must be taken as outlined in paragraph 802 3d.

c. Maintain positive control over the maintenance practices of subordinate commands to ensure compliance with the standard Navy-wide maintenance policy.

d. Provide guidance to facilitate the development of joint policy instructions and notes, addressing the issues of subparagraphs 803 1d(1) through 803 1d(4) as a minimum:

(1) Administrative requirements.

(2) Organizational-level and intermediate-level maintenance activity quality assurance organization and execution requirements.

(3) Responsibilities of organizational-level and intermediate-level activity personnel relating to the definition and oversight of maintenance performed by depot activities.

(4) Situational responsibility and accountability guidance.

e. Assign quality assurance responsibilities.

f. Advise NETC and provide guidance to learning centers concerning new training requirements identified as a result of work-procedure development, changes in current maintenance performance, and evaluations of maintenance quality problems.

g. Ensure SRFs comply with technical and quality requirements issued by COMNAVSEASYSKOM.

803.2. COMNAVSEASYSKOM. As the lead SYSKOM and technical authority for the life cycle management of ships, COMNAVSEASYSKOM will:

a. Develop the technical requirements necessary for performing quality maintenance. This includes issuing and maintaining such technical documentation as current selected record data and Navy equipment drawings, technical manuals, calibration and repair standards, test requirements, and plans, as required.

b. Identify those systems, portions of systems, or components that, due to their essentiality, complexity, cleanliness or material requirements, must have additional process

controls to ensure technical requirements are met.

c. Develop and manage special programs to implement additional process controls for those systems and components identified as requiring such.

d. Provide necessary technical support and oversight of naval shipyards, supervisors of shipbuilding, conversion and repairs, and RMCs.

e. Provide technical support to fleet commanders to ensure quality objectives are met.

f. Ensure all depot-level maintenance is accomplished per the cognizant SYSCOM technical requirements and specifications. When this requirement cannot be satisfied, action should be taken as outlined in paragraph 802.3.

g. Issue quality assurance policy for naval shipyards, SRFs, and RMCs for depot-level maintenance.

h. Assist and advise fleet commanders to ensure guidance provided in such areas as work-procedure preparation, material requirements and control, work control, testing, and certification instructions are technically correct and consistent with Navy quality objectives.

i. Advise NETC of new training requirements identified with new procedures, systems, or troubleshooting techniques.

j. Provide COMNAVSUPSYSCOM with

(1) Sufficient, accurate, and up-to-date technical information to ensure consistent procurement and control of material that fulfills all technical requirements.

(2) Assistance in the evaluation of discrepancies reported through the quality deficiency report program, per reference (ab).

(3) Assistance in determining whether or not the severity of a reported problem warrants purging of supply system stocks. If purging is required, details of the inspection characteristics and methods should be provided, including the scope of the action to be taken.

803.3. COMNAVAIRSYSCOM and COMSPAWARSYSCOM will:

a. Coordinate with COMNAVSEASYSYSCOM in the development of technical requirements essential to performing quality maintenance. This includes promulgating and maintaining such technical documentation as current selected record drawings and Navy equipment component drawings, technical manuals, calibration and repair standards, test

requirements, and plans, as required.

b. Identify to COMNAVSEASYS COM those systems, portions of systems, or components that, due to their essentiality, complexity, cleanliness or material requirements must have additional process controls to ensure technical requirements are met.

c. Assist COMNAVSEASYS COM in the development of the additional process controls required to ensure proper maintenance actions or repairs are performed.

d. Provide COMNAVSEASYS COM and fleet commanders necessary technical support to ensure quality objectives are met.

e. Assist or advise fleet commanders to ensure guidance provided in such areas as work-procedure preparation, material requirements, work control, testing, and certification instructions are technically correct and consistent with Navy quality objectives.

f. Advise NETC of training requirements identified with work procedures, systems, and troubleshooting techniques.

g. Provide COMNAV SUPSYS COM with the technical information and assistance outlined in 803.2.j.

803.4. COMNAV SUPSYS COM. COMNAV SUPSYS COM is responsible for procurement of material per technical specifications provided by the hardware SYS COMs.

