

# **Fleet Modernization Program (FMP) Management and Operations Manual**



## **Volume 2**

**SUPERSEDES: SL720-AA-MAN-020, Volume 2, dated August 1993**

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## TABLE OF CONTENTS

### **Appendix A: Technical Specifications**

- Tech Spec 9090-100A Liaison Action Record (LAR)
- Tech Spec 9090-210B Justification/Cost Form (JCF)
- Tech Spec 9090-310D Alterations to Ships Accomplished by AITs
- Tech Spec 9090-500C Ship Alteration Record (SAR)
- Tech Spec 9090-600A Ship Alteration Drawing Preparation
- Tech Spec 9090-800A Ship Selected Record Drawings

### **Appendix B: Planning Yard Assignment Matrix**

### **Appendix C: Ship Selected Records**

### **Appendix D: Ship Alteration Development Reports (Deleted)**

### **Appendix E: Distribution List (Deleted)**

### **Appendix F: ILS Actions and Milestones (Deleted)**

### **Appendix G: Alteration Functional Identification Numbers**

### **Appendix H: SAR/Alteration Material List Preparation Guide**

**TECHNICAL SPECIFICATION**

**TITLE: LIAISON ACTION RECORD (LAR)**

**NO.: TS9090-100A**

**DATE: JUNE 2002**

**SUPERSEDES: TS9090-100, dated August 1993**



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**TABLE OF CONTENTS**

1. SCOPE.....1

2. APPLICABLE DOCUMENTS

    2.1 SPECIFICATIONS .....1

    2.2 PUBLICATIONS .....2

3. REQUIREMENTS.....2

4. CHANGES AND DEVIATIONS.....3

5. QUALITY ASSURANCE .....4

FIGURES

FIGURE 1 LIAISON ACTION RECORD.....5

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## LIAISON ACTION RECORD (LAR)

### 1 SCOPE

**1.1** This specification establishes requirements for a formal technical liaison system among SHAPEC Activities, Planning Yards (PYs), Supervisors of Shipbuilding Conversion and Repair (SUPSHIPS), Overhaul Yards, Space and Naval Warfare Systems Command (SPAWAR), Participating Managers (PARMs), Alteration Installation Teams (AITs), Ship Program Managers (SPMs), and other organizations involved in the Ship Alteration (SHIPALT) process.

**1.2 APPLICATION** - The technical liaison system described herein shall be used for the following reasons:

- a. Technical Information
- b. Interpretation of Drawings, Specifications, etc.
- c. Material Identification
- d. Change Requests
- e. Planning Yard approval of Drawings

The primary document to be used in this Liaison System is the Liaison Action Record (LAR); however, it is not the intent of this specification to require the use of LARs where other mechanisms exist such as the direct liaison between the overhauling activity and the PY On Site Representative (OSR).

**1.3 CHANGES** - Any changes to SHIPALT drawings which affect, material specifications, pipe stress levels or distribution, system design or operational characteristics/features, component or fitting selection, ratings and MIL-SPECS, structural integrity, power requirements, compartment/topside arrangements or require insertion in drawing for follow on ships are not permitted except where concurred on by the PY. This concurrence can be obtained either via LAR or the OSR process. Where approved changes require the revision of drawings, the appropriate activity will modify these on a priority basis.

**1.4** This specification does not apply to Nuclear Propulsion Plant matters under the cognizance of NAVSEA 08.

**2 APPLICABLE DOCUMENTS.** The following documents of the issue in effect on the date specified in the data of the tasking correspondence form a part of this specification.

### 2.1 SPECIFICATIONS

2.1.1 9090-600 SHIP ALTERATION DRAWING PREPARATION

2.1.2 9090-500C SHIP ALTERATION RECORD PROCESS

2.1.3 MIL-HDBK-61 CONFIGURATION MANAGEMENT GUIDANCE

### 2.2 PUBLICATIONS

2.2.1 NAVSEA TL 130-AB-PLN-010, Trident System Change Management Plan

2.2.2 NAVSEA 0902-018-2010, General Overhaul Specifications For Deep Diving  
SSBN/SSN Submarines

2.2.3 GSO (NAVSEA S90A-AB-GOS-010/GSO)

### 3. REQUIREMENTS

**3.1** Each activity shall designate individuals to act as liaison representatives. The number of liaison representatives shall be limited to that which is absolutely necessary to maintain effective liaison while avoiding duplication of effort. The signature of an assigned liaison representative on a LAR shall signify that the record is an official communication from the activity involved.

**3.2** Technical liaison services may be requested by the following form of communication.

**3.2.1** A LAR shall be used to request services which are within the Scope of this specification. Each LAR shall be prepared in the standard form described in Figure 1, and meet the legibility requirements of MIL-D-5480 (paragraph 2.1). In addition to identification of the requesting activity, each shall include:

a. An action number as follows

<b>SHIPALT</b>	<b>HULL</b>	<b>SERIALIZATION</b>
0596/	DDG5/	0001

b. The date of the communication.

c. Complete identification of all references and attachment of enclosures necessary to define the problem. Cost and impact information should not be included in the LAR but should be provided in supplementary documentation.

d. A clear statement of the information or action desired.

e. A specific date when a reply is required. . The originator should normally allow the following reply times depending on the Priority of the LAR:

a. Immediate	3 Working Days
b. Urgent	5 Working Days
c. Routine	10 Working Days
d. Review	60 Working Days (See Tech Spec 9090-310)

f. Additional distribution shall be added to Fig. 1 as necessary to keep concerned parties informed.

g. The installing activity (Navy or Contractor) should include a recommendation for resolving the engineering data problem. The details should include information that can be readily transferred from the LAR to engineering drawings without further need to shipcheck. This information is to be included in supplementary documentation to the LAR.

**3.2.2** Telephone communications may be used to request services considered urgent in nature where written communications will not provide timely support. In such cases the request shall subsequently be made and answered in writing on a serialized LAR. Phonecon memos of

record shall be attached to the LAR as a matter of record.

**3.2.3** Messages may be used when services or information needed is considered urgent. A LAR action number shall be assigned each correspondence. Messages will be answered within five working days of receipt. Priority messages will be answered within three working days.

**3.3** Incoming liaison inquiries should be answered by the date requested. In cases where more time is required, the addressee shall notify the originating activity of the date the answer will be provided particularly when the response will require more than two weeks. In all cases of urgent requests, the originating activity shall be notified of any delay in response immediately.

**3.4** Each activity shall maintain a log of incoming and outgoing liaison inquiries and their reply status.

**3.5** Each activity shall maintain a file, which contains all information, associated with each answered incoming and outgoing inquiry.

**3.6** Each activity shall respond to all LARs by phonecon giving the estimated time to reply if response time will exceed that established in this specification and maintain a record of that communication. This record should contain the date of call, new response date established and persons participating in the conversation. This record shall be kept in the file required by Section 3.5 of this specification.

**3.7** Questions regarding SHIPALT technical requirements will be directed to the PY.

**3.8** The SPM shall monitor the LAR process by periodically reviewing the response time to LARs.

#### **4. CHANGES AND DEVIATIONS**

**4.1** Minor waivers and deviations and Class II Engineering changes IAW MIL-HDBK-61 will be approved by installing activities, except for waivers or deviations from non-reactor plant, non-deviation (ND) SSN 688 and SSBN 726 Class drawings or documents.

**4.2 DESIGN CHANGES** - The PY in the process of developing the detail design shall request approval from the SPM for major/critical deviations or changes that affect the Technical Requirements IAW MIL- HDBK-61. The change approval request is to contain:

4.2.1 Identification of the affected NAVSEA Technical Requirements.

4.2.2 Identification of the affected SHIPALT(s) and drawings.

4.2.3 A brief description of the existing system or area of the ships configuration being impacted.

4.2.4 Reasons why it is not considered feasible or appropriate to accomplish in accordance with the technical requirement(s) for this hull or class. Full technical rationale is required.

**4.3 SUBMARINE CHANGES** - For SSN 688 and SSBN 726 Classes, all waivers and deviations from non-reactor plant, non-deviation (ND) SHIPALT drawings or documents shall be in accordance with ND drawing procedures for these classes as described in NAVSEA 0902-018-2010, General Overhaul Specifications For Deep Diving SSBN/SSN Submarines and NAVSEA TL 130-AB-PLN-010, Trident System Change Management Plan.

## **5. QUALITY ASSURANCE**

**5.1** Each activity using this specification is responsible for compliance with all the requirements of this specification.

**5.2** Each activity using this specification may be audited to assure compliance with the requirements of this specification.

<b>LIAISON ACTION RECORD</b>		ACTION NO. _____ DATE _____
From:		
To:		
Subj:		
Ref:		
ORIGINATOR	CODE	APPROVED
Question or Action Required		Reply is Required by _____
COMPLETED BY	APPROVED BY (BRANCH HEAD)	DATE
TELE. NO.	SIGNATURE	
Answer or Action Taken		

**Distribution:**

Planning Yard Code \_\_\_\_\_  
NSA Code \_\_\_\_\_  
PEO/SPM \_\_\_\_\_

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**TECHNICAL SPECIFICATION**

**TITLE: JUSTIFICATION/COST FORM**

**NO.: TS9090-210B**

**DATE: AUGUST 2003**

**SUPERSEDES: TS9090-210A, dated JUNE 2002**



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## TABLE OF CONTENTS

Section	Title	Page
<b>1.0 SCOPE</b>		
1.1	General	1
1.2	Applicability	1
1.3	Exceptions	1
<b>2.0 REQUIREMENTS</b>		
2.1	No Foreign Countries (NOFORN)	1
2.2	Program Executive Office (PEO) Administrative Use Only	1
2.3	Ship Alteration (SHIPALT) Brief	2
2.4	Recommended Category	2
2.5	Operations Navy (OPNAV) Sponsor	3
2.6	Submitting Activity	3
2.7	Technical Authority	3
2.8	Sequence Number for Proposed Alteration	3
2.9	Acquisition Category (ACAT) I-IV Program	3
2.10	Description of Alteration	3
2.11	Requirement and Justification of Alteration	3
2.12	OPNAV Category Code	4
2.13	Type Commander (TYCOM) Priority	5
2.14	Expanded Ship Work Breakdown Structure (ESWBS)/Ship Work Authorization Boundary (SWAB) Number	5
2.15	Detail Design Criteria	5
2.16	Distributed Systems Impact	5
2.17	Other Considerations	6
2.18	Shock, Vibration, Electromagnetic Interference (EMI), & Test Requirements	7
2.19	Applicable Ships	8
2.20	Integrated Logistics Support (ILS) Impact	8
2.21	Indicator Bill of Material Source Code (IBOM)	8
2.22	Critical Material	9
2.23	First Planned Installation	9
2.24	Concurrent/Prior Alteration Accomplishment	9
2.25	Operations & Support (O&C) Cost	9
2.26	Estimated Costs	9
2.27	Recommended Execution Parameter	10
2.28	Remarks	10
2.29	Approving Official Signatures	11
<b>3.0 APPENDICES</b>		
3.1	Appendix A Official Justification/Cost Form Format	12
3.2	Appendix B Calculating Return on Investment (ROI)	18

**JCF PREPARATION**

**1.0 SCOPE:** This specification provides criteria for the uniform preparation, processing, and approval of a Justification/Cost Form (JCF).

**1.1 GENERAL:** The JCF is used by System Commands (SYSCOMs) and Program Executive Offices (PEOs) to arrive at a management decision of whether or not to proceed with the development of a Ship Alteration (SHIPALT). The document in general will define the top-level requirements and anticipated costs for the SHIPALT and, when approved and assigned a number, will serve as the authorization to initiate Ship Alteration Record (SAR) development. In accordance with FMP Milestones, the JCF shall be submitted not later than A-16 for the availability of the first intended install and the Ship Program Manager (SPM) shall adjudicate the JCF no later than A-14. The JCF shall be completed in Microsoft Word using the requirements in the FMP Management and Operations Manual, residing on the **FMP Website**, URL [www.fmp.navy.mil](http://www.fmp.navy.mil).

**1.2 APPLICABILITY:** This specification is applicable to carriers, surface ships, surface craft, and submarine JCFs and shall be utilized by all personnel for preparing, processing and maintaining JCFs except as noted herein (see Section 1.3).

**1.3 EXCEPTIONS:** This specification does not apply to:

- Nuclear Propulsion Systems under the cognizance of NAVSEA 08.
- Special Project Alterations (SPALTs) affecting the Configuration and/or Capabilities of systems and equipments under the cognizance of the Director, Strategic Systems Programs (DIRSSP).
- Aircraft launch and recovery equipment changes under the cognizance of the Naval Air Systems Command (NAVAIR).

**2.0 REQUIREMENTS:** All of the following requirements apply to the JCF format, as shown in Appendix A. This section provides step-by-step instructions for the preparation of a JCF. The amount of detail to be provided in the JCF will depend on the complexity of the proposed change or modification and should be determined by the submitter.

**2.1 NO FOREIGN COUNTRIES (NOFORN):** Determination of No Foreign (NOFORN) Countries will be established at outset and reflected at the top of the JCF.

**2.2 PROGRAM EXECUTIVE OFFICE (PEO) ADMINISTRATIVE USE ONLY:**

<b>PROGRAM EXECUTIVE OFFICE (PEO) ADMINISTRATIVE USE ONLY – This section to be completed by the designated</b>				
<b>ASSIGNED JCF TRACKING NO:</b>		The designated PEO Administrator to enter the JCF tracking No..		
<b>Assigned Execution No. To be completed after the JCF has been approved by the Program Manager and designated for accomplishment via AER, New Construction, SHIPALT or TEMPALT</b>	<b><u>AER</u> The designated PEO ADMIN to enter assigned AER # (if applicable)</b>	<b><u>New Construction</u> The designated PEO ADMIN to enter assigned Contract Mod # (if applicable)</b>	<b><u>SHIPALT</u> The designated PEO ADMIN to enter assigned SHIPALT # (if applicable)</b>	<b><u>TEMPALT</u> The designated PEO ADMIN to enter assigned TEMPALT # (if applicable)</b>

**2.3 SHIPALT BRIEF:** The JCF Submitter is to enter a brief description of JCF - limited to 30 characters. Acronyms should be spelled out.

**2.4 RECOMMENDED CATEGORY (check all applicable):** The JCF Submitter is to check all applicable categories recommending how the change or alteration should be accomplished.

**Alterations Equivalent to Repair (AER)** - An AER has one or more of the following TYCOM alteration attributes:

- Use of different material, which has been approved for like or similar use and such materials are available from standard stock.
- Replacement of obsolete, worn-out or damaged parts, assemblies, or equipment, requiring renewal by that of later and more efficient design previously approved by the System Commands (SYSCOMs) concerned providing such replacement does not cause a change to the existing system design and does not effect a change to the systems or equipment normally associated with the military characteristics of the ship.
- Strengthening of parts, which require repair or replacement in order to improve reliability of the parts and of the unit, provided no other change in design is involved.
- Minor modifications involving no significant changes in design or functioning of equipment but considered essential to prevent recurrence of unsatisfactory conditions.
- Replacement of parts, assemblies, or equipment with the following characteristics:
- Ships updated with like items of more efficient and less costly design.
- New parts, assemblies, or equipment and their installation less costly than maintaining existing parts, assemblies, or equipment.
  1. Update does not cause a change in the existing system design.
  2. Update does not effect any interfacing system design and does not affect a change to the system or equip normally associated with the military characteristics of the ship.
- AERs must meet all of the following criteria:
  1. It does not impact Battle Force Inter-operability (BFI).
  2. It does not impact the ship's stability records (weight and moment).
  3. It does not impact or alter the 3-dimensional footprint or the equipment it is replacing.
  4. It does not impact shipboard distributive systems (i.e. water, ventilation, electrical, or power), their Ship Selected Records (SSRs), or interfacing equipment or systems; compartmental arrangement records; or Damage Control records.
- It does not impact Manpower and Personnel.

**New Construction** - Modifications to the shipbuilding contract.

**Ship Alterations (SHIPALT); Title:**  **D** or  **K** or  **KP** - Any change in hull, machinery equipment, or fittings which involves change in design, material quality, location, or relationship of the component parts of an assembly. SHIPALTS are classified by either Title D or K.

- **Title D SHIPALT** is a permanent alteration that is equivalent to a repair, does not affect the military characteristics of a ship, and may require Centrally Provided Material (CPM) but does not require Headquarters CPM (HCPM) for accomplishment.

- **Title K SHIPALT** is a permanent alteration to provide a military characteristic or additional capability not previously held by a ship affecting configuration controlled areas or systems of a ship or which otherwise requires the installation of HCPM.
  - **Title KP SHIPALT** is for submarine use only.
- Temporary Alterations (TEMPALTs)** - Alterations that provide new capabilities or improve existing capabilities on a temporary basis (**not to exceed one year or one operational deployment in duration**). **TEMPALTs** supports research development, test and evaluation, or military exercise or mission requirements. **Note: TEMPALT data package is required.**

**2.5 OPNAV SPONSOR:** The JCF Submitter is to enter the Name, Code, Phone Number, and Email Address of the OPNAV Sponsor or N/A. If the change proposal will result in a Title K SHIPALT, there must be an OPNAV Sponsor listed.

**2.6 SUBMITTING ACTIVITY:** The JCF Submitter is to enter his/her Name, Activity, Code, Phone Number, and Email.

**2.7 TECHNICAL AUTHORITY ACTIVITY:** The JCF Submitter is to enter the Name, Activity, Code, Phone Number, and Email of the organization that has technical authority over the change. If more than one activity has technical authority over the change, both shall be entered.

**2.8 SEQUENCE NUMBER FOR PROPOSED ALTERATION, FROM NAVY DATA ENVIRONMENT-NAVY MODERNIZATION (NDE-NM) (if applicable):** The sequence number is assigned automatically when the originator enters the proposed alteration into the NDE-NM. The JCF Submitter is to enter the sequence number or N/A, if not applicable.

**2.9 ACQUISITION CATEGORY (ACAT) I-IV PROGRAM:**  Yes  No This will be checked “yes” if the proposed change is an **ACAT I-IV** Program.

**2.10 DESCRIPTION OF ALTERATION:** The JCF Submitter is to provide a brief scope of the proposed change, including alternatives that may have been considered the technical risk, and why the proposed change is preferable. List equipment to be added and/or deleted. Discuss compensation that could be accomplished concurrently with this proposed change, in order to minimize or offset the weight, moment, or space impact of the proposed installation. Discuss interfaces with existing shipboard systems, including functional interfaces (diagrammatic) and physical interfaces. Include references to any other amplifying information or data, if available.

**2.11 REQUIREMENT AND JUSTIFICATION OF ALTERATION (check all that apply):** The JCF Submitter is to check all applicable boxes requiring the change or alteration and note requirements, deficiencies or explanations as requested.

**Legislated (Statutory or Regulatory) Requirement** - Legislation

Cite Requirement: Enter the applicable requirement.

**Proposed Military Improvement (PMI)** - Approved/directed by OPNAV and are intended to increase the ship’s ability to meet its Required Operational Capability (ROC).

Cite Rationale: Enter the system/equipment level Operational Requirements Documents (ORD) and/or applicable ROCs.

**Proposed Survivability Improvement (PSI)** - Approved/directed by OPNAV, and are intended to reduce the ship's susceptibility to defined threats, or to increase the ability to recover from damage.

Cite Requirement: Enter the system/equipment level Operational Requirements Documents (ORD) and/or applicable ROCs.

**Reduction of Total Ownership Costs (R-TOC)** - This block shall only be checked when the primary purpose of the change proposal is R-TOC. These initiatives address long-standing concerns about the adverse impact of defense budgetary and operational trends on force structure and readiness. Department of Defense (DOD) has directed Program Managers to achieve specific R-TOC goals in their programs. ROI Enter the calculated ROI number; Payback Enter the calculated Payback Period. (**Refer to Appendix B**) – If this box is checked, the calculation sheets must be attached to the JCF.

**Battle Force Interoperability (BFI)**

Cite Requirement: Enter the applicable requirement.

**Safety** - Item changes are required to eliminate hazards to ship personnel or components as officially documented by oversight organizations. If safety analysis has been accomplished, attach copy to the JCF.

Cite Deficiency: Enter the officially documented deficiency.

**Restoring Margins** - Restoring system capacity (weight and kilogram (kg); electrical system; heating, ventilation and air conditioning; etc).

Explanation: Provide an explanation.

**Contract Defect** - Address correction of defective specifications, unavailable Government Furnished Equipment (GFE), or unavailable Government Furnished Information (GFI).

Cite Requirement: Enter contract number, CLIN, and problem to be corrected.

**Unavailable, Obsolete or Unreliable Equipment** - Changes that replace equipment or components no longer available or supportable.

**Testing and Trial Deficiency** - Testing and trial deficiencies address component or system modifications derived from deficiencies noted during developmental or operational testing.

**Top Management Attention/Top Management Interest (TMA/TMI)** - Indicate whether or not this change is a TMA/TMI item and include number.

**Aviation Capability and Air Wing Compatibility**

**Other (Specify)** - Enter any other requirement not specified above.

**Narrative Justification** - The JCF Submitter is to enter a brief history of the need for this alteration. This data shall be provided with reference to the activity and official document that initially requested the change or alteration (i.e. TYCOM, PMI, etc). Include references to any other amplifying information or data, if available.

**2.12 OPNAV CATEGORY CODE (1-6):** Enter the most appropriate category code.

**Category 1: Safety and Mandatory.** Includes alterations required to provide a ship which is safe, mobile and capable of supporting future modernization. That level also includes those mandatory requirements imposed upon the Navy by outside agencies.

**Category 2: Reliability and Maintainability: Primary Mission Area.** Includes alterations that provide significant increases in reliability and maintainability of installed primary mission area systems/equipment.

**Category 3: Primary Mission System Modernization.** Includes alterations that provide increased capability in combat mission (combatant ships), primary mission (non-combatant ships), ship survivability and self-protection areas.

**Category 4: Reliability and Maintainability: Secondary Mission Area.** Includes alterations that provide significant increases in the reliability and maintainability of installed secondary mission area systems/equipment.

**Category 5: Secondary Mission Area Modernization.** Includes alterations that provide increased capability in secondary mission areas.

**Category 6: Mission Support.** Includes those alterations that are required to provide support to primary and secondary mission areas and are not included in the above categories.

**2.13 TYCOM PRIORITY (if applicable):** The TYCOM will provide narrative to indicate priority in relation to other candidate JCFs.

**2.14 EXTENDED WORK BREAKDOWN STRUCTURE (ESWBS) or SHIPWORK AUTHORIZATION BOUNDARY (SWAB) NUMBER:** The JCF Submitter is to enter one ESWBS Number selected from NAVSEA S9040-SWAB-IDX-010/SWBS 5D, which is most closely associated with the system, component or structure being impacted by the alteration. This ESWBS is to be to the 5<sup>th</sup> level (ex. 15092). SWAB Number is a 3 or 4 digit number from the SWAB book (SUBMEPP ltr. 1843.7/231 of 3 Jun 93) which is an enclosure to joint COMSUBLANT/COMSUBPAC INST 4710.2. SWAB numbers range from 002.1 to 999.2.

**2.15 DETAIL DESIGN CRITERIA TO BE USED (check all that apply):** The JCF Submitter is to check all applicable boxes noting the design criteria to be used for the change or alteration.

- Ship Specification - The shipbuilding contract specifications for a particular ship.
- Deep Diving General Overhaul Specification - The contract specification for a particular ship.
- General Specifications for Overhaul (GSO) – Check if GSO Manual will be used.
- Other (Specify): Enter any design criteria to be used that is not addressed above.

**2.16 DISTRIBUTED SYSTEMS IMPACT:** The JCF Submitter is to indicate whether or not Ship’s Critical Distributive Systems (SCDS) are impacted (net increase, net decrease or no impact) by the accomplishment of the change or alteration.

	Net Increase	Net Decrease	No Impact	N/A
Electrical (60 Hz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical (400 Hz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chilled Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Main	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Portable Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aviation Fuel System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Net Increase	Net Decrease	No Impact	N/A
<b>Networks (Identify Each Network Impacted)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Topside</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Fiber Optic Cable Plant</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>OTHER:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**2.17 OTHER CONSIDERATIONS (if yes, provide explanation):**

- **Ship Characteristics Document change required:**  Yes  No  
 The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change or alteration impacts the ship characteristics document.  
**Explanation:** If yes, provide details of how the change would impact ship characteristics document.
- **Ship/Aviation Systems Integration Impact:**  Yes  No  
 The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change or alteration impacts the ship or aviation systems integration (for example, C4ISR, catapults or arresting gear) of applicable ships.  
**Explanation:** If yes, provide details of how the change would impact ship/aircraft integration.
- **Environmental Impact (Air/water discharge, use of hazardous materials, solid waste generation, etc.):**  Yes  No  
 The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change or alteration has an environmental impact (air/water discharge, use of hazardous materials, solid waste generation, etc) to applicable ships.  
**Explanation:** If yes, provide details of how the change would impact the environment.
- **Flight Deck/Hangar Bay Encroachment:**  Yes  No  N/A  
 The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change or alteration impacts the flight deck or hangar bay of applicable ships.  
**Explanation:** If yes, provide details of how the change would encroach the hangar bay or flight deck.
- **Habitability:**  Yes  No  
 The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change or alteration impacts the habitability (i.e. messing, berthing, recreational, and sanitary spaces) of applicable ships.  
**Explanation:** If yes, provide details of how the change would impact habitability spaces.
- **Storage Requirements:**  Yes  No  
 The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change alteration impacts the storage requirements of applicable ships.  
**Explanation:** If yes, provide details of how the change would impact storage space.
- **Weight & Moment Change:**  Yes  No

The JCF Submitter is to indicate (Y/N) whether or not accomplishment of the change or alteration impacts the weight and moment of applicable ships.

**Explanation:** If yes, provide details of how the change would impact weight and moment. As a minimum a rough order of magnitude weight impact should be provided.

- **Dry Docking:**  Yes  No

The JCF Submitter is to indicate (Y/N) whether or not the alteration requires the ship to be dry-docked.

**Explanation:** If yes, provide details of why the change would require dry-docking.

- **Certification Required:**  Yes  No

The JCF Submitter is to indicate (Y/N) whether or not certification is required (e.g. TEMPEST, EMI).

**Explanation (include responsible activity):** If yes, provide details of certification requirements.

- **SUBSAFE Impact:**  Yes  No  N/A .

**Other:** The submitter will include considerations not included in the above categories.

- **Nuclear Weapons Impact:**  Yes  No

**Explanation:** The JCF Submitter is to indicate yes or no whether or not the alteration impacts are nuclear weapons factors.

**2.18 SHOCK, VIBRATION, EMI, AND TEST REQUIREMENTS:**

**Shock Grade (check one):**

- A - for Vital Systems/Equipment; Must Function After Shock Event
- B - In Spaces Manned at GQ, Housing A Level Equipment, Cannot be a Hazard (Missile, Electrical, Hazardous material (HAZMAT), Structures on Mast/Island B Minimum
- C - all others
- N/A – not applicable

**Compliant with MIL-STD-167 –1, Vibration Requirements (check one):**

- Yes  No  N/A

The JCF Submitter is to indicate (Y/N) whether or not the alteration is compliant with **MIL-STD-167-1, Mechanical Vibrations of Shipboard Equipment**. MIL-STD-167-1, which covers Reciprocating Machinery and Propulsion System and Shafting, is a NOFORN document.

**Compliant with MIL-STD-461E EMI Requirements (check one):**

- Yes  No  N/A

The JCF Submitter is to indicate (Y/N) whether or not the alteration is compliant with **MIL-STD-461E, Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment**

**Compliant with MIL-STD-464 EMI Requirements (check one):**

- Yes  No  Tailored (specifics appended)  N/A

The JCF Submitter is to indicate (Yes, No, Tailored or Not Applicable) whether or not the alteration is compliant with **MIL-STD-464, Electromagnetic Environmental Effects Requirements for Systems.**

**Compliant with OPNAVINST-2400.20E RF Spectrum Management Requirements (check one):**

- Yes  No  N/A

The JCF Submitter is to indicate (Y/N or Not Applicable) whether or not the alteration is compliant with **OPNAV Instruction 2400.20E, Navy Management of the Radio Frequency Spectrum.**

**Compliant with HERO/HERP/HERF Requirements (check one):**

- Yes  No  N/A

The JCF Submitter is to indicate (Y/N or Not Applicable) whether or not the alteration is compliant **HERO/HERP/HERF** requirements detailed in DoDINST 6055.11 and OP 3565 Volume I.

**HERO**-Hazards of electromagnetic Radiation to ordnance

**HERP** -Hazards of electromagnetic Radiation to personnel

**HERF** -Hazards of electromagnetic Radiation to fuel

**REMARKS** - The JCF Submitter is to provide status on the above requirements and enter any other test requirements (e.g. component qualification) for installation of the proposed change.

**2.19 APPLICABLE SHIPS (check all that apply):** The JCF Submitter is to check all of the ships which the proposed change applies to, including those that have already had the change installed. In the event that this change has been accomplished on any ship or is contained within a shipbuilding contract it shall be noted in remarks section (2.28).

**2.20 ILS IMPACT (check all that apply):** The JCF Submitter is to check all boxes where installation of this alteration will affect the following Integrated Logistics Support (ILS) elements.

- Technical Manuals
- Provisioning
- Planned Maintenance System (PMS)
- Training/Personnel Qualification Standards (PQS)
- Ship's Selected Records (Drawings & Manuals)
- Operating Sequencing Systems (OSS)
- Steam Plant Manual (SPM)
- Manning Analysis Required
- Test Equipment
- Software Management  
Specify software support activity: \_\_\_\_\_
- Spares Affected  
Specify responsible activity: \_\_\_\_\_
- Other (Specify) \_\_\_\_\_

**2.21 INDICATOR BILL OF MATERIAL SOURCE CODE (IBOM (0-8):** The Indicator, Bill of Material (IBOM) is required by material management personnel to identify the source document used to enter the material into NDE. It provides the level of maturity of the list of material being reviewed. It indicates if a BOM is applicable to the alteration and the status of development. This

field will be updated as the alteration matures from JCF to SAR to SID for title "K", "D" and "F" alterations.

- 0- source of BOM not specified
- 1-BOM not yet developed
- 2-Justification Cost Form(JCF)
- 3-Shipalt Record (SAR) BOM
- 5-Ship installation Drawing(SID) BOM
- 6-Hull Unique Material
- 7-Material Required- Sub use only
- 8-BOM not required

**2.22 CRITICAL MATERIAL:** This data field will allow the JCF to enter the top line system configuration identification of the Hardware Systems Command (HSC) material to be installed. The items listed in this field should be the same as those that will be listed in the P1 funding line in NDE-NM/Fleet Modernization Program Management Information System (FMPMIS).

**2.23 FIRST PLANNED INSTALLATION:** The JCF submitter is to supply the intended hull for the first install and availability of first unit or lead-time for delivery of first unit. If there are significant differences in description, material requirements, and/or installation costs among ship classes, a separate JCF shall be developed for each class. The N/A box should be "X" if first hull availability has not yet been programmed.

**Planned First Installation: Hull \_\_\_\_\_ Availability \_\_\_\_\_ N/A \_\_\_\_\_**

**2.24 CONCURRENT/PRIOR ALTERATION ACCOMPLISHMENT:** The JCF submitter is to list any prior or concurrent alts required for this change or alteration to perform as stated. This section should include but not be limited to SHIPALTs (both approved and pending), MACHALTs, ORDALTs, Engineering Changes, Field Changes, SPALTs and Technical Directives. Ensure all concurrent/prior ship alterations are identified by class, number, title and Revision. **In other words: CG-47 Class 5000K, Revision 1.** The minutes from the CCBs should be available.

**2.25 O&S COST IMPACT:**  Increase  Decrease  No Impact

The JCF Submitter is to indicate whether or not the Operation & Support Cost is impacted (increase, decrease or no impact) by the accomplishment of the change or alteration. The O&S Costs are fleet operating and support costs associated with the maintenance and repair of systems or equipment.

**2.26 ESTIMATED COSTS:** The JCF Submitter is to provide estimated costs for all below items. Note: M/D x Rate = Cost. If alt impacts EMI spectrum, the cost should reflect the EMI effort.

**Engineering Planning (Shipchecks/Drawings/etc)(\$K):** The JCF Submitter is to provide estimated cost for engineering planning, including costs for shipchecks, drawing development, etc.

**GFE Cost (\$K):** The JCF Submitter to provide estimated costs for Government Furnished Equipment (GFE).

**CFE and Installation Material Cost (\$K):** The JCF Submitter is to provide estimated costs for Contractor Furnished Equipment (CFE) and installation material cost.

- **Installation Mandays:** The JCF Submitter is to provide an estimated installation mandays for accomplishing the change or alteration. These estimate will be ballpark (+/- 40%) cost estimate.
- **Services (Mandays):** For Alteration Installation Team (AIT) capable alterations, the JCF Submitter is to provide an estimated shipyard services cost in mandays. Shipyard services include crane services, welding, gas freeing, tag-outs, work authorization forms, work integrations, etc. For changes that are not AIT capable, enter N/A.
- **Accomplishing Activity:**  **Shipyard**  **AIT** The JCF Submitter is to recommend the appropriate activity to accomplish the change or alteration either the shipyard or an AIT.

**ILS Cost (\$K):** The JCF Submitter is to provide estimated costs for Integrated Logistics Support (ILS) elements identified in paragraph 14.

**Total Cost Estimate per Carrier (BALLPARK) (\$K):** The JCF submitter is to provide a ballpark (+/- 40%) cost estimate for the installation per Carrier. This estimate should include all costs (ILS, material, services, EMI surveys etc.) associated with this alteration. If a more refined cost estimate is available provided the cost estimate and the designated estimate classification. See reference (h) section 5.2 for classification of cost estimates information.

## 2.27 RECOMMENDED EXECUTION PARAMETER (check all that apply).

**SAR Required:**  **Yes**  **No** The JCF Submitter is to indicate whether or not a SHIPALT Record (SAR) is required for the change or alteration.

If Yes, Approval level:  **NAVSEA**  **PY** The JCF Submitter is to indicate whether the NAVSEA SPM should approve the SHIPALT Record or if it can be delegated to the Planning Yard to approve the SAR and sign in the SPM block.

**Technical Guidance Package Required:**  **Yes**  **No** List any additional guidance (drawings, schematics, etc.) required the planning yard to develop the SAR.

**NAVSEA Review Initial Ship Installation Drawing (SID) Package:**  **Yes**  **No** The JCF Submitter to indicate whether or not NAVSEA should review the initial SID Package.

**AIT Capable:**  **Yes**  **No**

The JCF Submitter is to indicate (Y/N) whether or not accomplishment of this alteration is within the capability of an Alteration Installation Team (AIT). If this field is marked **Yes** then the services mandays must be provided.

**New Construction:**  **During Construction**  **PSA**  **IN-SERVICE**

The JCF Submitter is to recommend if the change or alteration is to be accomplished during construction, Post Shakedown Availability (PSA,) or IN-SERVICE.

**2.28 REMARKS:** The JCF Submitter is to enter any amplifying information relating to the change or alteration that is not addressed elsewhere in the JCF. Provide in this section a list of all carriers that have had this installation already completed or if the change is already included in shipbuilding contract. For example (1) "This change was accomplished on CVN 68 during RCOH by ECP 1460", (2) "This change is contained in the CVN 77 baseline contract", or (3) This change will be incorporated in the CVN 77 by HMR\_\_\_ or FMR\_\_\_." If the CV 63 or CV 64 is checked the statement "The CV 63 or CV 64 is within the 5 year decommissioning window and a SECNAV

Waiver is required IAW FMP Manual Subsection 1-6.” must be added to the remarks. Identify cost, schedule, and technical risks associated with this change proposal.