COMNAVSUPSYSCOM will:

- a. Control material designated by hardware SYSCOMs for special programs such as level I and submarine safety per cognizant SYSCOM procedures.
- b. Provide or support material control training for those supply personnel who receive, handle, and issue material for designated special programs.
- c. Take action to ensure rapid correction of quality deficiencies as they are identified, utilizing guidance received from the cognizant SYSCOM.

803.5. NETC. NETC is responsible for providing effective training in maintenance skills for military personnel. NETC will:

- a. Emphasize quality maintenance principles in all leadership, management, and maintenance courses.
- b. Develop new quality-oriented leadership, management, and maintenance courses as required by fleet commanders and SYSCOMs.
- c. Ensure appropriate shipboard quality assurance fundamentals are included in rate advancement examinations.

803.6. Board of INSURV. INSURV is responsible for identifying and reporting ship material conditions that substantially reduce a ship's fitness for naval service, its ability to perform its primary and secondary missions, and to reach its expected service life. In performance of these duties, INSURV will:

- a. Collaborate with COMNAVSEASYSYSCOM to develop Common Assessment Procedures.
- b. Perform maintenance process audits that validate reported material condition metrics. Based on inspection and audit findings, INSURV may:
 - (1) Recommend a ship's equipment, systems, or programs be decertified or operations suspended until repaired.
 - (2) Report maintenance processes as ineffective (non-conforming).
 - (3) Submit technical feedback reports to appropriate SYSCOMs.

APPENDIX A
REFERENCES

- (a) OPNAVINST 4780.6F
- (b) OPNAVINST 4770.5H
- (c) 14 U.S.C.
- (d) OPNAVINST 3000.15A
- (e) COMUSFLTFORCOMINST 4790.3, Rev. C
- (f) SL720-AA-MAN-030
- (g) OPNAVINST 9640.1B
- (h) OPNAVINST 5090.1D
- (i) NAVAIRINST 5400.158A
- (j) NAVSEAINST 4790.27A
- (k) MIL-STD-3034A, Reliability-Centered Maintenance Process, 29 April 2014
- (l) OPNAVINST 4790.16B
- (m) OPNAVINST 3120.47
- (n) OPNAVINST 3120.33C
- (o) NAVSEAINST 4790.8C
- (p) 10 U.S.C.
- (q) NAVSEA TM S0600-AA-PRO-010 Rev. 8 (NOTAL)
- (r) SECNAVINST 5400.15C
- (s) OPNAVINST 4790.4F
- (t) NAVSEAINST N9210.4B (NOTAL)
- (u) NAVSEA 0989-058-8000 (NOTAL)
- (v) NAVSEAINST C9210.30A (NOTAL)
- (w) NAVSO P-1000, Dec 2015
- (x) NAVSEAINST C9210.44C (NOTAL)
- (y) NAVSEAINST 4790.17B
- (z) NAVSEA TE000-AA-MAN-010/2M (NOTAL)
- (aa) OPNAVINST 1650.8D
- (ab) SECNAVINST 4855.5A
- (ac) NWP 1.03.1 of Nov 2014
- (ad) OPNAVINST 4700.8K