**2.29 APPROVING OFFICIAL SIGNATURES**

To be signed by Submitting Activity official with appropriate signature authority. Name is to be typed in and signed.	Date signed	Lead Ship Design Manager’s for the carrier program recommending the change. Name is to be typed in and signed.	Date signed
<b>SUBMITTING ACTIVITY</b>	<b>DATE</b>	<b>LEAD SHIP DESIGN MANAGER</b>	<b>DATE</b>
To be signed by SEA08 official with appropriate signature authority, if applicable, if not enter “N/A”. Name is to be typed in and signed.	Date signed	To be signed by the PEO Carriers IWS Director, if applicable, if not enter “N/A”. Name is to be typed in and signed.	Date signed
<b>NUCLEAR PROPULSION DIR. (SEA08 if applicable)</b>	<b>DATE</b>	<b>PEO IWS DIRECTOR (PEO IWS if applicable)</b>	<b>DATE</b>
To be signed by the PEO Carriers Aviation Director, if applicable, if not enter “N/A”. Name is to be typed in and signed.	Date signed	To be signed by PEO Carriers Technical Director or Deputy. Name is to be typed in and signed.	Date signed
<b>PEO AVIATION DIRECTOR (PEO CV if applicable)</b>	<b>DATE</b>	<b>PEO CARRIERS TECHNICAL DIRECTOR</b>	<b>DATE</b>
To be signed by PMS312 Program Manager after CCB recommended approval. Name is to be typed in and signed.	Date signed		
<b>PMS APPROVAL</b>	<b>DATE</b>		

### **3.1 APPENDIX A: JUSTIFICATION/COST FORM**



- Contract Defect**  
Cite Requirement: \_\_\_\_\_
- Unavailable, Obsolete or Unreliable Equipment**
- Testing and Trial Deficiency**
- Top Management Attention/Top Management Initiative (TMA/TMI)**
- Aviation Capability and Air Wing Compatibility**
- Other (Specify)\_\_\_\_\_**

**Narrative Justification:**

**10. OPNAV CATEGORY CODE (1-6): \_\_\_\_\_ (2.12)**

- Category 1: Safety and Mandatory**
- Category 2: Reliability and Maintainability: Primary Mission Area**
- Category 3: Primary Mission System Modernization**
- Category 4: Reliability and Maintainability: Secondary Mission Area**
- Category 5: Secondary Mission Area Modernization**
- Category 6: Mission Support**

**11. TYCOM PRIORITY (if applicable): \_\_\_\_\_ (2.13)**

**12. EXTENDED SHIP WORK BREAKDOWN STRUCTURE (ESWBS) OR SHIP WORK AUTHORIZATION BOUNDARY (SWAB) NUMBER: \_\_\_\_\_ (2.14)**

**13. DETAIL DESIGN CRITERIA TO BE USED (CHECK ALL THAT APPLY): (2.15)**

- Ship Specification
- Deep Diving General Overhaul Specification
- General Specifications for Overhaul (GSO)
- Other (Specify): \_\_\_\_\_

**14. DISTRIBUTED SYSTEMS IMPACT: (2.16)**

	Net Increase	Net Decrease	N/A	No Impact
Electrical (60 Hz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical (400 Hz)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chilled Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Main	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potable Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aviation Fuel System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Networks (Identify Each Network Impacted)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Topside	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fiber Optic Cable Plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**15. OTHER CONSIDERATIONS (IF YES, PROVIDE EXPLANATION): (2.17)**

Ship Characteristics Document change required:  Yes  No

Explanation:

**Ship/Aviation Integration Impact:**  Yes  No

Explanation:

**Environmental Impact (Air/water discharge, use of hazardous materials, solid waste generation, etc.):**

Yes  No

Explanation:

**Flight Deck/Hangar Bay Encroachment:**  Yes  No  N/A

Explanation:

**Habitability Impact:**  Yes  No

Explanation:

**Storage Requirements:**  Yes  No

Explanation:

**Weight & Moment Change:**  Yes  No

Explanation:

**Dry Docking Required:**  Yes  No

Explanation:

**Certification Required:**  Yes  No

Explanation (include responsible activity):

**SUBSAFE Impact:**  Yes  No  N/A

**Nuclear Weapons Impact:**  Yes  No

**Other:** \_\_\_\_\_

Explanation:

**16. SHOCK, VIBRATION AND EMI REQUIREMENTS: (2.18)**

Shock Grade (check one):

A  B  C  N/A

Compliant with MIL-STD-167 Vibration Requirements (check one):

Yes  No  N/A

Compliant with MIL-STD-461E EMI Requirements (check one):

Yes  No  N/A

Compliant with MIL-STD-464 EMI Requirements (check one):

Yes  No  Tailored (specifics appended)  N/A

Compliant with OPNAVINST-2400.20E RF Spectrum Management Requirements

Yes  No  N/A

Compliant with HERO/HERP/HERF Requirements (check one):

Yes  No  N/A

**Remarks:** \_\_\_\_\_

**17. APPLICABLE SHIPS (list all that apply): \_\_\_\_\_ (2.19)**

**18. INTEGRATED LOGISTICS SUPPORT (ILS) IMPACT (check all that apply): (2.20)**

- Technical Manuals
- Provisioning
- Planned Maintenance System (PMS)
- Training/Personnel Qualification Standards (PQS)
- Ship's Selected Records (Drawings & Manuals)

- Operating Sequencing Systems (OSS)
- Steam Plant Manual (SPM)
- Manning Analysis Required
- Test Equipment
- Software Management  
Specify software support activity: \_\_\_\_\_
- Spares Affected  
Specify responsible activity: \_\_\_\_\_
- Other (Specify) \_\_\_\_\_

**19. IBOM CODE (0-8): (2.21) \_\_\_\_\_**

- 0- source of BOM not specified
- 1-BOM not yet developed
- 2-Justification Cost Form(JCF)
- 3-Shipalt Record (SAR) BOM
- 5-Ship installation Drawing(SID) BOM
- 6-Hull Unique Material
- 7-Material Required- Sub use only
- 8-BOM not required

**20. CRITICAL MATERIAL: (2.22) \_\_\_\_\_**

**21. FIRST PLANNED INSTALLATION: (2.23)**

Hull \_\_\_\_\_ Availability \_\_\_\_\_ or QTR/FY \_\_\_\_\_ N/A \_\_\_\_\_

**22. CONCURRENT/PRIOR ALTERATION ACCOMPLISHMENT: (2.24)**

**23. OPERATION & SUPPORT COST IMPACT: (2.25)**

- Increase  Decrease  No Impact

**24. ESTIMATED COSTS: (2.26)**

Engineering Planning (Shipchecks/Drawings/etc)(\$K) \_\_\_\_\_

GFE Cost (\$K) \_\_\_\_\_

CFE and Installation Material Cost (\$K) \_\_\_\_\_

Installation (Mandays) \_\_\_\_\_

Accomplishing Activity:  Shipyard (D)  AIT (T)  IMA(I)  SHIP FORCE (F)

ILS Cost (\$K) \_\_\_\_\_

Total Cost Estimate per Ship (ROM)(\$K) \_\_\_\_\_

Support Services Required  Yes  No, if yes, provide M/D estimate \_\_\_\_\_

**25. RECOMMENDED EXECUTION PARAMETER (check all that apply): (2.27)**

SAR Required  Yes  No

If Yes, Approval level:  NAVSEA  Planning Yard

Technical Guidance Package Required, i.e. ICDS, schematics etc.  Yes  No

NAVSEA Review Initial SID Package  Yes  No

AIT Capable  Yes  No

New Construction  During Construction  PSA  INSERVICE

**26. REMARKS: (2.28)**



## **3.2 APPENDIX B: CALCULATING RETURN ON INVESTMENT**

## CALCULATING RETURN ON INVESTMENT

Notes: The Return on Investment (ROI) calculations described herein will assist decision authorities in determining the best course of action for ship equipment/system upgrades, installations, and replacements. It is not necessary to use the services of a trained cost estimator to provide the level of detail needed to make an informed management decision; approximations based upon the best available information at the time are adequate for this purpose.

Also note that in order to reduce calculation complexity, time value of money calculations are not used when discussing dollar amounts of costs or savings.

### 1. Life Cycle Maintenance Costs, Present (LCMC<sub>p</sub>):

This is the current cost of doing business.

First, calculate the present cost for repairing the old equipment (**P\$/e**):

$$\mathbf{P\$/e = Present\ man\text{-}hours\ (PMH)\ to\ repair/equipment\ X} \\ \mathbf{Present\ Labor\ Cost\ ((PL\$/PMH) + Present\ Material} \\ \mathbf{Cost\ (PM\$/equipment)}$$

Then, calculate the present cost per equipment per year (**P\$/e/y**):

$$\mathbf{P\$/e/y = P\$/e\ X\ Present\ Maintenance\ Periodicity/equipment/year\ (PMP/e/y)}$$

where: PMP/e/y is the number of times equipment is repaired each year

Next, calculate the present cost per ship per year (**P\$/s/y**):

$$\mathbf{P\$/s/y = P\$/e/y\ X\ Number\ of\ Equipment/Ship\ (N1)}$$

Next, calculate the present cost per ship class per year (**P\$/sc/y**):

$$\mathbf{P\$/sc/y = P\$/s/y\ X\ Number\ of\ Ships/Class\ (N2)}$$

Finally, calculate **LCMC<sub>p</sub> through End of Life (EOL)**:

$$\mathbf{LCMC_p = P\$/sc/y\ X\ Years\ of\ EOL}$$

**CALCULATING RETURN ON INVESTMENT (ROI)**

(continued)

**2. Life Cycle Maintenance Cost, Future (LCMC<sub>f</sub>):**

The cost of the process once the change is made.

For figuring the LCMC<sub>f</sub> metrics associated with the new equipment, the same basic logic as that used for the LCMC<sub>p</sub> would apply.

First, calculate the future cost for repairing the new equipment (F\$/e):

$$\text{F}\$/\text{e} = \text{Future Man-hours (FMH) to repair/equipment} \times \frac{\text{Future Labor Cost (FL\$) + Future Material Cost (FMS)/equipment}}{\text{FMH}}$$

Then, calculate the future cost per new equipment per year (F\$/e/y):

$$\text{F}\$/\text{e}/\text{y} = \text{F}\$/\text{e} \times \text{Future Maintenance Periodicity/equipment/year (FMP/e/y)}$$

where: FMP/e/y is the number of times the new equipment is repaired each year

Next, calculate the future cost per ship per year (F\$/s/y):

$$\text{F}\$/\text{s}/\text{y} = \text{F}\$/\text{e}/\text{y} \times \text{Number of Equipment/Ship (N1)}$$

Next, calculate the future cost per ship class per year (F\$/sc/y):

$$\text{F}\$/\text{sc}/\text{y} = \text{F}\$/\text{s}/\text{y} \times \text{Number of Ships/Class (N2)}$$

Finally, calculate LCMC<sub>f</sub> through End of Life (EOL):

$$\text{LCMC}_f = \text{F}\$/\text{sc}/\text{y} \times \text{Years to EOL}$$

Note that for calculating the Life Cycle Maintenance Cost, Future (LCMC<sub>f</sub>), the Future Man-hours (FMH), Future Material Cost (FMS), and Future Maintenance Periodicity (FMP) would probably be different, while the Future Labor Cost (FL\$), the number of equipment (N1), and the number of ships (N2) may be the same as those for LCMC<sub>p</sub>.

**CALCULATING RETURN ON INVESTMENT (ROI)**

(continued)

**3. Maintenance Cost Effectiveness (MCE):**

The maintenance cost effectiveness {or anticipated cost savings} of a modification is the total change in Life Cycle Maintenance Cost (LCMC) over the remaining life of a system or given ship class. Accordingly, it is computed by subtracting the approximated LCMC<sub>f</sub> from the LCMC<sub>p</sub>.

$$MCE = LCMC_p - LCMC_f$$

**4. Implementation Cost (IMPS):**

The cost to develop and test the modification. Implementation Costs (IMPS) consists of all costs associated with new product or process development up to the point where it is ready to be installed. This would include Research and Development Costs (RD\$), prototypes, lab tests, and reports, in addition to such costs as the preparation of class drawings for SHIPALTs, etc. These costs are shared as "overhead" costs as they are invoked only once and are spread over the ships, classes of ships, or groups of ships as far as the modification would apply. For example a new radar technology would have the RD\$ spread over all ships having or requiring that radar.

$$IMPS = \frac{\text{All one time costs associated with fielding new equipment or using a new process}}{\text{Number of ships}}$$

**5. Pay Back Period (PBP):**

The Payback Period (PBP) is a metric that tells the decision maker how long it will take for the new process, system, equipment, or technology (PSET) to pay for itself. It is expressed in units of time (normally years) and is based on the Implementation Costs (IMPS) for the new PSET compared to the costs savings realized once the new PSET is in place.

$$PBP = \frac{IMPS}{P\$/sc/y - F\$/sc/y}$$

**CALCULATING RETURN ON INVESTMENT (ROI)**

(continued)

**6. Return on Investment (ROI):**

The ROI metric relates the MCE to the up-front IMP\$.

$$\text{ROI} = \frac{\text{MCE}}{\text{IMP\$}}$$

***ROI EXAMPLE***

The example that follows is a representation of a transmitter assembly modification that will require some RD\$ for new parts purchases, but will result in enhanced performance and longer service life, therefore extending periods between repairs and radar downtime.

**Number of Transmitter Assemblies/Ship (N1) = 10**

**Number of Ships/Class (N2) = 50**

**Remaining Years to EOL = 10**

**Implementation Cost (IMP\$) = \$100K**

**P\$/e = \$500 Labor + \$250 Material = \$750**

**F\$/e = \$200 Labor + \$300 Material = \$500**

**Present Maintenance Periodicity/transmitter/year  
(PMP/e/y) = 4 repairs per year**

**Future Maintenance Periodicity/transmitter/year  
(FMP/e/y) = 1/4 (one repair every 4 years)**

**CALCULATING RETURN ON INVESTMENT (ROI)****ROI EXAMPLE**

(continued)

**Life Cycle Maintenance Cost, Present (LCMC<sub>p</sub>):**

$$\text{P\$/e/y} = \$750 \times 4 = \$3\text{K per year}$$

$$\text{P\$/s/y} = \$3\text{K/yr} \times 10 \text{ transmitters/ship} = \$30\text{K/yr/ship}$$

$$\text{P\$/sc/y} = \$30\text{K} \times 50 \text{ ships} = \$1.5\text{M per year}$$

$$\text{LCMC}_p \text{ (EOL)} = \$1.5\text{M} \times 10 \text{ years} = \$15\text{M}$$

**Life Cycle Maintenance Cost, Future (LCMC<sub>f</sub>):**

$$\text{F\$/e/y} = \$500 \times 1/4 \text{ year} = \$125/\text{yr}$$

$$\text{F\$/s/y} = \$125 \times 10 \text{ transmitters/ship} = \$1.25\text{K/yr}$$

$$\text{F\$/sc/y} = \$1.25\text{K} \times 50 \text{ ships} = \$62.5\text{K/yr}$$

$$\text{LCMC}_f \text{ (EOL)} = \$62.5\text{K} \times 10 \text{ years} = \$625\text{K}$$

**Maintenance Cost Effectiveness (MCE):**

$$\text{MCE} = \text{LCMC}_p - \text{LCMC}_f = \$15\text{M} - \$625\text{K} = \$14.375\text{M}$$

**Pay Back Period (PBP):**

$$\begin{aligned} \text{PBP} &= \text{IMPS}/(\text{P\$/sc/y} - \text{F\$/sc/y}) \\ &= \$100\text{K}/(\$1.5\text{M} - \$62.5\text{K}) = \$100\text{K}/\$1,437,500 \\ &= 0.07 \text{ years} \end{aligned}$$

**Return on Investment (ROI):**

$$\text{ROI} = \$14.375\text{M}/\$100\text{K} = 14400\% \text{ or}$$

ROI is 144:1

**TECHNICAL SPECIFICATION**

**TITLE: ALTERATIONS TO SHIPS ACCOMPLISHED BY ALTERATION  
INSTALLATION TEAMS**

**NO.: TS9090-310D**

**DATE: FEBRUARY 2004**

**SUPERSEDES: TS9090-310C, dated JUNE 00**



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**PUBLISHED BY**

**COMMANDER, NAVAL SEA SYSTEMS COMMAND**

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## DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND  
1333 ISAAC HULL AVE SE  
WASHINGTON NAVY YARD DC 20376-0001

IN REPLY TO

4720  
Ser 04RP/091  
27 Feb 2004

From: Commander, Naval Sea Systems Command (SEA 04)

Subj: CHANGE 2 TO THE FLEET MODERNIZATION PROGRAM (FMP)  
MANAGEMENT AND OPERATIONS MANUAL

Ref: (a) FMP Management and Operations Manual, Revision 2  
dtd Jun 02

1. The purpose of this letter is to issue change 2 to reference (a).
2. Change 2 is promulgated to replace FMP Management and Operations Manual, Volume 2, Appendix A, TS9090-310C, Alterations to Ships Accomplished by Alteration Installation Teams (AITs) dated June 2000, with revised TS9090-310D dated February 2004, which provides updated policy guidance applicable for all shipboard alterations accomplished by AITs. In addition, the revision description and revision record histories in the FMP Manual, Volume 1 will reflect the appropriate updates.
3. Change 2 is effective this date and has been posted to the FMP Website Library at the URL address, [www.fmp.navy.mil](http://www.fmp.navy.mil).
4. NAVSEA point of contact for FMP Documentation is Mrs. Sharon Ann Shaw, SEA 04RP12. Mrs. Shaw can be reached at (202) 781-1817 or by e-mail at [ShawSA@navsea.navy.mil](mailto:ShawSA@navsea.navy.mil).

A handwritten signature in cursive script, reading "Iona Evans", is positioned above the typed name.

IONA EVANS  
Assistant Deputy Commander  
Maintenance, Modernization,  
Environment, & Safety

## TABLE OF CONTENTS

<b>1.</b>	<b>SCOPE.....</b>	<b>1</b>
1.1.	General.....	1
1.2.	Definitions.....	2
1.3.	Applicability.....	2
1.4.	Exceptions.....	2
1.5.	Roles and Responsibilities.....	2
1.6.	Cancellation.....	7
<b>2.</b>	<b>REFERENCED DOCUMENTS .....</b>	<b>7</b>
2.1.	Issues of Documents.....	7
<b>3.</b>	<b>REQUIREMENTS.....</b>	<b>10</b>
3.1	General.....	10
3.1.1.	Quick reaction alteration accomplishment.....	10
3.2.	Ship Alteration (SHIPALT) and Equipment Alteration [Machinery Alteration (MACHALT), Ordnance Alteration (ORDALT), Field Change (FC), Engineering Change (EC)] Pre-Installation Requirements.....	10
3.2.1.	Initial determination of SHIPALT/Equipment Alteration accomplishment by AIT.....	10
3.2.2.	Equipment Alteration development.....	11
3.2.3.	SHIPALT development.....	11
3.2.4.	Planning.....	13
3.2.5.	Scheduling and Pre-installation Coordination Requirements.....	13
3.2.6.	AIT tasking.....	17
3.2.7.	SHIPALT design development.....	18
3.3.	Temporary Alteration (TEMPALT) Pre-installation Requirements. (Surface Ships and Service Craft).....	23
3.3.1.	Initial determination of alteration accomplishment by AIT.....	23
3.3.2.	TEMPALT development.....	23
3.3.3.	Planning.....	23
3.3.4.	Budgeting.....	24
3.3.5.	Scheduling.....	24
3.3.6.	Tasking.....	24
3.3.7.	TEMPALT design development.....	24
3.4.	Installation Preparation Requirements.....	25
3.4.1.	Installation planning and preparation.....	25
3.4.2.	Pre-installation coordination requirements.....	25

- 3.4.3. Special requirements. .... 26
- 3.4.4. Design shipcheck..... 28
- 3.4.5. Incidental material..... 29
- 3.4.6. Material requirements. .... 29
- 3.4.7. AIT requirements. .... 30
- 3.5. Installation Requirements..... 32
  - 3.5.1. AIT Check-in and Pre-brief..... 33
  - 3.5.2. In-brief..... 33
  - 3.5.3. Shipwork outside of a Chief of Naval Operations (CNO) scheduled availability. .... 34
  - 3.5.4. Shipwork during a CNO scheduled availability..... 34
  - 3.5.5. Pre-Installation Equipment Checkout (PICO)..... 34
  - 3.5.6. Installations Impacting the Propulsion Plant on Nuclear Powered Ships. 34
  - 3.5.7. Installations Impacting Critical Systems or Critical System Boundaries.35
  - 3.5.8. AIT On-site Installation Coordinator. .... 36
  - 3.5.9. Workmanship. .... 36
  - 3.5.10. Deactivations..... 36
  - 3.5.11. Interference removal..... 37
  - 3.5.12. Housekeeping..... 37
  - 3.5.13. Testing..... 37
  - 3.5.14. Integrated Logistics Support (ILS) (including Training)..... 38
  - 3.5.15. Final housekeeping..... 38
- 3.6. Installation Follow-up. .... 39
  - 3.6.1. Out-briefing..... 39
  - 3.6.2. Drawings developed by the Planning Yard (PY). .... 39
  - 3.6.3. Drawings developed by the AIT..... 39
  - 3.6.4. Ship Selected Record (SSR) Documentation. .... 39
- 3.7. Reporting Requirements..... 39
  - 3.7.1. Task Status Report. .... 40
  - 3.7.2. Readiness to Start Naval Message..... 40
  - 3.7.3. Naval Message Completion Report..... 40
  - 3.7.4. Alteration Completion Report..... 40
  - 3.7.5. Naval Message Final Completion Report. .... 41
- 4. QUALITY SYSTEM PROVISIONS..... 41**
  - 4.1. AIT Responsibilities..... 41
  - 4.2. Acceptance of the Quality Systems..... 41
    - 4.2.1. Initial Acceptance..... 41
  - 4.3. Resubmittal. .... 42
  - 4.4. Quality Assessment..... 42
- 5. SPECIFICATION COMPLIANCE ..... 42**
  - 5.1. Performance Inspections/Compliance Audits. .... 42

## LIST OF APPENDICES

Appendix A - AIT Tasking Data.....	43
Appendix B - AIT Support Requirements Checklist.....	45
Appendix C - Messages, Checklists and Reports.....	48
Suggested Format for Readiness to Start Naval Message.....	49
Suggested Naval Message Format for Installation Completion Report.....	50
Suggested Naval Message Format for Final Completion Report.....	51
Alteration Completion Report.....	52
Attachment (1) General Report.....	54
Attachment (2) AIT ILS Verification Checklist.....	59
Regional Maintenance and Modernization Coordination Office (RMMCO)/AIT Installation Check-in Sheet.....	60
Section I - AIT Installations Completed Outside CNO Availability.....	61
Section II - AIT Installations Completed During CNO Availability.....	63
Exceptions to ILS Verification.....	68
Attachment (3) End of Installation Report.....	69
Alteration ILS Summary for USS.....	71
Onboard Repair Parts Summary.....	73
Modified Spares.....	74
Technical Documentation Status.....	75
Removed Material.....	76
Attachment (4) Physical Configuration Audit Report.....	77
Attachment (5) Training Verification Statement.....	78
Appendix D - AIT Quality System Requirements.....	79
Appendix E - Guidance for Design Shipchecks.....	86

Appendix F - Ship's Force In-Brief ..... 97

Appendix G - List of Acronyms..... 101

Appendix H - Definitions..... 109

## ALTERATIONS TO SHIPS ACCOMPLISHED BY ALTERATION INSTALLATION TEAMS

### 1. SCOPE

This specification establishes required methodology and procedures applicable for all shipboard alterations (ALTs) accomplished by Alteration Installation Teams (AITs).

#### 1.1. GENERAL

OPNAVINST 4720.2 (Series) establishes policies and procedures for the planning and management of the Fleet Modernization Program (FMP) and establishes various types of alterations as the vehicle for implementation of permanent configuration changes to ships and ship systems. NAVSEA SL720-AA-MAN-010/020 (Series) implements the policies and procedures of OPNAVINST 4720.2 (Series). NSTS 9090-310D is a part of Appendix A of NAVSEA SL 720-AA-MAN-010/020 (Series) for alterations to ships accomplished by AITs. This specification provides requirements for the planning, estimating, scheduling, design and accomplishment of logistically supported alterations on active and reserve fleet ships by AITs and provisions for a Quality System for accomplishment of such work. Except as noted in **paragraph 1.4**, this specification is applicable to **ALL** AIT installations whether accomplished in CNO assigned availabilities or AIT installations accomplished outside such availabilities.

- a. **Budgeting**. Details of the budgetary process for the various types of alterations accomplished by AITs are contained in NAVSEA SL720-AA-MAN-010/020 (Series), Section 6.
- b. **Funding**. Alteration accomplishments are funded based on the budgeted and programmed requirements. Details of financial management of Alterations accomplished by AITs are contained in NAVSEA SL720-AA-MAN-010/020 (Series), Section 6.
- c. **Navy Data Environment - Navy Modernization (NDE -NM)**. NDE-NM is designated as the official US Navy authoritative database to provide automated and timely information to the FMP community. NDE-NM is a web enabled enterprise model that integrates and merges existing modernization, maintenance and logistics structures into a single architecture system that provides timely FMP information that supports planning, programming, budgeting, management and execution of the FMP.
- d. **Trouble Reports**. The trouble report is the vehicle for reporting significant problems to NAVSEA and other activities involved in work performed on Naval ships for use in training and improving the weaknesses identified as a result of the problems. NAVSEA Instruction 4700.17 (Series) provides requirements for preparing and submitting trouble reports.

## 1.2. DEFINITIONS

As used in this document, the definitions contained in **Appendix H** apply.

## 1.3. APPLICABILITY

This specification is applicable to all alterations accomplished on U.S. Navy ships, including surface ships, surface combatants, carriers, submarines and service craft (hereafter collectively referred to as “ships”), by AITs except as noted herein (see **paragraph 1.4**).

## 1.4. EXCEPTIONS

This specification does not apply to:

- a. Alterations to nuclear components and systems under the cognizance of the Deputy Commander for Nuclear Propulsion (NAVSEA 08). AITs shall not perform depot level work in naval nuclear propulsion plants.
- b. Strategic Systems Program Alterations (SPALTs) issued by the Director, Strategic Systems Programs (DIRSSP).
- c. Temporary modifications performed as part of a shipyard availability to support industrial work or associated testing.
- d. Temporary Alterations (TEMPALTs) to be accomplished on submarines. NAVSEAINST 4720.14 (Series) and NAVSEA S9070-AA-MME-010/SSN/SSBN (Series) provide specific policy and procedures for submarine TEMPALTs.
- e. Installation support personnel and certification teams, who only provide technical guidance, equipment check-out and grooming, certification of systems or on-site training for ship’s force not associated with the accomplishment of an alteration.

## 1.5. ROLES AND RESPONSIBILITIES

The general roles and responsibilities for the following activities are identified to provide guidance for AIT installations. These roles and responsibilities are further defined throughout this technical specification and can be refined, if required, in a Memorandum of Agreement.

- a. Naval Supervising Activity (NSA) - the single naval activity charged with the oversight responsibility of work being accomplished on U.S. Naval ships during any type of availability. The NSA has overall responsibility for integrating the planning and execution of work on Naval Ships by all involved activities. Implementation of an integrated planning, schedule, work control, and ship certification process is essential to a project’s success. Effective

coordination and oversight must be provided to ensure that all work performed during any availability will allow the NSA to meet the overall project schedule, cost, and quality requirements. NSAs have the authority and responsibility to preclude and/or stop AITs from performing work when they are not in compliance with this or other invoked specifications. NSAs shall notify the applicable program office and NAVSEA 04 of any AIT work suspension/cancellation. The NSA has the following specific responsibilities:

- Control AIT access to ships.
  - Ensure that the AIT's intended work is authorized.
  - Ensure AIT work is scheduled and integrated into the total work plan for the availability.
  - Ensure that all ship systems and locations impacted by AIT work is known and understood by NSA cognizant departments.
  - Participate in critiques and problem investigations (e.g., Trouble Reports), as necessary.
  - Monitor the effectiveness of AIT Manager execution of Quality Assurance (QA) oversight responsibilities.
  - Coordinate with the AIT Manager and Ship's Force to ensure satisfactory completion of alterations.
- b. AIT Sponsor is the government activity that tasks and funds the AIT Manager and AIT. The AIT sponsor will:
- Ensure that all subordinate activities are in compliance with the requirements of this Technical Specification.
  - Ensure AIT installations are funded to the level necessary to ensure all quality system requirements are met, NSA quality sampling (in accordance with **paragraph 1.5.a**) above is provided, and qualified/trained personnel are in place to perform requisite technical, environmental, safety and quality oversight responsibilities.
  - When appropriate, prepare and issue a formal agreement with the regional/Lead Chief Engineer (CHENG) regarding engineering and technical authority policy as well as technical support. Per NAVSEAINST 5400.95 (Series), NAVSEA CHENG concurrence on the agreement is required.
  - Ensure AIT compliance with Integrated Logistic Support (ILS) requirements.
  - Perform annual quality assessments of AITs in accordance **with section 4.4**.
  - Ensure that all work within the Submarine Safety (SUBSAFE) certification Boundary is performed by a NAVSEA Note 5000 activity and that Supervising Authority functions required by NAVSEA 0925-062-0010, (Series), SUBSAFE Requirements Manual are performed by a Government Activity identified by NAVSEA Note 5000.

c. The AIT Manager is the government activity, In Service Engineering Agent (ISEA), military person or government civilian tasked and funded by the AIT Sponsor to initiate, plan, coordinate, schedule, manage and oversee the successful accomplishment of the alteration in accordance with Fleet Modernization Program (FMP) policy and procedures. The AIT Manager is responsible for investigating significant problems, and preparing and submitting trouble reports in accordance with NAVSEA Instruction 4700.17 (Series). Additionally, the AIT Manager is responsible for implementing the corrective actions addressed in the trouble report. The ship involved, the contractor(s) involved, and the applicable NSA will be party to the investigation and will assist in the preparation of the trouble report. The AIT manager will:

- Ensure that the AIT effort is fully coordinated with the Ship Program Managers (SPMs), Life Cycle Manager (LCM), NSA, and Planning Yard (PY).
- Plan a tentative schedule of alteration accomplishment as soon as the determination is made to accomplish the alteration by an AIT.
- Provide a 4790/2K to the Type Commander (TYCOM) for loading in Regional Maintenance Automated Information System (RMAIS).
- Submit configuration change data to the Configuration Data Manager (CDM) sixty (60) days prior to installation.
- Ensure that the AIT/AIT on site installation coordinator reports to the Regional Maintenance and Modernization Coordination Office (RMMCO) gatekeeper and/or NSA, as applicable, prior to reporting onboard, with all requisite documentation as required by this Technical Specification.
- Issue a ship-check report in coordination with the SPM.
- Liaison with planning activity, RMMCO and NSA no later than 180 days prior to the start of installation.
- Provide advance notification of alteration accomplishment requirements/impacts and make arrangements (including funding) for any required support services not being provided by AIT.
- Provide funding for any required support services in accordance with **section 3.4.3**
- Ensure that the AIT's have a quality system/plan approved by NAVSEA 04 prior to installation and that proper training, certifications and quality assurance/control is in place for the work identified.
- Ensure all quality system requirements are met, appropriate quality oversight during installation is provided and qualified/trained personnel are in place to perform requisite technical and quality oversight responsibilities, including in-process monitoring on all shifts conducting work.
- Validate compliance with quality plan.

- Ensure adherence to safety, technical, environmental, and production process requirements.
  - Verify compliance with installation plan.
  - Verify required training and personnel/procedure qualifications.
  - Ensuring proper completion of inspection/installation records.
  - Ensure that required environmental permits are onsite prior to the start of work.
  - Ensure a site specific Environment Protection Agency (EPA) Hazardous Waste (HW) Generator ID Number is in place for disposal of AIT generated HW.
  - Forward copies of the Alteration Completion Report in accordance with **section 3.7.4** of this technical specification.
- d. The AIT is a unit (military, government activity or contractor) under the direction of an AIT Manager or designated agent (ISEA, military or government civilian) of the AIT Manager that is trained and equipped to accomplish specific alterations on specified ships. The AIT is responsible for the installation, performance and completion of the alteration. The AIT will:
- Establish contact with the applicable NSA/TYCOM to determine acceptable design shipcheck dates.
  - Provide visit clearance information to the ship, TYCOM, NSA, or other appropriate naval activity.
  - Provide and maintain an approved Quality System.
  - Release the readiness to start message.
  - Check-in with the designated RMMCO and/or NSA, as applicable.
  - Present a pre-brief that provides specific details of the installation.
  - Supply, assemble, and transport all of the material that is not Headquarters Centrally Provided Material (HCPM) for the installation.
  - Provide proper handling and storage of hazardous material (HM)/hazardous waste (HW) during the installation process
  - Perform continuous daily housekeeping (including broom cleaning) and properly dispose of all installation and associated material including hazardous material/waste.
  - Provide all required environmental reports cited in NAVSEA Standard Item 009-02 to the NSA via the environmental coordinator.
  - Protect equipment from contamination during the installation process.
  - Perform testing in accordance with test procedures.
  - Provide certification test results to the certifying authority.
  - Witness ships force pre-installation check-out of applicable systems.
  - Submit periodic task status reports.
  - Conduct final housekeeping in all areas involved in the alteration accomplishment.
  - Comply with all NSA environmental instructions and procedures.
  - Notify the NSA of AIT departure from the alteration site.

- Conducts out-brief and obtain signatures of the ship's designated representatives.
  - Provide redline drawings to the ship and planning yard.
  - Comply with all the requirements of NAVSEA Technical Publication S0400-AD-URM-010/TUM Rev level: 00- Tag-out Users Manual (TUM).
  - Comply with all local, state, and federal safety and environmental laws and regulations. Comply with facility and US Navy safety and environmental instructions.
  - When requested by the NSA/RMMCO, provide a copy of the approved quality system, applicable work instructions/procedures, evidence of required personnel training/qualification, and evidence of required procedure approval/qualification.
  - Comply with requirements of NAVSEA 0925-062-0010, (Series), Submarine Safety (SUBSAFE) Requirements Manual to ensure that all SUBSAFE work is performed by activity authorized by NAVSEA Note 5000.
- e. The AIT On-site Installation Coordinator is the government or military employee designated by, and acting with the authority of, the AIT Manager. The AIT On-site installation coordinator will:
- Be responsible for the conduct of the installation.
  - Act as the point-of-contact with the ship and NSA.
  - Ensure AIT adherence to safety, environmental, quality, and technical requirements.
  - Be responsible for the conduct of the AIT.
  - Resolve AIT issues, particularly those relating to a stop work order.
  - Maintain completed test reports during accomplishment of the alteration.
  - Attend NSA availability production and coordination meetings and Planning Board for Maintenance (PBM) meetings.
  - Provide and update installation progress.
  - Provides copy of a current, approved ILS Certification Form during In-brief to the NSA/RMMCO.
  - Ensure delivery of all documentation and ILS elements.
  - Provide on site installation oversight and management for respective installs.
  - Resolve quality discrepancies as directed by the AIT manager.
  - In accordance with NAVSEA 0925-062-0010, Revision C (Series), Submarine Safety (SUBSAFE) Requirements Manual, ensure that AIT work responsibilities that involve SUBSAFE work is performed only by a NAVSEA Note 5000 activity.
- f. The Regional Maintenance and Modernization Coordination Office (RMMCO) is a Regional Maintenance Center-aligned, Fleet-chartered organization that serves as the primary point of entry for all waterfront related alteration and maintenance activities. The RMMCO will:

- Serve as the "gate keeping" office for Alteration Installation Team (AIT) check-in and checkout.

## **1.6. CANCELLATION**

This technical specification cancels and supercedes NAVSEA Technical Specification 9090-310C.

## **2. REFERENCED DOCUMENTS**

### **2.1. ISSUES OF DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. Use current revisions where the version referenced has been superceded.

## **SPECIFICATIONS**

### **NAVAL SEA SYSTEMS COMMAND**

- Technical Specification 9090-210 (Series) - Justification/Cost Form and Alteration Equivalent to Repair Process - <http://www.fmp.navy.mil>
- Technical Specification 9090-100 (Series) - SHIPALT Liaison Action Report (LAR) - <http://www.fmp.navy.mil>
- Technical Specification 9090-500 (Series) - Ship Alteration Report (SAR) Preparation - <http://www.fmp.navy.mil>
- Technical Specification 9090-600 (Series) - Ship Alteration (SHIPALT) Installation Drawing (SID) Preparation - <http://www.fmp.navy.mil>
- Technical Specification 9090-700 (Series) - Ship Configuration and Logistics Support Information System (SCLSIS)
- NAVSEA Standard Items

## **PUBLICATIONS**

### **CHIEF OF NAVAL OPERATIONS**

- OPNAVINST 4720.2 (Series) - Fleet Modernization Program (FMP) Policy - <http://www.fmp.navy.mil>
- OPNAVINST 4790.4 (Series) - Ships Maintenance and Material Management (3-M) Manual
- OPNAVINST 5100.19 (Series) - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat

**COMMANDER U.S. FLEET FORCES COMMAND (CFFC) /COMMANDER  
U.S. PACIFIC FLEET (COMPACFLT)**

- FFC 4790.3 (Series) - Joint Fleet Maintenance Manual
- CINCLANTFLT/CINCPACFLT 4720.3 (Series) - Management of Afloat Combat Systems and Command, Control, Communications, Computer, Intelligence (C4I) Installations and Improvements

**NAVAL SEA SYSTEMS COMMAND**

- NAVSEA SS800-AG-MAN-010/P-9290 (Series) – System Certification Procedures and Criteria Manual for Deep Submergence Systems
- NAVSEA 0905-LP-485-6010 (Series) – Control of Testing and Ship Conditioning (Submarines)
- NAVSEA S0400-AD-URM-010/TUM (Series) – Tag-out User’s Manual (TUM)
- NAVSEAINST 5400.95 (Series) – Naval Shipyard, SUPSHIP and Fleet Engineering and Technical Authority Policy
- NAVSEA 0948-LP-045-7010 (Series) – Material Control Standard (Non-Nuclear)
- NAVSEA S9074-AR-GIB-010/278 (Series) - Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping and Pressure Vessels
- NAVSEA 0900-LP-001-7000 (Series) – Fabrication and Inspection of Brazed Piping Systems
- NAVSEA TL855-AA-STD-010 (Series) – Naval Shipyard Quality Program Manual
- NAVSEA S0300-B2-MAN-010 (Series) - SUPSHIP Operations Manual (SOM)
- NAVSEA 0902-018-2010 (Series) - General Overhaul Specifications for Deep Diving Submarines (DDGOS)
- NAVSEA 0924-062-0010 (Series) - Submarine Material Certification Requirements Manual for the Submarine Safety Program

- NAVSEA S9040-AA-GTP-010/SSCR (Series) - Shipboard Systems Certification Requirements for Surface Ship Industrial Periods (Non-Nuclear)
- NAVSEA S9070-AA-MME-010/SSN/SSBN (Series) - Guidance Manual for Temporary Submarine Alterations
- NAVSEA S9AAO-AB-GOS-010/GSO (Series) - General Specification for Overhaul of Surface Ships
- NAVSEA S9AAO-AB-GOS-030 (Series) - General Specification for Overhaul of Surface Ships (GSO) AEGIS Supplement
  
- NAVSEA SL720-AA-MAN-010/020 (Series) - Fleet Modernization Program Management and Operations Manual (Volumes 1 & 2)  
<http://www.fmp.navy.mil>
- NAVSEA T9066-AA-MAN-010 (Series) - Navy Outfitting Program Policy and Procedures Manual
- NAVSEAINST 2450.2 (Series) - Electromagnetic Compatibility
- NAVSEAINST 4700.17 (Series) - Preparation and Review of Trouble Reports
- NAVSEAINST 4720.3 (Series) - Process for Initiating, Approving and Scheduling Afloat C4I Systems Installations and Upgrades
- NAVSEAINST 4720.11 (Series) - Shipboard Installations and Modifications Performed by Alteration Installation Teams
- NAVSEAINST 4720.14 (Series) - Temporary Alterations to Active Fleet Submarines; Control of
- NAVSEAINST C9210.4 (Series) - Changes, Repair and Maintenance to Nuclear Powered Ships
- NAVSEAINST 9304.1 (Series) - Shipboard Electrical Cable and Cableway Inspection and Reporting Procedures
- NAVSEANOTE 5000 (Series) - Activities Authorized to Perform Submarine Safety (SUBSAFE) Work

**NATIONAL SECURITY TELECOMMUNICATIONS AND  
INFORMATION SYSTEMS SECURITY MEMO**

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### **3. REQUIREMENTS**

#### **3.1. GENERAL**

OPNAVINST 4720.2 (Series) establishes policies and procedures for the planning and management of the FMP and establishes the alterations as the vehicle for implementation of permanent configuration changes to ships and ship systems. NAVSEA SL720-AA-MAN-010/020 (Series) implements the policies and procedures of OPNAVINST 4720.2 (Series). NAVSEAINST 4720.11 (Series) defines the use of AITs in this process and in the accomplishment of TEMPALTs. This specification outlines the process to be followed for the planning, estimating, scheduling and accomplishment of all permanent and temporary alterations, except as defined in **paragraph 1.4**, to ships by AITs.

##### **3.1.1. QUICK REACTION ALTERATION ACCOMPLISHMENT**

In the event an AIT Manager is directed to accomplish an unplanned or unscheduled alteration, the accomplishment of that alteration shall be in accordance with the requirements outlined in this specification. All alterations are to be provided with complete logistics support. A waiver is required if ILS products are not complete and verified by Start Of Availability (SOA) and on-board End Of Availability (EOA). If provisions of this specification cannot be met, the AIT Manager shall submit a waiver request to the applicable Ship Program Manager (SPM)/TYCOM for approval, as required by the applicable section of NAVSEA SL720-AA-MAN-010/020 (Series), with an information copy to the PY, CDM, designated NSA and other activities as appropriate. ILS waivers are covered in Section 8 of the FMP Manual. Waiver requests may be made by letter or message and shall explain why specific provisions of this specification cannot be met and shall indicate when these provisions will be corrected or completed. Work impacting the material readiness of the ship shall not begin until the waiver has been granted. In all cases, the AIT Manager should begin immediate liaison with the NSA and/or RMMCO to facilitate rapid installation completion.