APPENDIX B
MAINTENANCE AVAILABILITY TYPES AND STRATEGIES

MAINTENANCE AVAILABILITY TYPES			
CIA	Carrier Incremental Availability	ESRA	Extended Selected Restricted Availability
CM	Continuous Maintenance	INTERIM DRY-DOCKING	Interim Dry-Docking
COH	Complex Overhaul	INACTIVATION AVAILABILITY	Inactivation Availability
DEMA	Docking Extended Maintenance Availability	MMP	Major Maintenance Period
DIA	Destroyer Incremental Availability	OH	Overhaul
DMP	Depot Modernization Period	PEMA	Pier side Extended Maintenance Availability
DPHASED MAINTENANCE AVAILABILITY	Docking Planned Incremental Availability	PHASED MAINTENANCE AVAILABILITY	Planned Incremental Availability
DOCKING PHASED MAINTENANCE AVAILABILITY	Docking Phased Maintenance Availability	PIRA	Pre-Inactivation Availability Restricted Availability
DOCKING SERVICE CRAFT OVERHAUL	Docking Service Craft Overhaul	PHASED MAINTENANCE AVAILABILITY	Phased Maintenance Availability
DOCKING SELECTED RESTRICTED AVAILABILITIES	Docking Selected Restricted Availability	PSA	Post Shakedown Availability
EDOCKING PHASED MAINTENANCE AVAILABILITY	Extended Docking Phased Maintenance Availability	RCOH	Refueling Complex Overhaul
EDOCKING SELECTED RESTRICTED AVAILABILITIES	Extended Docking Selected Restricted Availability	ROH	Regular Overhaul
EOH	Engineered Overhaul	SCO	Service Craft Overhaul
ERO	Engineered Refueling Overhaul	SRA	Selected Restricted Availability

EXTENDED REFIT PERIOD	Extended Refit Period	SRA(d)	Selected Restricted Availability with short docking inspection period
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MAINTENANCE STRATEGIES	
EOC	Engineered Operating Cycle
IMP	Incremental Maintenance Plan
PM	Phased Maintenance
PROG	Progressive Maintenance

APPENDIX C
DEFINITIONS

1. Carrier Incremental Availability. A CNO availability for continuous accomplishment of depot maintenance and selected modernization on aircraft carriers.
2. Class Maintenance Plan. The principal document for executing the approved maintenance program for all ships in a class. The class maintenance plan describes all preventive maintenance actions (organizational-level, intermediate-level, and depot-level) and maintenance support requirements, including material condition assessment requirements, approved modernization, and shipyard routines. The class maintenance plan may also include standard repairs required based on commonly expected assessment results.
3. Complex Overhaul. See overhaul.
4. Condition-Based Maintenance. Condition-based maintenance is a maintenance strategy derived from analysis, using Department of Defense (DoD) approved RCM principles. Condition-based maintenance includes maintenance processes and capabilities derived from real or near-real time assessments obtained from embedded sensors and external tests and measurements using either portable equipment or actual inspection. The objective of condition-based maintenance is to perform maintenance based upon the evidence of need in order to ensure safety, reliability, and availability, at an acceptable total ownership cost. See reference (1).
5. Condition-Based Maintenance Plus. Condition-based maintenance plus is the application and integration of appropriate processes, technologies, and knowledge-based capabilities to achieve the target availability, reliability, and operation and support costs of DoD systems and components across their life cycle. At its core, condition-based maintenance plus is maintenance performed based on evidence of need, integrating RCM analysis with those enabling processes, technologies, and capabilities that enhance the readiness and maintenance effectiveness of DoD systems and components. Condition-based maintenance plus uses a systems engineering approach to collect data, enable analysis, and support the decision-making processes for system acquisition, modernization, sustainment, and operations. See reference (1).
6. Condition-Directed Preventive Maintenance. A periodic diagnostic test or inspection that compares the existing material condition or performance of an item with established standards and takes further action accordingly. The purpose of condition-directed tasks is to discover a potential failure that can be corrected before actual failure occurs. The fact that such condition-

directed tasks are scheduled does not make them time-directed tasks.

7. Continuous Maintenance. Scheduled depot level maintenance conducted outside of CNO availabilities.

8. Continuous Maintenance Availability. A scheduled availability normally two to six weeks in duration and normally scheduled once per non-deployed quarter during a period when the ship will be in port. Additional details specific to surface ships, submarines and carriers is provided in reference (e) volume II, part I chapter 4.

9. Core Depot Maintenance. The capability maintained within organic defense depots to meet readiness and sustainability requirements of the weapons systems that support the Joint Chiefs of Staff contingency scenario. Core depot maintenance capabilities will comprise only the minimum facilities, equipment, and skilled personnel necessary to ensure a ready and controlled source of required technical competence. See reference (p) section 2464.

10. Corrective Maintenance. Maintenance actions performed as a result of failure in order to return or restore equipment to acceptable performance levels.