#### **3.2. SHIPALT AND EQUIPMENT ALTERATION (MACHINERY ALTERATION (MACHALT), ORDNANCE ALTERATION (ORDALT), FIELD CHANGE (FC), ENGINEERING CHANGE (EC) ) PRE-INSTALLATION REQUIREMENTS**

##### **3.2.1. INITIAL DETERMINATION OF SHIPALT/EQUIPMENT ALTERATION ACCOMPLISHMENT BY AIT.**

The initial determination that a given SHIPALT/Equipment Alteration hardware and/or computer programs could be accomplished by an AIT is usually made by the Chief of Naval Operation (CNO) Resource Sponsors (military improvements), the System Command (SYSCOM) (technical improvements) or TYCOMs when the alteration is approved as a feasible and desirable requirement. In general, an AIT should be used when the technical and/or specific nature of the work requires specialized skills, a substantial government financial savings can be obtained, the

flexibility of an AIT is required due to short notice installations or substantial "lessons learned" can be obtained from re-using the same team.

### **3.2.2. EQUIPMENT ALTERATION DEVELOPMENT**

The Life Cycle Manager (LCM) should begin alteration development in accordance with the configuration control requirements of the applicable equipment prior to, or concurrent with, the initial determination that a given alteration is to be accomplished by an AIT. The LCM should also determine whether or not ship, system or equipment certification, in accordance with NAVSEA S9040-AA-GTP-010/SSCR (Series), would be required upon completion of the alteration development. This determination is part of the alteration development. If certification is required, the certification testing should be determined coincident with determination of the AIT activity. The AIT Manager will ensure that the alteration development effort is fully coordinated with the SPMs and LCM. Total cost estimation data should be reflected in an approved Engineering Change Proposal (ECP)

### **3.2.3. SHIPALT DEVELOPMENT**

Prior to or concurrent with the initial determination that a particular SHIPALT is to be accomplished by an AIT, the Systems Command should begin alteration development. This will include development and approval of a Justification/Cost Form (JCF), in accordance with NAVSEA Tech Spec 9090-210 (Series) or equivalent, and entry of the requirement into NDE-NM database. SHIPALT development also includes updating of applicable configuration baseline documentation, coordination with the applicable PY to avoid creating interference with other SHIPALT designs and completion of SHIPALT Record (SAR) development, in accordance with NAVSEA Tech Spec 9090-500 (Series). The SPM, for all alterations under his/her cognizance, must also determine whether ship or system certification, in accordance with NAVSEA S9040-AA-GTP-010/SSCR (Series), will be required upon completion of the alteration, select the AIT and, when applicable, select the activity to perform certification testing. The AIT Manager will ensure that the AIT effort is fully coordinated with the designated SPM, LCM, NSA, and PY.

#### **3.2.3.1. INITIAL ENTRY OF A SHIPALT REQUIREMENT INTO NDE**

The SPM shall enter a SHIPALT requirements and PARM/LCM equipment alterations requirements into the NDE database using procedures specified in NAVSEA SL720-AA-MAN-010/020 (Series) as soon as the requirement is approved, generally after approval of the JCF and assignment of the SHIPALT number. The NDE entry should indicate if the alteration is capable of being accomplished by an AIT. Material/equipment that has been identified in the JCF, as being procured by the AIT from the Federal Supply System should be entered into NDE by the SPM as part of the initial SHIPALT entry so that the applicable procurement activity can be made aware of the requirement.

### 3.2.3.2. COST ESTIMATING FOR SHIPALTS.

When the SHIPALT is entered into NDE as “AIT CAPABLE”, an alteration cost estimate by the AIT, to include the cost of additional industrial support services, including work integration and QA sampling identified in **paragraph 1.5** required by the AIT, but not within its capability, will be entered, as well as an industrial activity cost estimate to accomplish the alteration. At the JCF stage of alteration definition, costs are difficult to accurately estimate, but provisions for these requirements must be made. The estimate will be entered into NDE by the SPM after approval of the JCF. After the SAR is prepared and the full extent of the SHIPALT has been defined, accurate estimates must be developed and entered into NDE by the SPM to provide a more accurate basis for budget development. The following factors must be considered in the development of the cost estimate:

a. **Installation Manday Estimates for JCFs.** Installation mandays are the number of mandays required to actually accomplish the SHIPALT. This number includes certification testing (if required); along with certification test report development and all associated incidental work. Incidental work includes interference removal and reinstallation, fastener replacement, replacement of damaged insulation and deck matting, cableway banding, painting, clean-up, training, documentation updates, storage, handling, disposal of HM/HW, permit application, EPA HW Generator ID No., environmental reports, etc. Also included in the manday estimates are industrial support services (e.g. crane services, local office facility support, electricity, hazardous waste disposal, welding, compressed air, and other services listed in **paragraph 3.4.3** of this specification) not provided by the AIT. These services may be provided by a Naval Station outside of a Chief of Naval Operations (CNO) scheduled availability, or by a Naval Shipyard or Master Ship Repair (MSR)/Agreement for Boat Repair (ABR) contractor during a CNO scheduled availability. The JCF for SHIPALT accomplished by AITs shall reflect the number of mandays required to accomplish the alteration in its entirety, including the incidental work described herein. After the SAR is prepared and the full extent of the SHIPALT is defined, a more accurate estimate shall be developed and entered into NDE by the SPM.

b. **Planning Manday Estimates for JCFs.** Planning manday estimates are estimates of the mandays required to perform the necessary planning to accomplish an alteration on one ship. This includes mandays to be expended for the acquisition of AIT-furnished material, prefabrication of assemblies, equipment burn-in, packaging/crating of equipment, management functions and, when applicable, certification test plan development. At the JCF stage of SHIPALT development, required planning mandays are difficult to accurately estimate but some provision for these requirements must be made. After the SAR is prepared and the full extent of the SHIPALT has been defined, a more accurate estimate shall be developed and entered into NDE by the SPM.

c. **Incidental Material Estimates for JCFs.** Incidental material is that material which the AIT will be required to procure to accomplish a SHIPALT. This consists of all material not being supplied as Headquarters Centrally Provided Material (HCPM), including consumable materials such as welding rods, paint, etc., required in completing a SHIPALT. After the SAR is prepared and the full extent of a SHIPALT is defined, a more accurate estimate shall be developed and entered into NDE by the SPM.

### 3.2.4. PLANNING

The AIT Manager should begin planning a tentative schedule of alteration accomplishment as soon as the determination is made to accomplish the alteration by AIT. For SHIPALTs, the planning schedule should be based on SPM approval of the SAR, SIDs and ILS, schedule of equipment delivery, availability of AITs, availability of ILS products, and the anticipated industrial availability schedules of applicable ships. For Equipment Alterations, the planning schedule should be based on the schedule of alteration kit deliveries, the availability of AITs, the availability of ILS products and the anticipated industrial availability schedules of applicable ships. The NSA will require submission of a tentative SHIPALT or Equipment Alteration installation schedule at A-180 days, for CNO Scheduled Availabilities, in order to ensure proper integration into the overall production schedule.

If the SHIPALT or Equipment Alteration is to be accomplished by someone other than the prime contractor/shipyard, the NSA is responsible for determining when the AIT will be allowed access to spaces and systems so as to optimize overall project performance and adherence to schedule.

If system certification, in accordance with NAVSEA S9040-AA-GTP-010/SSCR (Series), is required for SHIPALTs or Equipment Alterations, the certification-testing schedule must also be included. The planned schedule of accomplishment and, if applicable, system certification should be fully coordinated with the SPM(s), LCM (if not the AIT Manager), Alteration Management Planning (AMP) organization, NSA, PY(s), and TYCOM(s).

### 3.2.5. SCHEDULING AND PRE-INSTALLATION COORDINATION REQUIREMENTS

#### **a. Routine AIT Scheduling and Pre-installation Coordination Requirements for SHIPALTs/Equipment Alterations/TEMPALTs.**

(1) Outside of Scheduled CNO Availabilities. AIT visits to ships for approved alterations (e.g., SHIPALTs, Field Changes, Engineering Changes) will be scheduled and coordinated In Accordance With (IAW) appropriate SPM, TYCOM and, if applicable, RMMCO policy and procedures. The AIT Manager shall present the proposed alteration accomplishment schedule to the SPM and TYCOM for coordination and concurrence. This will provide advance notification to the applicable ships, CDM, NSA, Alteration Management Planning-Field Coordinating Office (AMP-FCO), and PY of the intent to accomplish the alteration. SHIPALTs, TEMPALTs, and all equipment alterations information are entered into NDE. This becomes the actual programming of the alteration for accomplishment outside of a scheduled CNO availability.

The AIT Manager responsible for the installation shall submit configuration change data to the CDM at least 30 days prior to installation. All AIT-planned installations must have configuration and/or alteration records pre-loaded in the Configuration Data Manager Database – Open Architecture (CDMD-OA) database after alteration approval but prior to the installation. TYCOMs must ensure that approved AIT installation schedules (e.g., quarterly scheduling message) are provided to CDMs in order for this process to function correctly. CDMs will submit configuration records in CDMD-OA for the approved alterations with an ASC/ISC of "J" for

unconfirmed planned installations. The CDM should change the ASC/ISC to "P" to initiate any on-board spares and other support processes prior to the installation to facilitate the ship having all required support items on-board prior to completion of the installation. For planned deletes, CDMs will modify ship's configuration records with an ASC/ISC of "N"/"E" (except Ohio Class). Upon installation accomplishment, the AIT Manager will electronically report the change of the ASC/ISC TO "D"/"G" ("D"/"A" for Ohio Class) to the CDM for processing in CDMD-OA. In addition, if affected ships have Shipboard Non-tactical ADP Program (SNAP/NTCSS installed, configuration and logistics data will be transmitted to the ship via the Automated Shore Interface (ASI) process. For ships that do not have SNAP installed, a hard copy Mini Coordinated Shipboard Allowance List (COSAL) must be developed by the Naval Inventory Control Point (NAVICP), Mechanicsburg, and returned to the AIT. The AIT must have this document at the time of alteration accomplishment. At the time of entry into the NDE database, required inputs to complete an OPNAV Form 4790/2K will be provided by the AIT Manager to the TYCOM for loading in the RMAIS shore file to document the scheduling and, later, the accomplishment of the alteration in Maintenance and Material Management (3M).

Additionally, if the AIT will require industrial support, as listed in **paragraph 3.4.3** of this specification (e.g., crane and rigging services, welding/burning, compressed air), during accomplishment of the alteration, additional information (OPNAV Form 4790/2K) requesting these services will be provided for loading into the RMAIS shore file. The AIT On-site Installation Coordinator/AIT Leader will contact the RMMCO to coordinate scheduling of an in-brief with the ship's Commanding Officer, or designated representative, prior to installation commencement. The AIT On-site Installation Coordinator/AIT Leader will notify the RMMCO as to the date, time, and location of the ship's out-brief. The AIT On-site Installation Coordinator/AIT Leader will provide the ship with a draft electronic installation completion report, in Navy message format, and a listing of equipment impacted, with assigned CDM Record Identification Numbers (RINs) and alteration/installation status codes (in lieu of 4790/CK), during the out-brief in accordance with TYCOM directives.

(2) During Scheduled Chief of Naval Operations Availabilities. The AIT Manager shall verify that the SPM included the alteration in the Availability Advance Planning Letter and in the subsequent Availability Authorization Letter for that CNO availability. The AIT Manager, or designated representative, shall keep the LCM, TYCOM, SPM, CNO availability planning activity, CDM, AMP-Field Coordinating Office (FCO), PY, and NSA informed of the AIT's schedule and any schedule changes. OPNAV Form 4790/2K shall be initiated to document the need for support services if any support services are required. In addition, if required by the NSA, any required support services must be specified using Standard Work Template (SWT) 980-01, "Support Services, Provide." The NSA can then prepare a 4E specification work item in accordance with the Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP) Operations Manual for inclusion in the CNO availability solicitation for private sector industrial availabilities, or a job summary and Task Group Instruction (TGI) for Naval shipyard availabilities.

The AIT Manager, or designated representative, shall present the proposed alteration accomplishment schedule to the SPM and TYCOM for coordination and concurrence. This will provide advance notification to the applicable ship, CDM, NSA, AMP-FCO, and PY of the intent

to accomplish the alteration. For SHIPALTs and TEMPALTs not identified in **paragraph 1.4** as well as all other equipment alterations, this information is entered into the NDE, or the TYCOM approved Test & Monitoring Systems (TAMS) for submarines, LCRS or SAS for carriers) scheduling databases. At the time of entry into the scheduling database, the AIT Manager will provide an OPNAV Form 4790/2K to the TYCOM for loading in the shore file to document the scheduling and, later, the accomplishment of the alteration in the 3M database.

The PY shall submit to the CDM by A-2 (months), final Configuration Overhaul Planning (COP) data of all alterations/installations in the work package.

The In Service Engineering Agent (ISEA) or the AIT Manager, as tasked by the SPM, shall pre-load configuration and/or alteration records in CDMD-OA prior to the installation. CDMs will ensure that ship's configuration records in CDMD-OA for planned alterations/installations contain an alteration/installation status code (ASC/ISC) of "J" for unconfirmed planned installations prior to A-2 (months). Subsequent to receipt of final COP data, but not sooner than A-2 (months), the CDM will modify ship configuration records in CDMD-OA with an ASC/ISC of "P" for confirmed planned installations. For planned deletes, CDMs will ensure that ship's configuration records contain an ASC/ISC of "N"/"E" (except for Ohio class).

Regional Maintenance Commands (RMC) will confirm that planned alterations are resident in the ship's database by matching CDMs and ships using Data Comparison for Integrated Logistic Overall/Data Base Reconciliation (DC4ILO/DBR) process. If the data is not present in the ship's database, the RMC will notify the CDM and assist in correcting the discrepancies.

The NSA shall list the status of all availability work package alterations (i.e. installed by shipyard and/or AIT) for which they are responsible in the A-60 (days) notification letter and any Emergent/Quick Reaction alterations in the end of availability completion report. The AIT Manager is responsible for verification of delivery of all corresponding ILS products as required in the ILS Certification Sheets. The AIT Manager will validate/verify alteration/installation accomplishment and reports the change of the ASC/ISC to the CDM. The CDM will indicate completion in CDMD-OA with the use of ASC/ISC of "D"/"G" ("D"/"A" for Ohio class). In addition, if the affected ship has SNAP/NTCSS installed, configuration and logistics data will be transmitted to the ship via the Automated Shore Interface (ASI) process.

For ships that do not have SNAP installed, a hard copy Mini-COSAL must be developed by the NAVICP, Mechanicsburg, and returned to the AIT. The AIT must have this document at the time of alteration accomplishment.

b. **Quick Reaction Alteration Scheduling.** The AIT Manager will upon receipt of SPM approval and authorization, schedule quick Reaction Alterations, including Equipment Alterations, with the TYCOM, in the most expeditious manner available. The NSA should be provided at least five (5) day advance notification to allow adequate industrial support planning. Once scheduling is accomplished, the SPM, AIT Manager, LCM (if not the AIT Manager), PY, CDM, AMP-FCO, and NSA shall be notified of the schedule. At this time, inputs required to generate an OPNAV Form 4790/2K are to be provided by the AIT Manager to the TYCOM for loading in the RMAIS shore file to document the scheduling and, later, the accomplishment of

the alteration in the 3M database. Additionally, if the AIT will require industrial support (e.g., crane and rigging services, welding/burning, compressed air, etc.) during accomplishment of the alteration, an additional OPNAV Form 4790/2K requesting these services will be provided to the TYCOM by the AIT Manager for loading in the RMAIS shore file. For Quick Reaction Alterations being accomplished during CNO availabilities, the requirements pertaining to access and support services in paragraph 3.2.5.a. (2) should be accomplished as early as possible. The AIT Manager shall keep the TYCOM, SPM, CDM, PY, AMP-FCO, and NSA informed of any schedule changes.

c. **Scoping and Readiness Assessments.** When the alteration schedule is presented to the TYCOM, the AIT shall provide an assessment of the size of the effort (number of mandays), estimated total length of time required to complete the installation (number of calendar days) and the possible impact on ship readiness requirements. When required, the TYCOM will take action to establish a Restricted Availability (RAV) or Technical Availability (TAV) in coordination with the appropriate operational commander unless the alteration is scheduled to be accomplished during a CNO scheduled availability. Following TYCOM approval for installation the AIT Manager will contact the designated NSA to facilitate generation of a detailed ship installation schedule, inclusion of the ALT installation into the ship's maintenance and modernization work integration plan, determination of potential cross-task common support opportunities, determination of common "trade" tasks that might be accomplished under the NSA's auspices and determination of common service (e.g., electrical power, water) cost allocation.

d. **Memorandum of Agreements.** Memorandum of Agreements (MOAs) will be written by the AIT Manager to clarify the responsibilities of all participants involved in the alteration installation. AIT Sponsors are responsible for ensuring that NSA QA support services and funding requirements to accomplish the responsibilities are planned and clearly defined in a written MOA and, when applicable, are in accordance with NAVSEA letter Serial 04/086 of 22 Apr 2002, Submarine Non-Nuclear ShipAlt Migration and Pricing Policy. Some NSAs provide standard MOA templates for use during their availabilities. The NSA should be contacted by the AIT Manager prior to writing an alteration specific MOA to facilitate incorporation of NSA requirements. The NAVSEATS 9090-310D is written to provide general guidance to activities involved in the alteration process. The MOA shall be written to provide specific requirements to each activity involved in accomplishing an alteration. The depth of the specific requirements, identified in the MOA, will depend on the complexity of the subject alteration. Participants include but are not limited to the installing activity, NSA, LCM, ship, and support activity. Topics to be addressed in the MOA depend on the complexity and scope of the alteration. The following are sample topics:

1. Funding requirements
2. Meeting attendance
3. Asbestos
4. Tagout, work control & testing
5. QA, testing & certification
6. Schedules
7. Clearances

8. Hazardous waste
9. Safety
10. General cleanliness
11. In brief/out brief
12. Support services
13. Industrial radiation safety
14. SUBSAFE (Sub only) QA
15. Violations of safety/hazardous materials
16. DSS-SOC (Subs only)
17. NAVSEA Standard Items that are invoked for the installation.
18. Clearly defined Technical Authority responsibilities consistent with NAVSEA Instructions 5400.97 and 5400.95.
19. Environmental reporting e.g. paint, solvent, adhesive, fuel, welding rod usage reports as per NAVSEA Standard Item 009-02.
20. Painting and adhesive application permit.
21. Diesel engine (50hp or greater) registration/permit.
22. Site-specific EPA HW Generator ID No. if using an MSR or ABR to dispose of HW.

**Note:** This is not an all-inclusive topic list. The areas that may require clarification will vary with each alteration installation.

### **3.2.6. ALTERATION INSTALLATION TEAM TASKING**

An AIT activity must be tasked to accomplish a specific alteration by the applicable equipment/system LCM (NAVAIR, NAVSEA, and Space and Naval Warfare Systems Command [SPAWAR]), SPM, or TYCOM. AITs should be tasked as soon as funding is identified, to allow the AIT the maximum possible planning time. The tasking may be in one or two parts, depending on the level of AIT involvement. If the alteration design and ILS documentation are to be prepared by another activity (usually the applicable PY), the AIT may be tasked to procure the required long lead-time and incidental material and accomplishment of the SHIPALT. The AIT Manager shall ensure that copies of the tasking (and all subsequent changes) are forwarded to the SPM, the equipment/system LCM, the AMP office (NAVSEA 04) and the applicable PY. AIT managers will ensure that all AITs under their control are directed to report to the applicable NSA and RMMCO Gatekeeper prior to boarding the ship.

#### **3.2.6.1. DESIGN DEVELOPMENT TASKING**

Under normal circumstances, the applicable PY will be tasked and funded to develop the detailed design and associated drawings for a SHIPALT. When design development for a Title K SHIPALT cannot be completed by the PY in time to support the scheduled alteration accomplishment, the SPM and the AIT Manager will choose an activity for development of the detailed design drawings for alterations based on competitive bid or best value. The competitive bid process may include the PY. The design development task will authorize development, by a qualified design agent, of detailed design and associated drawings (including the performance of shipchecks), preparation of applicable ILS documentation, development of acceptance testing documentation and, when required, a preliminary certification test plan. Tasking will address all

items in **Appendix A**. Unless otherwise agreed by the SPM and the AIT Manager, the SPM shall be the only activity to task PY efforts.

### **3.2.6.2.ALTERATION ACCOMPLISHMENT TASKING**

Tasking for accomplishment of alterations will authorize procurement of required long lead-time and incidental material and accomplishment of the applicable alteration. Tasking will address all items in **Appendix A**.

### **3.2.7. SHIP ALTERATION DESIGN DEVELOPMENT**

In accordance with NAVSEA SL720-AA-MAN-010 (Series), the class PY(s) are responsible for the total integrated design of assigned ships and are normally tasked to develop the detailed design of alterations to these ships and associated ship systems. In those instances where the detailed design is not developed by the PY, the SHIPALT design development shall be coordinated with the PY. The final design products, including drawings, shall be approved by the PY, at a minimum (see **3.2.7.4**). Drawing approval and SPM authorization shall be obtained prior to the initiation of work.

#### **3.2.7.1. SHIP ALTERATION DESIGN REQUIREMENTS DEVELOPMENT**

The basic alteration design criteria for a given SHIPALT, including prerequisite/concurrent SHIPALTs, ORDALTs, MACHALTs, etc. shall address the following items as applicable:

- Magnetic material restrictions
- Electromagnetic Compatibility (EMC) requirements
- Electromagnetic Interference (EMI) requirements
- Firing zone cut outs rotating element zone requirements
- Radiation Hazard (RADHAZ) requirements
- Noise, Shock and Vibration (NSV) requirements
- Electrostatic Discharge (ESD) requirements
- Electromagnetic Pulse (EMP) requirements
- Hazardous/Toxic Materials (HAZMAT)
- Radar Cross Section (RCS) requirements
- Signal Security (SIGSEC) and TEMPEST requirements
- SUBSAFE program requirements
- Impact on interfaced systems
- Battle group interoperability
- Risk/Safety Analysis
- DSS-SOC program requirements

Alteration design shall address impacts on ship services (e.g. electrical power and lighting, heating, ventilation, air conditioning, cooling water and cooling air), deck strength, ship mass properties, stability (weight and moment), storage capacity and other critical ship systems such as the Collective Protection System (CPS) and Countermeasures Wash Down System (CMWDS). The AIT shall interface with the PY to obtain associated ship system impacts.

### **3.2.7.2. SHIP ALTERATION INSTALLATION DRAWINGS**

Individual Ship Alteration Installation Drawings (SIDs) shall be prepared in accordance with NAVSEA Technical Specification 9090-600 (Series) for each hull authorized in the tasking documentation, unless development of class-applicable SIDs has been authorized by the SPM. The alteration design that is represented in these drawings will be based on criteria presented in the approved SAR for the SHIPALT, design guidance provided by the PY, actual configuration determined during a design shipcheck of the applicable ship, NAVSEA 0902-018-2010 (Series), NAVSEA S9AAO-AB-GOS-010/GSO (Series) or other general specification as applicable.

#### **3.2.7.2.1. SHIP ALTERATION DESIGN SHIPCHECK**

Whether the PY or an AIT develops the design, a design shipcheck will be conducted on each hull when the AIT Manager and SPM determine the technical risk warrants the cost. Shipchecks shall be conducted at the convenience of the ship being checked, following the policies of the TYCOM, on a not-to-interfere basis. For those TYCOMs that hold AIT Scheduling Conferences, shipchecks shall be scheduled at these conferences. Ship availability dates will be coordinated between the activity developing the alteration design and the respective TYCOM or TYCOM designee. Whether a shipcheck is to be accomplished inside or outside of a CNO scheduled availability, the AIT On-site Installation Coordinator/AIT Leader shall provide visit clearance information to the designated NSA and ship a minimum of five (5) working days prior to arrival or as established by TYCOM policy. Prior to sending the clearance message, the AIT On-site Installation Coordinator/AIT Leader will verify with the NSA that ship and/or industrial activity operations will permit completion of ship-check requirements during the intended ship-check period. If not, it should be re-scheduled. When an AIT is performing the shipcheck, participation by the PY is required, as specified in the tasking documentation. The AIT Manager, in coordination with the SPM's designated design agent and/or the PY, shall issue a shipcheck report to the appropriate offices, including the Ship and NSA if assigned, within ten (10) working days after the design shipcheck is completed. The shipcheck report shall include redline mark-ups, when applicable, to reflect the ship's unique configuration to the PY, allow coordination and to identify interference/interaction with other SHIPALT designs under development by the PY. Unless otherwise agreed to by the SPM and the AIT Manager, the SPM shall be the only activity to task PY efforts. (See [Appendix E](#).)

#### **3.2.7.3. SUPPORT DOCUMENTATION**

The AIT On-site Installation Coordinator/AIT Leader is responsible for ensuring delivery to the ship and NSA of all documentation and ILS elements required by the FMP Manual (NAVSEA SL720-AA-MAN-010/020 (Series), Sections 4, 7, 8 and 9) at the time of alteration accomplishment. ILS deliveries to the ship shall be signed for by the Commanding Officer (CO), Executive Officer (XO), Supply Officer, or 3M Coordinator. This includes, as applicable, supply support and Allowance Parts List (APL) updates, redline mark-ups of Ship Selected Records (SSRs), Selected Record Drawings (SRDs), Liaison Action Requests (LARs), Ship's Information Books (SIBs), Ship's Systems Manuals (SSMs), Training Aid Books (TABs), Combat System Technical Operating Manual (CSTOM), Combat System Operation and Sequencing System (CSOSS), Engineering Operational Sequencing System (EOSS), Engineering Operational

Procedure (EOP), etc.), and all required ILS/3M/SCLISIS documentation (technical manuals, Planned Maintenance System (PMS), 4790/2K, proof of inclusion in CDMD-OA (i.e. a printout of the “Process Load Results” showing that the work file has been submitted and a completion report indicating affected RINs, etc.), whether developed by the AIT or not. Prior to the first installation, the LCM shall provide the SPM with a copy of ILS Certification Form for approval, in accordance with NAVSEA SL720-AA-MAN-010 (Series), Section 8. The activity tasking the AIT (e.g. LCM/Participating Manager (PARM)/ISEA of SPM) shall provide the AIT a copy of the completed ILS Certification Form. Until such time that SHIPALT ILS Certification Forms can be obtained electronically (i.e. NDE ILS Module), the AIT On-site Installation Coordinator/AIT Leader will provide the NSA/RMMCO with copies/advance copies of applicable SHIPALT ILS Certification Forms in support of planned installations.

a. **Configuration and Logistic Support Updates.** The LCM is responsible for ensuring that all equipment has proper logistics support completed and available for delivery to the ship at the time of the first alteration installation. This includes interim supply support (both initial outfitting and wholesale stock) until the Material Support Date (MSD) has been reached. As part of this responsibility, the LCM will task the AIT Manager to provide accurate and timely configuration and logistics change information to the ship’s CDM (generally the PY) in the form of Configuration Overhaul Planning (COP) data by A-2. Program Support Data (PSD) will be provided to the Supply System prior to or concurrent with, alteration accomplishment.

(1) COP data is the preferred method of providing a ship with supply support. Out of sequence ASI tapes shall not be used.

(2) All other alteration logistics support documentation, including proof of inclusion in CDMD-OA (i.e. a printout of the “Process Load Results” showing that the work file has been submitted) and a completion report indicating affected RINs must be supplied to the ship by the AIT at the time of alteration accomplishment. Electronic transfer of configuration data is the preferred method of transmittal.

b. **Ship Selected Record Documentation.** The AIT Manager will request a list of SSRs that are impacted by the SHIPALT from the PY prior to the initiation of alteration accomplishment. The AIT Manager is responsible for providing the ship and the PY with redlined copies of the impacted SSR as part of the Alteration Completion Report (**Appendix C**). Unless otherwise agreed to by the SPM and the AIT Manager, the SPM shall be the only activity to task PY efforts. The AIT Manager shall provide funding necessary for the PY update of SSR documentation as directed by the SPM and funded by the PARM, Program Executive Office (PEO) or SYSCOM. The actual update of SSR documentation will be accomplished by the PY as part of the normal SSR update process associated with scheduled ship availabilities. SSR updates for AIT installations accomplished outside of scheduled ship availabilities may be accomplished on an annual basis but shall be accomplished before expiration of AIT funding. If possible, these updates should be aligned with the normal SSR update process associated with the next scheduled availability of the respective ship. As installed drawings must be received by the PY in order for SSR updates to be accomplished.

c. **ILS/3M/SCLISIS Documentation.** The various elements of ILS documentation are discussed in NAVSEA SL720-AA-MAN-010/020 (Series). The elements of 3M documentation are discussed in OPNAVINST 4790.4 (Series). Configuration and logistics management requirements associated with SCLISIS are contained in NAVSEA Technical Specification 9090-700 (Series).

d. **Certification Test Documentation.** When certification testing is required, and the AIT is tasked to perform certification testing, the AIT will issue the certification test results to the Certifying Authority within thirty (30) days of test completion.

#### **3.2.7.4. SHIP ALTERATION DESIGN APPROVAL**

AIT prepared design products shall be approved by the applicable PY, and SPM authorization granted for the SHIPALT installation prior to the initiation of work on any U.S. Navy ship. Unless otherwise agreed, the AIT Sponsor, SPM, Participating Manager (PARM), Program Executive Officer (PEO) or SYSCOM will provide funding for the PY to review AIT developed design products, including drawings. Unless otherwise agreed to by the SPM and the AIT Manager, the SPM shall be the only activity to task PY efforts. Once approved, only the PY, SPM or the SPM's designated representative can approve deviations and waivers to the design. **Note:** NSA Chief Engineers designated in NAVSEAINST 5400.95 (Series) may approve minor deviations and waivers to the design. AITs without PY approved drawings shall not attempt to accomplish alterations to ships without documented approval from the SPM. AITs without PY approved designs or documented approval from the SPM shall be denied access to ships.

a. **SHIPALT Design Impacting the Propulsion Plant on Nuclear Powered Ships.** Alteration designs that impact the portions of propulsion plant or designated spaces of nuclear powered ships that are not under the cognizance of the Deputy Commander for Nuclear Propulsion (NAVSEA 08) shall be approved by the SPM as required by NAVSEAINST C9210.4. All design products that indicate such an impact, whether prepared by the PY or the AIT, shall be approved by the SPM as stated above.

b. **Ship Alteration Drawing Approval.** Unless otherwise specified in the tasking documentation, AIT-developed design drawings for the first planned accomplishment of an alteration on a ship class shall be reviewed and approved by the applicable PY. When tasking indicates that the drawing review will be coordinated by the SPM, the PY, the Deputy Commander for Integrated Warfare Systems (SEA 05), NAVSEA Chief Engineer (CHENG) and the system/equipment LCM will participate in the review. The drawings will be reviewed for technical accuracy, design adequacy, compliance with applicable design technical requirements (e.g. SIGSEC, TEMPEST, EMC, EMI, RADHAZ, NSV, ESD, EMP, RCS, SUBSAFE) and applicable technical specifications (including new construction and General Overhaul), format (in accordance with NAVSEA Technical Specification 9090-600 (Series)), and clarity.

AIT-developed drawings will be submitted to the PY with a transmittal letter (copy to the SPM) that includes at least the following: scheduled installation date for the specific hull, two points of contact, with corresponding phone numbers and e-mail addresses, and an explanation of that submittal (i.e., initial review, comment incorporation validation, etc.)

Except for very large or complex alterations, **the review cycle will be sixty (60) working days or less** following PY receipt of drawings and appropriate funding. If the review cannot be completed in sixty (60) working days, the SPM will coordinate the completion date with the AIT Manager. The requirement to review alteration designs for follow-on ships will be at the discretion of the applicable PY if not otherwise required by the tasking documentation. A PY review of follow-on ship alteration designs will usually be required due to significant design differences among ship hulls. The interpretation of the degree of change required to prompt additional design review will be defined by the SPM unless specifically delegated to the PY. The PY shall, subsequent to the review of the first ship design, advise the AIT Manager if a review of follow-on ship design is considered necessary, and under what circumstances. AITs without PY-approved drawings will be denied access to ships unless the TYCOM certifies that a waiver has been granted by the SPM.

- 1) Drawing Reviews for SHIPALTs Impacting Electromagnetic Compatibility. Alterations to a ship's topside configuration can impact the electromagnetic wave propagation as well as the reception of signals by the ship's electromagnetic sensors (i.e. radar, navigation equipment, magnetic field detectors, communications and other receivers). Additionally, below deck electrical and electronic equipment may emit or react to harmful electromagnetic energy. In accordance with NAVSEAINST 2450.2 (Series), the NAVSEA Electromagnetic Effects Office (NAVSEA 53H3) shall participate in drawing approval reviews for alterations that effect ship topside configurations or which add electrical or electronic equipment. These reviews are held to prevent AIT installations from creating topside interferences.
- 2) Drawing Reviews for SHIPALTs Impacting Command and Control Spaces. Alterations to a ship's command and control spaces can have a significant impact on physical arrangements and critical system integration characteristics of the information and data control capability realized through software, networks, etc. The appropriate Systems Command Combat System Design and Engineering Group shall participate in drawing approval reviews for alterations that effect ship Command and Control spaces.

c. **Electronic Equipment Test Procedure/Record Approvals.** Equipment-specific test procedures and test record forms for electronic equipment may be required to be approved for work on critical systems or for high visibility programs. The approving activity in these cases shall be the system/equipment LCM (usually the AIT Manager). When an alteration impacts interfaces with other systems or equipment via various modes (fiber or copper Local Area Networks (LANs), switchboards, etc.), the ISEAs for each impacted system or equipment shall participate in the test procedure approval process.

d. **Technical Liaison Services.** The LAR is the implementation tool for the formal technical liaison system between the AIT and the applicable PY. The system facilitates resolution of questions and change requests regarding drawings and technical documentation, and the transmittal of requests for deviations and waivers. All deviations from drawings and invoked specifications (e.g. change in weld joint design, material substitution, location change beyond

tolerances provided on drawing) require technical approval. For each required deviation from an approved design, the AIT shall prepare a LAR that documents the request for the design change in accordance with NAVSEA Technical Specification 9090-100 (Series). All LARs will be forwarded to the PY for resolution. Copies of all LARs and PY responses will be attached to redline drawing package and be submitted to the PY within 15 days of installation completion. All LARs that impact design shall be incorporated in SIDs by the AIT and approved by the PY as part of the final drawing update. The submittal and review process shall take no longer than 60 days. The LAR may also be used to document PY review and approval of AIT-prepared drawings, as tasked by the SPM.

### **3.3. Temporary Alteration (TEMPALT) PRE-INSTALLATION REQUIREMENTS. (SURFACE SHIPS AND SERVICE CRAFT)**

#### **3.3.1. INITIAL DETERMINATION OF ALTERATION ACCOMPLISHMENT BY ALTERATION INSTALLATION TEAM**

TEMPALT guidance is provided in CINCLANTFLT/CINCPACFLT 4720.3 (Series). With the exception of major TEMPALTs that require significant industrial support, accomplishment of TEMPALTs is usually considered to be within the capability of AITs. In general, an AIT should be used when the technical and/or specific nature of the work requires specialized skills, a substantial government financial savings can be obtained, flexibility of an AIT is required due to short timeframe installations or substantial "lessons learned" can be obtained from re-using the same team.

#### **3.3.2. TEMPORARY ALTERATION DEVELOPMENT**

TEMPALTs do not require the development of a formal document like the SAR, which is required for SHIPALTs. Instead, a tentative Plan of Actions and Milestones (POA&M) is normally developed which outlines requirements for design shipcheck, design development, drawing approval, assembly fabrication, alteration accomplishment and removal. The AIT On-site Installation Coordinator/AIT Leader shall coordinate the POA&M with the TYCOM, designated point of contact (RMMCO, NSA, CHET) and SPM as soon as the plan is developed and anytime it is revised. Applicable ILS requirements should be identified and documented by the alteration sponsor using the ILS Certification Form provided in Appendix F of the FMP Manual. TEMPALTs that affect Battle Group interoperability shall be coordinated with the Commander U.S. Fleet Forces Command (CFFC) and AMP-FCO prior to installation scheduling.

#### **3.3.3. PLANNING**

After the tentative Plan of Action & Milestone (POA&M) is issued, detailed planning must be coordinated by the AIT with the TYCOM to establish which ship is to receive the TEMPALT (if not previously identified in the tasking documentation) and to determine dates that the ship will be available for design shipcheck and alteration accomplishment. If the dates are coincident with a scheduled CNO availability, AIT coordination with the designated NSA and the CNO availability planning activity is also required. **Section 3.4** includes specific requirements. In all

cases, the AIT must provide the ship and the NSA with security clearance data in order to be granted access to the ship.

### **3.3.4. BUDGETING**

Budgeting and funding for non-submarine TEMPALT accomplishment is usually part of the applicable project or program for Research, Development, Test & Evaluation (RDT&E) alterations, the CFFC, TYCOM or CNO Resource Sponsor for mission support alterations. Budgeting for TEMPALTs shall include sufficient funding to remove the alteration and restore the ship to its original configuration. TEMPALTs are not funded as part of the FMP.

### **3.3.5. SCHEDULING**

Scheduling for non-submarine TEMPALTs is performed in the same manner as for SHIPALTs (see **paragraph 3.2.5**). Development of a mini-COSAL is not required for TEMPALTs that are planned to be removed within ninety (90) days of accomplishment.

### **3.3.6. TASKING**

Tasking of AITs for accomplishment of non-submarine TEMPALTs generally includes the total effort: design development, alteration accomplishment, alteration removal, and ship restoration. Tasking will address all items in **Appendix A**.

### **3.3.7. TEMPORARY ALTERATION DESIGN DEVELOPMENT**

Alteration design development for non-submarine TEMPALTs is the same as for SHIPALTs (see **paragraph 3.2.7**).

#### **3.3.7.1. TECHNICAL DATA PACKAGE**

For all TEMPALTs, regardless of intended duration, a Technical Data Package (TDP) shall be prepared which includes a description of the alteration, ship impact data, stress calculations, weight and moment calculations, and alteration drawings; and submitted to the SPM for approval.

#### **3.3.7.2. DESIGN DRAWINGS**

The form and format of design drawings shall be as directed by the SPM.

#### **3.3.7.3. DESIGN APPROVAL**

TEMPALT designs, including design drawings, will be reviewed for safety and technical adequacy and impact on ship stability, operational characteristics, damage control, ship structure, ship services, ship interfaces and habitability. TEMPALTs shall be reviewed and approved as directed by the SPM. The CFFC will also approve TEMPALTs affecting Battle Group (BG) interoperability. AITs without documented SPM approval of alteration designs should not attempt alteration accomplishment and will be denied access to ships.

### 3.3.7.4. SUPPORT DOCUMENTATION

TEMPALTs shall be supported with all requisite ILS products to the extent necessary to support operation and maintenance of the equipment for the duration of the alteration in accordance with Section 8 of the FMP Manual and as determined by the SPM. ILS requirements shall be documented on the ILS Certification Form, as required by Section 8 of the FMP Manual, and provided to the SPM No Later Than (NLT) 4 months prior to installation for review and approval. The applicable submarine TEMPALT ILS requirements are in accordance with NAVSEAINST 4720.14 (Series) and NAVSEA S9070-AA-MME-010/SSN/SSBN (Series). **Note: Section 1.4** exempts submarines from the requirements of **Section 3.3** TEMPALT Pre-installation Requirements (Surface Ships and Service Craft) of this technical specification.

## 3.4. INSTALLATION PREPARATION REQUIREMENTS

### 3.4.1. INSTALLATION PLANNING AND PREPARATION

The AIT shall not initiate preparation for alteration accomplishment until specifically tasked and funded by an AIT Manager. The AIT Manager will coordinate with and obtain approval of the SPM, LCM (if not the AIT Manager), and applicable TYCOM(s) prior to tasking an AIT for accomplishment of a SHIPALT, Equipment ALT or TEMPALT.

### 3.4.2. PRE-INSTALLATION COORDINATION REQUIREMENTS

All alterations that are scheduled to be accomplished by an AIT during a scheduled CNO availability will be coordinated with and approved in advance by the SPM and the NSA that is designated to supervise the CNO availability. These alterations must be included in the NAVSEA Availability Advance Planning Letter and subsequent Availability Authorization Letter for that CNO availability. Liaison between the AIT Manager, CNO availability planning activity, designated RMMCO and NSA shall be initiated NLT 180 days prior to the start of the scheduled installation. Specifically, the AIT will notify the NSA who will then provide the Master Ship Repair (MSR)/Agreement for Boat Repair (ABR), when applicable, all significant installation preparation requirements including material, team formulation and AIT production schedule to allow coordination and integration of the alteration. The RMMCO AIT Check-In/Check-Out application <https://rmmco.navy.mil/> provides the AIT On-site Installation Coordinator/AIT Leader with a means to initiate the check-in procedures required for the installation of an alteration aboard ship. This application should be used by the AIT in order to ensure rapid, problem-free completion of the check-in gatekeeping requirement.

a. **Notification of significant installation preparation requirements shall be provided no later than A-135 and include:**

- (1) AIT activity and alteration(s) to be accomplished.
- (2) Type of MSR/ABR industrial support services (welding, rigging, hazardous material handling/disposal, etc.) that will be required (see SUPSHIP SWT 980-01, "Alteration Installation Team Support Service, Provide"). A sample checklist is provided as **Appendix B**.

(3) Quantity (mandays, man-hours, number of lifts, etc.) of each service that will be required.

(4) Listing of systems, locations and proposed sequence of events in which the AIT work will be accomplished, including any lay-down area requirements.

(5) Verification of compliance with insurance and Quality System requirements.

(6) Points of Contact for the AIT.

(7) Alteration installation production and testing schedule (including ship work approximate start date). This schedule should be provided via electronic means whenever possible to facilitate its timely integration into the overall CNO availability schedule and rapid NSA review.

(8) Expected duration of the AIT ship work (in calendar days).

(9) Installation production test schedules and Bill of Materials (desired in electronic format). These schedules will specify the expected start dates and duration of all AIT shipboard work and testing, along with time frames that could significantly impact ship's operations.

b. **Planned Accomplishment Outside of a Chief of Naval Operations Scheduled Availability**. When the installation is not to be accomplished during a CNO-scheduled availability, the AIT shall provide scheduling information to the TYCOM, RMMCO, and NSA. The AIT will provide **paragraph 3.4.2** information to the NSA, 180 days but not later than thirty (30) days before the start of the availability, or as directed by applicable Joint Fleet instructions/Joint Fleet Maintenance Manual (JFMM).

### **3.4.3. SPECIAL REQUIREMENTS**

The AIT Manager is responsible for providing advance notification of alteration accomplishment requirements/impacts and making arrangements (including funding) for any required support services not being provided by the AIT. These arrangements shall be made with the appropriate activity, including NSA, prior to the arrival of the AIT for accomplishment of the alteration, 180 days but not later than 135 days in advance. Possible requirements/impacts will be identified at initial scheduling of the alteration for accomplishment. Identified requirements for individual ships will be discussed in detail at the ship design shipcheck out-brief and will be verified at the alteration accomplishment in-brief. Notification of these requirements may include, but are not limited to:

a. Material delivery and stowage requirements (number of boxes/pallets, special handling [e.g. Electrostatic Discharge (ESD), SUBSAFE, magnetic protection], special stowage, etc.).

b. Crane service requirements (capacity, on-load, offload, high reach, etc.).

- c. Rigger service requirements.
- d. Impacted areas and spaces, including required access to secure spaces.
- e. Inspection requirements (gas-free, Signal Security (SIGSEC), TEMPEST, weight tests, etc.).
- f. Scope of Pre-installed Check-out (PICO) requirements for ship's force validation of existing equipment/system operating conditions prior to accomplishment of the alteration (specific equipment, testing, etc.).
- g. Scope of hot work requirements (cutting, welding, brazing, etc.).
- h. Fire watches (number of welders working, number and length of shifts, etc.).
- i. Access cut requirements.
- j. Work control review of specific equipment, systems, circuits, components, piping or valves which will require isolation, deactivation or removal to accomplish planned work, and any associated tag-out processing requirements.
- k. Planned handling, use and disposal of identified hazardous materials (e.g. fluorocarbons, paint, welding rods, partially used material, hazardous waste).
- l. Specific ventilation/environmental requirements (e.g. special air flow/cooling/heating requirements, protective shelters to be installed).
- m. Ship systems service requirements (e.g. power, low or high-pressure air) that may be required to support the accomplishment of the alteration or calibration or certification of the equipment.
- n. Weapons/ordnance handling requirements.
- o. Post-installation testing support requirements.
- p. System certification (SIGSEC, TEMPEST, Electromagnetic Compatibility (EMC)/Electromagnetic Interference (EMI)/Radiation Hazard (RADHAZ), SUBSAFE, etc.) that could be required/affected by accomplishment of the alteration.
- q. Non-Destructive Testing (NDT) requirements.
- r. Man-aloft requirements.
- s. Diver and cofferdam requirements.
- t. NSA turned-in equipment/material disposal requirements.

- u. Administration support requirements (dedicated telephone service, desk space, etc.).
- v. Scaffolding and staging requirements.
- w. Entry of OPNAV form 4790/2K for ALT being accomplished and for any services required from the assigned NSA.
- x. Tagout/Lockout
- y. Applicable environmental permit.
- z. Site-specific EPA HW Generator ID Number.
- aa. Applicable environmental reporting as per NAVSEA Standard Item 009-02.

Whether these requirements are to be provided by the AIT or arrangements are to be made with the ship, NSA or another activity for meeting these requirements, they shall remain the responsibility of the AIT. The AIT Manager will provide the designated activity with the funding for any required support services no later than 30 days prior to contract award or 90 days before the start of availabilities to be accomplished at public shipyards.

#### **3.4.3.1. NAVAL SUPERVISION ACTIVITY NOTIFICATION OF SPECIAL REQUIREMENTS**

When alterations are planned for accomplishment during a CNO scheduled availability, the applicable NSA and availability planning activity, normally the Ship Availability Planning and Engineering Center (SHAPEC), shall be notified of any special requirements needed to accomplish the alteration, as soon as the requirements are identified. Funding for these special requirements shall also be identified. Excepting emergent requirements, the notification shall be provided NLT 180 days prior to the start of the availability in order to support the contract solicitation process. Funding for support services during a CNO availability shall be provided to the NSA ninety (90) days prior to the start of the availability. To facilitate this process, **Appendix B** provides a recommended format for the AIT On-site Installation Coordinator/AIT Leader to provide this information to the NSA.

#### **3.4.4. DESIGN SHIPCHECK**

In preparation for the design shipcheck (see **Appendix E**), the AIT Manager shall establish contact with the applicable NSA or TYCOM to determine acceptable design shipcheck dates. For TYCOMs that hold AIT Scheduling Conferences, the AIT Manager should present the proposed shipcheck schedule at the next AIT Scheduling Conference to allow notification of applicable ships and NSA of the intent to accomplish the alteration.

### **3.4.4.1. SECURITY CLEARANCES**

Where access is required to secure areas or equipment, the individual design shipcheck team members requiring such access are required to have the proper level of clearance for access without escort. Whether a shipcheck is to be accomplished in or out of a scheduled CNO availability, the AIT On-site Installation Coordinator/AIT Leader shall provide visit clearance information to the ship, TYCOM, NSA and other appropriate Naval activities a minimum of five (5) working days prior to the scheduled ship check date or as established by TYCOM policy.

### **3.4.4.2. DESIGN SHIPCHECK IN-BRIEF**

A design shipcheck in-brief shall be conducted upon arrival on board for appropriate members of ship's force, TYCOM, NSA personnel and, if applicable, the PY On-Site Representative. The briefing will explain the purpose and extent of the planned alteration(s) and provide an outline of data to be gathered, spaces requiring access, and any other relevant information.

### **3.4.4.3. DESIGN SHIPCHECK OUT-BRIEF**

After completion of the design shipcheck, the team shall conduct a design shipcheck out-brief for appropriate members of ship's force, TYCOM, NSA personnel and, if applicable, the PY On-Site Representative. This briefing will discuss the extent of work required to accomplish the alteration as well as any ship provided support requirements. This will include requirements for PICOs, weapons handling, and other relevant information.

### **3.4.5. INCIDENTAL MATERIAL**

The AIT shall be responsible for supplying all material that is not HCPM, including incidental/expendable (shop stores) material (e.g. tape, solder, welding rods, paint, fasteners, deck covering, insulation), required to accomplish the alteration.

### **3.4.6. MATERIAL REQUIREMENTS**

All material required being installed/provided, as part of an alteration, should be assembled by the AIT for each tasked hull. This material includes all material (HCPM and AIT-procured) required by the installation drawings and all required logistic support items (special tools/test equipment, interim spares, APLs [or Preliminary APLs where no APL is yet available], maintenance plans, technical manuals, test procedures, PMS, Maintenance Assistance Modules (MAMs), Operating Space Item (OSI), Material Safety Data Sheets (MSDS), etc.) required to be turned over to the ship.

a. When ordering AIT-procured material (other than shop stores-type material) from the Federal Supply System, the AIT should first check with the material item manager to determine whether or not the supply activity has pre-staged or reserved material for the applicable alteration.

b. For ease of accomplishment and reduced on-board effort, prefabricated material (foundations, cable/harness assemblies, etc.) should be utilized to the maximum extent possible.

c. All SUBSAFE material shall be accompanied with a full set of certification documentation to expedite alteration accomplishment.

d. All SUBSAFE or Level I material, which is temporarily removed as part of a submarine ALT, shall be controlled, stored and protected while removed in accordance with NAVSEA 0924-062-0010 (Series) in order to maintain the SUBSAFE or Level I certification of the material.

e. All DSS-SOC material shall be controlled and protected in accordance with NAVSEA SS800-AG-MAN -010/P-9290 (Series) System Certification Procedures and Criteria Manual for Deep Submergence Systems to maintain certification of the material.

f. All DSS-SOC material shall be accompanied with a full set of certification documentation to expedite alteration accomplishment.

### **3.4.7. AIT REQUIREMENTS**

The make-up and management of the AIT is the responsibility of the AIT Manager tasked to accomplish the alteration.

#### **3.4.7.1. AIT FORMULATION**

The make-up of the AIT shall be as determined by the AIT Manager based on the skill level requirements of the work to be accomplished and the number of shifts the AIT is planned to work. Each AIT will be outfitted with all required hand tools, Personal Protective Equipment (PPE), General Purpose Electronic Test Equipment (GPETE), special purpose electronic test equipment, Installation and Check-Out (INCO) spares, special alignment equipment, etc., required to accomplish the alteration. For those skills that require specific training, qualification and/or certification (welding, electrical connector assembly, SUBSAFE, SIGSEC, TEMPEST, PCMS installation, Level 1, etc.), AIT members performing these functions shall be fully qualified/certified.

#### **3.4.7.2. ALTERATION INSTALLATION TEAM ON-SITE INSTALLATION COORDINATOR**

Each AIT shall have an AIT On-site Installation Coordinator/AIT Leader who is a government or military employee designated by, and acting with the authority of, the AIT Manager. The AIT On-site Installation Coordinator/AIT Leader will have general responsibility for the conduct of the installation. He/she will be the point-of-contact with the ship, AIT Manager and the NSA. AIT On-site Installation Coordinators/AIT Leader shall be knowledgeable of and responsible for AIT adherence to all invoked requirements including safety, quality plan, technical instructions, and, when applicable as identified in the MOA, the SUPSHIP Operations Manual (SOM), Appendix 4-E or any NSA MOA in effect with the NSA and AIT Manager. AITs that do not have an assigned AIT On-site Installation Coordinator (or documented approval from the SPM that an AIT On-site Installation Coordinator is not required) shall not attempt to accomplish alterations to ships and will be denied access to ships. Additionally, if multiple-shift work is to be accomplished, the AIT On-site Installation Coordinator(s) for each shift shall be identified.

### **3.4.7.3. PARTICIPATION OF OTHER ACTIVITIES**

Any participation of a system/equipment ISEA or other activity which is required for accomplishment of required conjunctive or associated ORDALTs, MACHALTs, FCs, etc., or for testing or certification of equipment or systems associated with the accomplishment of the tasked alteration(s) shall be coordinated with the AIT.

### **3.4.7.4. TRANSPORTATION AND BILLETING**

Transport of AIT personnel, tools, material and support equipment to and from the installation site and all billet arrangements shall be the responsibility of the AIT.

### **3.4.7.5. ALTERATION INSTALLATION TEAM READINESS TO START MESSAGE**

At least five (5) working days prior to the scheduled start of the AIT installation, the AIT On-site Installation Coordinator/AIT Leader will release a “readiness to start message” following the format provided in **Appendix C**. The AIT On-site Installation Coordinator/AIT Leader shall address each area identified in the Readiness to Start Message. The message will reference all pertinent scheduling information and coordination, the industrial level skills required, design readiness, ship requirements, affects of the alteration, ships spaces affected, and any other information considered pertinent. Security clearance data required in **paragraph 3.4.7.6** below might be incorporated, if desired.

### **3.4.7.6. SECURITY CLEARANCES**

Where access is required to secure areas or equipment, the individual AIT members requiring such access shall have the proper level of clearance for access without escort. A minimum of five (5) working days prior to arrival or as established by TYCOM policy, the AIT On-site Installation Coordinator/AIT Leader should provide clearance information for AIT members to the ship, TYCOM, NSA, and any other appropriate Naval activities. In situations requiring a quick response, security clearance information will be provided as far in advance as possible and by the fastest means practicable. For alterations being accomplished during CNO availabilities, the AIT shall comply with security requirements of the industrial or naval activity in addition to those required for access to the ship.

### **3.4.7.7. PERSONAL PROTECTION EQUIPMENT (PPE)**

Each AIT member is responsible for possessing and properly utilizing Personal Protective Equipment (PPE) while on board a ship and while transiting an industrial area to or from a ship. For alterations being accomplished at an industrial activity, PPE shall meet the requirements of that facility. The AIT On-site Installation-Coordinator shall be responsible for ensuring compliance with this requirement and needed PPE and HAZCOM training by all AIT members. AIT members who do not possess or utilize proper PPE while on board ship or while transiting an industrial area will be required to leave the facility/ship.

a. **Footwear.** Shoes or boots to be worn on ships should have hard soles with leather or equivalent tops. Water and oil resistant footwear with non-slip soles is recommended. Steel-

toed shoes or boots are required when working on ships on which industrial work is being performed or when transiting an industrial area to or from the ship.

b. Head protection. Hardhats meeting OSHA requirements are required to be worn by each individual transiting an industrial area (shipyard, etc.) or on any ship on which industrial work is being performed. The individual's name and activity should be printed on the hardhat.

c. Hearing protection. Hearing protection (ear plugs, etc.) meeting OSHA requirements is required to be used by each individual entering a high noise area. Hearing protection is required to be carried on the person of each individual transiting through an industrial area (shipyard, etc.) or on any ship that industrial work is being performed.

d. Eye protection. Eye protection (shatter-proof glasses, goggles, etc.) meeting OSHA requirements is required to be used by each individual entering an industrial area (shipyard, etc.) or on any ship that industrial work is being performed.

e. Emergency lighting. Each AIT member shall carry an operable flashlight or chemical light stick while on any ship that industrial work is being performed.

f. HAZCOM training. Each AIT member shall be given HAZCOM training prior to the start of work.

### 3.5. INSTALLATION REQUIREMENTS

The alteration/installation is to be accomplished at the convenience of the ship in accordance with the AIT Task Data (Appendix A) and Alteration Completion Report (Appendix C) and, to the maximum extent possible, on a not-to-interfere basis. Ship's Force will monitor the quality of AIT performance in accordance with CINCLANTFLT/CINCPACFLTINST 4790.3 (Series). All work practices shall conform to the latest version of NAVSEA Standard Items. The AIT shall provide and maintain a Quality System in accordance with the requirements of paragraph 4 below and Appendix D. The AIT On-site Installation Coordinator (paragraph 3.4.7.2 above) will ensure that the AIT is following its approved Quality Assurance Plan, applicable safety and environmental compliance requirements, and technical instructions. The NSA has Quality Assurance sampling and monitoring responsibilities and will assist ship's force in monitoring the quality of AIT performance. The AIT On-site Installation Coordinator/AIT Leader shall fully coordinate all AIT actions with the NSA. Ship's Force has ultimate responsibility and authority for all matters related to the safety and security of the ship and has the authority to inspect or stop work at any time. If ship's force stop work order is expected to last in excess of 1 hour, the AIT On-site Installation Coordinator must coordinate with the NSA, ship's force and AIT Manager if practical to determine a plan of action and resolution of the stop work order. The AIT On-site Installation Coordinator/AIT Leader is responsible for keeping Ship's Force apprised of the status of their work aboard the ship and of any impact the work may have on ship's operations or safety. The general procedure for AIT accomplishment of an alteration is as follows:

### 3.5.1. ALTERATION INSTALLATION TEAM CHECK-IN AND PRE-BRIEF

The AIT On-site Installation Coordinator/AIT Leader or designated agent shall check-in with the NSA and/or RMMCO/and pre-brief the installation prior to reporting to the ship. During this check-in, RMMCO will ensure that the alteration has been approved for installation and that the schedule accurately reflects the AIT's plan. The TYCOM, Squadron, NSA, RMMCO, and AIT Installation Coordinators shall be invited to attend the pre-brief. The pre-brief shall provide a detailed installation plan, review ILS documentation and note ILS deficiencies, identify special support requirements, safety and environmental compliance and review System Operation Verification Test (SOVT) requirements (as applicable). AITs not meeting any of the above requirements will not be allowed to proceed to the ship until satisfactory resolution has been accomplished.

### 3.5.2. IN-BRIEF

An in-brief with the TYCOM, Squadron, NSA, RMMCO, AIT Installation-Coordinators and ship shall be scheduled and coordinated by the AIT On-site Installation Coordinator/AIT Leaders. The in-brief shall be conducted upon arrival on board the ship and prior to the initiation of alteration accomplishment. The in-brief shall be conducted as outlined in **Appendix F**. Whenever possible, for alterations which impact several systems or spaces or will require more than a week to complete, or will impact systems identified in **paragraph 3.5.6**, the in-brief shall be held for key personnel prior to the start of alteration accomplishment, and coordinated by the TYCOM, NSA or Squadron, as appropriate. Ship's personnel present should include, as applicable:

Commanding Officer (CO)	Executive Officer (XO)
Operations Officer	Combat Systems Maintenance Officer
Systems Test Officer (STO)	Combat Systems Officer (CSO)
Combat Decision Center Officer	Communications Officer
Intelligence Officer	Supply Officer
Maintenance Manager/3-M Officer	Electrical Officer
Engineering Officer	Weapons Officer
Ship Material Maintenance Officer (SMMO)	
Associated technical and operational personnel, (e.g. ET, FC, IT, OS, IC, EM ratings, etc., as applicable)	

If the alteration is to be accomplished during a scheduled CNO availability, the NSA, the PY On-Site Representatives (Program Representative and CDM) and the lead ship availability manager from the industrial activity will also be invited to attend. The AIT shall record the attendance and minutes of the in-brief and distribute this information to all of the attendees. AITs that have not held an in-brief shall not attempt to accomplish alteration and may be denied access to ship.

### **3.5.3. SHIPWORK OUTSIDE OF A CHIEF OF NAVAL OPERATIONS SCHEDULED AVAILABILITY**

If the alteration is to be accomplished outside of a scheduled ship CNO availability, the AIT On-Site Installation Coordinators shall check in with the TYCOM designated point of contact (usually the RMMCO) and then report to the previously established ship's point-of-contact: the applicable Department Head, Division Officer or the Commanding Officer prior to the arrival of the AIT and the installation material. Work shall be conducted in accordance with the schedule presented at the in-brief. It will be the responsibility of the AIT to perform required shipwork around restrictions that may be imposed by the ship due to emergent ship's evolutions. Any changes to the work schedule provided to the ship at the in-brief shall be reported to the ship, and TYCOM designated point of contact as soon as changes are identified. The TYCOM designated point of contact shall be informed of the progress/completion of ship work and SOVT.

### **3.5.4. SHIPWORK DURING A CHIEF OF NAVAL OPERATIONS SCHEDULED AVAILABILITY**

If the alteration is to be accomplished during a scheduled CNO availability, the AIT On-site Installation Coordinators shall report to the NSA prior to the arrival of the AIT. The previously established ship's point-of-contact shall also be contacted. As in the case of work accomplished outside of availability, the AIT shall be responsible for scheduling work around events occurring as part of the availability. Any changes to the work schedule provided to the NSA and the ship at the in-brief shall be reported to the NSA and the ship as soon as they are identified. The NSA shall be informed regularly on the progress/completion of shipboard work and SOVT.

### **3.5.5. PRE-INSTALLATION CHECK-OUT (PICO)**

For alterations that require modifications to existing systems, Ship's Force shall complete a PICO, witnessed by the AIT, of applicable systems and equipment prior to modification/relocation. This PICO shall be conducted in order to validate the operational status and characteristics of the systems and equipment. Ship's Force PICO testing shall be based upon PMS currently implemented on the ship. Any additional testing shall be the responsibility of the AIT. The PICO report shall outline SAT or UNSAT performance and will include known discrepancies and designate the activity responsible for correction. The AIT On-site Installation Coordinator/AIT Leader shall provide a copy of the PICO report to the appropriate ship, NSA and TYCOM representatives for record purposes within 3 working days of PICO completion.

### **3.5.6. INSTALLATIONS IMPACTING THE PROPULSION PLANT ON NUCLEAR POWERED SHIPS**

Alteration installations that impact portions of the propulsion plant or designated spaces of nuclear powered ships that are not under the cognizance of the Deputy Commander for Nuclear Propulsion (NAVSEA 08) shall be accomplished as required by NAVSEAINST C9210.4 (Series). This instruction, along with its two enclosures (1. List of Propulsion Plant Systems, 2. Areas of Ships Within Which Arrangement Changes Require Prior NAVSEA Approval) provides requirements for implementing changes, repair and maintenance to nuclear powered

ships. The instruction defines work criteria within shipboard nuclear spaces, or in any part of the propulsion plant or the ship that could affect reactor safety or personnel radiation exposure. It also identifies the affected shipboard spaces, areas and systems. When an installation interfaces with one or more of these, the procedural requirements of the instruction, including its attachments, are mandatory. Caution must be exercised; as such interfaces are not always readily apparent. A careful review of this instruction is necessary to determine possible applicability to a work assignment. The AIT manager is responsible for this review prior to execution. The AIT on-site installation coordinator is responsible during execution. The NSA should be requested to assist in review of changes to specifications during execution to ensure requirements are met.

### **3.5.7. INSTALLATIONS IMPACTING CRITICAL SYSTEMS OR CRITICAL SYSTEM BOUNDARIES**

For CNO scheduled availabilities, the AIT Manager will fund and assign production work required for any portion of an alteration impacting critical system boundaries to the cognizant NSA for execution.

Critical systems are defined as all SUBSAFE, Level 1, Deep Submergence scope of certification, and P1 and P3A piping systems as defined in the following technical guidance documents:  
NAVSEA 0948-LP-045-7010 (Series) – Material Control Standard (Non-Nuclear)  
NAVSEA 0924-LP-062-0010 (Series) – Submarine Safety (SUBSAFE) Requirements Manual  
NAVSEA S9074-AR-GIB-010/278 (Series) - Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping and Pressure Vessels  
0900-LP-001-7000 (Series) – Fabrication and Inspection of Brazed Piping Systems  
SS800-AG-MAN-010/P-9290 (Series) - System Certification Procedures and Criteria Manual for Deep Submergence Systems

Critical work consists of production processes such as fit-up/welding, brazing and mechanical joint assembly, documentation of work, and performance of related tests and inspection on critical systems.

If the NSA cannot execute the critical work due to resource constraints or other significant reasons, the NSA shall contract out the work utilizing a Supervisor of Shipbuilding or obtain the required resources from another NSA. If either of these situations is not feasible, the NSA can coordinate and approve the AIT manager assignment of this work to a qualified contractor. For contracted work, the NSA shall perform QA oversight in accordance with the requirements of NAVSEA TL855-AA-STD-010 (Series), Naval Shipyard Quality Program Manual, NAVSEA S0300-B2-MAN-010 (Series), SUPSHIP Operations Manual (SOM), and CINCLANTFLT/CINCPACFLT 4790.3 (Series), Joint Fleet Maintenance Manual, as applicable, to ensure compliant production processes, personnel/procedure qualifications, and work documentation and certification.

### **3.5.8. ALTERATION INSTALLATION TEAM ON-SITE INSTALLATION COORDINATOR**

Once work has been initiated, the designated AIT On-site Installation-Coordinators (paragraph 3.4.7.2) shall be responsible for the conduct of the AIT and the resolution of any AIT issues that may arise. When work is to be accomplished during scheduled CNO availabilities, the AIT On-site Installation Coordinators shall attend NSA availability production and coordination meetings. The AIT On-site Installation coordinator should inform the NSA and ship's force of any deficiencies noted during the performance of AIT work so NSA and ship's force can pay particular attention to these areas during their oversight. In addition, the AIT On-site Installation coordinator should keep the NSA and ship's force apprised of any deficiencies (example CORNs) written by the AIT as a result of poor NSA or ship's force performance or support, so they can use them as opportunities to improve. The AIT On-Site Installation Coordinators shall provide an update on installation progress and status of accomplishment during production and coordination meetings. NSA's or Ship's Force shall report AIT deficiencies to the coordinator in writing, except when the deficiency is minor in severity. The AIT On-site Installation Coordinators is responsible for correction/resolution of such deficiencies.

### **3.5.9. WORKMANSHIP**

Workmanship and work practices shall meet the requirements of all contract specifications including applicable NAVSEA Standard Items and Submarine Maintenance Standards as invoked/applicable. AIT Managers must ensure that the AITs have an approved Quality System (see paragraph 4.2) prior to commencing installations. The AIT documented Quality System will include or make reference to procedures that will ensure product conformance. AITs without an acceptable Quality System will be denied access to the ship. When tasked, PYs shall provide oversight in AIT installations and production milestones (critical path) to ensure conformance to ship specifications and that the installation is accomplished in accordance with design. PY participation will ensure cradle-to-grave conformance to ship standards throughout the entire AIT installation process. Upon request, in support of NSA spot-checks conducted in their oversight role, the AIT should provide documentation (i.e. welder quals) showing the requirements included in Appendix D are met.

### **3.5.10. DEACTIVATIONS**

During accomplishment of the alteration, various circuits, pipe runs, equipment, etc., may have to be temporarily deactivated or placed in a reduced operating status. The Commanding Officer's designated representative and assigned NSA shall be notified in writing, using a Work Authorization Form (WAF) per CINCLANTFLT/CINCPACFLT 4790.3 (Series), of equipment and systems that require isolation to accomplish the alteration. During CNO availabilities when the NSA is coordinating all WAFs and Tag-outs, this request should be made to the NSA. This notification shall be provided prior to initiation of ship work so that tag-outs can be accomplished as required by NAVSEA Instruction S0400-AD-URM-010/TUM (Series), Tag-out Users Manual (TUM). Notification shall be made at least forty-eight (48) hours prior to required deactivation to ensure proper coordination with other on-going work. During periods of intense industrial activity, 48-hour notification may be insufficient to ensure proper coordination and

accomplishment of isolation. In these circumstances, notification should be accomplished as early as possible and/or as required by alteration MOA. **AIT members shall comply with all the requirements identified in the TUM.** The AIT On-site Installation Coordinator will ensure compliance of the TUM is accomplished. Deactivated SUBSAFE or Level I material removed as part of a submarine TEMPALT, which is intended to be reinstalled when the TEMPALT is removed, shall be controlled and stored in accordance with **paragraph 3.4.6.**

### **3.5.11. INTERFERENCE REMOVAL**

Installation of approved alterations often involves removal of interference to gain access for alteration accomplishment. Removal, reinstallation and testing of temporary interference shall be in accordance with the requirements set forth in NAVSEA Standard Item 009-23. Systems and equipment requiring permanent modification or relocation to accommodate the alteration are not to be considered interference but part of the alteration design.

### **3.5.12. HOUSEKEEPING**

The AIT shall perform general housekeeping, including the proper disposal of any hazardous waste, industrial waste or excess hazardous material, in all impacted areas as an on-going part of the alteration accomplishment. At the completion of each shift, each work site shall be broom-cleaned of all debris and trash, including any hazardous waste; industrial waste or excess hazardous material and all trash and debris shall be removed from the ship. The AIT shall properly dispose of all installation and associated material. Additionally, the AIT On-site Installation Coordinator/AIT Leader will be responsible for protecting equipment from contamination during the alteration installation process. NAVSEA Standard Item 009-06 (Protection during Contamination-Producing Operations and Maintaining Cleanliness Accomplish) provides additional housekeeping guidance. The AIT leader will also insure that all hoses, welding leads, temporary ventilation trunks, and other material and services shall be kept clear of Water tight doors and hatches or be capable of being removed in accordance with NAVSEA 0905-485-6010 (submarines).

### **3.5.13. TESTING**

The AIT will test the alteration and all equipment directly impacted by accomplishment of the alteration in accordance with the approved drawings, test procedures and applicable ship specifications. This includes inspection and testing of all systems impacted by the alteration, including systems that have had equipment or machinery removed and reinstalled as interference. Systems shall be subjected to appropriate testing to demonstrate operational acceptability including SIGSEC, TEMPEST, EMC, SUBSAFE, CPS, etc., as applicable. Such tests will be conducted under conditions simulating normal service conditions as closely as possible. An individual alteration will not be considered complete until a SOVT and/or appropriate systems integration testing have been successfully accomplished. The AIT On-site Installation Coordinator shall maintain completed test reports during accomplishment of the alteration. A complete set of the test reports shall be provided to the ship at the completion of the alteration. When shipwork is to be accomplished during a scheduled CNO availability, testing requirements shall be finalized with the NSA and industrial activity for CNO availabilities assigned to a

private shipyard and the SUPSHIP is the NSA generally beginning at the A-60 time point for inclusion into availability Integrated Test Plan/Total Ship Test Plan. This will ensure that testing requirements do not conflict with other on-going shipwork or present possible personnel safety hazards. The NSA shall be notified prior to all testing events and completed test reports shall be provided to the NSA. For submarines, any testing required to be accomplished at sea must be identified to the NSA prior to commencement of the alteration.

#### **3.5.14. INTEGRATED LOGISTICS SUPPORT (INCLUDING TRAINING)**

Upon completion of the alteration, any required on-the-job training of assigned members of the ship's crew shall be conducted by the AIT. Training will include both operation and maintenance of all new and modified equipment. All ILS items including any required interim supported on-board spares that can not be procured by requisition, documentation, and a complete set of redlined installation drawings shall be turned over to the Integrated Logistics Overhaul (ILO) if the ship is in a CNO availability, or directly to the ship if the ship is not in a CNO availability, in accordance with the check off lists in Attachments 2 through 5 of the **Completion Report** in Appendix C. Any On Board Repair Parts (OBRPs) that are not covered under APL MUST be listed on a Preliminary Allowance List with a correct RIC assigned from the responsible ISEA. For applicable ships, this data, including the Completion Report, may be delivered directly to the local PY Homeport Representative. CSTOM and CSOSS documentation shall be updated if applicable. Combat system software/firmware and related documentation shall be turned over to the designated officer. This includes unclassified and classified programs. Unique OBRPs or interim spares (as applicable), publications (2 copies), special test equipment and ship's red-lined drawings, marked to indicate all variances, will be turned over to the appropriate ship's representative. This will allow proper recording of the receipt of the material in the ship's SNAP or other custody files. Proof of inclusion in the CDMD-OA work file (i.e. printout of the 'Process Load Results' showing that the work file has been submitted), a completion report indicating affected RINs, and a completed OPNAV Form 4790/2K with the Job Control Number (JCN) assigned will be turned over to the Ship's 3-M Coordinator and the NSA. For ships that do not have SNAP installed, appropriately annotated hard copy APL pages will be supplied through the TYCOM. This updated information, validated by the AIT and ship's representatives, will serve as both basis and authority for generating configuration change information in accordance with OPNAVINST 4790.4 (Series) and requisitions for supply support deficiencies in accordance with NAVSEA T9066-AA-MAN-010 (Series).

#### **3.5.15. FINAL HOUSEKEEPING**

After completion of all shipwork, the AIT will conduct final housekeeping in all areas involved in the alteration accomplishment. With the exception of cryptographic gear, equipment that is removed as part of the alteration and is to be turned-in for accounting purposes shall be the responsibility of the AIT. Turn-in of cryptographic equipment will be the responsibility of the ship. If the alteration is accomplished during a scheduled CNO availability, the NSA shall be notified by the AIT of their departure from the alteration site, and of all outstanding discrepancies, environmental reports (paint, solvent, adhesive, welding, fuel, and abrasives usage report) and the corrective POA&M indicated in the completion report. All special badges,

passes, check-out forms, dosimeters, etc. will be turned-in, as required, in accordance with NSA requirements.

### **3.6. INSTALLATION FOLLOW-UP**

#### **3.6.1. OUT-BRIEF**

After completion of all ship work, the AIT On-site Installation Coordinator/AIT Leaders will conduct an out-brief and obtain the signature(s) of the ship's designated representative(s) on the Alteration Completion Report (See Appendix C) cover sheet. The TYCOM, NSA, RMMCO/CHET, AIT Installation Coordinators and, when applicable, the local PY On-Site Representatives (Program Representative and CDM) shall be invited to attend all out-briefs.

#### **3.6.2. DRAWINGS DEVELOPED BY THE PLANNING YARD**

For alterations where the design drawings are prepared by the PY, the AIT shall provide a redline mark-up of the drawings to the ship and the PY indicating any/all deviations/variances authorized by the PY to support the actual alteration accomplishment. The redlined drawings shall be forwarded within 15 working days of installation completion. Copies of LARs, which authorized the deviations or waivers, shall also be forwarded to the PY. Unless otherwise agreed to by the SPM and AIT Manager, the SPM shall be the only activity to task PY efforts.

#### **3.6.3. DRAWINGS DEVELOPED BY THE ALTERATION INSTALLATION TEAM**

For alterations where design drawings are prepared by the AIT and reviewed and approved by the PY, the AIT Manager shall ensure that the approved design drawings are revised to indicate the actual "as installed" configuration on the ship. The ship will receive a redlined copy of the drawings at the time of alteration completion and, when revised, electronic media copies of the as-built drawings shall be forwarded NLT 30 days after alteration completion to the applicable ship and the PY. Copies of any LARs, which authorized deviations or waivers from approved designs, shall also be forwarded NLT 30 days after alteration completion to the PY.

#### **3.6.4. SHIP SELECTED RECORD DOCUMENTATION**

The actual update of SSR documentation will be accomplished by the PY as part of the normal SSR update process associated with scheduled ship availabilities. SSR updates for AIT installations accomplished outside of scheduled ship availabilities may be accomplished on an annual basis but shall be accomplished before expiration of AIT funding and, if possible, be aligned with the normal SSR update process associated with the next scheduled availability of the respective ship. The PY must receive the as-installed drawings for SSR updates to be accomplished.

### **3.7. REPORTING REQUIREMENTS**

For all alterations, there is a minimum of four (4) reports required from the AIT for each task: Task Status Report, Readiness to Start Naval Message, Naval Message Completion Report, and an Alteration Completion Report. In the event that the Naval Message Completion Report and

Alteration Completion Report list installation deficiencies, the ship receiving the installation will send a naval message Final Completion Report when all deficiencies have been corrected and the ship has accepted the installation as complete. **Suggested formats for these naval message reports** and the **Alteration Completion Report** are provided in Appendix C.

### **3.7.1. TASK STATUS REPORT**

A periodic Task Status Report, as required by the tasking activity, shall be submitted to the AIT Manager with copies to the SPM, applicable TYCOMs, applicable NSA, LCM, and the PY. The form and format of Task Status Reports shall be as specified by the tasking activity. For AITs with more than 1 alteration task from the same AIT Manager, the reports may be combined in the same document, but the data shall be segregated by alteration. Whether tasked by the LCM, SPM, or another activity, copies of the report will be distributed so that the LCM, SPM and PY are informed of the progress of the task(s).

### **3.7.2. READINESS TO START NAVAL MESSAGE**

At least 5 working days prior to the scheduled start of the AIT installation, the AIT On-site Installation Coordinator/AIT Leader will release a Readiness to Start Message following the format provided in Appendix C. The message will reference all pertinent scheduling information and coordination, the required industrial level skills, design readiness, ship requirements, effect of the alteration, ships spaces affected, duration of the installation, and any other pertinent information. Security clearance data required in **paragraph 3.4.7.6** above may be incorporated, if desired.

### **3.7.3. NAVAL MESSAGE COMPLETION REPORT**

Upon completion of the installation, the AIT Manager and ship will send a “joint” naval message reporting completion of the effort, as well as any deficiencies in the installation and the comments from the ship’s Commanding Officer relative to the installation. For alterations accomplished outside of availability, a joint ship/AIT alteration completion message shall be issued within seventy-two (72) hours of operational certification. The message will indicate any system interface not demonstrated during operational certification and include all known discrepancies assigned to the responsible activity (e.g. the ship, the AIT, TYCOM). An alteration completion message is required in addition to the Alteration Completion Report required in **paragraph 3.7.4** below. A **sample Naval Message Completion Report format** is provided in Appendix C.