11. Depot-Level Maintenance. The highest maintenance echelon. Depot-level maintenance consists of maintenance tasks that focus on repair, fabrication, manufacture, assembly, overhaul, modification, refurbishment, rebuilding, test, analysis, design, upgrade, painting, assemblies, subassemblies, software, components, or end items that require specialized facilities, tooling, support equipment, personnel with higher technical skill, or processes beyond the scope of the intermediate maintenance activity (IMA).

12. Depot Modernization Period. A major availability scheduled primarily for the installation of high priority warfare improvement alterations.

13. Surface Incremental Availability. Dedicated 48-day non-docking maintenance period for destroyers on ballistic missile defense assignment based out of Rota, Spain.

14. Docking Extended Maintenance Availability. Depot availability for moored training ships (MTS) for the accomplishment of maintenance and modernization that requires docking.

15. Docking Phased Maintenance Availability. A Phased Maintenance Availability expanded to include maintenance and modernization that require dry-docking.

16. Docking Planned Incremental Availability. A labor-intensive dry-docking availability, with a duration of 16 months or less, for aircraft carriers in an IMP. Maintenance and modernization are accomplished. Aircraft carriers assigned to IMPs are maintained through Carrier Incremental

Availabilities, planned incremental availability, and Docking Planned Incremental Availability in lieu of overhauls.

17. Docking Selected Restricted Availabilities. An SRA expanded to include maintenance and modernization that require dry-docking.

18. Docking Service Craft Overhaul. A major industrial docking availability for the accomplishment of maintenance and modernization on service craft.

19. Emergent Maintenance. Maintenance conducted with little or no notice to restore a failed mission-essential system or component to service. This maintenance is normally related to category 3 or 4 CASREPs which are defined in reference (ac).

20. Engineered Operating Cycle. This maintenance philosophy keeps ships in an acceptable material condition while sustaining or increasing the operational availability of the ship, and is earmarked by a structured engineered approach for ship maintenance while minimizing the time

spent in depot-level availabilities. Major elements of this maintenance strategy include:

- a. Periodic inspections of selected systems and equipment to identify and document necessary repair requirements and material condition trends.
- b. Periodic maintenance tasks to be accomplished at specified times during the ship's life cycle.
- c. Scheduled intra-cycle depot level intermediate maintenance availabilities, docking selected restricted availabilities, SRAs, and ROHs to accomplish the maintenance and modernizations required to sustain or improve the material condition of the ship.
- d. Extensive modernization to maintain and upgrade the ship class war fighting capability.

21. Engineered Overhaul. See overhaul.

22. Engineered Periodicity. The recommended periodicity for accomplishment of a maintenance action based upon an engineering analysis of all relevant technical maintenance history information, including material condition and performance feedback data.

23. Engineered Refueling Overhaul. See overhaul.

24. Extended Docking Phased Maintenance Availability. A docking phased maintenance availability expanded to include maintenance and modernization that cannot be accomplished in a normal docking phased maintenance availability.

25. Extended Docking Selected Restricted Availability. A docking selected restricted availabilities expanded to include maintenance and modernization that cannot be accomplished in a normal docking selected restricted availabilities. Categorized as an overhaul, for non-nuclear surface ships only, based on duration.

26. Extended Refit Period. A labor-intensive period typically lasting four to six months, during which SSBNs and SSGNs accomplish maintenance and modernization which cannot be completed during a normal refit period.

27. Extended Selected Restricted Availability (ESRA). An SRA expanded to include maintenance and modernization that cannot be accomplished in a normal SRA. Categorized as an overhaul, for non-nuclear surface ships only, based on duration.

28. Fleet Maintenance Activity. All government waterfront ship maintenance and modernization activities, e.g., regional maintenance centers, naval ship repair facilities, naval submarine support facilities, naval intermediate maintenance facilities, TRIDENT refit facilities, weapons repair facilities, naval shipyards, tenders and other activities of that type responsible for the processing,

screening and brokering, and execution of work candidates.