### **3.7.4. ALTERATION COMPLETION REPORT**

The AIT On-site Installation Coordinator/AIT Leader or his designated agent will fill out the Alteration Completion Report to include signatures and data filled in on all applicable attachments (attachments 1 through 5 for **ALL ALTERATIONS**). The AIT Manager shall forward copies of the completed and signed **Alteration Completion Report** (Appendix C) to the applicable TYCOM, Group Commander, Squadron Commander, LCM, SPM, ship's CDM, PY (if the PY is not the CDM), and NSA within fifteen (15) working days of alteration completion.

For alterations to CV/CVN's, a copy shall also be forwarded to SUPSHIP Newport News (Code 1800); for submarines, to Submarine Maintenance, Engineering, Planning, and Procurement (SUBMEPP) (Code 1800); and for surface ships, to SUPSHIP Portsmouth (Code 900). As a report attachment, the PY shall also receive a redlined copy of all alteration drawings, marked-up to indicate all variances from the original drawings. PYs will notify the SPM in the event of non-receipt of an Alteration Completion Report within thirty (30) days of the scheduled completion date initially established in accordance with the provisions of this specification. AIT activities responsible for relatively large numbers of AIT equipment alteration installations may customize the format of **Appendix C** as long as all of the essential information required by the LCM, SPM, CDM, NSLC and PY for the AIT alterations is included.

### **3.7.5. NAVAL MESSAGE FINAL COMPLETION REPORT**

Upon correction of all deficiencies reported in the Completion Report, the ship receiving the alteration installation will send a Naval Message Final Completion Report accepting the installation as complete. A sample Naval Message Final Completion Report format for this report is provided in **Appendix C**.

## **4. QUALITY SYSTEM PROVISIONS**

### **4.1. AIT RESPONSIBILITIES**

The AIT shall provide and maintain a Quality System in accordance with **Appendix D**. Upon request by the designated NSA, the AIT will be required to show proof that their Quality System has been accepted by NAVSEA 04 or a SUPSHIP office. Additionally, all other contractually related procedures requiring acceptance shall be available to the NSA prior to the start of shipwork when requested.

### **4.2. ACCEPTANCE OF THE QUALITY SYSTEMS**

#### **4.2.1. INITIAL ACCEPTANCE**

Contractors and Government activities performing AIT work shall submit their Quality System for review and acceptance to NAVSEA 04. The Quality System shall comply with the requirements of **Appendix D**.

#### **4.2.1.1. SUPERVISOR OF SHIPBUILDING (SUPSHIP), CONVERSION AND REPAIR ACCEPTANCE**

SUPSHIP offices are authorized, if tasked, to review and accept an AIT's Quality System. The SUPSHIP office shall then forward a copy of the acceptance letter to NAVSEA 04 for their master files.

**NOTE:** Master Ship Repair Agreement (MSRA) and ABR contractors. Contractors performing AIT work who are MSRA or ABR Agreement holders are not required to submit their Quality System to NAVSEA 04, but must maintain a current Quality System that has been accepted by the designated SUPSHIP.

### 4.3. RESUBMITTAL

Upon acceptance by NAVSEA 04 or a SUPSHIP office, the Quality System does not require resubmittal or re-acceptance unless changes to technical requirements are made or the AIT contractor's status changes.

### 4.4. QUALITY ASSESSMENT

The AIT Sponsor will perform an annual quality trend analysis for each sponsored contractor using oversight reports, deficiency reports, departure requests, critiques, customer feedback, etc. to evaluate contractor performance. The AIT Sponsor will report results of this trend analysis including weaknesses identified and actions taken to NAVSEA 04.

## 5. SPECIFICATION COMPLIANCE

### 5.1. PERFORMANCE INSPECTIONS/COMPLIANCE AUDITS

The TYCOMs, NSAs, Headquarters Systems Commands (NAVSEA, SPAWAR, NAVAIR), SPMs, LCMs and PYs shall perform inspections of installations, on a sampling basis, and will use the sampling evidence to indicate conformance or nonconformance with this specification. In addition, the accepted Quality System will also be subject to periodic compliance audits to the requirements of Appendix D as directed by SEA 04.

# APPENDIX A AIT TASKING DATA

**ALTERATION INSTALLATION TEAM TASKING DATA**

- a. The specific alteration(s) covered by the task.
- b. The specific applicable hull(s) covered by the task.
- c. The type of task (alteration design or accomplishment).
- d. Whether Naval Sea Systems Command (NAVSEA) 0902-018-2010, NAVSEA S9070-AA-MME-010/-SSN/SSBN, NAVSEA S9AAO-AB-GOS-010/GSO or other general specification is invoked for basic guidance for design, installation, material selection, testing and certification requirements. Tasking will require the AIT to be in compliance with the requirements of this Technical Specification.
- e. The Ship Program Manager (SPM) point(s) of contact.
- f. The equipment/system Life Cycle Manager (LCM) (Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), Space and Naval Warfare Systems Command (SPAWAR), etc.) point of contact and, when certification in accordance with NAVSEA S9040-AA-GTP-010/SSCR is required, the designated Certifying Authority.
- g. The AIT Manager point of contact (if other than the LCM or the SPM).
- h. The applicable Class Planning Yard (PYs) points of contact.
- i. Monthly Task Status Reports to the AIT Manager (tasking activity) with copies to all other interested activities (the applicable Type Commander (TYCOMs) and Naval Supervising Activities (NSAs), the SPM, the equipment/system LCM, the applicable PY [s] and the Operation Navy (OPNAV) platform and/or program sponsors [when requested], etc.) are required.
- j. Approval requirements for installation design products (Ship Alteration Installation Drawings [SIDs], test procedures, etc.) for installation design tasks.
- k. An Alteration Completion Report (Appendix C) is required upon alteration accomplishment. A Naval message report is also required for accomplishment outside a Chief of Naval Operations (CNO) scheduled availability.
- l. An acceptable Quality System (Appendix D) is required prior to commencing installations.
- m. The AIT Manager shall ensure that copies of the task (and all subsequent changes) are forwarded to the SPM, the LCM, and the applicable PY. When copies of tasks are received by the LCM, the LCM will complete the AIT checklists on all logistic products required to support the installation, including Allowance Parts lists, Preliminary Allowance Lists, Planned Maintenance System Documentation, Technical Manuals and Changes. The LCM shall forward copies of the logistics products to the AIT On-site Installation Coordinator/AIT Leader for delivery to the ships. The SPM shall provide a copy of the approved Integrated Logistics Support (ILS) Certification.
- n. For submarines, whether SUBSAFE work is required and verification that the SUBSAFE work is tasked to an activity authorized by NAVSEA Note 5000 to perform SUBSAFE work.

# **APPENDIX B**

## **AIT SUPPORT REQUIREMENTS CHECKLIST**

<b>ALTERATION INSTALLATION TEAM (AIT) SUPPORT REQUIREMENTS CHECKLIST</b>												
ALTERATION NUMBER	ALTERATION BRIEF	INSTALLER/SPONSOR										
<i>SCHEDULE INFORMATION</i> PROVIDE SCHEDULE DATES/TIMES AS INDICATED												
<u>INSTALLATION</u>	<u>AIT WORKING HOURS</u>	<u>TESTING SCHEDULE</u> (Notional)										
START DATE:	DAY SHIFT:	START DATE:										
ENDING DATE:	NIGHT SHIFT:	ENDING DATE:										
<b>SERVICE REQUIREMENTS</b> CHECK REQUIRED SERVICES AND FILL IN BLANKS FOR REQUIREMENTS												
<input type="checkbox"/> CRANE AND OPERATOR (Number of lifts required): MAXIMUM LIFT HEIGHT REQUIRED: <i>Notes: 1) Maximum crane lift shall not exceed 10,000 pounds.</i>												
<input type="checkbox"/> RIGGING (Mandays required):		<input type="checkbox"/> FORKLIFT (Mandays required): <i>Notes: 1) Maximum lift for the forklift NTE 2,500 lbs.</i>										
<input type="checkbox"/> COMPRESSED AIR (List requirements):												
<input type="checkbox"/> STORAGE/LAY-DOWN AREA (List requirements):												
<input type="checkbox"/> OFFICE SPACE: DESKS (Number required): PHONE/FAX/DATA LINES (List requirements): COPIER (List requirements): PARKING SPACES (Number required):												
<input type="checkbox"/> TANK WORK (List tanks to be opened): _____ <table style="float: right; margin-left: 20px;"> <tr> <td><input type="checkbox"/> Defuel/pump down</td> <td><input type="checkbox"/> Gas-free</td> </tr> <tr> <td><input type="checkbox"/> Defuel/pump down</td> <td><input type="checkbox"/> Gas-free</td> </tr> <tr> <td><input type="checkbox"/> Defuel/pump down</td> <td><input type="checkbox"/> Gas-free</td> </tr> <tr> <td><input type="checkbox"/> Defuel/pump down</td> <td><input type="checkbox"/> Gas-free</td> </tr> <tr> <td><input type="checkbox"/> Defuel/pump down</td> <td><input type="checkbox"/> Gas-free</td> </tr> </table>			<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free	<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free	<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free	<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free	<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free
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<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free											
<input type="checkbox"/> Defuel/pump down	<input type="checkbox"/> Gas-free											
<input type="checkbox"/> WELDING SERVICES (Mandays required):		<input type="checkbox"/> FIREWATCH										
<input type="checkbox"/> SANDBLASTING/PAINTING SERVICES (Mandays required):												
<input type="checkbox"/> INSULATION/LAGGING SERVICES (Mandays required):												

<input type="checkbox"/> STAGING REQUIRED (List locations):
<input type="checkbox"/> TEMPORARY ELECTRICAL SERVICES (List locations and requirements):
<u><i>SERVICE REQUIREMENTS CONTINUED</i></u> CHECK REQUIRED SERVICES AND FILL IN BLANKS FOR REQUIREMENTS
<input type="checkbox"/> VENTILATION/TEMPORARY AIR CONDITIONING (List requirements):
<input type="checkbox"/> SPECIAL TOOLS (List requirements):
<input type="checkbox"/> SYSTEMS REQUIRING ROTATION AND RADIATION TO SUPPORT SYSTEM OPERATION AND VERIFICATION TESTING:
<input type="checkbox"/> OTHER REQUIREMENTS/REMARKS (List):
POINT OF CONTACT FOR THE AIT REPRESENTATIVE:
POINT OF CONTACT FOR THE IN SERVICE ENGINEERING AGENT (ISEA):
This Checklist Will Be Submitted to the Designated Advanced Planner Before Day A-minus 135 of the Availability.

# APPENDIX C

## MESSAGES CHECKLISTS & REPORTS

Suggested Naval Message Format for Alteration Installation Team Scheduling (*Add to this appendix*)

<u>Suggested Suggested Format for Readiness to Start Naval Message</u> .....	49
<u>Suggested Naval Message Format for Installation Completion Report</u> .....	50
<u>Suggested Naval Message Format for Final Completion Report</u> .....	51
<u>Alteration Completion Report</u> .....	52
<u>Attachment (1) General Report</u> .....	54
<u>Attachment (2) AIT ILS Verification Statement Checklist Completion Instructions</u> .....	59
<u>RMMCO/AIT Installation Check-In Sheet</u> .....	60
<u>Section I - AIT Installations Completed Outside CNO Availability</u> .....	61
<u>Section II - AIT Installations Completed During CNO Availability</u> .....	63
<u>Exceptions to ILS Verification</u> .....	68
<u>Attachment (3) End of Installation Report</u> .....	69
Alteration ILS Summary for USS .....	71
<u>Onboard Repair Parts Summary</u> .....	73
<u>Modified Spares</u> .....	74
<u>Technical Documentation Status</u> .....	75
<u>Removed Material</u> .....	76
<u>Attachment (4) Physical Configuration Audit Report</u> .....	77
<u>Attachment (5) Training Verification Statement</u> .....	78

**SUGGESTED FORMAT FOR READINESS TO START NAVAL MESSAGE**

ADMINISTRATIVE MESSAGE

ROUTINE

R (DTG)

FM AIT

TO IMMEDIATE SENIOR IN COMMAND

SHIP/STATION

INFO TYPE COMMANDER

GROUP COMMANDER

NAVAL SUPERVISING ACTIVITY (AS APPLICABLE)

RMMCO

PLANNING YARD

SHIP'S CONFIGURATION DATA MANAGER (IF OTHER THAN PLANNING YARD)

IN-SERVICE ENGINEERING AGENT (ISEA)

LIFE CYCLE MANAGER (LCM)

COMNAVSEASYSKOM WASHINGTON DC//04M5/05/PMS444/SPM//

PEO (as applicable)

COMSPAWARSYSKOM SAN DIEGO CA//04F//

NAVICP MECHANICSBURG PA//

FTSC (as applicable)

CHET//SURFACE COORDINATOR// (SURFACE COMBATANTS)

CHET //EHET// for AMPHIB SHIPS

SUPSHIPS NEWPORT NEWS VA//1800//((CARRIERS ONLY)

SUPSHIPS PORTSMOUTH VA//900//((SURFACE SHIP ONLY)

SUBMEPP PORTSMOUTH NH//1800//((SUBMARINE ONLY)

Designated RSG, SIMA as applicable

BT

UNCLAS //N04720//

MSGID/GENADMIN/NSWCCD-SSES 9783/SER25//

SUBJ/SHIP/STATION/ALTERATION TITLE /READINESS TO START//

REF/ (REFERENCE ALL PREVIOUS APPLICABLE SCHEDULING AND COORDINATION COMMUNICATIONS)

RMKS/1. ALTERATION INSTALLATION SCHEDULE INFORMATION

2. INDUSTRIAL LEVEL MANPOWER SKILLS AND EQUIPMENT STATUS.

3. DESIGN READINESS: ALTERATION APPROVAL DATE: \_\_\_\_\_; SID APPROVAL DATE: \_\_\_\_\_; RED LINE DRAWINGS TO BE PROVIDED TO PLANNING YARD UPON COMPLETION OF WORK; ILS CERT DATE \_\_\_\_\_.

4. SHIP REQUIREMENTS:

A. REQUEST A SINGLE POINT OF CONTACT ON SHIP.

B. PRODUCTION WORK IMPACT ON SHIPS SCHEDULE AND ROUTINE.

C. HOT WORK REQUIREMENTS.

D. FIRE WATCH REQUIREMENTS.

E. EQUIPMENT STAGING AREA REQUIREMENTS.

F. SHIPS FORCE REQUIREMENTS WHILE CONDUCTING CHECK POINTS AND DURING POST INSTALLATION TEST OUT OF EQUIPMENT.

G. SAFETY/ENVIRONMENTAL REQUIREMENTS.

5. ALTERATION DESCRIPTION AND PURPOSE.

6. SPACES AFFECTED.

7. DURATION OF VISIT: \_\_\_\_\_. ESTIMATED COMPLETION DATE: \_\_\_\_\_.

8. IN-BRIEF SCHEDULE.

9. CLEARANCE INFORMATION AS APPLICABLE.

10. ANY OTHER APPLICABLE INFORMATION

11. NEGREP ONLY.//

BT

**SUGGESTED NAVAL MESSAGE FORMAT FOR INSTALLATION COMPLETION REPORT**

ADMINISTRATIVE MESSAGE

ROUTINE

R (DTG)

FM SHIP/STATION

TO ISIC

INFO TYPE COMMANDER//N4/N6//

GROUP COMMANDER

PLANNING YARD

NAVAL SUPERVISING ACTIVITY (AS APPLICABLE)

SHIP'S CONFIGURATION DATA MANAGER (IF OTHER THAN PLANNING YARD)

IN-SERVICE ENGINEERING AGENT (ISEA)

LIFE CYCLE MANAGER (LCM)

COMNAVSEASYS COM WASHINGTON DC//04M5/05/PMS444/SPM//

PEO (as applicable)

COMSPAWARSYS COM SAN DIEGO CA//04F//

NAVICP MECHANICSBURG PA//

FTSC (as applicable)

CHET//SURFACE COORDINATOR// (SURFACE COMBATANTS)

CHET //EHET// for AMPHIB SHIPS

SUPSHIPS NEWPORT NEWS VA//1800// (CARRIERS ONLY)

SUPSHIPS PORTSMOUTH VA//900// (SURFACE SHIP ONLY)

SUBMEPP PORTSMOUTH NH//1800// (SUBMARINE ONLY)

Designated NSA, RMMCO, RSG, SIMA as applicable

BT

NCLAS //NO4720//

MSGID/GENADMIN//

SUBJ/(EQUIPMENT/SYSTEM INSTALLATION ON USS SHIP)

RMKS/

1. THIS IS A JOINT (SHIP)/AIT MESSAGE.
2. (EQUIPMENT/SYSTEM) WAS (INSTALLED/MODIFIED/REMOVED) ON (COMPLETION DATE) AND ACCEPTED AS OPERATIONAL WITH/WITHOUT DISCREPANCIES.  
(List all known discrepancies, responsible activity, and date discrepancy will be completed. If there are no discrepancies, this is the final and only message report required.)
3. FOLLOWING INFORMATION PROVIDED:
  - A. TYPE INSTALLATION:
  - B. ALTERATION NUMBER:
  - C. SYSTEM OPERATION VERIFICATION TESTING (SOVT) CONDUCTED:
  - D. NO CHANGES TO SIDS ARE REQUIRED / SIDS REQUIRE REVISION.
  - E. REDLINE DWGS WILL BE PROVIDED TO PY NLT (15 DAYS FROM COMPLETION FILL IN BLANK).
  - F. ALTERATION COMPLETION REPORT COMPLETED AND FORWARDED NLT (15 DAYS FROM COMPLETION FILL IN BLANK)
  - G. EQUIPMENT INSTALLED: NOMENCLATURE, SERIAL NUMBER, 4790/CK JCL, RINs Affected
  - H. ILS STATUS STATEMENT (individually listed MAMs to include serial number)
  - I. SUMMARY OF INSTALLATION
4. INSTALLATION ACTIVITY POC (Name, phone number and e-mail address)
5. COMMANDING OFFICER'S COMMENTS.

**SUGGESTED NAVAL MESSAGE FORMAT FOR FINAL COMPLETION REPORT**

ADMINISTRATIVE MESSAGE

ROUTINE

R (DTG)

FM SHIP/STATION

TO ISIC

INFO TYPE COMMANDER//N4/N6//

GROUP COMMANDER

PLANNING YARD

NAVAL SUPERVISING ACTIVITY (AS APPLICABLE)

SHIP'S CONFIGURATION DATA MANAGER (IF OTHER THAN PLANNING YARD)

LIFE CYCLE MANAGER (LCM)

IN SERVICE ENGINEERING AGENT (ISEA)

COMNAVSEASYSYSCOM WASHINGTON DC//04M5/05/PEOEXW/PMS444/PEO/SPM//

COMSPAWARSYSYSCOM SAN DIEGO CA//SPAWAR 04F//

NAVICP MECHANICSBURG PA//

FTSCLANT/PAC

CHET//Surface coordinator//

SUPSHIPS NEWPORT NEWS VA//1800//

Designated NSA, RMMCO, RSG, SIMA as applicable

BT

UNCLAS //NO4720//

MSGID/GENADMIN//

SUBJ/(EQUIPMENT/SYSTEM INSTALLATION ON USS SHIP)

REF/A/RMG/SHIP/STATION/DTG//(ORIGINAL INSTALLATION MSG RPT)

REF/B/DOC/DATE/SERIAL// (AIT INSTALLATION COMPLETION REPORT)

RMKS/

1. THIS IS A FINAL COMPLETION REPORT MESSAGE.
2. (EQUIPMENT/SYSTEM) WAS (INSTALLED/MODIFIED/REMOVED) ON (COMPLETION DATE). ALL DISCREPANCIES LISTED IN REFS A AND B CORRECTED/COMPLETED.
3. INSTALLATION ACTIVITY POC
4. COMMANDING OFFICER'S COMMENTS.

SAMPLE

**ALTERATION COMPLETION REPORT**

ALTERATION NO.: \_\_\_\_\_  
 ALTERATION BRIEF: \_\_\_\_\_  
 CONCURRENT ALTERATION NO.: \_\_\_\_\_  
 CONCURRENT ALTERATION BRIEF: \_\_\_\_\_

SHIP HULL NO.: \_\_\_\_\_ SHIP NAME: \_\_\_\_\_  
 SHIP CLASS: \_\_\_\_\_ PLANNING YARD: \_\_\_\_\_  
 \_\_\_\_\_  
 TYPE COMMANDER: \_\_\_\_\_ SQUADRON/GROUP: \_\_\_\_\_

SHIP PROGRAM MANAGER  
 Point of Contact: \_\_\_\_\_ (Name, phone number, activity)  
 PLANNING YARD  
 Point of Contact: \_\_\_\_\_ (Name, phone number, activity)  
 LIFE CYCLE MANAGER  
 Point of Contact: \_\_\_\_\_ (Name, phone number, activity)  
 INSTALLING ACTIVITY  
 Point of Contact: \_\_\_\_\_ (Name, phone number, activity)  
 NAVAL SUPERVISING ACTIVITY  
 Point of Contact: \_\_\_\_\_ (Name, phone number, activity)

INSTALLATION DATES: \_\_\_\_\_ to \_\_\_\_\_

SHIP AIT On-site Installation Coordinator

_____	_____
(Signature)	(Signature)
_____	_____
(Printed Name)	(Printed Name)
_____	_____
(Department/Division)	(Department/Division)
_____	_____
(Phone) (Date)	(Phone) (Date)

This signature does not accept the alteration as complete if there are discrepancies noted in Attachment. The Ship shall not accept the alteration as complete until all discrepancies noted in Attachment are corrected, at which time the ship will accept the alteration as complete by Naval message. A suggested message format is provided in this appendix.

**ALTERATION COMPLETION REPORT CONTINUED****DISTRIBUTION:****SHIP**

Type Commander

Group Commander

Squadron Commander

Naval Supervising Activity (NSA)

Alteration Management Planning-Field Coordinating Office (AMP-FCO)

Life Cycle Manager (LCM)

NAVSEA Ship's Program Manager (SPM) and NAVSEA 04M5

In Service Engineering Agent (If different than LCM)

Ship's Configuration Data Manager (CDM)

Planning Yard (if different than the CDM)

SUPSHIP NEWPORT NEWS (Code 1800) (Carriers only)

SUBMEPP PORTSMOUTH NH (Code 1800) (Submarines only)

SUPSHIP PORTSMOUTH VA (Code 900) (Surface Ships only)

**ENCLOSURES:** (Circle reports applicable and provided)

- (1) GENERAL REPORT (**ALL INSTALLATIONS**)
- (2) INTEGRATED LOGISTICS SUPPORT VERIFICATION STATEMENT CHECKLIST (ALL INSTALLATIONS)
- (3) END OF INSTALLATION (EOI) INTEGRATED LOGISTICS SUPPORT (ILS) REPORT (ALL INSTALLATIONS)
- (4) PHYSICAL CONFIGURATION AUDIT REPORT (ALL INSTALLATIONS)
- (5) TRAINING VERIFICATION STATEMENT (ALL INSTALLATIONS)
- (6) SIGSEC, TEMPEST Visual Report (if applicable [See NSTISSAM TEMPEST/2-95])
- (7) HF ANTENNA INSTLN AND IMPEDANCE REPORT (cover sheet, if applicable [See NAVSEA S9AA0-AA-SPN-010/GEN-SPEC, Sec 400])
- (8) CABLE/CABLEWAY INSPECTION REPORT (if applicable [See NAVSEAINST 9304.1])
- (9) CERTIFICATION TEST FINDINGS/REPORT (if applicable [See NAVSEA S9040-AA-GTP-010/SSCR])

**GENERAL REPORT**

DATE \_\_\_\_\_

ALTERATION IDENTIFICATION: \_\_\_\_\_  
 (Type Hull-Class-Alteration Number)

SHIP: \_\_\_\_\_ ALTERATION ACCOMPLISHMENT DATE: \_\_\_\_\_  
 (Hull No./Name) (From - To)

This report documents the proper installation of the alteration identified above. To ensure conformance with quality standards and installation specifications and procedures, a physical installation shipcheck was conducted jointly by Ship's Force and the Alteration Installation Team (AIT) for completion of the various elements of this report. Non-acceptance of an individual element requires that the Remarks line be filled-in by Ship's Force. The AIT shall provide a Plan of Actions and Milestones (POA&M) for completion or correction of all non-acceptance items within 5 working days of rejection of the individual element. The POA&M will describe the degree of completion or correction required, lead activity point of contact, and the scheduled completion date. Final completion of discrepancies will be accepted jointly by Ship's Force and the lead Installing Activity (IA). AIT Coordinator blocks are signed by the AIT On-site Installation Coordinator.

1. In-Brief. An In-Brief by a Government representative was held with Ship's Force and a Naval Supervising Activity (NSA) representative.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

2. Pre-Installation Check-Out (PICO). A PICO was conducted on existing systems/equipment to verify operational status. Testing was conducted by Ship's Force and witnessed by the AIT. A PICO report was provided to Ship's Force representatives within 3 working days of PICO completion.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

3. Operational and/or operational testing. An equipment operational test and/or System Operational and Verification Test (SOVT) was performed on all equipment/systems impacted by accomplishment of the alteration.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

4. Integrated Logistic Support (ILS). ILS for new equipments was provided and verified.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

5. Training. On-the-Job operator and maintenance training for ship's force was conducted and verified.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

6. Physical installation shipcheck. To ensure conformance with quality standards and procedures, the following elements were shipchecked after completion of shipwork:

a. Design conformance. Alteration was accomplished in accordance with the approved alteration drawings provided.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Planning Yard Representative: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

b. Equipment access. Access to new and relocated equipment is acceptable for operation and maintenance of the equipment including access to connectors where practicable.

Ship's Force \_\_\_\_\_ AIT Coordinator \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

c. Removal items. In addition to items indicated on removal drawings, piping, cabling, mounts, racks, foundations, pipe/cable hangers, etc., which were made unnecessary or redundant as a result of the accomplishment of the alteration, have been removed and properly discarded.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

d. Structural installation. All structural work (deck/bulkhead modifications, foundations, etc.) is satisfactory in terms of workmanship, fit, function, preservation and finish.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

e. Piping installation. All piping work (pipe modifications, valves, pipe fittings, etc.) is satisfactory in terms of workmanship, fit, function, preservation and finish.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

f. Cabling. Cabling is satisfactory in terms of type, function, workmanship, designation and marking, cable shield grounding, cable entry into equipment, penetrations (including coamings), routing (including avoidance of interferences with equipment or personnel/material movement), acceptable bending radius and finish.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

g. Cableways. Cableway work (hangers, supports and trunks) is satisfactory in terms of workmanship, clearances, spacing, new hanger/support installation (when required), fit and finish. New banding has been applied to all new or disturbed hangers.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

h. Wiring. Wiring is satisfactory in terms of workmanship, designation and marking, terminal lug application (proper type, size, and attachment process [crimp/solder]), sufficient wire length, signal shield terminations, and wire routing within equipment.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

i. Connectors. Connector work is satisfactory in terms of workmanship, connector selection, connector assembly (fully pinned with proper pin type, size, and attachment process [crimp/solder]), sufficient wire length, backshell application (type, assembly, cable shield termination, strain relief, etc.), and accessibility.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

j. Grounding and bonding. Grounding and bonding requirements for safety, TEMPEST, and Electromagnetic Interference (EMI)/Intermediate Modulation Interference (IMI)/Radio Frequency Interference (RFI) have been observed and properly applied and grounding and bonding is satisfactory in terms of workmanship, fit, function, preservation and finish.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

k. Labels and label plates. New labels and label plates have been installed where required (piping, valves, equipment, racks, switch/patch boards, panels, connection boxes, etc.). Existing labels and label plates removed or damaged during accomplishment of the alteration and requiring restoration or relocation have been restored. Labels and label plates have been properly applied and are satisfactory in terms of workmanship, type, fit, function and finish.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

l. Compartment marking. Compartment marking, which was removed or damaged during accomplishment of the alteration and requires restoration or relocation, has been restored in accordance with NAVSEA S9086-CN-STM-020/CH-79 V2 and NAVSEA S9086-RK-STM-010/CH-505. Compartment marking has been properly applied and is satisfactory in terms of workmanship, type, fit, function, and finish.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

m. Impacted equipment condition. Equipment installed or relocated as a result of the alteration accomplishment has been tested and demonstrated to be operational and free from defects. Equipment or components removed and re-installed as interferences are in at least an "as-found" condition. Interference items, which were operational prior to removal, have been tested and demonstrated to be operational and free from defects. (See NAVSEA Standard Item 009-23)

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

n. Clean-up. Chips, shavings, refuse, dirt, fluids (including water), and all scrap and other foreign material, including hazardous waste, industrial waste and excess hazardous material produced as a result of the accomplishment of alteration have been removed from spaces and areas impacted by the alteration and properly disposed. Operational spaces, tanks and unoccupied spaces and compartments have been left "broom clean".

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

o. Out-brief. A government representative held an Out-Brief with Ship's Force and a NSA representative.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_  
 Remarks: \_\_\_\_\_  
 \_\_\_\_\_

7. Redline Drawings. Redline drawings will be forwarded to the planning yard within 15 working days.

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

8. Correction of Discrepancies (if required). POA&Ms for discrepancies noted above is (are) as follows:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Ship's Force: \_\_\_\_\_ AIT Coordinator: \_\_\_\_\_

Remarks: \_\_\_\_\_

\_\_\_\_\_

**ALTERATION INSTALLATION TEAM (AIT) INTEGRATED LOGISTICS SUPPORT (ILS)**  
**VERIFICATION STATEMENT CHECKLIST**  
**COMPLETION INSTRUCTIONS**

1. The AIT Checklist must be completed for all Ship Alterations (SHIPALTs), Temporary Alterations (TEMPALTs), Ordnance Alterations (ORDALTs), Engineering Changes (ECs), Field Changes (FCs), Machinery Alterations (MACHALTs), and all other configuration changes accomplished by an AIT. An AIT is a Navy activity (military, government civilian or civilian contractor, including shipyard TIGER teams and intermediate maintenance activities) tasked and supervised by a Headquarters/Hardware Systems Command (HSC) or Type Commander (TYCOM). AITs are trained and equipped to accomplish approved shipboard installations and modifications, including Alterations Equivalent to Repair (AERs), on specific ships.
2. Specific completion instructions are as follows:
  - a. Annotate items that do not apply as "NA" (Not Applicable).
  - b. To report ILS verification for multiple alterations accomplished on single system/equipment the use of a matrix highlighting applicability of each checklist item is authorized.
  - c. For AIT installations completed outside of CNO availability complete Section I only.
  - d. For AIT installations completed during CNO availability complete Section II only.
  - e. For ships in CNO availability but not co-located with the Integrated Logistics Overhaul (ILO) site, complete Section I only.
  - f. Obtain the signature of authorized acting personnel or equivalent duty personnel in the absence of designated individual. The Command Duty Officer (CDO) will be point of contact if department head/department duty officer is not available. Prior to certifying delivery of ILS products, the ship's authorized agent must verify the ILS products listed in the Logistics Support Products were delivered to the ship.
  - g. All AITs must check-in/check-out with the applicable Naval Support Activity (NSA)/ Regional Maintenance and Modernization Coordination Office (RMMCO) before and after installation. It is recommended that all AITs, which are required to check-in through the appropriate RMMCO, utilize the RMMCOs web-based check in site. This will expedite check in and save time. AIT initial check in can be accomplished through RMMCO web site at <https://rmmco.navy.mil/>
  - h. Use the End Of Installation (EOI) ILS REPORT (Attachment 3 of this Appendix) to list all of the Logistics Support Products provided to ship, (e.g. technical manuals by identification number, Maintenance Index Page (MIPs)/Maintenance Requirement Card (MRCs) by number, Test Equipment by SCAT code, Allowance Parts List (APL)/Allowance Equipment List (AELs) by number, with LSSC status indicated and listing of all material being delivered by category [On Board Repair Parts (OBRPs), Maintenance Assistance Module (MAMs) and Operating Space Items (OSI) by National Stock Number (NSN) or Part Number [P/N]).
  - i. Prepare an Exception Report for deficient ILS, identifying the activity responsible for providing deficient ILS and expected delivery date.
3. The completed checklist and EOI ILS document shall be attached to the Completion Report. A copy of the completed checklist and EOI document shall be forwarded to Naval Sea Logistics Center (NSLC) Code N54.

**RMMCO/AIT INSTALLATION CHECK-IN SHEET**

Check-in Gatekeeper<sup>1</sup>: Initials: \_\_\_\_\_ Serial #: \_\_\_\_\_ Date: \_\_\_\_\_

I. Installation Data: CS/C<sup>4</sup>ISR:  HM&E:   
SHIPALT/Equipment Alt: # \_\_\_\_\_ and Title: \_\_\_\_\_ System/Equipment: \_\_\_\_\_  
Ship Name \_\_\_\_\_ Hull Number: \_\_\_\_\_  
Ship/Sub POC, Phone Number & Email: \_\_\_\_\_  
Scheduled Installation Dates: Start: \_\_\_\_\_ Completion: \_\_\_\_\_  
List associated Conjunctive Alt(s) if applicable: # \_\_\_\_\_ and Title: \_\_\_\_\_  
# \_\_\_\_\_ and Title: \_\_\_\_\_ # \_\_\_\_\_ and Title: \_\_\_\_\_  
# \_\_\_\_\_ and Title: \_\_\_\_\_ # \_\_\_\_\_ and Title: \_\_\_\_\_

II. Installing Activity<sup>2</sup>:  
On Site Leader Name (Gov't): \_\_\_\_\_ Phone Number: (\_\_\_\_) \_\_\_\_\_  
AIT/On Site Leader Name (Contr.): \_\_\_\_\_ Company/Organization: \_\_\_\_\_  
Company Phone Number: (\_\_\_\_) \_\_\_\_\_ Local Phone Number: (\_\_\_\_) \_\_\_\_\_  
E-mail Address: \_\_\_\_\_  
Gov't. Sponsor Activity: \_\_\_\_\_ POC: \_\_\_\_\_ Code: \_\_\_\_\_  
Phone Number: (\_\_\_\_) \_\_\_\_\_ Visit Clearance Request sent<sup>3</sup>:   
E-Mail Address: \_\_\_\_\_ CNO Availability?:

III. Required Items:	Required <sup>4</sup> ?	Approved?	POC name and EDD
SIDs:	<input type="checkbox"/>	<input type="checkbox"/>	_____
SAR <sup>5</sup> :	<input type="checkbox"/>	<input type="checkbox"/>	_____
ILS Certification Form <sup>5a</sup> :	<input type="checkbox"/>	<input type="checkbox"/>	_____
MOA/Production Schedule/POA&M in-hand:	<input type="checkbox"/>	<input type="checkbox"/>	_____
Approved Quality System <sup>6</sup> :	<input type="checkbox"/>	<input type="checkbox"/>	_____
SUBSAFE Certified <sup>6</sup> :	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Required <sup>4</sup> ?	In Hand?	POC name and EDD
Tech. Manuals:	<input type="checkbox"/>	<input type="checkbox"/>	_____
PMS Documentation:	<input type="checkbox"/>	<input type="checkbox"/>	_____
Spares/MAMs:	<input type="checkbox"/>	<input type="checkbox"/>	_____
COSAL/APL Documentation:	<input type="checkbox"/>	<input type="checkbox"/>	_____
Operating Procedures <sup>7</sup> :	<input type="checkbox"/>	<input type="checkbox"/>	_____
SOVT/Operational Performance Test:	<input type="checkbox"/>	<input type="checkbox"/>	_____
Planned Configuration Change Documentation: <sup>22</sup>	<input type="checkbox"/>	<input type="checkbox"/>	_____
4790/2K Properly Documented in RMAIS:	<input type="checkbox"/>	<input type="checkbox"/>	JCN ( )-( )-( )
Known CFM/GFM Issues:			_____

**RMMCO OFFICE USE**

IV. Installation/Waiver Authority:  
Alt Install Authorized<sup>8</sup>? YES:  NO:  ⇒ Call TYCOM for Authorization/Waiver Status:  
Availability Work Package:  Scheduling Conference:   
Letter of Authorization/Message:  ⇒ Ltr Ser. No./DTG \_\_\_\_\_  
Authorization/Waiver Granted? Required? Authorized? (TYCOM POC Name, Date/Time)  
ILS Deferral:   \_\_\_\_\_  
SPM Authorization Waiver:   \_\_\_\_\_  
Authorized Baseline Waiver (eCCB):   \_\_\_\_\_  
TCD Waiver:   \_\_\_\_\_  
SECNAV Waiver (5 year decomm):   \_\_\_\_\_

V. Security Clearance/MSR/NSY Check-In<sup>9</sup>: Security Clearance Check-in POC Initials: \_\_\_\_\_  
 Naval Station/Naval Air Station/Sub Base<sup>9</sup>  MSR/NSY<sup>10</sup>

VI. Production Check-in: (AIT Leader Check-in with below POC prior to proceeding with Alt install.<sup>11</sup>)  
Name: \_\_\_\_\_ Activity: \_\_\_\_\_  
Phone Number: (\_\_\_\_) \_\_\_\_\_ E-Mail Address: \_\_\_\_\_  
Check-out POC verify appropriate PLAD(s) are on Installation Completion Report messages and applicable  
DFS draft message for prototype/proof of concept installs as required<sup>12</sup>: YES:  NO:   
Gatekeeper summarize check-out procedure for AIT Leader (see Check-out Sheet<sup>13</sup>)  
Electronic form can be found on WWW.RMMCO.NAVY.MIL

**AIT INSTALLATION & ILS VERIFICATION COMPLETION CHECK-OUT SHEET**  
**SECTION I - AIT Installations Completed Outside CNO Availability**

SHIP: \_\_\_\_\_ SHIPALT/Equipment Alt: # \_\_\_\_\_ and Title: \_\_\_\_\_ Serial #: \_\_\_\_\_

Check-out POC: _____	Phone: (_____) _____
Organization: _____	Initials: _____

I. Waiver, deviation, DFS or LAR/RLAR required<sup>14</sup>: YES  NO  Approved: YES  NO   
 Waiver, deviation, DFS or LAR/RLAR comments/special considerations (e.g. approved as temporary repair, requires correction next availability): \_\_\_\_\_

II. Outstanding installation issue(s): \_\_\_\_\_

III. Using AIT Leader-provided documentation, Check-out POC verify that the ship has acknowledged receipt of all applicable deliverables or that an estimated delivery date and POC has been provided by the AIT:

<b>WORK CENTER/DEPT. Ship's Dept. Head (Or Acting) Signature Required<sup>15</sup>.</b>	<b>PRINTED NAME</b>	<b>RATE/RANK</b>	<b>DATE</b>
	<b>SIGNATURE</b>		
Deliver special tools and special test equipment to Work Center. <sup>16</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			
Certify copies of Tech. Manuals and Manufacturer Manuals for COTS/NDI have been provided to Work Center. <sup>16,17,18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			
Deliver Operational Procedures (CSOSS/EOSS, SSM) documentation to Work Center. <sup>18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			
Deliver Software Programs to Work Center. <sup>18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			
Deliver or provide On-Board Training (OBT) to ship's crew, if applicable. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			
<b>SUPPLY OFFICER. Supply Officer (Or Acting) Signature Required<sup>15</sup>.</b>			
Deliver MAMs and associated supply/material support data listings <sup>19</sup> to SUPPO for sub-custody to appropriate work center in accordance with TYCOM directives. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			
Deliver repair parts (OBRPs) and a copy of associated supply/material support data listings to SUPPO. <sup>15,19</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____ _____			

Provide SUPPO a listing of all MAMs removed from the Work Center. SUPPO document transfer of MAMs to AIT rep. on DD1149 expenditure document. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Provide SUPPO a listing of all upgraded MAMs in the Work Center including a cross reference of old to new part number and stock numbers. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Deliver hard copy allowance documentation (APLs/AELs) to SUPPO for SNAP I ships (optional if data included in SNAP II). <sup>16</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Certify PMS documentation (MIPs/MRCs) has been provided to the Work Center and 3M office. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Deliver SSRD markups and redlined installation drawings to SUPPO/CHENG or Duty Officer. <sup>16,18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Certify additional copies of Tech. Manuals have been provided to 3M Coordinator. <sup>16,17,18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
<b>3M COORDINATOR. 3M Coordinator signature required<sup>15</sup>.</b>			
Deliver a listing of equipment impacted with assigned CDM Record Identification Numbers (RIN) and alteration/installation status codes for all configuration alterations (adds, deletes and modifications) to the 3M Coordinator (copy to NSA). On the very rare occurrence that the data is not entered into SNAP/NTCSS or CDMD/OA provide completed OPNAV 4790/CK to both 3M Coordinator and NSA with TYCOM approval. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____	JCN		
<b>CHECK-OUT: Appropriate signature required from designated ships force Department Head, Supply Officer or 3M Coordinator. Final check-out signature is NSA/RMMCO.</b>			

IV. Check-out POC verify that ship/sub POC has signed for a copy of the SOVT/OPT Procedure<sup>20</sup>: YES:  NO:

Production Work Completion Date: \_\_\_\_\_ Testing Completion Date: \_\_\_\_\_  
Training Completion Date: \_\_\_\_\_ Alt Total Completion Date: \_\_\_\_\_

Check-out POC "X" appropriate RMMCO Gatekeeper block<sup>21</sup> SERIAL #: \_\_\_\_\_ DATE: \_\_\_\_\_  
 Combatant Initials \_\_\_\_\_  Carrier Initials \_\_\_\_\_  Amphib Initials \_\_\_\_\_  Sub Initials \_\_\_\_\_

Notify On Site Representative (OSR)/Maintenance Manager (MM)/Platform Broker (PB)/MC/PE

**AIT INSTALLATION & ILS VERIFICATION COMPLETION CHECK-OUT SHEET**  
**SECTION II - AIT Installations Completed During CNO Availability**

SHIP: \_\_\_\_\_ SHIPALT/Equipment Alt: # \_\_\_\_\_ and Title: \_\_\_\_\_ Serial #: \_\_\_\_\_

Check-out POC: _____	Phone: (_____) _____
Organization: _____	Initials: _____

I. Waiver, deviation, DFS or LAR/RLAR required<sup>14</sup>: YES  NO  Approved: YES  NO   
 Waiver, deviation, DFS or LAR/RLAR comments/special considerations (i.e. approved as temporary repair, requires correction next availability, etc): \_\_\_\_\_

II. Outstanding installation issue(s): \_\_\_\_\_  
 \_\_\_\_\_

III. Using AIT Leader-provided documentation Check-out POC verify that the ship has acknowledged receipt of all applicable deliverables or that an estimated delivery date and POC has been provided by the AIT:

<b>WORK CENTER/DEPT. Ship's Dept. Head (Or Acting) Signature Required<sup>15</sup>.</b>	<b>PRINTED NAME</b>	<b>RATE/RANK</b>	<b>DATE</b>
	<b>SIGNATURE</b>		
Deliver special tools and special test equipment to Work Center. <sup>16</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Deliver Operational Procedures (CSOSS/EOSS, SSM) documentation to Work Center. <sup>18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Deliver Software Programs to Work Center. <sup>18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Deliver or provide On-Board Training (OBT) to ship's crew, if applicable. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
<b>SUPPLY OFFICER. Supply Officer (Or Acting) Signature Required<sup>15</sup>.</b>			
SUPPO document transfer of MAMs to AIT rep. on DD1149 expenditure document. N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
<b>FLTILOTEAM Logistics Management Specialist signature required<sup>15</sup>.</b>			
Deliver SSRD markups and redlined installation drawings to FLTILOTEAM ,CHENG or Supply Officer <sup>16,18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			
Certify all Tech. Manuals have been provided to FLTILOTEAM. <sup>16,17,18</sup> N/A YES NO; POC Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____			

Deliver MAMs and associated supply/material support data listings <sup>19</sup> to FLTILOTEAM. A copy shall be provided to SUPPO for sub-custody to appropriate work center in accordance with TYCOM directives. N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
Deliver repair parts (OBRPs) and associated supply/material support data listings <sup>19</sup> to FLTILOTEAM. N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
Provide FLTILOTEAM a listing of all MAMs removed from the Work Center. N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
Provide FLTILOTEAM a listing of all upgraded MAMs in the Work Center including a cross reference of old to new part number and stock numbers. N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
Deliver hard copy allowance documentation (APLs/AELs) to FLTILOTEAM. <sup>16</sup> N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
Certify PMS documentation (MIPs/MRCs) has been provided to FLTILOTEAM. N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
Deliver a listing of equipment impacted with assigned CDM Record Identification Numbers (RIN) and alteration/installation status codes for all configuration alterations (adds, deletes and modifications) to the FLTILOTEAM or appropriate NSA. On the very rare occurrence that the data is not entered into SNAP/NTCSS or CDMD/OA, provide completed OPNAV 4790/CK to both the FLTILOTEAM and NSA with TYCOM approval. N/A    YES    NO; POC    Estimated Delivery Date <input type="checkbox"/> <input type="checkbox"/> _____    _____			
<b>CHECK-OUT: Appropriate signature required from designated ships force Department Head, Supply Officer or 3M Coordinator. Final check-out signature is NSA/RMMCO.</b>			

IV. Check-out POC verify that ship/sub POC has signed for a copy of the SOVT/OPT Procedure<sup>20</sup>: YES:  NO:

Production Work Completion Date: \_\_\_\_\_ Testing Completion Date: \_\_\_\_\_  
 Training Completion Date: \_\_\_\_\_ Alt Total Completion Date: \_\_\_\_\_

Check-out POC "X" appropriate RMMCO Gatekeeper block <sup>21</sup> SERIAL #: _____ DATE: _____ <input type="checkbox"/> Combatant Initials _____ <input type="checkbox"/> Carrier Initials _____ <input type="checkbox"/> Amphib Initials _____ <input type="checkbox"/> Sub Initials _____ Notify OSR/Maintenance Manager (MM)/Platform Broker (PB)/MC/PE
--

**RMMCO/AIT INSTALLATION COMPLETION CHECK SHEET NOTES**

1. CHET, EHET, SUBMET, TYCOM, etc. Gatekeeper (specifics for each region see below) inserts initial, date and locally assigned serial number to indicate Gatekeeper approval.

<b>Region</b>	<b>CV/CVN</b>	<b>Submarines</b>	<b>Combatants</b>	<b>Amphibs/Aux/Com</b>	<b>MCM/MHC/MCS</b>
SW-RMMCO	CNAP N43	SUBMET-SW	CHET	EHET	N/A
NW-RMMCO	CNAP N43	N/A	IMACC	IMACC	N/A
MP-RMMCO	N/A	NSSC	CHET	CNSGMP	N/A
YO-RMMCO (Yokosuka)	CNAP N43	SUBGRU SEVEN?	CHET	SURFMO Yokosuka/PE	N/A
SA-RMMCO (Sasebo)	N/A	N/A	N/A	SURFMO Sasebo/PE	SURFMO Sasebo/PE
GQ-RMMCO (Guam)	N/A	CSS15	COMLOGWESTPAC	N/ A	N/A
MA-RMMCO	RSG/SIMA	RSG/SIMA	RSG/SIMA	RSG/SIMA NORFOLK	N/A
NE-RMMCO	N/A	SSSU NLON	SUPSHIP BATH	RSG/SIMA EARLE	N/A
SE-RMMCO (Mayport)	CNAL	N/A	CHET	N/A	N/A
SC-RMMCO (Ingelside)	N/A	N/A	N/A	N/A	ACT
SC-RMMCO (Pascgoula)	N/A	N/A	CHET	N/A	N/A

2. Gatekeeper shall fill-in Section I blanks based on information provided by the AIT Leader.
3. Gatekeeper shall verify that visit clearance request (including overseas requirements) has been received. If not on hand, notify AIT Leader of requirement.
4. Gatekeeper shall review SAR, Master List and other available information sources to determine which items are to be delivered to the ship by the AIT. If sources are not available, contact AMP-FCO. If items are required, check the "Required" block. If items are known to be authorized, check the "Authorized" block. If items are in the waiver process, enter estimated delivery date and POC responsible for providing the waiver. For the items under the "In-Hand" section, if one or more EDD is beyond Production Schedule installation completion date, Gatekeeper contact TYCOM for waiver status. If items are sighted at time of check-in, check the "In-Hand" block. If items are required, but not available for Gatekeeper physical verification at check-in time, Gatekeeper enter estimated delivery date and POC responsible for delivering item by entered date. If one or more EDD is beyond Production Schedule installation completion date, Gatekeeper contacts TYCOM for waiver status.
5. SAR is not applicable to Letter type AER (surface ships), A & I item (subs only) and Alt Requests (CV/CVN only)
- 5a. ILS Certification Form: Provide a current, approved copy to NSA/RMMCO.
6. Gatekeeper shall ensure that AIT's company appears on the list of companies that have a NAVSEA-approved Quality System. If the company is not on the list, contact the RMMCO Coordinator or AMP-FCO for assistance. If installation involves SUBSAFE work, ensure that AIT's company appears in NAVSEANOTE 5000. If the company is not on the list, contact the RMMCO Coordinator, AMP-FCO or Submarine Gatekeeper for assistance.
7. Operating Sequencing Instructions and Procedures include such items as CSOSS, EOSS, SSM (subs only), etc.
8. Check the "YES" block if this ALT has SPM/TYCOM authorization for installation during the scheduled installation dates entered in section II and fill in the appropriate means used to obtain this authorization in the block below. Check the "NO" block if the alteration has not received SPM/TYCOM authorization for installation or the scheduled installation dates in section II are not in accordance with the SPM/TYCOM scheduling guidance. Contact the TYCOM to obtain authorization. Check appropriate "Authorization/waiver granted?" block ("YES" or "NO") and enter TYCOM POC name, date and time. Gatekeeper shall notify RMMCO Leader and OSR/MC of all AITs being denied access.
9. Gatekeeper shall check the appropriate security check-in POC location block (specifics for each region see below).

<b>Region</b>	<b>CV/CVN</b>	<b>Submarines</b>	<b>Combatants</b>	<b>Amphib/Aux/Cmd</b>	<b>MCM/MHC/MCS</b>
SW-RMMCO	SSSD Det NASNI	SUBMET-SW	SSSD (C-190)	SSSD (C-190)	N/A
NW-RMMCO	SSPS	N/A	SSPS	SSPS	N/A
MP-RMMCO	N/A	NSSC	SS Det PH/PHNSYSS Det	PH/PHNSY	N/A
YO-RMMCO	CNAP N43	N/A	SRF (C213)	SRF (C213)	N/A
SA-RMMCO	N/A	N/A	N/A	SRF (C480?)	SRF (C480?)
GQ-RMMCO	N/A	CSS15	N/A	N/A	N/A
MA-RMMCO	RSG/SIMA	RSG/SIMA	RSG/SIMA Norfolk	RSG/SIMA Norfolk	N/A
NE-RMMCO	N/A	SSSU/SUBBASE New London	SUPSHIP BATH	RSG/SIMA EARLE	N/A
SE-RMMCO	TBD	TBD	CHET	N/A	N/A
SC-RMMCO	N/A	N/A	N/A	N/A	ACT
SC-RMMCO	N/A	N/A	CHET	N/A	N/A

10. The Gatekeeper shall only check this block if the ALT is to be accomplished in a Master Ship Repair (MSR) or Naval Shipyard facility. Checking this block signifies that the AIT Leader must check-in with the designated MSR/NSY prior to the production POC.
11. The Gatekeeper will fill in the appropriate Production Check-in POC's name, activity and phone number based on OSR/MC guidance.

12. Check-out POC shall review the NSTS 9090.310D Installation Completion Report message to ensure the listed information addressees are included as appropriate (see list below). If addressees are incorrect, direct the AIT Leader to correct the discrepancies and provide a corrected copy of the message report. Ensure that the ISIC and Battle Force Commander are listed on all messages.

SW-RMMCO: SOUTHWEST RMC SAN DIEGO CA //40/41/42/60// (all messages)

CHET SAN DIEGO CA //OIC// (all combatants)

COMNAVAIRPAC SAN DIEGO CA//N42/N43/N436/N6/N61/N62/N63// (all CVNs)

SUBMETSW SAN DIEGO CA //N40// (all submarines)

NW -RMMCO: NORTHWEST RMC PUGET SOUND WA //40/41/42/60// (all auxiliaries)

CHET EVERETT WA//OIC// (all combatants)

**COMNAVSURFGRU PACNORWEST//N43/N431// (all aux/combatants)**

COMNAVAIRPAC SAN DIEGO CA//N42/N43/N436/N6/N61/N62/N63// (all CV/CVNs)

**(TBD) SUBDEVROUN NINE//xx/xx// (all submarines)**

MP-RMMCO: FTSCPAC DET PEARL HARBOR HI//00// / (all messages)

COMNAVSURFGRU MIDPAC//N43// (all amphibs)

CHET PEARL HARBOR HI//OIC// (all combatants)

NSSC PEARL HARBOR HI//N40// (all submarines)

YO-RMMCO: NAVSHIPPREPAC YOKOSUKA JA//OIC// (all messages)

COMCARGRU FIVE SURFMO YOKOSUKA JA//JJJ// (all messages)

COMPHIBGRU ONE (all amphibs)

CHET YOKOSUKA JA//OIC// (all combatants)

COMCARGRU FIVE SURFMO YOKOSUKA JA//JJJ// (all combatants)

**(TBD) COMSUBGRU SEVEN //N4/N3/N5/N7// (all submarines)**

SA-RMMCO: NAVSHIPPREPAC YOKOSUKA DET SASEBO JA//OIC// (all messages)

**SURFMO SASEBO JA//JJJ// (all messages)**

**FTSCPAC DET SASEBO JA//JJJ// (all amphibs)**

COMNAVAIRPAC SAN DIEGO CA//N42/N43/N436/N6/N61/N62/N63// (all CV/CVNs)

GQ-RMMCO: COMSUBRON FIFTEEN //N4// (all submarines)

MA-RMMCO: RMMCO NORFOLK VA//OIC// (all messages)

NE-RMMCO: TO: SUBRON SUPPU NEW LONDON CT//RMMCO/N42// (all submarines)

**INFO: SUPSHIP GROTON CT//157// (all submarines)**

**SUPSHIP BATH ME//100/600// (all combatants)**

**TO: SIMA EARLE NJ//RSG// (all AOE's)**

**INFO: SUPSHIP COLTS NECK NJ//100/600// (all AOE's)**

SE-RMMCO: CHET MAYPORT FL//OIC// (all messages)

**(TBD) SUBRON? (all submarines)**

CHET PASCAGOULA MS//OIC// (all Gulf combatants)

RSG INGLESIDE TX//N40// (all MHC/MCM/MCS)

**(TBD) COMNAVAIRLANT NORFOLK VA//N42/N43/N436/N6/N61/N62/N63// (all CV/CVNs)**

13. Gatekeeper shall ensure that the AIT Leader understands the check-out procedure to be followed after installation completion. Review RMMCO check-out sheet with AIT Leader, then identify check-out POC and "X" appropriate block in top section of check-out sheet.
14. Check the "YES" block if a waiver, deviation or DFS is required. Check the "Approved" "YES" block if it was approved. The AIT Leader will provide any waiver, deviation or DFS data describing the deviations or outstanding issues, if required.
15. The Command Duty Officer (CDO) or Supply Officer will be the point of contact if the dept. head/dept. duty officer or FLTILOTEAM personnel are not available.
16. For CV/CVNs deliver to Maintenance Support Center (MSC). MSC signature required. The authorized acting personnel in the absence of the designated individual are the Combat System Officer of the Watch (CSOOW).
17. Technical manuals provided in electronic media format Compact Disk – Read Only Memory (CD-ROM) must be loaded into the Advanced Technical Information System (ATIS).
18. For AEGIS ships Combat Systems/C<sup>4</sup>ISR material, deliver to Combat Systems Maintenance Central (CSMC) Systems Test Officer (STO). STO signature is required. For HM&E material, deliver to Central Control Station (CCS).
19. SNAP/NTCSS is the only official source of configuration and supply data. This list is for the administrative use of the AIT only. In the event of a conflict between the list and SNAP/NTCSS, SNAP/NTCSS always takes precedence.
20. AIT Leader shall provide a copy of the SOVT/OPT page with the ship/sub POC's signature affixed indicating receipt acknowledgement
21. The check-out POC will "X" the appropriate RMMCO Gatekeeper block. If IPM involvement was requested by the OSR/MC, the check-out POC will forward the RMMCO/AIT CHECK-IN/-OUT SHEETS, the NSTS 9090.310 Alteration Completion Report, any waiver or deviation documentation and the SOVT/OPT receipt documentation page to him/her. The IPM shall

review these documentation and resolve problems as necessary. The IPM will then forward all documentation to the Gatekeeper. If IPM involvement was not requested, the Gatekeeper shall complete the IPM duties noted above. The Gatekeeper will initial the appropriate blank in the bottom section of the check-out sheet, file the documentation originals and provide copies to the AMP-FCO for data input and metric collection.

22. Planned configuration changes shall be verified in CDMD-OA or proof of inclusion in CDMD-OA (i.e. printout of the "Process load results"). OPNAV 4790/CK is required only if configuration data has not been pre-loaded in CDMD-OA.

**EXCEPTIONS TO INTEGRATED LOGISTICS SUPPORT (ILS) VERIFICATION**

ALTERATION IDENT: \_\_\_\_\_ DATE \_\_\_\_\_  
 (Type Hull-Class-Alteration Number)

SHIP: \_\_\_\_\_ ALTERATION ACCOMP DATE: \_\_\_\_\_  
 (Hull No./Name) (From - To)

INSTALLING ACTIVITY: \_\_\_\_\_

1. The following ILS was not provided upon completion of this alteration:
  - a. Technical Manuals (listed by identification number and equipment application).
  - b. Spares Support that is without RIC/PAL No./Interim Repair Parts (listed by Equipment Nomenclature).
  - c. Coordinated Shipboard Allowance List (COSAL) Updates (list documentation not onboard).
  - d. Test Equipment and Maintenance Assistance Modules (MAMs) (listed by Equipment Nomenclature).
  - e. Planned Maintenance System (PMS) Documentation (listed by Maintenance Index Pages (MIPs), Maintenance Requirements Card (MRC) Numbers).
  - f. Ship Selected Record Drawings (SSRD) Markups (list mark-ups not onboard).
  - g. Installation Drawings (list drawings not onboard).
2. The following information is provided for items indicated in paragraph (1):
  - a. Information on how and when this missing ILS was ordered (i.e. Requisition Number, Letter/Transmittal Number, etc.).
  - b. Information on the current status/estimated receipt date/reason for late arrival (if known) (i.e. out of stock, not developed, etc.).
  - c. Information on the anticipated method of transfer to the ship when received (i.e. transshipment, forwarding letter, to be accomplished by someone other than Naval Supervising Activity (NSA)/Alteration Installation Team (AIT), etc.).

REMARKS:

**END OF INSTALLATION REPORT**

4720  
 Ser \_\_\_\_/\_\_\_\_  
 Date \_\_\_\_\_

From: INSTALLING ACTIVITY  
 To: APPLICABLE SPM

Subj: End Of Installation (EOI) Integrated Logistics Support (ILS) Report for USS ( ) OF ( )  
 2001

Encl: (1) Alteration ILS Summary  
 (2) Onboard Repair Parts Summary

1. Provision of the following logistic support products (as listed in the Ship Program Manager (SPM) approved ILS Certification Form) is certified in accordance with 9090-310D Certification criteria:

ALT	EQUIPMENT	OPNAV 4790/2K	OPNAV 4790/CK	CDMD OA UPDATE	REPAIR PARTS	TECH DOC	PMS	TEST EQUIP	DWG NO.	APL/ AEL	MAMs	OSS	TRAINING

LEGEND:  
 C - COMPLETE - ENCL (1) AND ATTACHMENTS THERETO PROVIDE ILS STATUS  
 I - INCOMPLETE - ENCL (1) PROVIDES STATUS OF INCOMPLETE ACTIONS  
 N - NOT APPLICABLE - ALTERATION DOES NOT IMPACT ILS

2. Activity Name, Code point of contact is \_\_\_\_\_, Commercial (\_\_\_\_)\_\_\_\_-\_\_\_\_/DSN  
 \_\_\_\_-\_\_\_\_, or Commercial (\_\_\_\_) \_\_\_\_-\_\_\_\_/DSN \_\_\_\_-\_\_\_\_.

By direction

Copy to:  
 COMNAVSEASYS COM (PMS 444)  
 TYCOM  
 Designated NSA  
 ISEA  
 CDM  
 PLANNING YARD  
 NAVSEALOGCEN (CODE N54)  
 FLTILOACT/FTSCPAC (if applicable)  
 CHET (if applicable)  
 USS \_\_\_\_\_ ( )



**ALTERATION INTEGRATED LOGISTICS SUPPORT (ILS) SUMMARY FOR  
USS \_\_\_\_\_**

DATE \_\_\_\_\_

SHIP IS SNAP I \_\_\_\_\_ SNAP II \_\_\_\_\_ MANUAL \_\_\_\_\_ NTCSS \_\_\_\_\_

	STATUS	NOTE
1. Updated Configuration Data Manager Database – Open Architecture (CDMD-OA) Data Base		
2. Provided Push Spares to Supply Department		
3. Provided ADD/DELETE List for On board Repair Parts (OBRPs)		
4. Provided Coordinated Shipboard Allowance List (COSAL) SOEAPL update information (NON SNAP/NTCSS ONLY)		
5. Provided COSAL Part I Sections A & B update information (NON SNAP/NTCSS ONLY)		
6. Provided Hard Copy Allowance Parts List (APL) as indicated below		
7. Provided Technical Documentation identified on page ____		

Following APL's were provided and/or deleted:

<u>ALT</u>	<u>APL NUMBER</u>	<u>LSSC</u>	<u>EIC</u>	<u>DATE</u>	<u>MOD FLSIP</u>	<u>.25 FLSIP</u>	<u>.50 FLSIP</u>	<u>APL ADD/DEL</u>

NOTES: (1) CONFIGURATION DATA ENTERED IN CDMD-OA. (COPY OF CDMD-OA FILES ARE ATTACHED)  
 (2) SNAP/NTCSS DATA BASE UPDATED BY JSN'S: PENDING TRANSACTION REPORT IS ATTACHED.  
 (3) SNAP/NTCSS DATA BASED UPDATED BY JSN'S:  
 (4) OPNAV 4790 CK provided if configuration data not entered in CDMD-OA (TYCOM approval)

**REMARKS:**





DATE \_\_\_\_\_

**MODIFIED SPARES**

MODIFIED	PART NUMBER	NSN	NOMENCLATURE	SER	QTY	O/B	ALT	APL	NOTE
FROM									
TO									
FROM									
TO									
FROM									
TO									
FROM									
TO									

- NOTES: (1) PART SHOULD BE REQUISITIONED BY THE SHIP  
 (2) SRI PUSHED BY ALTERATION  
 (3) OSI/MAM PUSHED BY ALTERATION  
 (4) ITEM DELETED FROM ALLOWANCE PARTS LIST/REMOVED SEE PAGE  
 (5) PART MODIFIED SEE PAGE \_\_\_\_\_ FOR DETAILED INFORMATION  
 (6) NON-ALLOWED PUSH ITEM SHIP TO STOCK AS AT5





**PHYSICAL CONFIGURATION AUDIT REPORT**

ALTERATION IDENT: \_\_\_\_\_  
(Type Hull-Class-Alteration Number)

SHIP: \_\_\_\_\_ ALTERATION ACCOMP DATE: \_\_\_\_\_  
(Hull No./Name) (From - To)

INSTALLING ACTIVITY: \_\_\_\_\_

EQUIPMENT NOMENCLATURE: \_\_\_\_\_

SERIAL NO.: \_\_\_\_\_

LOCATION: \_\_\_\_\_

EQUIPMENT DISPOSITION:

\_\_ INSTALLED \_\_ REMOVED \_\_ MODIFIED

EIC NO.: \_\_\_\_\_

4790/2K JCN: \_\_\_\_\_ (4790/2K and 4790/CK if not pre-loaded in CDMD-OA [Attached])

TECHNICAL MANUAL(S): \_\_\_\_\_  
(New/Revised/Copies) \_\_\_\_\_  
\_\_\_\_\_

APL/AEL/PAL: \_\_\_\_\_

TEST EQUIPMENT: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PMS DOCUMENTATION: \_\_\_\_\_ (MIP NO.)

REMARKS:

**TRAINING VERIFICATION STATEMENT**

ALTERATION IDENT: \_\_\_\_\_  
(Type Hull-Class-Alteration Number)

SHIP: \_\_\_\_\_ ALTERATION ACCOMP DATE: \_\_\_\_\_  
(Hull No./Name) (From - To)

INSTALLING ACTIVITY: \_\_\_\_\_

1. It is hereby verified that on-the-job operator and maintenance training has been provided to the ship for equipments installed as part of the above alteration as follows:

OPERATOR TRAINING:

<u>EQUIPMENT</u>	<u>NAME</u>	<u>SIGNATURE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

MAINTENANCE TRAINING:

<u>EQUIPMENT</u>	<u>NAME</u>	<u>SIGNATURE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

SHIP INTEGRATION TRAINING (IF APPLICABLE):

<u>EQUIPMENT</u>	<u>NAME</u>	<u>SIGNATURE</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

2. Formal training for this equipment is available as follows:

Course No. \_\_\_\_\_  
 CIN \_\_\_\_\_  
 Quota Control \_\_\_\_\_  
 Training Act \_\_\_\_\_  
 Length \_\_\_\_\_  
 NEC \_\_\_\_\_  
 Phone No. \_\_\_\_\_

Course No. \_\_\_\_\_  
 CIN \_\_\_\_\_  
 Quota Control \_\_\_\_\_  
 Training Act \_\_\_\_\_  
 Length \_\_\_\_\_  
 NEC \_\_\_\_\_  
 Phone No. \_\_\_\_\_

**APPENDIX D**

**ALTERATION INSTALLATION TEAM (AIT)**  
**QUALITY SYSTEM REQUIREMENTS**

**ALTERATION INSTALLATION TEAM (AIT)**  
**QUALITY SYSTEM REQUIREMENTS**

The AIT shall provide to NAVSEA 04 and maintain a documented Quality System to ensure product conformance to contractual requirements. The system shall be approved by NAVSEA 04 and, as a minimum, comply with the requirements of Naval Sea Systems Command (NAVSEA) Standard Item 009-04 and all additional contract requirements.

NOTE: This will provide for the same level of quality assurance required for private sector industrial facilities under Master Ship Repair Agreements (MSRA) and Agreement for Boat Repairs (ABR).

1. **General**. The AIT shall maintain a quality system that will assure that all supplies and services provided for the accomplishment of alterations to ships conform to contract or task requirements whether manufactured or provided by the AIT, or procured from contractors or vendors. The quality system shall apply to supplies and services provided for the accomplishment of alteration to ships whether the alteration is a permanent change to the ship, Ship Alteration (SHIPALT), an equipment alteration (Field Change [FC], Ordnance Alteration [ORDALT], etc.) or a Temporary Alteration (TEMPALT). The AIT shall perform, or have performed, the inspections and tests required to substantiate product conformance to approved design drawings, specifications, and contract or task requirements and shall also perform, or have performed, all inspections and tests otherwise required by applicable SHIPALT records, installation drawings, contract or tasking documentation. Inspection and test Plans and Records shall be made available upon request by the NSA.

The Quality System shall include the following additional requirements, clarifications, and processes:

1.1. **Master Test Plans (MTPs)**. MTPs describe test objectives and the inspections and tests to be conducted to verify compliance with specifications and operating requirements to verify proper operation of impacted systems, equipment and interfaces after completion of shipwork. An MTP shall be prepared for each alteration (permanent or temporary), shall be prescribed by clear, complete and current instructions and shall be developed in conjunction with the Planning Yard (PY), the system/equipment Life Cycle Manager (LCM) and the responsible In-Service Engineering Activity (ISEA). During accomplishment of an alteration, associated MTPs shall be provided to the ship, and designated Naval Supervising Activity (NSA).

1.2. **Test Procedures (TPs)**. Equipment-unique TPs shall be obtained from the system/equipment LCM or the responsible ISEA and shall cover in detail the procedures for accomplishment of each of the equipment unique tests required to demonstrate the proper operation of all equipment impacted by accomplishment of the alteration. This includes all equipment that was modified or relocated as a result of the accomplishment of the alteration. Testing will be adequate to demonstrate compliance with applicable installation certification requirements (Signal Security [SIGSEC], TEMPEST, Radiation Hazard [RADHAZ]/Electromagnetic Interference [EMI]/Electromagnetic Compatibility [EMC], Submarine Safety [SUBSAFE], etc.). When TPs are not available from the system/equipment LCM or the

responsible ISEA, the AIT shall develop the equipment unique TPs based on technical manual information and direct coordination with the responsible ISEA, PY and Class Planning Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP).

1.3. Process controls. Process control procedures shall be an integral part of the quality system. In addition to process controls that may be required by the SHIPALT record, installation drawing, or contract or tasking documentation, the AIT will provide and maintain such process controls as are necessary to assure the quality of shipwork. At a minimum, process controls shall include the following:

1.3.1. Design product control procedures. The AIT's design product control procedures shall cover:

a. Assignment of responsibility for detailed examination, review, and internal approval authority for AIT design products.

b. Required qualifications of personnel performing detailed examination, review, and approval of AIT design products.

c. Procedural flow of design drawings and other associated documentation.

d. Checklists to be used in the detailed examination and review of design products. The checklists shall specify each examination to be performed to verify conformance of products to the applicable specifications.

e. Method of safeguarding classified information.

f. Methods providing for the prevention and ready detection of discrepancies and for timely and positive corrective action.

g. Method of safe storage of Master File Drawings, reference drawings, and other ship design documentation.

h. Methods providing for controlled issue of design drawing copies, both reproducible and non-reproducible.

i. Method for ensuring that listing of training and personnel qualifications/certifications is maintained and made available upon request by the NSA.

1.3.2. Installation process control procedures. Instructions shall be developed which identify requirements necessary to preclude damage to the ship or injury to personnel during the accomplishment of shipwork. These instructions shall include, but are not limited to:

a. Control of magnetic material.

b. Material storage at the work site.

c. Storage and use of hazardous materials including:

(1) Control of respirable fibers from man-made mineral fiber thermal insulating material during insulation and lagging operations.

(2) Control of fluorocarbons when utilized aboard ship.

(3) Control of MIL-H-19457 and MIL-H-22072 hydraulic fluid when utilized aboard ship.

(4) Control, clean-up, and disposal of Poly Chlorinated Biphenyl (PCBs).

(5) Control, clean-up, safety precautions, and environmental precautions for organotin.

(6) Initial monitoring, daily monitoring, and control of insulation and lagging operations.

d. Fire prevention.

e. Sight and hearing protection.

f. Material for staging and screening temporary covers and shelters.

g. Installation of cofferdams, patches, and shaft wraps.

h. Hotwork including:

(1) Determination of gas-free status and for control of hot work safety. (Note: AITs are required to use an OSHA certified marine chemist for entry into confined spaces.)

(2) Welding, brazing, and inspection operations (one for each operation). (Note: NAVSEA 04/SUPSHIP approval of the quality plan does not constitute approval of individual welding, brazing and NDT procedures. The approval requirements for these procedures are specified in NAVSEA S9074-AQ-GIB-010/248 (Requirements for Welding and Brazing Procedure and Performance Qualification) or NAVSEA T9074-AS-GIB-010/271 (Requirements for Non-Destructive Testing Methods).)

i. Uncrating/unpacking of equipment.

j. Storage and use of tools and test equipment.

k. Protection of pipes, cables, and equipment during shipwork.

l. System or equipment de-activation/reactivation.

m. Control of connector fabrication.

n. Workmanship. As a minimum, workmanship shall comply with all contract specifications including applicable NAVSEA Standard Items.

NOTE: Procedures required to control processes in the Safety and Environmental area, are not required to be submitted as part of the written Quality System.

1.4. Personnel Certifications. Procedures shall be maintained to assure personnel certifications that may be required to perform shipwork, depending on the work to be accomplished. These certifications include, but are not limited to, the following:

a. Hot work.

(1) Competent Person. Department of Labor Form OSHA 73, Designation of competent person(s) for each certified member of the AIT and designation of the certified marine chemist(s) responsible of preparing certificates are required.

(2) Firewatch personnel. Certificates of training for fire watch standing.

(3) Tank cleaning personnel. Certificates of safety practices training for tank cleaning personnel.

(4) Persons performing hot work. Certification(s) of qualification for performance of applicable hot work.

(5) Test personnel qualification. Certification(s) qualifications for nondestructive testing personnel.

b. Insulation work.

(1) Qualified Person. Provide written designation of the qualified person who will take and count samples, monitor personnel, inspect affected spaces, and certify affected areas are safe to enter.

c. Fluorocarbon use.

(1) Qualified/Competent Person. Certification of the person who will monitor atmosphere, inspect and certify spaces are safe to enter, and who will supervise these activities.

d. Electrical/Electronic Connector Work.

(1) Qualified personnel. Qualification certification for all Connector Fabricators, Connector Fabricator Supervisors, and Connector Fabrication Quality Assurance Inspector(s).

e. Accomplishment of Nondestructive Testing (NDT).

(1) Qualified personnel. Certification of qualifications for all certified NDT inspectors in the applicable NDT method/methods to be employed.

f. Painting of Critical Surfaces.

(1) Qualified personnel. Certification of qualification for all certified coating inspectors and painters/blasters.

g. Entry into Confined Spaces. Provide written designation of the OSHA certified marine chemist who will inspect atmosphere of confined spaces prior to entry.

h. SUBSAFE work. Workers require qualification and/or certification. AIT must be on NAVSEA Note 5000 in order to perform subsafe work.

i. Electrostatic Discharge (ESD) Work. Workers require ESD qualification.

j. PCMS Work. Workers require qualification/certification.

1.5. Headquarters Centrally Procured Material (HCPM).

1.5.1. Receipt of HCPM. Provide for receipt of HCPM as follows:

a. When the HCPM is received directly, one signed copy of the Shipping Document (DD Form 1348-1) and one signed copy of the Government Bill of Lading (GBL) shall be retained by the AIT.

b. The HCPM shall be inspected immediately upon receipt to verify conformance with description and requirements, verify quantity and check for possible damage.

c. Notify the shipping activity of any damage immediately after inspection. The Headquarters equipment manager and the SPM shall be notified if the damage is more than superficial.

d. If the HCPM is electronics equipment, the AIT shall provide testing and calibration of the equipment to verify that the equipment meets operational specifications.

1.5.2. Records of HCPM. Records of the receipt and disposition of each HCPM item shall be maintained.

1.6. Configuration Status Accounting. Depending on the program, the AIT may be tasked to maintain configuration records of equipment and software so that the ship and equipment managers can maintain configuration control. If configuration status accounting is tasked, the material control process shall provide the following:

1.6.1. Equipment accounting. For each piece of HCPM equipment (not material), which is intended to be installed aboard ship, that is received, ordered, or fabricated by the AIT, a computerized index of purchase orders, modifications accomplished and final disposition shall be maintained.

1.6.2. Software accounting. For each software item, which is to be installed in shipboard equipment, a computerized index of purchase orders, modifications accomplished and final disposition shall be provided and maintained.

1.6.3. Weight Accounting. Depending on the program and the ship class, the AIT may be tasked to maintain a written record of equipment and material removed (weight and installed location) which are not indicated on removal drawings to allow the ship and equipment managers to maintain an accounting of weight changes on weight critical ships. Generally this includes the removal of unused or dead-ended cables, the removal of unused foundations or the removal of unused equipment with associated cables and foundations when such removal is authorized by the ship and designated NSA and approved by the Ship Program Manager (SPM). The material control process shall provide procedures for weight accounting and reporting to the Planning Yard (PY) when required.

1.7 Problem Resolution Process Procedures shall be maintained that allow for documentation of actions to resolve any quality problems with installation or work control. The necessary documentation shall be made available to the AIT Manager and applicable NSA.

# **APPENDIX E**

## **GUIDANCE FOR DESIGN SHIPCHECKS**

## GUIDANCE FOR DESIGN SHIPCHECKS

1. General. The purpose of the design shipcheck is to gather as much relevant information as possible about the existing configuration of shipboard equipment, systems and compartments that may be impacted by the accomplishment of an alteration. The information should be as complete and accurate as possible in order to prevent the development of inaccurate or inadequate alteration design or the requirement for a second shipcheck of the ship to gather additional data. Design shipchecks shall be conducted at the ship's convenience on a not-to-interfere basis. Ship availability dates shall be coordinated between the activity developing the installation design and the respective Type Commander (TYCOMs)/Naval Supervising Activity (NSA). Prior to sending the clearance message, the AIT On-site Installation Coordinator/AIT Leader will verify with the NSA that ship and/or industrial activity operations will permit completion of ship-check requirements during the intended ship-check period. If not, the shipcheck shall be re-scheduled.

1.1. Planning Yard (PY) participation. When an Alteration Installation Team (AIT) is performing a design shipcheck in support of the accomplishment of a Ship Alteration (SHIPALT), participation by the PY may also be required as specified in the contract or tasking documentation. When PY participation is required by the contract or tasking documentation, funding for that participation shall be provided by the AIT Sponsor. When the PY does not participate in an AIT design shipcheck for accomplishment of a SHIPALT, the AIT Manager shall issue a Shipcheck Report to the PY to allow coordination with other SHIPALT designs that may be under preparation for the applicable ship. Shipcheck Reports are not required to be submitted by AITs for design shipchecks in support of accomplishment of Temporary Alterations (TEMPALTs) unless specified in the tasking documentation.