29. Fleet Maintenance Board of Directors. The group responsible to COMUSFLTFORCOM for providing oversight in the development of requirements and processes associated with providing materially ready ships. Chaired by the COMUSFLTFORCOM fleet maintenance officer (N43), Fleet Maintenance Board Of Directors principal membership includes the COMPACFLT fleet maintenance officer (N43), NAVSEA logistics, maintenance and industrial operations directorate (NAVSEA (04)), and OPNAV fleet readiness directorate (N83). Force type commanders will be represented by the appropriate ship maintenance directorates (N43) when required. COMNAVRMC will represent the RMCs when required. Expanded membership of the fleet maintenance board of directors will be as specified by COMUSFLTFORCOM.

30. Inactivation Availability. An availability assigned to prepare a ship for Inactivation Availability or disposal. The scope of work depends on the planned disposition of the ship.

31. Incremental Maintenance Plan (IMP). A maintenance philosophy which ensures aircraft carriers are kept in an acceptable material condition through a series of incremental depot maintenance actions. Types of availabilities under this maintenance philosophy include Carrier Incremental Availability, Planned Incremental Availability, and Docking Planned Incremental Availability.

32. Integrated Logistics Support (ILS). ILS consists of various support elements that are required for effective operation, maintenance, and sustainability of systems and equipment. Traditional ILS elements include design interface; maintenance planning; support equipment; technical data; manpower, personnel and training; packaging, handling, storage and transportation; configuration management; computer resources; and supply support. Proper ILS planning ensures that required ILS elements are resourced and available to effectively support the system or equipment initial operational dates and throughout its life cycle.

33. Interim Dry-Docking. A hull specific availability used to extend the operating cycle prior to the next major maintenance availability.

34. Intermediate-Level Maintenance. Maintenance that requires a higher skill, capability, or capacity than organizational-level maintenance. Intermediate-level maintenance is normally accomplished by centralized repair facility personnel such as a Navy fleet maintenance activities, submarine refit and support facilities, RMCs, and battle group or other intermediate maintenance activities.

35. In-Service Support. Management and technical support provided between delivery to operational forces and final disposal. This includes maintenance, systems engineering, technical

support, configuration management, test and evaluation, and all aspects of ILS.

36. Life Cycle Planning Activity. Life cycle planning activities are those organizations responsible to track, manage and defend life cycle maintenance requirements to ensure ships meet ESL. Life cycle planning activities include Surface Maintenance Engineering Planning Program (SURFMEPP), the Carrier Planning Activity and the Submarine Maintenance Engineering Planning and Procurement (SUBMEPP) activity.

37. Maintenance Program. A maintenance program identifies, by ship class, maintenance actions required to sustain ship safety and required material condition at levels commensurate with expected ship operational tempo through its expected life. The maintenance program is developed by the PEO and COMNAVSEASYS COM for OPNAV approval. It specifies key elements such as depot-level availability intervals and durations, frequency of continuous maintenance availabilities, and any special maintenance, maintenance support, or infrastructure requirements.

38. Major Maintenance Period (MMP). A non-CNO availability for guided-missile nuclear submarines (SSGN) for the accomplishment of maintenance and modernization.

39. Micro-miniature Electronics Repair. A more technically demanding level of repair than miniature electronics repair, which requires additional training and specialized tools, materials and repair equipment. It includes wiring and soldering of terminals and connectors (wires of American wire gage 28 and smaller), removal and replacement of discrete components and integrated circuits on multilayer circuit card assemblies (CCAs), repair of damaged conductors and laminate on multilayer CCAs, installation and repair of jumper wiring, removal and replacement of flat packs, repair of edge-lighted (plastic) panels, removal and replacement of components with welded leads, removal and replacement of surface mount devices and damaged land and conductor repair on surface mount technology CCAs.

40. Miniature Electronics Repair. The repair of single-sided and double-sided through-hole technology CCA. It includes the removal and replacement of discrete components and integrated circuits, removal and application of conformal coatings, wiring and soldering terminals and connectors American wire gage 26 and larger, and repair of damaged pads, eyelets, conductors and laminate. Some miniature repairs require the use of a stereomicroscope.