2. Design shipcheck materials. Typical materials that should be considered for a design shipcheck are as follows:

a. Paper prints of the arrangement of equipment, associated foundations, and the structural fabrication drawings (when significant bulkhead, deck, or overhead work is anticipated) of areas associated with the alteration are required. Also, system prints (e.g. ventilation [when modification of the ventilation duct system is anticipated], power distribution, lighting, Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance [C4ISR], Heating, Ventilation and Air Conditioning (HVAC), cooling water, lubricating oil) of all systems expected to be impacted by the accomplishment of the alteration. If modifications to electronics cooling water or HVAC systems are considered a possibility, piping diagrams of these systems should also be taken. Include a diagram that indicates the location of the applicable spaces relative to the total ship.

b. Copies of all correspondence between shipcheck activity and TYCOM, NSA, squadron/industrial activity, and ship that discuss the shipcheck, including the forwarding of security clearances, and any special arrangements/requirements.

c. Courier pass for carrying classified drawings/photographs and/or videotapes to and from the site.

3. Procedure. The following is a general procedure that may be used to conduct a design shipcheck on an active fleet ship. During conduct of the shipcheck, all members of the shipcheck team shall wear identification badges prominently displayed at all times. If the shipcheck is to be conducted on a nuclear ship, each member of the shipcheck team is to wear a thermal luminescent device (TLD) or other radiation-detection device, as directed by the applicable squadron, group, or NSA.

3.1. Advance Notification. Officially request the TYCOM/NSA to assign a date for access to the ship to be shipchecked. For TYCOMs that hold AIT Scheduling Conferences, the AIT Manager should present the proposed shipcheck schedule at the next conference to allow advance notification to the applicable ships and NSA of the intent to accomplish the alteration. The purpose of the shipcheck, number of people expected to participate and number of days that access will be required, access to secure areas or any other special requirements (securing transmitting equipment while shipchecking masts, etc.) shall be identified. The ship, NSA, and appropriate squadron or group shall be provided information copies of the request. For shipchecks conducted during a scheduled Chief of Naval Operations (CNO) availability, the AIT On-site Installation Coordinator/AIT Leader shall provide clearance information to the Ship/NSA a minimum of 5 working days prior to arrival or as established by TYCOM policy. If the shipcheck is to be conducted outside of a scheduled availability, the AIT On-site Installation Coordinator/AIT Leader shall provide visit clearance information, to the ship/NSA, a minimum of 5 working days prior to the AIT arrival or as established by TYCOM policy.

3.1.1. Security clearances. After the TYCOM/NSA has provided the access date(s) for the shipcheck, the AIT On-site Installation Coordinator/AIT Leader shall provide security clearance information to the ship, TYCOM, NSA, and appropriate Naval activities preferably 30 days but no less than 5 working days prior to the AIT arrival or as established by TYCOM policy.

3.1.2. Check-in. The AIT On-site Installation Coordinator/AIT Leader or his designated agent shall check-in with the appropriate NSA, to effect security verification, shipcheck schedule verification, and badge issuance prior to proceeding to the shipcheck ship.

3.2. Arrival. Arrival at the ship should be arranged in advance with the applicable NSA. Generally, arrival will be no earlier than 0830 and no later than 1530 unless previously arranged. Arrival between 1200 and 1300 should also be avoided.

3.2.1. Personnel identification. All required personnel identification should be available upon arrival at the site. Personnel identification shall be clearly visible, worn above the waist at all times when onboard ship and when transiting an industrial area.

3.2.2. Boarding the ship. Depending on the location of the ship at the site, access to the ship may be gained directly from the pier or via another ship. Personnel identification will generally be checked and recorded at the entrance to the pier or the industrial area, when passing through other ships and upon arrival on the ship to be shipchecked. Upon arrival at the ship to be shipchecked, the AIT On-site Installation Coordinator/AIT Leader will contact the established ship's point-of-contact or the Command Duty Officer. If neither is available, the Operations Officer or Work Center Supervisor of the area primarily involved in the shipcheck will be

requested. The AIT On-site Installation Coordinator/AIT Leader shall state the purpose of the visit and provide a short in-brief.

NO MEMBER OF THE TEAM SHALL LEAVE THE QUARTERDECK OR SHIP ENTRY AREA WITHOUT AN ESCORT OR UNTIL PERMISSION TO DO SO HAS BEEN GRANTED.

3.3. In-Brief. An in-brief shall be conducted to explain the purpose of the shipcheck, the systems and spaces to be shipchecked and the procedures to be used as follows:

a. Provide a list of all personnel involved in the shipcheck and indicate that member(s) is (are) designated as point(s) of contact for the shipcheck team.

b. Outline the general procedures and approximate schedule for use during the shipcheck.

c. If a camera will be used as part of the shipcheck, request permission to photograph and/or video tape the shipcheck area(s).

d. Request permission to scrape paint from cable tags or equipment label plates to determine tag/plate information. Provide a list of the locations where this was done to the ship at the end of the shipcheck.

e. If normally unmanned or restricted areas of the ship are to be shipchecked, request permission to access these areas during prearranged periods on a not-to-interfere basis.

f. If transmitting systems such as communications or radar systems need to be inhibited or secured to gain safe access to masts, antennas or topside equipment as part of the shipcheck, or if power or other ship services must be secured to a specific equipment to gain safe access to the interior or back of that equipment, request permission for ship's force personnel to inhibit or secure the required equipment during a prearranged period of the shipcheck. Ensure that the members of the ship's force follow proper tag-out procedures.

MEMBERS OF THE SHIPCHECK TEAM SHALL NOT INHIBIT OR SECURE SHIP EQUIPMENT. ENSURE THAT EQUIPMENT HAS BEEN SECURED OR INHIBITED AND THAT PROPER TAG-OUT PROCEDURES HAVE BEEN OBSERVED PRIOR TO GOING ALOFT OR GOING INTO OR BEHIND EQUIPMENT. ENSURE THAT SHIP'S FORCE IS NOTIFIED WHEN A PERSON IS GOING ALOFT OR IS ENTERING OR GOING BEHIND DANGEROUS EQUIPMENT AND WHEN THAT PORTION OF THE SHIPCHECK IS COMPLETED SO THAT CIRCUITS MAY BE RESTORED TO NORMAL OPERATION.

3.4. Shipcheck. Record the name and hull number of the ship being shipchecked and the date on each sheet of each drawing or sketch and all notes that are used or developed during the shipcheck as well as the date(s) of the shipcheck.

3.4.1. Recording physical configurations. Whenever possible, mark-up paper copies of the existing general arrangement drawing(s) of the space(s) to be impacted by the alteration. This will provide a record of the actual configuration of areas where equipment is to be removed or where new equipment is to be installed at the time of the shipcheck. If use of a camera is approved, photograph and/or video tape all critical locations, from more than one vantage point, and all areas that may have special design or installation problems. Place one or more six or eight-foot folding rules with enhanced markings in the areas to be photographed and/or video taped to provide an indication of scale and record critical measurements. For photographs, record the details of each photograph on the back of the photograph (ship identification, space identification and frame number, identification of the view [looking to port-forward from the centerline, etc.], and the subject of the photograph [back of rack no. 3], etc.). When using a video camera to record shipcheck information, record the data in a film log noting the tape number, ship identification, and sequence of recorded data (space identification and frame number, identification of the view [looking to port-forward from the centerline, etc.], and the subject of the view [back of rack no. 3], etc.). Information that may be needed to develop detail installation design includes:

a. Location of all compartments, spaces and areas in the ship that may be impacted by accomplishment of the alteration. This includes the name, compartment number and level of each space as well as all adjacent spaces (including above and below).

b. Within each space:

(1) Overall dimensions of the space.

(2) Measured distance between ship centerline and a specific location in the space (generally the bulkhead nearest the centerline).

(3) Frame member information including frame numbers in the areas of interest, type, construction, and measured separation between adjacent frames.

(4) Details of bulkhead and partition construction, including type, material and contour. Determine and note if bulkheads are part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, Collective Protection System (CPS) boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(5) Details of bulkhead and partition support members including type, material, size and spacing.

(6) Location and measured details of all structural interference within the space.

(7) Details of overhead construction (including main support beams), including type, material, contour and measured distance above the deck at the corners of the space and at other locations within the space. Determine and note if the overhead is part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, CPS boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(8) Details of deck construction (including support beams), including type, material and contour. Determine and note if deck is part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, CPS boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(9) Location and details of all doors, hatches, and scuttles including type, material, size and swing. Determine and note if doors and hatches are part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, CPS boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(10) Location and details of all stanchions including type and size.

(11) Location and details of all pipe runs including pipe size, service, distances from overhead at various locations, distance from nearest bulkhead at various locations, and penetration locations.

(12) Location and details of all waveguide runs including waveguide type/dimensions, service (radar, Electronic Warfare (EW), etc.), distances from overhead at various locations, distance from nearest bulkhead at various locations, and penetration locations.

(13) Location and details of all vent duct runs including duct type/dimensions, service, distances from overhead at various locations, distance from nearest bulkhead at various locations and penetration locations.

(14) Location and details of all cableways including type, construction, routing, distances from overhead at various locations, distance from nearest bulkhead at various locations, available space, and penetration locations (stuffing tubes, riser boxes and bulkhead/-deck coamings).

(15) Locations and measured details of all fabricated equipment foundations (measurements referenced to centerline/bulkhead and height above the deck). Indicate equipment mounted on foundation.

(16) Locations, details and identification of all power, lighting, and Interior Communications (IC) distribution panels and switchboards, including type (symbol number), panel or switchboard number, service, distribution data, distance of the bottom of the enclosure to the deck, and distance from an outside edge of the enclosure to the nearest bulkhead.

(17) Locations, details and identification of all power, lighting, and IC fixtures (including connection boxes and power outlets) that are not rack mounted, including type (symbol number), service, system identification data, distance of the bottom of the fixture to the deck (or overhead for overhead mounted equipment), and distance from the outside edge of the fixture to the nearest bulkhead.

(18) Identification and measured location of all other permanent equipment including:

(a) Racks and all equipment mounted in the racks. Include space between back of rack and bulkhead (or nearest structure) and space between front of rack and nearest rack, equipment or structure if less than five feet. Also note any pull-out, swing-out, or special access clearances that must be maintained.

(b) Shelf mounted equipment.

(c) Bulkhead, deck and overhead mounted equipment.

(d) Desks and tables including type, size, and fabrication.

(e) Fiddle boards including type, size, and fabrication.

(f) Plotting tables including type, size, and fabrication.

(g) Status or display panels including type, size, and fabrication.

(h) Workbenches including type, size, and fabrication.

(i) Storage containers (safes, lockers, cabinets, book shelves, bins, etc.) including type, size, and fabrication.

(j) Chairs, stools and benches including type, size, and fabrication.

(k) Administrative support equipment (copiers, shredders, sorting bins/trays, etc.) including type, size, and fabrication.

Note specifically the model (R-2368A/URR, etc.) and variant (AN/WSC-3 (V) 3, etc.) of the equipment, as applicable.

(19) Identify and measure the location of all other permanent equipment that may require removal as interference during accomplishment of the alteration. Systems and equipment that requires permanent modification or relocation to accommodate the alteration are not considered interference but part of the alteration design.

c. Within adjacent spaces (including above and below), the measured locations of cable, pipe, waveguide, and vent duct penetrations that may be impacted by the alteration. Determine possible access problems and special requirements such as fire watches, equipment protection, interference removal, etc., which may be needed in these spaces when the alteration is accomplished.

d. Where cables will be removed or installed in cableways outside of the primary areas impacted by the alteration, these cableways shall also be shipchecked. For cableways that will have existing cable(s) permanently removed, the required information includes measured cableway routing, general cableway construction, penetrations that need to be plugged/filled, and general accessibility. For cableways that will have new cables installed, the required

information includes measured routing of the cableway, general construction, existing spare capacity, spare penetrations that can be reused or measurements of locations where new penetrations can be installed, and locations where existing cableway hangers need to be modified or replaced or where new hangers will be required.

e. Where modifications to ship's weatherdeck structure are required or the arrangement of weatherdeck equipment is impacted by the accomplishment of an alteration. Required information may include:

(1) Detailed measurements will be required of all antennas, damage control equipment, and replenishment stations within 30 feet of the impacted structure or equipment will be required. Record the identification of all such equipment/stations that fall within this radius.

(2) Detailed measurements will be required of all CPS and Counter Measure Wash Down System (CMWDS) components and boundaries within 30 feet of the impacted structure or equipment will be required. Record the identification of all such components that fall within this radius.

(3) Material composition of the ship structure (steel, aluminum, etc.).

(4) Types, sizes, and locations of structural beams supporting the deck and structure in the vicinity of proposed new structure or equipment location(s). Determine interior structure and equipment that may be immediately inside the ship from the proposed location(s).

(5) Possible location(s) for required cable penetration(s) for new or relocated equipment. Determine possible interior installation/access problems associated with new penetrations.

(6) Electromagnetic Compatibility (EMC) and Electromagnetic Pulse (EMP) protection measures.

(7) Measured cable routing through interior and exterior cableways for all cables from new or relocated equipment to the primary termination (power or control, etc.). Determine locations where conduit, penetrations, cable protection, etc., will be required to meet all physical protection, Electromagnetic Interference (EMI), Radio Frequency Interference (RFI), EMC, EMP and TEMPEST requirements. Determine what modifications to existing cableways will be required. Where the most direct cable run does not appear to be practicable for an AIT installation or where portions of the proposed cable run could not be visually observed as part of the shipcheck and the actual condition of the existing cableway is unknown, identify possible alternate cable runs with the above information.

(8) Photographs and/or videotapes of the proposed new or modified structure or equipment location(s), all surrounding antennas, equipment and structure, and the entire proposed cable run(s).

f. Where antennas are to be installed or relocated as part of the alteration, detailed measurements must be made not only for the new antenna location but also for the routing of the antenna cables. Required information may include:

(1) Identification of all antennas (type, function [communications, radar/Identification Friend of Foe (IFF), Electronic Warfare (EW), Close In Weapons System (CIWS), special function, etc.] and antenna identification number) and all permanent weatherdeck equipment and ship's structure within 30 feet of the proposed new antenna location.

(2) Measured distances from new antenna location to existing antennas, permanent weatherdeck equipment, and ship's structure within 30 feet of the proposed new antenna location.

(3) Material composition of ship structure (steel, aluminum, etc.).

(4) Type, size, and locations of structural beams supporting the deck and structure in the vicinity of the proposed new antenna location. Determine interior structure and equipment that may be immediately inside the ship from the proposed location.

(5) Possible location(s) for required cable penetration(s). Determine possible interior installation/access problems associated with new penetrations.

(6) Measured cable routing through interior and exterior cableways for all antenna cables from the antenna to the primary termination (receiver, transmitter, coupler, Radion Frequency (RF) distribution panel, etc.). Determine locations where conduit, penetrations, cable protection, etc., will be required to meet all physical protection, EMI, RFI, EMP, EMC and TEMPEST requirements. Determine what modifications to existing cableways will be required. Where the most direct cable run does not appear to be practicable for an AIT installation, or where portions of the proposed cable run could not be visually observed as part of the shipcheck and the actual condition of the existing cableway is unknown, identify possible alternate cable runs with the above information.

(7) Photographs and/or video tapes of the proposed new antenna location(s), all surrounding antennas, equipment and structure, and the entire proposed RF and control cable run(s). Take photographs and/or videotapes of the proposed new antenna location from the pier area or from another ship (from a distance) to clarify the relationship of the proposed antenna location(s) to the rest to the ship.

3.4.2. Determining configurations of electrical/electronic systems. Whenever possible, mark-up paper copies of the existing system diagrammatic drawing(s) (block, isometric or cabling deck plan) of the individual systems to be impacted by an alteration. This will provide a record of the actual configuration of those systems at the time of the shipcheck. It is important to determine and record all equipment, components, and cabling to be impacted by the alteration. Information that may be required to develop a detailed design includes:

a. All equipment that could be removed or require relocation as a result of the accomplishment of the alteration. Note specifically the model (CU-2279A/U, etc.) and variant (AN/WSC-3 (V) 3, etc.) of the equipment, as applicable.

b. All components (panels, connection boxes, transition devices, etc.) that could be impacted. Identify transformers planned for removal or relocation that could contain PCBs and therefore require special handling and disposal as hazardous material.

c. All cabling and cabling components that are part of the system that could be impacted. These include:

(1) All cabling identified by circuit identification number and cable type. For cables to be removed or relocated identify cable-insulating material (older cables may contain asbestos or other hazardous material and will require special handling and disposal as hazardous material).

(2) All connectors identified by type and connection to equipment or components (J1, etc.).

(3) All in-line devices (tees, dividers, combiners, transition fittings, etc.) by type/nomenclature.

(4) All impacted (existing or required new) cable penetrations (equipment, bulkhead, or deck stuffing tubes, strain relief, etc.) by type, size, material, and construction (kickpipes, gang or multiple penetrator, etc.) For existing penetrations and tubes, record penetration hole number/location identification number if assigned. Record also any existing spare penetrations that could be used for new cabling. Indicate locations where new penetrations will be required.

(5) Identify the general routing of the cabling through the cableways if an isometric or deck cabling diagram is to be prepared for the ripout diagram and/or the alteration cabling diagram. Include special cable routing requirements (e.g. physical protection, major obstructions, ship expansion joints, EMI/EMP/TEMPEST protection), and the general location of all penetrations and stuffing tubes.

d. All existing waveguide and waveguide components (bends, transitions, etc.) that are to be impacted by the alteration and all special design considerations will need to be addressed as part of the alteration design. Major interference that will be relocated, rerouted, or modified to accommodate the alteration installation, maintenance access plate locations, and locations of new bends or fittings are also part of the alteration design.

3.4.3. Recording configurations of mechanical systems. Whenever possible, mark-up paper copies of the existing system diagrammatic drawing(s) of the individual mechanical systems to be impacted by an alteration. This will provide a record of the actual configuration of those systems at the time of the shipcheck. It is important to determine and record all equipment, components, and piping to be impacted by the alteration. Information that may be required to develop a detailed design includes:

a. All equipment that could be removed or relocated as a result of the accomplishment of an alteration. Note specifically the model and or type identification of the equipment, as applicable.

b. All components (indicator/control panels, sensors, limit switches, etc.) that are part of the system that could be impacted.

c. All piping and piping components that are part of the system that could be impacted. This includes:

(1) All piping identified by system identification, type, size and length.

(2) All valves identified by system identification, type, size and application.

(3) All fittings (elbows, tees, transition fittings, check valves, filters, hoses, etc.) by type and size.

(4) All pipe penetrations by type and size. Record penetration number/location identification number if assigned. Record also any spare penetrations that could be used for new piping.

(5) All pipe insulation that must be removed, relocated or replaced, even as interference (older insulation may contain asbestos or other hazardous material and will require special handling, storage, and disposal as hazardous material).

d. All bulkhead or deck insulation that must be removed, even to gain access to interference items (older insulation may contain asbestos or other hazardous material and will require special handling, storage, and disposal as hazardous material).

3.5. Shipcheck completion. Upon completion of the shipcheck, collect all materials used for the shipcheck and prepare to depart the ship. Ensure that all equipment and component access panels that were opened or disturbed are restored to their proper position. Ensure that all materials and portable equipment, which were temporarily removed to gain access to items to be shipchecked, are restored to their original locations and are stowed to the satisfaction of the crew. Ensure that all shipcheck-generated trash is picked up and properly stored/disposed .

3.6. Departure. When departing the ship at the completion of the shipcheck, notify the ship's point-of-contact or other assigned member of the crew that the shipcheck has been completed and offer (and be prepared) to provide an out-brief on the information gathered/determined as part of the shipcheck. Allow a review of all photographs and/or videotapes for possible classification prior to departure from the ship. When departing an industrial activity, inform the NSA of the departure. All special badges, passes, dosimeters, etc. will be turned-in, as required, in accordance with local requirements. Prior to final departure from the area, check out with the NSA.

# **APPENDIX F**

## **SHIP'S FORCE IN-BRIEF**

## SHIP'S FORCE IN-BRIEF

Purpose. The purpose of a Ship's Force in-brief is to provide an overview and objectives of the alteration to be accomplished. The in-brief shall outline work to be performed, review the schedule of accomplishment and identify impacts on the ship, confirm arrangements for requested/required services, establish responsibilities and points of contact, review planned ship's evolutions, and review Integrated Logistics Support (ILS) products and training to be provided.

1. Alteration Overview. The overview provides a description of the alteration purpose and the expected improvements to be provided, areas of the ship impacted by the alteration and additional areas affected by the accomplishment of the alteration and the impact on ship's services.

2. Work to be accomplished.

a. Review of installation drawings.

(1) Arrangement drawing(s) indicating equipment to be removed and locations of new, modified, and relocated equipment.

(2) System drawing(s) indicating system interconnections and interfaces with ship system interfaces including power and ventilation.

(3) Cable and/or pipe runs.

b. Review of equipment and materials to be used.

(1) Review of equipment and material to be installed.

(2) Review of equipment and material to be removed

(3) Review of hazardous materials to used or removed and handling and disposal procedures.

c. Review of ship's systems impacted during alteration accomplishment and duration of impact.

d. Review of areas that may have restricted access during alteration accomplishment.

(1) Areas where welding is to be accomplished.

(2) Areas where hazardous materials is to be used or handled.

e. Review of applicable process control procedures to be used for fire prevention, hot work, sight and hearing protection, protection of pipes, cables, and equipment during shipwork, system or equipment deactivation/reactivation, material storage at the work site, storage, use and disposal of hazardous materials (including excess and partially used hazardous material

and hazardous material removed as part of the accomplishment of the alteration), material for staging and screening, temporary covers and shelters, uncrating/unpacking of equipment and workmanship.

f. Review of personnel qualification/certifications for work requiring specific qualifications.

Schedule of events. A detailed review of schedule-of-work and test plan and/or System Operational Verification Testing (SOVT) agenda of all functional items shall be provided during the briefing. Key event checkpoints (e.g. piping flush, hydrostatic testing, cableway and compartment closeout) and system operational testing of all functional items will be provided for ship witnessing. The material deliveries, required compartment accesses, security requirements, and shift schedules will also be discussed at this time. The schedule information shall include projected start and finish dates, planned shift start time(s), planned testing periods, planned training dates and planned ILS turnover.

Planned ship's evolutions. Any special restrictions due to ship's evolutions during the availability (weapon/ordnance loading, ship's receiver/transmitter testing, emergent requirements, other alterations being accomplished, etc.), which could impact or be impacted by work being performed by the Alteration Installation Team (AIT), will also be discussed at this time. It will be the responsibility of the AIT to perform required shipwork around these restrictions. If restrictions exist which can not be accommodated by the AIT without jeopardizing scheduled completion date of the alteration or the scheduled departure date of the ship, the AIT will make arrangements with the Naval Supervising Activity (NSA) for accomplishment of the alteration during a subsequent availability and withdraw from the ship.

Confirmation of services. AIT arrangements for crane and/or welding services, special test requirements, fire watches, etc., will also be confirmed at this time. For alterations being accomplished during Chief of Naval Operations (CNO) availability, arrangements and associated funding for services included in the contract (if the alteration is to be accomplished at a private activity) (crane services, welding services, special test requirements, fire watches, NSA disposal of turned-in equipment/material, etc.) will also be confirmed at this time.

Points-of-contact. The AIT On-site Installation Coordinator/AIT Leader shall request the ship to provide a list of all points-of-contact for accomplishment of the alteration(s). The points-of-contact list will include those technical personnel assigned to work with the AIT and witness testing, the names of those people authorized to sign-off the Alteration Completion Report, and the names of personnel authorized to accept delivery of computer tapes and ILS items. For alterations being accomplished during CNO availability, the NSA representatives, Planning Yard (PY) On-Site Representatives (Program Representative and Configuration Data Manager [CDM]), and the lead ship availability manager from the industrial activity will also be identified. For alterations being accomplished during a CNO availability, the AIT On-site Installation Coordinator will also identify which AIT member(s) will attend daily progress meetings.

Responsibilities. The AIT On-site Installation Coordinator will be identified as being responsible for the conduct of the AIT and the person to be contacted in regard to work deficiencies, scheduling problems, or problems with AIT members. The AIT On-site Installation Coordinator shall be accessible to ship's force throughout the period(s) the AIT is on board and is responsible for the resolution of identified deficiencies or issues associated with accomplishment of the assigned alteration(s). When work is being accomplished during a CNO

availability, the AIT On-site Installation Coordinator shall also be accessible to the NSA and the lead ship availability manager at all times during period(s) the AIT is on board the ship. The AIT On-site Installation Coordinator shall be responsible for reporting any changes in schedule and providing notification to the ship and NSA of upcoming key event checkpoints and testing evolutions. Additionally, If multiple-shift work is to be accomplished, the AIT On-site Installation Coordinator(s) for each shift shall be identified.

ILS and training to be provided. The AIT On-site Installation Coordinator/AIT Leader will review all ILS products and provide a current, approved ILS Certification Form as well as all training to be provided at the time of installation. All applicable ILS elements listed in the ILS portion of the Alteration Completion Report and any known ILS deficiencies shall be addressed.

# **APPENDIX G**

## **LIST OF ACRONYMS**

## List of Acronyms

3M	Maintenance and Material Management
AAO	Approved Acquisition Objective
ABR	Agreement for Boat Repair
ACAT	Acquisition Category
AD	Airworthiness Directive
ADP	Automated Data Processing
ADUSD(L)(MDM)	Assistant Deputy Under Secretary of Defense(Materiel and Distribution Management)
AEL	Allowance Equipage List
AER	Alteration Equivalent to Repair
AIPS	Alteration Installation Planning System (Now NDE-NM)
AIT	Alteration Installation Team
A&I	Alteration and Improvement Item
ALT	Administrative Lead Time
ALT	Alteration (or change/ modification)
ALTID	Alteration Identification
AMP	Alteration Management Planning
AMP-FCO	Alteration Management Planning – Field Coordinating Office
APL	Allowance Parts List
AR	Alteration Request
ASC	Alteration Status Code
ASI	Automated Shore Interface
BG	Battle Group
BOM	Bill of Material
BOSS	Buy Our Spares Smart Program
C4I	Command, Control, Communications, Computer, Intelligence
C4ISR	Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance
CAGE	Contractor And Government Entity
CCB	Configuration Control Board
CCP	Container Consolidation Point
CDO	Command Duty Officer
CD-ROM	Compact Disk - Read Only Memory
CDM	Configuration Data Manager
CDMD-OA	Configuration Data Manager Database-Open Architecture
CFFC	Commander U.S. Fleet Forces Command
CHENG	Chief Engineer
CHET	Combatant Homeport Engineering Team
CINCLANTFLT	Commander-in-Chief U.S. Atlantic Fleet
CINCPACFLT	Commander-in-Chief U.S. Pacific Fleet
CIWS	Close In Weapons System
CLSSA	Cooperative Logistics Supply Support Arrangements
CM	Configuration Management
CMWDS	Counter Measure Wash Down System
CN	Change Notice
CNO	Chief of Naval Operations
CO	Commanding Officer
COH	Complex Overhaul
COMNAVSEASYSKOM	Commander Naval Sea Systems Command
COMPACFLT	Commander U.S. Pacific Fleet
CORN	
COSAL	Coordinated Shipboard Allowance List
COSIS	Care of Supplies in Storage
CPM	Centrally Provided Material
CPS	Collective Protection System
CRMS	Contingency Retention Munitions Stock

CRS	Contingency Retention Stock
CSIS	Central Secondary Item Stratification
CSOSS	Combat Systems Operational Sequencing System
CSTOM	Combat System Technical Operations Manual
DAASC	Defense Automatic Addressing System Center
DBR	Data Base Reconciliation
DDGOS	Deep Diving, General Overhaul Specifications
DDP	Demand Development Period
DC4ILO	Data Companion for Integrated Logistic Overall/Data Base Reconciliation
DEPRA	Defense Program for Redistribution of Assets
DIIP	Defense Inactive Item Program
DIOR	Director for Information Operations and Reports
DIRSSP	Director, Strategic Systems Programs
DLA	Defense Logistics Agency
DLAI	DLA Instruction
DLAR	DLA Regulation
DLMS	Defense Logistics Management System
DLMSO	Defense Logistics Management Standards Office
DLIS	Defense Logistics Information Service (Now FLIS)
DLSS	Defense Logistics Standard System
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DMP	Depot Modernization Period
DPMA	Docking Phased Maintenance Availability
DoDAAD	Department of Defense Activity Address Directory <b>(Parts I through III, References (a) through (c))</b>
DoDSASP	DoD Small Arms Serialization Program
DPIA	Docking Planned Incremental Availability
DPPG	Defense Packaging Policy Group
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
DSS-SOC	Deep Submarine System-Scope of Certification
DSRA	Docking Selected Restricted Availability
DSAA	Defense Security Assistance Agency
DTR	Defense Transportation Regulation
DUSD(L)	Deputy Under Secretary of Defense for Logistics
EA	Equipment Alteration
EC	Engineering Change
ECP	Engineering Change Proposal
EDFP	Engineering Data For Provisioning
EDI	Electronic Data Interchange
EDSRA	Extended Docking Selected Restricted Availability
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
EOA	End of Availability
EOH	Engineering Overhaul
EOI	End Of Installation
EOP	Engineering Operational Procedure
EOQ	Economic Order Quantity
EOSS	Engineering Operational Sequencing System
EPA	Environmental Protection Agency
ERMS	Economic Retention Munitions Stock
ERO	Engineering Refueling Overhaul
ERS	Economic Retention Stock
ERT	Engineering Review Team
ESD	Electrostatic Discharge
ESRA	Extended Selected Restricted Availability
EW	Electronic Warfare
FAA	Federal Aviation Administration

FAD	Force/Activity Designator
FC	Field Change
FCB	Field Change Bulletin
FCO	Field Coordinating Office
FLIS	Federal Logistics Information System
FLTINC	Fleet Commander-in-Chief
FLTILOTEAM	Fleet Integrated Logistics Overhaul Team
FMP	Fleet Modernization Program
FMPMIS	FMP Management Information System
FMS	Foreign Military Sales
FSC	Federal Supply Classification
FSCAP	Flight Safety Critical Aircraft Part
FSCG	Federal Supply Classification Group
FTSCLANT	Fleet Technical Support Center Atlantic
FTSCPAC	Fleet Technical Support Center Pacific
GAITS	Global Alteration Installation Team Scheduling (Now NDE-NM)
GBL	Government Bill of Landing
GIDEP	Government Industry Data Exchange Program
GFE	Government Furnished Equipment
GFM	Government Furnished Material
GPETE	General Purpose Electronic Test Equipment
GSA	General Services Administration
GSO	General Specification for Overhaul
HCPM	Headquarters Centrally Provided Material
HAZCOM	Hazardous Communication
HAZMAT	Hazardous/Toxic Material
HME&O	Hull, Mechanical, Electrical, and Ordnance (equipment)
HSC	Hardware Systems Command
HW	Hazardous Waste
IA	Installing Activity
IAW	In Accordance With
IC	Interior Communications
ICE	Inventory Control Effectiveness
ICP	Inventory Control Point
ICS	Interim Contractor Support
IDIQ	Indefinite Delivery/Indefinite Quantity
IFF	Identification Friend or Foe
ILO	Integrated Logistics Overhaul
ILS	Integrated Logistics Support
IMA	Intermediate Maintenance Activity
IMC	Item Management Code
IMI	Intermediate Modulation Interference
IMM	Integrated Materiel Manager
INCO	Installation and Checkout
IPT	Integrated Product Team
IR	Installation Report
I&C	Installation And Checkout
I&S	Interchangeable and Substitutable
ISC	Installation Status Code
ISEA	In-Service Engineering Agent
ISRA	Incremental Selected Restricted Availability
ISS	Interim Supply Support
ITM	Index of Technical Manuals
JASMMM	Joint Aviation Supply and Maintenance Material Management
JCF	Justification/ Cost Form
JCN	Job Control Number
JETDS	Joint Electronics Type Designation
JFMM	Joint Fleet Maintenance Manual
JPIWG	Joint Physical Inventory Working Group

JSACG	Joint Small Arms Coordinating Group
LAN	Local Area Network
LANTFLTIO	Atlantic Fleet Integrated Logistics Overhaul
LAR	Liaison Action Request
LCM	Life Cycle Manager
LCRS	
LMARS	Logistics Metric Analysis Reporting System
LOGDESMAP	Logistics Data Element Standardization and Management Program (DoD) Procedures
LOR	Level of Repair
LOT	Life-of-Type
LRU	Lowest (or Line) Replaceable Unit
LSIS	Local Secondary Item Stratification
LSSC	Logistic Support Status Code
LUIT	Local-Level Unique Item Tracking
MAM	Maintenance Assistance Module
MAPAD	Military Assistance Program Address Directory
MCA	Materiel Control Activity
MACHALT	Machinery Alteration
MIA	Missing In Action
MIL-SPEC	Military Specification
MILSBILLS	Military Standard Billing System
MILSCAP	Military Standard Contract Administration Procedures
MILSTAMP	Military Standard Transportation and Movement Procedures
MILSTRAP	Military Standard Transaction Reporting and Accounting Procedures
MILSTRIP	Military Standard Requisitioning and Issue Procedures
MIP	Maintenance Index Page
MME	Military Mission Essentiality
MOA	Memorandum of Agreement
MPMP	Maintenance Program Master Plan
MRC	Maintenance Requirement Card
MRO	Materiel Release Order
MSD	Material Support Date
MSDS	Material Safety Data Sheet
MSR	Master Ship Repair
MSRA	Master Ship Repair Agreement
MTP	Master Test Plan
NATO	North Atlantic Treaty Organization
NAVAIR	Naval Air Systems Command
NAVICP	Naval Inventory Control Point
NAVOSH	Naval Occupational Safety and Health
NAVSEA	Naval Sea Systems Command
NDE-NM	NAVY Data Environment-Navy Modernization
NDI	Non-developmental Item
NDT	Non-Destructive Testing
NIMSR	Non-consumable Item Materiel Support Requests
NLT	No Later Than
NSA	Naval Supervising Activity
NSLC	Naval Sea Logistics Center
NSN	National Stock Number
NSRF	Naval Ship Repair Facility
NSTS	NAVSEA Technical Specification
NSV	Noise, Shock, and Vibration
NTCSS	Naval Tactical Command Support System
NUCALT	Nuclear Alteration
NUIT	National-level Unique Item Tracking
OASD (C4I)	Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence
OBRP	On Board Repair Part

OEM	Original Equipment Manufacturer
OL	Operating Level
O&MN	Operation and Maintenance, Navy
OPNAV	Operations Navy
ORDALT	Ordnance or Fire Control System Alteration
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
OSI	Operating Space Item
OSR	On Site Representative
OST	Order and Shipping Time
OSTL	Order and Shipping Time Level
PAL	Preliminary Allowance List
PARM	Participating Manager
PBM	Planning Board for Maintenance
PCA	Physical Configuration Audit
PCB	Poly Chlorinated Biphenyl
PCMS	Passive Counter Measure System
PEO	Program Executive Officer
PIA	Planned Incremental Availability
PICA	Primary Inventory Control Activity
PICO	Pre-Installation Checkout
PLT	Production Lead Time
PM	Program/ Project Manager
PMA	Phased Maintenance Availability
PMRP	Precious Metals Recovery Program
PMS	Planned Maintenance System
P/N	Part Number
POA&M	Plan of Actions and Milestones
POD	Port of Debarkation
POE	Port of Embarkation
POL	Petroleum, Oils, and Lubricants
POM	Program Objective Memorandum
PPE	Personal Protective Equipment
PPL	Provisioning Parts List
PR/DS	Potential Reutilization and/or Disposal Stock
PSAR	Preliminary SHIPALT Record
PSD	Program Support Data
PTD	Provisioning Technical Documentation
PY	Planning Yard
QA	Quality Assurance
QDR	Quality Deficiency Report
QR	Quality Review
QRA	Quick Reaction Alterations
QRC	Quick Reaction Capability
QRS	Quick Reaction Spares
QS	Quality System
QTY	Quantity
RADHAZ	Radiation Hazard
RAV	Restricted Availability
RBS	Readiness-Based Sparing
RCOH	Refueling Complex Overhaul
RCS	RADAR Cross Section
RDD	Required Delivery Date
RDT&E	Research, Development; Test, and Evaluation
REFDES	Reference Designation
RF	Radio Frequency
RFI	Radio Frequency Interference
RIC	Record Identification Code
RIN	Record Identification Number

RMAIS	Regional Maintenance Automated Information System
RMC	Regional Maintenance Command
RMMCO	Regional Maintenance and Modernization Coordination Office
ROH	Refueling Overhaul
RORO	Roll On – Roll Off
RRMS	Requirement Related Munitions Stock
RSC	Reason for Stockage Category
SAMIS	Ship Alteration Management Information System (Now FMPMIS)
SAR	Ship Alteration (SHIPALT) Record
SAS	
SCAT	Sub-Category Code
SCIB	Ship Characteristics Improvement Board
SCL	Standard Components List
SCLSIS	Ship Configuration and Logistic Support Information System
SCN	Shipbuilding and Conversion, Navy
SCN	Specification Change Notice
SCO	Service Craft Overhaul
SCPL	System Configuration Provisioning List
SECDEF	Secretary of Defense
SECNAV	Secretary of Navy
SEOC MOD	Submarine Engineered Operating Cycle Modernization
SF	Ships Force
SDR	Supply Discrepancy Report
SHAPEC	Ship Availability Planning and Engineering Center
SHF	Ship History File
SHIPALT	Ship Alteration, formal approved permanent change
SIB	Ship Information Book
SICA	Secondary Inventory Control Activity
SID	SHIPALT (Ship) Installation Drawing
SIGSEC	Signal Security (electromagnetic/ RF)
SMCA	Single Manager for Conventional Ammunition
SMMO	Ship Material Maintenance Officer
SM&R	Source, Maintenance, and Recoverability (code)
SNAP	Shipboard Non-tactical ADP Program
SOA	Start of Availability
SOEAPL	Summary of Effective APLs/AELs
SOVT	System Operation Verification Test
SOM	SUPSHIP Operations Manual
SPALT	Strategic Systems Program Alteration
SPAWAR	Space and Naval Warfare Systems Command
SPM	Ship Program Manager
SPR	Special Program Requirement
SPTTE	Special Purpose Test Equipment
SRA	Selected Restricted Availability
SRD	Selected Record Drawing
SRF	Ship Repair Facility
SSCR	Shipboard Systems Certification Requirements
SSIR	Supply System Inventory Report
SSM	Ship's System Manual
SSR	Ship Selected Record
SSRD	Ship Selected Record Drawing
STO	System Test Officer
SUBMEPP	Submarine Maintenance, Engineering, Planning, and Procurement
SUBSAFE	Submarine Safety
SUPSHIP	Supervisor of Shipbuilding, Conversion, and Repair
SWT	Standard Work Template
SYSCOM	Systems Command
TAB	Training Aid Booklet
TAMS	Test & Monitoring System

TAV	Total Asset Visibility
TAV	Technical Availability
TCD	Target Completion Date
TCN	Transportation Control Number
TDP	Technical Data Package
TEMPALT	Temporary Alteration
TEMPEST	
TGI	Task Group Instruction
TLD	Thermal Luminescent Device
TM	Technical Manual
TMR	Total Munitions Requirements
TP	Test Plan
TRF	Trident Refit Facility
TUM	Tag-out User's Manual
TYCOM	Type Commander
TYCOMALT	Type Commander Alteration
UII	Unique Item Identifier
UIT	Unique Item Tracking
UITC	Unique Item Tracking Committee
UMMIPS	Uniform Materiel Movement and Issue Priority System
UND	Urgency of Need Designator
USCG	United States Coast Guard
USSOCOM	United States Special Operations Command
USW	Undersea Warfare
VR	Voyage Repair
WAF	Work Authorization Form
WHS	Washington Headquarters Services
WSF	Weapon Systems File

# APPENDIX H

# DEFINITIONS

1. Alteration. Any change in the hull, machinery, equipment, fittings, computer program and/or interface to external equipment, regardless of whether it involves a change in design, materials, number, location or relationship of an assemblies component parts whether it is undertaken separately from, incidental to or in conjunction with repairs.
2. Alteration Approval, Technical. A certification that all requirements necessary for successful alteration installation, operation and support have been met. Requirements include such items as SAR, SHIPALT Installation Drawings (SIDS), installation funding, removal and system restoration funding (TEMPALTs only), etc. The SPM is the technical approval authority for all Title K, K-P, D and F SHIPALTs, Surface Ship TEMPALTs and Equipment Alterations that may affect ship's power, weight or air conditioning requirements and all Alteration and Improvement (A&I) items. All other types of Equipment Alterations normally require approval of the Participating Manager (PARM).
3. Alteration Authorization. Authorization that is required prior to the accomplishment of any alteration. Chief of Naval Operations (CNO) authorization is required before military improvement type K-Alts may be installed. The Ship Program Manager (SPM) approves and either the Fleet Commander-in-Chief (FLTCINC) or Type Commander (TYCOM) may authorize or program Title D or F Ship Alteration (SHIPALTs) and Equipment Alterations. Alteration Equivalent to Repair (AERs) require that the designated system command, Program Executive Office (PEO) or SPM who exercises technical authority over the affected article approve them for accomplishment. All Command, Control, Communications, Computer, Intelligence (C4I) and Combat System Alterations and alterations impacting interoperability must be authorized in accordance with the D-30 process, by the FLTCINC, before they can be installed, regardless of the type of alteration.
4. Alteration Completion Report. A mandatory report certifying an alteration's accomplishment. The cover-page, report distribution requirements and report enclosures are contained in Appendix C to this specification. This report provides detailed information for use in process improvement design, Alteration Installation Team (AIT) performance measurement, alteration deficiency tracking, etc.
5. Alteration Equivalent to a Repair.
  - a. An Alteration Equivalent to Repair (AER) is a technical alteration, which has one or more of the following attributes:
    - (1) The use of different material, which has been approved for like or similar use, and such materials are available from standard stock.
    - (2) The replacement of obsolete, worn-out or damaged parts, assemblies, or equipment, requiring renewal by a more efficient design previously approved by the System Command (SYSCOM), Program Executive Office (PEO) or Ship Program Manager (SPM); providing such replacement does not cause a change to the existing system design and does not effect a change to the systems or equipment normally associated with the military characteristics of the ship.