41. Miniature and Micro-Miniature Module Test and Repair Program. The Miniature and Micro-miniature Module Test and Repair Program provides the repair equipment, tools, documentation, and training for the repair of printed circuit boards and electronic/electrical assemblies.

42. Module Test and Repair. The Module Test and Repair Program includes test equipment, training, documentation, and Gold/Silver Disk test procedures to support component level

troubleshooting of printed circuit boards and electronic/electrical assemblies.

43. Navy Afloat Maintenance Training Strategy. A program for training Sailors to obtain journeyman mechanic Navy enlisted classification codes.

44. Naval Supervising Activity. Single naval activity (e.g., naval shipyard, RMC, and SRF) charged with the responsibility for oversight of work being accomplished on U.S. Navy ships during any type of availability.

45. Operational Availability. The percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission and can be expressed as uptime/(uptime + downtime). It can also be considered as the degree to which one can expect a piece of equipment or weapon system to work properly when it is required. The percent of time the equipment or weapon system is available for use.

46. Organizational-Level Maintenance. The lowest maintenance echelon. Organizational-level maintenance consists of all maintenance actions within the capability and resources provided to the organization who routinely oversees equipment operation (e.g., ship's force). It is the first defense against allowing small defects to become major material problems, which could impact ship operations and mission capability.

47. Overhaul. A major availability normally exceeding six-month duration for the accomplishment of maintenance and modernization. Types of overhauls include:

a. Regular, Complex, or Engineered Overhaul Availability and DMP. These describe or identify planning and execution differences among overhaul availabilities of different ship classes.

b. Refueling Complex or Engineered Refueling Overhaul Availability. These describe or identify fundamental planning and execution differences among overhaul availabilities of different nuclear powered ship classes during which the reactor is also refueled.

c. Extended Selected Restricted Availability (ESRA) and Extended Docking Selected Restricted Availability. These describe or identify differences among availabilities for ship classes operated under progressive maintenance or EOC maintenance philosophies for which the amount of maintenance and modernization normally requires extended duration exceeding six

months. ESRA and extended docking selected restricted availabilities are considered overhauls for non-nuclear surface ships only.

48. Overseas Maintenance Facilities. Facilities capable of performing maintenance for ships which are deployed or are in an FDNF status.

49. Phased Maintenance Availability. A short labor-intensive availability for ships in a Phased Maintenance program for the accomplishment of maintenance and modernization. Ships assigned to Phased Maintenance programs are maintained through phased maintenance availability in lieu of overhauls.

50. Pier side Extended Maintenance Availability. An on-site depot availability for moored-training ships for the accomplishment of maintenance and modernization.

51. Planned Incremental Availability. A labor-intensive availability with a duration of six months or less for aircraft carriers in an IMP. Maintenance and modernization are accomplished. Aircraft carriers assigned to IMPs are maintained through carrier incremental availability, Phased Maintenance Availability, and Docking Planned Incremental Availability in lieu of overhauls.

52. Planned Maintenance System (PMS). PMS is a standardized method for planning, scheduling, and accomplishing preventive maintenance by ship's force. The maintenance procedures used in PMS are the minimum required to maintain equipment and systems in a fully operational condition within specifications. PMS maintenance procedures are developed per NAVSEA RCM methodology as required in reference (j) and described in reference (k). Along with the maintenance data system, PMS is the other major component of the 3M system

53. Post-Shakedown Availability (PSA). An availability assigned to newly built, activated, or converted ships upon completion of post-delivery shakedown. PSAs will be scheduled so they are completed no later than the end of the Shipbuilding and Conversion, Navy obligation work limiting date, which is the date on which the Shipbuilding and Conversion funding and work authority terminates. Work performed will normally include correction of defects noted during shakedown, correction of deficiencies remaining from the acceptance trials, and performance of class modifications remaining from the new construction activation or conversion period. Reference (ad) provides additional guidance on the procedures, scheduling, and durations of PSAs.

54. Pre-Inactivation Availability Restricted Availability. A hull specific availability assigned to establish a final, abbreviated operational cycle prior to Inactivation Availability.

55. Preventive Maintenance. Maintenance actions intended to prevent or discover functional failures.

56. Progressive Maintenance. This maintenance philosophy is designed to support ships with reduced manning, limited organizational level maintenance, and operational tempos that limit availability periods. It is also designed to sustain a high level of readiness and increase the ship's availability for required operations. Ships with reduced manning are designed for major component removal and replacement. To compensate for the reduced manning and other shipboard maintenance, off-ship component refurbishment is done by intermediate and depot level activities. This concept requires maintenance and logistic support systems significantly different from those required for conventionally manned surface ships. Major elements of the maintenance strategy include:

- a. Engineered maintenance planning.
- b. Progressive overhaul.
- c. Upgrading of maintenance tasks from ship's force to the intermediate maintenance activity.
- d. Modular replacement.
- e. Dedicated material support and increased stock-level procurement.

57. Refueling Complex Overhaul. See overhaul.

58. Regular Overhaul. See overhaul.

59. Regional Maintenance Center (RMC). RMCs are ship maintenance activities and detachments located in various major fleet concentration areas, which were established to centralize all fleet maintenance, modernization, and technical support activities within a single regional command in the various fleet concentration areas. Each RMC reports to Commander, COMNAVRMC. RMCs are located in San Diego, CA; Mayport, FL; Norfolk, VA; with forward-deployed RMC detachments in Naples, Italy; Rota, Spain; and Manama, Bahrain. RMCs core responsibilities include:

- a. Provide in-service engineering and technical support to operational surface ships, carriers and submarines;
- b. Provide waterfront contracts management and oversight of private sector depot-level maintenance and modernization;
- c. Provide project management of surface ships maintenance availabilities; and
- d. Provide oversight of private sector quality assurance program.

60. Reliability-Centered Maintenance (RCM). A method for determining maintenance requirements based on the analysis of the likely functional failures of components, equipment, subsystems, or systems having a significant impact on safety, operations, and life cycle cost. RCM supports the failure-management strategy for any component, equipment, subsystem or system based on its inherent reliability and operating context. RCM is the engineering discipline that allows for the evaluation of evidence for the purpose of scheduling and executing maintenance. Criterion for objective evidence will be determined using RCM analysis per reference (k).

61. Scheduled Maintenance Requirements. Those inspection and repair actions essential to keeping the systems and equipment in a state of operational readiness commensurate with its design. These actions include inspections, failure finding tasks, and servicing or lubrication tasks that are scheduled on some recurring basis related to equipment age, such as operating time. Scheduled maintenance is identified, depending on ship type, in the class maintenance plan, incremental maintenance plan, and PMS.

62. Selected Restricted Availability (SRA). A labor-intensive industrial period assigned to ships in PROG or EOC maintenance programs for the accomplishment of maintenance and selected modernization. Ships assigned to PROG programs are maintained through SRAs in lieu of traditional overhauls.

63. Selected Restricted Availability docking (SRA(d)). A labor-intensive industrial period assigned only to Littoral Combat Ship (LCS) -1 and -2 class for the accomplishment of maintenance and selected modernization which includes an approximately 12-14 day docking period intended for the inspection of water jets, seals and underwater running gear. LCS class is maintained through SRA(d)s in lieu of overhauls.

64. Service Craft Overhaul. A major industrial availability for the accomplishment of maintenance and modernization on service craft.

65. Ship Sheet. Document which details the maintenance requirement, by ship and availability, over the future years' defense program. Ship sheets are developed using the approved notional workload as a baseline and are adjusted based on deferred life cycle requirements and other ship-specific work based on known material condition, not accounted for in the notional. Ship sheets are developed by the life cycle planning activities (CPA, SUBMEPP and SURFMEPP) and are reviewed by the cognizant technical authorities and provided to OPNAV (N83).

66. Technical Foundation Paper. Class-specific baseline life cycle maintenance requirements developed using historical maintenance analysis, current class maintenance studies, operational results and projected preservation trends. Inputs are periodically reviewed by life cycle planning activities (SURFMEPP, CPA and SUBMEPP) and are reviewed by the cognizant technical authorities and provided to OPNAV (N83) and the applicable resource sponsor for approval.

67. Time-Directed Maintenance. A task performed at some interval to renew life based on statistical analysis of population wear-out regardless of actual condition. This interval may be based on calendar time or the number of recurring events (rounds fired, cycles, starts, stops, etc.). Examples include critical hose replacement or component change out on a calendar basis and battery shelf life replacement. Time-directed tasks are only authorized when RCM analysis shows there is no applicable and effective condition-directed task.

68. Top Management Attention/Top Management Issues. The top management attention/top management issues process is the Navy's priority corrective action process for COMUSFLTFORCOM, fleet commanders, TYCOMs, SYSCOMs, and OPNAV. volume VI, chapter 32 of reference (e) explains top management attention/top management issues applicability, scope, and responsibilities.

69. Voyage Repair Availability. A maintenance period solely for the accomplishment of corrective maintenance of mission- or safety-essential items necessary for a ship to deploy or to continue on its deployment.

APPENDIX D
ACRONYMS

3M	maintenance and material management
CAP	common assessment procedure
CASREP	casualty report
CCA	circuit card assembly
CIA	carrier incremental availability
CM	continuous maintenance
CNO	Chief of Naval Operations
CO	commanding officer
COH	complex overhaul
COMNAVAIRSYSCOM	Commander, Naval Air Systems Command
COMNAVRESFOR	Commander, Naval Reserve Force
COMNAVRMC	Commander, Naval Regional Maintenance Center
COMNAVSEASYSYSCOM	Commander, Naval Sea Systems Command
COMNAVSUPSYSCOM	Commander, Naval Supply Systems Command
COMPACFLT	Commander, Pacific Fleet
COMSPAWARSSYSCOM	Commander, Space and Naval Warfare Systems Command
COMUSFLTFORCOM	Commander, United States Fleet Forces Command
CPA	Carrier Planning Activity
CSMP	current ship's maintenance project
DEMA	docking extended maintenance availability
DFARS	Defense Federal Acquisition Regulation Supplement
DFS	direct fleet support
DIRSSP	Director, Strategic Systems Programs
DMP	depot modernization period
EM	electronic module
EOH	engineered overhaul
ERO	engineered refueling overhaul
ESL	expected service life
ESRA	extended selected restricted availability
FAR	federal acquisition regulation
FDNF	forward-deployed naval force
FLTCDR	fleet commander
HM&E	hull, mechanical, and electrical
ILS	integrated logistics support
IMA	intermediate maintenance activity
INSURV	Board of Inspection and Survey
ISEA	in-service engineering agent
MMP	major maintenance period
MRC	maintenance requirements card
MSA	mandatory safety alteration

COMNAVSEASYSKOM	Naval Sea Systems Command Nuclear Propulsion Directorate
NETC	Naval Education and Training Command
OPNAV	Office of the Chief of Naval Operations
PEMA	pier side extended maintenance availability
PEO	program executive office
PIRA	pre-Inactivation restricted availability
PMS	planned maintenance system
PPBE(S)	planning, programming, budgeting, and execution (system)
PSA	post-shakedown availability
RCM	reliability-centered maintenance
ROH	regular overhaul
RCON	refueling complex overhaul
RMC	regional maintenance center
ROC/POE	Required Operational Capability/Projected Operational Environment
ROH	regular overhaul
SCLISIS	ship's configuration and logistics support information system
SCO	service craft overhaul
SELRES	selected reserve
SIA	surface incremental availability
SRA	selected restricted availability
SRA(d)	selected restricted availability with short docking inspection period
SRF	ship repair facility
SUBMEPP	Submarine Maintenance Engineering, Planning and Procurement
SURFMEPP	Surface Maintenance Engineering Planning Program
SYSCOM	systems command
TOC	total ownership cost
TYCOM	type commander
UWSH	underwater ship husbandry
VR	voyage repair