(3) The strengthening of parts require repair or replacement in order to improve the reliability of the parts and unit provided that no other change in design is involved.

(4) Minor modifications involving no significant changes in design or functioning of equipment but considered essential to prevent recurrence of unsatisfactory conditions.

(5) The replacement of parts, assemblies, or equipment with like items of later or more efficient design where it can be demonstrated that the cost of installation and maintenance of the new parts, assemblies or components is less than the cost of maintaining the installed parts, assemblies, or components; and such replacement does not cause a change to the existing system design or impact any external interfaces to the system and does not effect a change to the system or equipment normally associated with the military characteristics of the ship.

Only the SYSCOM, PEO or SPM exercising technical control over the article, or the authority to whom such technical control has been delegated by that command, shall designate an alteration as an Alteration Equivalent to Repair (AER) and approve it for accomplishment.

b. An AER is approved for accomplishment by a Title "D" or "F" Ship Alteration (SHIPALT), Alteration and Improvement Item (A&I), Alteration Request (AR) or Letter AER depending on the scope and effects of the change. Such AERs must be approved by NAVSEA and funded for accomplishment by the Type Commander (TYCOM). A definition of each type of AER follows:

(1) Title "D" SHIPALT - A Title "D" SHIPALT is an "alteration equivalent to a repair" that is formally approved by NAVSEA in the form of a SHIPALT Record (SAR). It may require Centrally Provided Material (CPM) and is programmed and funded by the TYCOM. It does not require Headquarters Centrally Provided Material (HCPM). A Title "D" SHIPALT may specify whether it should be accomplished only by a depot level maintenance facility, or if it is within the capabilities of ship's force or Intermediate Maintenance Activity (IMA) to accomplish. A Title "D" SHIPALT shall be issued for all non-nuclear AERs which require changes to the equipment or system Integrated Logistics Support (ILS).

(2) Title "F" SHIPALT - A Title "F" SHIPALT is an "alteration equivalent to a repair" that is formally approved by NAVSEA in the form of a Ship Alteration Record (SAR). It does not require Centrally Provided Material (CPM) and is programmed and funded by the TYCOM. Ship's force or an Intermediate Maintenance Activity (IMA) can accomplish a Title "F" SHIPALT. It is usually limited to the equipment removals or relocations or minor wiring, piping or ducting modifications.

6. Alteration Installation Team (AIT). A unit (military, government activity or contractor) under the direction of an AIT Manager or designated agent (ISEA, military or government civilian) of the AIT Manager, that is trained and equipped to accomplish specific alterations on specified ships.

7. Alteration Installation Team (AIT) Activity or AIT Manager. The government activity, In Service Engineering Agent (ISEA), military person or government civilian tasked and funded by the AIT Sponsor to initiate, plan, coordinate, schedule, manage and oversee the successful

accomplishment of the alteration in accordance with Fleet Modernization Program (FMP) policy and procedures. The AIT Manager will coordinate with the NSA to ensure satisfactory completion of the ship alteration installation during CNO availabilities. This coordination does not relieve the AIT manager of any his/her responsibilities.

8. Alteration Installation Team On-site Installation Coordinator. The Alteration Installation Team (AIT) On-site Installation Coordinator is a government or military employee designated by, and acting with the authority of, the AIT Manager. The AIT On-site Installation Coordinator is responsible for the conduct of the entire alteration installation and will be the point-of-contact with the ship, AIT Manager and the NSA. The AIT On-site Installation Coordinator shall be knowledgeable of and responsible for AIT adherence to all invoked requirements including safety, quality plan, technical instructions and, when applicable, the SUPSHIP Operations Manual (SOM), Appendix 4-E or NSA/AIT Manager MOAs. AITs that do not have an assigned AIT On-site Installation Coordinator (or documented approval from the SPM that an AIT On-site Installation Coordinator is not required) shall not attempt to accomplish alterations to ships and will be denied access to ships.

9. Alteration Installation Team (AIT) Sponsor. The Systems Command Naval Air (NAVAIR), Naval Supply (NAVSUP), Naval Sea (NAVSEA) or Space and Naval Warfare (SPAWAR), Program Executive Officer (PEO), (including Participating Manager (PARM) or Ship Program Manager (SPM), **Commander Pacific Fleet (COMPACFLT)**, Type Commander (TYCOM), Chief of Naval Operations (CNO) or other government activity that tasks and funds the AIT Manager/AIT.

10. Alteration, Mature. An alteration that has a reasonable expectation of successful installation, operation, maintenance and interoperability and is fully supported logistically. A mature alteration has a Justification Cost Form (JCF), Ship Alteration Record (SAR), Ship Alteration Installation Drawing (SIDs) and an approved Integrated Logistics Support (ILS) Certification Form.

11. Alteration, Permanent. Any logistically supported alteration, which is intended to remain on board the ship for more than 1 year or more than 1 operational deployment. These alterations are accomplished as Ship Alterations (SHIPALTs), Alterations Equivalent to Repair (AERs), Type Commander (TYCOM) alterations and other System Commands (SYSCOMs) and TYCOM alterations (e.g. Field Changes [FCs], Engineering Changes [ECs]).

12. Alteration Scheduling. The act of slating an alteration for installation on a given ship in a specific timeframe. Ship Program Manager (SPMs) schedule all alterations for installation during all Chief of Naval Operations (CNO) Availabilities via the SPM's Availability Advance Planning and Authorization Letters except for Title D and F alterations and Alteration Equivalent to Repair (AERs), which are scheduled by the Type Commander (TYCOM). TYCOMs schedule all alterations outside of the CNO Availability.

13. Alteration, Temporary (TEMPALT). Any alteration that provides given capabilities on a temporary basis (not to exceed one (1) year or one (1) operational deployment in duration). TEMPALTs support Research, Development, Test and Evaluation (RDT&E), exercise or mission requirements. TEMPALTs are reviewed, technically approved by the Ship Program Manager (SPM) and authorized and scheduled for accomplishment by the Type Commander

(TYCOM). All TEMPALTs impacting Battle Force interoperability or that are Command, Control, Communications, Computer, Intelligence (C4I) or Combat System related, need to be approved by the Fleet Commander-in-Chief (FLTCINC) in accordance with the D-30 process, before they can be installed. The Ship Program Manager (SPM) review considers logistic support, safety, technical adequacy, impact on ship stability, operational characteristics, damage control, ship structure, ship services, ship interfaces and habitability. Integrated Logistics Support (ILS) (final or preliminary) needs to be identified on the TEMPALT authorization letter and provided at time of installation. Alterations which are intended to be installed for a period in excess of one year or for more than one operational deployment are permanent changes to a ship's configuration and shall be accomplished accordingly (see "Alteration, Permanent"). After completion of testing requirements, mission or exercise support requirements or one year, whichever comes first, TEMPALTs must be removed and the ship restored to its previous configuration. The activity sponsoring the accomplishment of the TEMPALT shall be responsible for funding the removal of the TEMPALT and the restoration of the ship.

14. As-Built. Drawings prepared or developed by an Alteration Installation Team (AIT), approved by the Planning Yard (PY), used for installation, and revised to indicate the actual, as installed, configuration on the ship.

15. Battle Force Baseline Configuration Alterations. All Command, Control, Communications, Computer, Intelligence (C4I) and Combat System Alterations and alterations impacting Interoperability, that have been approved by the Fleet Commander-in-Chief (FLTCINC) for a specific ship in a specific Battle Force, in accordance with the D-30 process. These alterations should be technically approved by the Ship Program Manager (SPM) and coordinated with the Alteration Management Planning (AMP) Office, AMP Field Coordinating Offices (FCOs) and Naval Supervising Activities (NSAs), in accordance with this document.

16. Completion Report, Final. A message report from the ship receiving the alteration identifying that all discrepancies, noted in the Installation Completion Report, have been satisfactorily resolved. This message report is not required if the Installation Completion Report message also served as the Final Completion Report.

17. Completion Report, Installation. A mandatory message report from the ship receiving the alteration identifies the successful accomplishment of the alteration. This message will be drafted by the Alteration Installation Team (AIT) and provided to the ship for concurrence prior to the AIT's final departure. The ship will ensure that all known discrepancies associated with the alteration are fully documented, along with the activity responsible for resolution of each discrepancy and the estimated date of resolution. If no discrepancies exist, this report will also serve as the Final Completion Report.

18. Equipment Alteration. Any modification, other than a Ship Alteration (SHIPALT), to the configuration of an equipment or system (including embedded equipment, computer programs and expendable ordnance) after establishment of the product baseline. An Equipment Alteration involves a change in design, type of material, quantity, installed location, logistics, supportability or the relationship of the component parts of an assembly within the ship. Equipment Alterations include the addition, deletion, rework or replacement of parts, assemblies or equipment; or changes in assembly procedures. Alterations to associated

computer programs include the incorporation of different computer program versions and approved modifications or corrections to both operational test and maintenance programs. Equipment Alterations are initiated by approved Class I Engineering Change Proposals (ECPs). Equipment Alterations apply equally to changes installed in delivered systems and equipment, and changes installed in systems and equipment in production to identify differences from an established product baseline. Equipment Alterations may be initiated to correct a design defect, to change equipment operational capability, to eliminate safety hazards, to update obsolete components to change an external interface, or for any combination of these reasons. There are 6 types of Equipment Alterations:

a. Machinery Alteration (MACHALT). A planned change, modification or alteration of any in-service Hull, Mechanical or Electrical (HM&E) equipment when it has been determined by the MACHALT Configuration Control Board that the alteration or modification meets all of the following conditions:

(1) Can be accomplished without changing an interface external to the equipment or system.

(2) Are modifications made within the equipment boundary or are a direct replacement of the original equipment system.

(3) Can be accomplished without the ship being in an industrial activity.

(4) Will be accomplished individually and not conjunctive with a SHIPALT or other MACHALT.

If power, weight or air conditioning requirements are modified, the modification must be discussed with the appropriate Ship Program Manager (SPM), who will decide whether to proceed with the modification as a MACHALT or a SHIPALT.

b. Ordnance Alteration (ORDALT). An ORDALT is a change made to ordnance equipment or their associated computer programs by the addition, deletion, rework or replacement of parts, assemblies or equipment, or by a change in assembly procedures. Computer Program changes are any changes to maintenance or operational software.

c. Field Change (FC). A mechanical, electronic or electrical change, modification or alteration made to electronic equipment after delivery to the government or installation on-board ship. It includes software changes, which does not impact interfaces to other equipment within the ship, change the footprint, form or fit or change power, weight or air conditioning requirements. If power, weight or air conditioning requirements are modified, the modification must be discussed with the appropriate SPM, who will decide whether to proceed with the modification as a field change or SHIPALT. Field Changes are initiated and approved by the Systems Command and are implemented by Field Change Bulletin (FCB). Alteration Installation Team (AIT) or Ship's Force can accomplish FCs. For these specific types of alterations, the SPM shall be notified of the approved changes affecting their respective platforms. The SPM shall be periodically advised of installation status and shall be notified of any logistics upgrades, which have been completed as a result of the alteration.

d. Engineering Change (EC). A modification, usually to Under-Sea Warfare (USW) equipment or systems or other equipment groups as designated by the Systems Command, Program Manager (PM), Participating Manager (PARM) or Configuration Control Board (CCB).

e. Alteration & Improvement (A&I) Item. Tests, inspections, and minor alterations to submarines and submarine tenders. No significant Integrated Logistics Support (ILS) impact or significant material is required. A&I items are approved by Naval Sea Systems Command (NAVSEA) and authorized by the Type Commander (TYCOM).

f. Software delivery alteration. Any Operational Computer Program change that is not an ORDALT or FC. These programs must satisfy all platform and system certification requirements before they can be installed, or must have interim authority to be used if they have not passed appropriate software certification criteria. Provisioning Parts List (PPL) certification is required if the software is to run on the IT-21 Local Area Network (LAN).

19. Hardware Systems Commands (HSC). Commander Naval Sea Systems Command (COMNAVSEASYSCOM) is the lead hardware systems commander for the life cycle management of ships. Commander, Naval Air Systems Command and Commander, Space and Naval Warfare Systems Command are also hardware systems commands. They must coordinate with COMNAVSEASYSCOM in the development of technical requirements essential to performing quality maintenance. The HSC provides Naval Supply (NAVSUP) with sufficient, accurate, up-to-date technical information to ensure consistent procurement and control of material that fulfills all technical requirements.

20. Industrial Activity (IA). An IA is an activity capable of performing all aspects of work on ships. These activities generally include Naval Bases, Naval Ship Repair Facilities (NSRFs), Fleet Maintenance Activities, Trident Refit Facilities (TRFs), public (Naval) shipyards, and private shipyards, which hold Agreements for Boat Repair (ABR) or Master Ship Repair Agreements (MSRAs) in accordance with the Naval Sea Systems Command (NAVSEA) Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP), USN Operations Manual.

21. Integrated Logistics Support (ILS) Certification Forms. The ILS forms specified in Section 8-1.3.2 and Section 8 Exhibit II of the Fleet Modernization Program (FMP) Manual in which the Ship Program Manager (SPM) identifies all ILS elements that are required for a specific alteration. ILS Certification Forms may be general (applicable to all alteration installations) or conditional (applicable to only a specific alteration installation).

22. Maintenance Program Master Plan (MPMP). The MPMP provides a general overview of the Program Executive Office (PEO's) and/or Ship Program Manager's (SPM's) maintenance plan for the ship class. It specifies key elements such as depot-level availability intervals and duration, frequency of intermediate-level availabilities and any special maintenance, maintenance support or infrastructure requirements.

23. Naval Supervising Activity (NSA). The single Naval Activity charged with the responsibility of oversight of work being accomplished on U.S. Naval ships during any type of availability. The NSA has overall responsibility for integrating the planning and execution of work on Naval Ships by all involved activities. Implementation of an integrated planning, schedule, work control, and ship certification process is essential to a project's success. Effective coordination

and oversight must be provided to ensure that all work performed during any availability will allow the NSA to meet the overall project schedule, cost, and quality requirements. NSAs have the authority and responsibility to preclude and/or stop AITs from performing work when they are found to be in non-compliance with this or other invoked specifications. NSAs shall notify the applicable program office and NAVSEA 04 of any AIT work suspension/cancellation.

24. Quality System. A documented set of rules and procedures, which will assure that all provided supplies and services conform to a prescribed level of quality. For alterations accomplished on ships, the minimum prescribed level of quality shall be that specified in MSRAs and Agreements for Boat Repair (ABRs) as outlined in Naval Sea Systems Command (NAVSEA) Standard Item 009-04. (See Appendix D)

25. Quick reaction alteration. Alterations that are driven by an emergent requirement that requires rapid entry of high priority Secretary of Defense (SECDEF), Secretary of the Navy (SECNAV), Chief of Naval Operations (CNO), national interest items or vital technical changes into Fleet Modernization Program (FMP) process. Quick reaction alterations necessitate rapid Ship Alteration (SHIPALT) development and close coordination between Operations Navy (OPNAV) Resource Sponsors and the Hardware System Command (HSCs).

26. Red Lines or Red Lined Installation Drawings. Planning Yard (PY)-approved Ship Alteration Installation Drawings (SIDs) that have been revised manually (preferably in red ink) by the Alteration Installation Team (AIT) to reflect all approved deviations and variances of the completed installation.

27. Regional Maintenance and Modernization Coordination Office (RMMCO). A Regional Maintenance Center-aligned; Fleet-chartered organization that serves as the primary point of entry for all waterfront related alteration and maintenance activities. The RMMCO will serve as the "gate keeping" office for Alteration Installation Team (AIT) check-in and check-out, where applicable. The RMMCO's AIT Check-In/Check-Out application located at <https://rmmco.navy.mil> provides the AIT On-site Installation Coordinator/AIT Leader with a means to initiate the check-in procedures required for the installation of an alteration aboard ship. It also provides a means to measure performance of these installations.

28. Scheduled/Non-Scheduled Chief of Naval Operations (CNO) Availabilities. CNO Scheduled availability is a depot level maintenance window that is scheduled by CNO in accordance with the Maintenance Program Master Plan (MPMP) for the ship.

- a. CNO Scheduled Maintenance Availabilities greater than 6 months in duration are:

Overhaul. Availability scheduled for accomplishment of industrial maintenance and modernization. Types of Availabilities include:

- Regular Overhaul
- Complex Overhaul (COH)
- Engineered Overhaul (EOH)
- Refueling Overhaul (ROH)
- Refueling Complex Overhaul (RCOH)

### Engineered Refueling Overhaul (ERO)

Other Availabilities. Availability scheduled primarily for industrial maintenance and installation of major, high priority alterations. Types of these include:

- Depot Modernization Period (DMP)
- Planned Incremental Availability (PIA)
- Docking Planned Incremental Availability (DPIA)

b. CNO scheduled maintenance availabilities less than six months in duration are short, labor-intensive availabilities scheduled for accomplishment of industrial maintenance and modernization. Types of these availabilities include:

- Selected Restricted Availability (SRA)
- Docking SRA (DSRA)
- Phased Maintenance Availability (PMA)
- Docking Phased Maintenance Availability (DPMA)
- Service Craft Overhaul (SCO)
- Extended SRA (ESRA)
- Extended Docking SRA (EDSRA)
- Incremental SRA (ISRA)

c. Non-CNO Scheduled Availability. Availability that is not scheduled by CNO. The CFFC/TYCOMs assign and schedule Restricted Availabilities (RAVs), Technical Availabilities (TAVs) and Voyage Repair (VR) Availabilities.

29. Ship Alteration (SHIPALT). Approved permanent change to the configuration of a ship, which is documented as a Ship Alteration Record (SAR), and implemented through the Fleet Modernization Program (FMP) Process. SHIPALTs are classified by the following titles:

a. Title "D" SHIPALT. A Title "D" SHIPALT is an "alteration equivalent to a repair" that is formally approved by Naval Sea Systems Command (NAVSEA) in the form of a SAR. It may require Centrally Provided Material (CPM) and is programmed and funded by the Type Commander (TYCOM). It does not require Headquarters Centrally Provided Material (HCPM). A Title "D" SHIPALT may specify whether it should be accomplished only by a depot level maintenance facility, or if it is within the capabilities of ship's force or Intermediate Maintenance Activity (IMA) to accomplish. A Title "D" SHIPALT shall be issued for all non-nuclear Alteration Equivalent to Repair (AERs) that require changes to the equipment or system Integrated Logistics Support (ILS).

b. Title "F" SHIPALT. A Title "F" SHIPALT is an "alteration equivalent to a repair" that is formally approved by NAVSEA in the form of a SAR. It does not require CPM and is programmed and funded by the TYCOM. Ship's force or an Intermediate Maintenance Activity (IMA) can accomplish a Title "F" SHIPALT. It is usually limited to the equipment removals or relocations or minor wiring, piping or ducting modifications.

c. Title "K" SHIPALT. A permanent alteration to provide a military characteristic, upgrade existing systems or provide additional capability not previously held by a ship, which

affects configuration controlled areas or systems of a ship or which otherwise requires the installation of HCPM. These SHIPALTs are approved for development and authorized for accomplishment by the Chief of Naval Operations (CNO) (military improvements) or the Hardware System Command (HSCs) (non-military improvements). Commander Naval Sea Systems Command (COMNAVSEASYS COM) provides the technical approval for Title "K" SHIPALTs.

d. Title "K-P" SHIPALT. A Title "K" SHIPALT that is within forces afloat or Alteration Installation Team (AIT) capability for accomplishment and for which required special program and centrally provided materials are provided as a package by the HSC.

30. Ship's Program Manager (SPM). The Naval Sea Systems Command (NAVSEA) organization responsible for management of ships' acquisition, overhauls, or repairs.

31. Type Commander Alterations (TYCOMALTs). Type Commander (TYCOMs) are authorized to approve temporary changes to compartments of ships, other than nuclear support facilities or compartments adjacent to ship nuclear support facilities, through use of TYCOMALTs subject to the requirements laid out in OPNAVINST 4720.2 (Series) and CINCLANTFLT/CINCPACFLT 4790.3 (Series). The definition of a TYCOMALT is currently under review and may be changed in the next revision of the Fleet Modernization Program (FMP) Manual.

32. Work Authorization Form (WAF). A WAF is required to authorize the start of work on all ship systems and equipment by activities other than Ship's Force. Work includes all maintenance repairs or modifications and installation or removal of temporary support systems and equipment. Additional information is contained in CINCLANTFLT/CINCPACFLT 4790.3 (Series) (Joint Fleet Maintenance Manual) Volume IV, Part I, Chapter 21.

**TECHNICAL SPECIFICATION**

**TITLE: SHIP ALTERATION RECORD (SAR) PREPARATION**

**NO.: TS9090-500C**

**DATE: JUNE 2002**

**SUPERSEDES: TS9090-500B, dated MAY 89**



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**TABLE OF CONTENTS**

<b>Section</b>	<b>Title</b>	<b>Page</b>
<b>1. SCOPE</b>		
1.1	General	1
1.2	Applicability	1
1.3	Exceptions	1
<b>2. APPLICABLE DOCUMENTS</b>		
2.1	Issue of Document	1
<b>3. REQUIREMENTS</b>		
3.1	General	2
3.2	Responsibilities	3
3.3	SAR Preparation Requirements	3
3.4	SAR Content	4
<b>FIGURES</b>		
	FIGURE 1 Ship Alteration Record (SAR)	11
	FIGURE 2 Ship Alteration Record Cost Estimate Record Sheet	15
	FIGURE 3 Field Authority Table	17

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## SHIP ALTERATION RECORD PREPARATION

**1. SCOPE.** This specification provides criteria for the uniform development, processing and maintenance of a Ship Alteration Record.

**1.1 GENERAL.** The SAR is the official record defining the approved changes to be made to a ship. The SAR is based upon the Justification/Cost Form (JCF) providing greater detail, a more complete Alteration Material List (AML), Integrated Logistic Support (ILS) documentation impacts and equipment removals. The SAR is composed of the data defined in sections 3.4.1 through 3.4.23 below. This record requires approval by the organization designated as the SAR Approver in the JCF (See Tech Spec 9090-210B section 2.27). In accordance with the FMP milestones, the SAR shall be completed no later than A-12 for the availability of the first intended install and the SAR Approver shall approve the SAR no later than A-11. The SAR shall be completed in Microsoft Word © using the Template found on the FMP Website ([www.FMP.NAVY.MIL](http://www.FMP.NAVY.MIL)).

**1.2 APPLICABILITY.** This specification is applicable to surface ships, surface craft, and submarine SARs and shall be utilized by all Planning Yards/Design Agents (hereafter referred to as "Planning Yards") and NAVSEA/SPAWAR/NAVAIR etc. personnel for preparing, processing and maintaining Ship Alteration Data except as noted herein (see Section 1.3).

**1.3 EXCEPTIONS.** This specification shall not be used for preparation of the following:

- a. SARs under the cognizance of the Deputy Commander of Nuclear Propulsion, NAVSEA 08.
- b. Strategic Systems Program Alterations (SPALTS) issued for the Director, Strategic System Programs (DIRSSP).
- c. Aircraft launch and recovery equipment changes under the cognizance of the Commander, Naval Air Systems Command.
- d. Changes to the internals of equipments that do not impact the equipment interface with the ship. These include Machinery Alterations (MACHALTs), Ordnance Alterations (ORDALTs), Field Changes, Equipment Engineering Changes (ECs), Technical Directives (TDs), and Engineering Change Proposals (ECPs).
- e. Alterations affecting configuration of hardware, software, and support equipment of the TRIDENT System under the cognizance of PMS 392. The TRIDENT System comprises OHIO Class Submarines; dedicated maintenance, training and logistic facilities; and replacement equipment pools.

## 2. APPLICABLE DOCUMENTS

**2.1 ISSUE OF DOCUMENT.** The following documents, of the issue in effect on the date of the tasking documentation, form a part of this specification to the extent specified herein.

## PUBLICATIONS

### MILITARY

MIL-STD-1680 - Installation Criteria for Shipboard Secure Electrical Processing Systems

## **DEPARTMENT OF DEFENSE**

H4/H8 - Commercial and Government Entity (CAGE) Cataloging Handbook.

## **CHIEF OF NAVAL OPERATIONS**

OPNAVINST 4790.4 - Ship's Maintenance and Material Management (3-M) Manual

OPNAVINST 5510.1 - Department of the Navy, Information Security Program

## **NAVAL SEA SYSTEMS COMMAND**

S0924-062-0010 - SUBSAFE Manual

S9040-AA-IDX-010/SWBS 5D - Expanded Ship Work Breakdown Structure (ESWBS) for all Ships and Ship/Combat Systems

NAVSEAINST 5000.39 - Acquisition and Management of Integrated Logistic Support for Ships, Systems, and Equipment

NAVSEAINST 5510.1 – Command Headquarters Security Program Regulation

NAVSEAINST 9210.14 – Changes to Submarine Tenders and Destroyer Tenders with Nuclear Support Facilities

NAVSEAINST C9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships

NAVSEAINST C5511.32 - Naval Nuclear Propulsion Information; Safeguarding of

NAVSEAINST 5720.3 - Review and Release of Unclassified Technical Information and Assignment and Distribution Statements for "For Official Use Only" Markings to Technical Documents

## **TECHNICAL SPECIFICATIONS**

NAVSEA TS-9090-210B – Justification/Cost Form (JCF)

### **3. REQUIREMENTS**

**3.1 GENERAL.** The Ship Alteration Record (SAR) is a collection of elements required to further define an alteration from the data used to approve the concept in the JCF (See Tech Spec 9090-210B).

**3.1.1 RESTRICTIVE DATA.** Individual SARs shall not reference the following:

- a. Planning Yard or other local procedures, standards or specifications.
- b. Any specific availability or overhaul.
- c. The shipyard assignment for any ship.
- d. Any miscellaneous information relating to operations or procedures peculiar to a specific shipyard or activity.
- e. Material specifications based on the material's availability in the Planning Yard's shipyard stock. Material shall be selected on the basis of its general availability, according to the best information held by the Planning Yard, to all installing activities.
- f. Specifications of commercial proprietary material unless there is no generic

equivalent. If proprietary material is required, complete identification of the product shall be provided on the Alteration Material List (AML).

g. Proprietary vendor drawings unless required as part of product identification.

h. Material part numbers or stock numbers which are peculiar to the Planning Yards stock system or other Government agencies stock system other than the National Stock System.

**3.2 RESPONSIBILITIES.** Any organization may prepare Ship Alteration Records as determined, tasked, and funded by the cognizant Ship Program Manager (SPM). The Data elements listed in Section 3.3 and 3.4 below list the organization intended to input the required data. The description of these organizations is listed below.

**3.2.1 SAR Preparer.** The SAR Preparer is the organization designated by the SPM in the JCF (See Tech Spec 9090-210B) to develop the SAR document. The SAR Preparer will normally be the Planning Yard or the PARM.

**3.2.2 SAR Approver.** The SAR Approver is the organization designated by the SPM in the JCF (See Tech Spec 9090-210B) to approve the SAR.

**3.2.3 Participating Managers (PARMs).** The PARM is responsible to program, budget and procure all Headquarters Centrally Provided Material. In addition they are responsible to maintain the Navy Data Environment-Navy Modernization (NDE-NM) Material Dictionary and coordinate with the SPM to insure the material requirements match the installation requirements.

**3.2.4 PLANNING YARDS (PY).** The Planning Yard for each ship class, as designated by NAVSEA SL720-AA-MAN-010/FMP, is the Engineering Design Agent for assigned specific classes of ships. Responsibilities assigned to the Planning Yard include accuracy and completeness of the SAR. Planning Yards may be tasked to approve the SARs as tasked and funded by the SPM.

**3.2.5 SHIP PROGRAM MANAGER (SPM).** SPMs are responsible for final NAVSEA approval of a SAR unless the approval is delegated. The SPM is also responsible for obtaining appropriate concurrence from any other activity prior to their approval.

### 3.3 SAR PREPARATION REQUIREMENTS

**3.3.1 SECURITY CLASSIFICATION AND SPECIAL HANDLING.** Security classifications and special handling marking of SARs shall be limited to "UNCLASSIFIED", "FOR OFFICIAL USE ONLY" or "NOFORN". This will be determined by the SAR preparer and if the classification is other than UNCLASSIFIED the classification will be placed in the upper right and lower left corner of all copies of the SAR.

**3.4 SAR CONTENT.** The SAR content shall be as specified herein. Figure 3 lists all of the fields and the activity that is designated to provide the information in each field.

**3.4.1 SHIPALT IDENTIFICATION.** This field is for the approved SHIPALT Identification Number. The SHIPALT Number will include the ship class, the number and the title (e.g. K, D, F). This field will be copied from the approved JCF (See Tech Spec 9090-210B Section 2.4) by the SAR Preparer.

**3.4.2 REV.** This field is used to show the revision of the SAR. The initial issue of the SAR shall show 00 in the revision field. Subsequent revisions shall be 01, 02 etc.

**3.4.3 BRIEF.** This field is a brief description of the SHIPALT. This field will be copied from the JCF (See Tech Spec 9090-210B Section 2.3) by the SAR Preparer unless otherwise directed by the SPM (Note: changes in the shipalt Brief after JCF development may make Battle Group Interoperability confirmation more difficult). This field shall be no more than 30 Characters in length in order to comply with the FMPMIS (NDE-NM) Database requirements.

**3.4.4 NAVSEA/PEO LEAD TECH CODE CONCURRENCE.** This field is to be filled in by the SAR Approver after obtaining the required concurrences or NA will be entered if this approval is not required.

**3.4.5 ENGINEERING AGENT CONCURRENCE.** This field is to be filled in by the SAR Approver after obtaining the appropriate engineering agent concurrence or NA will be entered if this approval is not required.

**3.4.6 OTHER CONCURRENCE.** This field is provided to enter the Name and Phone number of any other organization and POC whose concurrence is required. The field is to be filled in by the SAR Approver after obtaining the required concurrence. The activity (SPAWAR, NAVAIR, NAVSEA 08) and the POCs name with the (S) to indicate the signature is on file is required for this field. This field has two columns; the first is for the Activity of the TPOC; the second is for the Name and Phone number of the TPOC.

**3.4.7 LEAD LCM (LOGISTICS).** This field is to be used for entering the logistics Life-Cycle Manager for the system or equipment being installed. This field will consist of two parts: the first is for the activity of the Lead LCM (Logistics); the second is for the Name and Phone number of the POC to be entered. This field shall be copied from the JCF (See Tech Spec 9090-210B) by the SAR Preparer.

**3.4.8 SAR APPROVER.** The SAR Approver as designated in Tech Spec 9090-210B is the approving authority for the SAR. This field will consist of three parts; the first is for the Activity of the SAR Approver; the second is for the Name and Phone number of the TPOC ; the third is the date the SAR was approved.

**3.4.9 PLANNING YARD TECHNICAL POINT OF CONTACT.** The Planning Yard TPOC is the name of the person at the planning Yard with intimate knowledge of the alteration. This field is to be completed by the Planning Yard.

**3.4.10 ESWBS (EXPANDED SHIP WORK BREAKDOWN STRUCTURE) NUMBER.** The ESWBS fields shall indicate the ESWBS number selected from NAVSEA

S9040-AA-IDX-010/SWBS 5D, which is most closely associated with the system, component or structure being impacted by the alteration. This field is to be completed by the SAR Preparer.

**3.4.11 3-M NOUN NAME.** The 3-M Noun Name field shall indicate the 3-M equipment/system noun name. The equipment/system nomenclature/description shall be the same as that identified by the ESWBS number in NAVSEA S9040-AA-IDX-010/SWBS 5D. In cases where the equipment being installed or modified has a specific nomenclature (AN/SSQ-80, R-1051(F)/URR, etc.), the nomenclature shall be utilized as the 3-M Noun Name. The 3-M Noun Name is utilized by the Type Commanders (TYCOMs) as a data element entry in the TYCOM Alteration Management System (TAMS)(Applicable to SUBLANT and SUBPAC ships only) and on OPNAV Form 4790/CK (Configuration Change Notification) as required by OPNAVINST 4790.4. This field is to be completed by the SAR Preparer.

**3.4.12 EIC (EQUIPMENT IDENTIFICATION CODE).** The EIC field shall indicate the Equipment Identification Code of the equipment or system being installed by the SHIPALT. The number should be selected from the EIC Master Index S9040-AC-IDX-010/SHIPS, the 3-M Reference CD, the EIC Master File tape from NAVSEALOGCEN or the NAVSEALOGCEN website. The EIC is a seven-digit alpha/numeric field that is left justified and zero filled. This field is to be completed by the SAR Preparer.

**3.4.13 AIT CAPABLE.** This field is an indication (Y/N) of whether or not accomplishment of this alteration is within the capability of an Alteration Installation Team (AIT). If this field is marked as Yes, then the mandays shown on the cost estimate sheet (see 3.4.37) should be the installation mandays required by the AIT. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.27) by the SAR Preparer.

**3.4.14 SAFETY ALT.** This checkbox is an indication (Y/N) of whether or not the change or alteration is specifically intended to correct a pre-existing safety problem or provide a safety operating or living environment. If this box is checked the Category Code (Paragraph 3.4.18) must be a 1 or 2. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.11) by the SAR Preparer.

**3.4.15 SUBSAFE IMPACT.** This field is an indication (Y/N) of whether or not accomplishment of the change or alteration impacts a SUBSAFE boundary. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.17) by the SAR Preparer.

**3.4.16 ILS AFFECTED.** This field is an indication (Y/N) whether or not installation of this alteration will affect Integrated Logistics Support (ILS). This will include but not be limited to any update/changes to any existing Technical Manuals, new Technical Manuals, Supply Support (e.g., INCO's, MAMs, Onboard Spares, etc.), Maintenance Index Pages (MIPs), Maintenance Requirements Cards (MRCs), Technical Repair Standards (TRSs), Class Maintenance Plans (CMPs), Intermediate Repair Standards (IRSs), any changes or additions to any existing training plan, new training plan, special tools, alignment jigs, test equipment, any changes or additions to any existing SRD's or development of new SRD's for equipment installation and certification of this alteration. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.20) by the SAR Preparer.

**3.4.17 SHIPBOARD STOWAGE AFFECTED.** This field is an indication (Y/N) whether or not installation of this alteration will require any use of shipboard Stowages. This field shall be copied from the JCF (See Tech Spec 9090-210B) by the SAR Preparer.

**3.4.18 CATEGORY CODE.** This field lists the NDE category code for the alteration as shown below. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.12) by the SAR Preparer.

<u>CODE</u>	<u>DESCRIPTION</u>
0	PRIORITY LEVEL NOT ESTABLISHED
1	MANDATORY AND SAFETY
2	RELIABILITY AND MAINTAINABILITY (PRIMARY)
3	PRIMARY MISSION SYSTEM MODERNIZATION
4	RELIABILITY AND MAINTAINABILITY (SEC) MISSION AREA
5	SECONDARY MISSION AREA MODERNIZATION
6	MISSION SUPPORT

**3.4.19 INDUSTRIAL STOWAGE AFFECTED.** This field is an indication (Y/N) whether or not installation of this alteration will require any use of industrial Stowages. This field shall be copied from the JCF (See Tech Spec 9090-210B) by the SAR Preparer.

**3.4.20 TOC.** This field is used to list the estimated Total Ownership Costs (TOC) for the change or alteration. This cost should be expressed in manhours and can be either positive or negative. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.11) by the SAR Preparer.

**3.4.21 TMA/TMI.** This field is used to indicate (Y/N) whether or not this change or alteration is a Top Management Attention (TMA) or Top Management Issue (TMI) item. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.11) by the SAR Preparer.

**3.4.22 DESCRIPTION.** The Description field shall provide a brief description of the alteration to the extent necessary to begin detailed design. The description of the alteration shall indicate the spaces, systems and equipment impacted by the alteration and the extent of the impact. The description shall specifically address equipment to be added (Government or installing activity furnished) and/or deleted and the impact (increase or decrease) on power (steam generation, electrical generation and/or distribution systems), fluids (water, hydraulic, dry air, lubricating oil, fuel oil, etc.), compressed gasses (oxygen, nitrogen, etc.), firemain, ship's structure, interior communications circuits, habitability/accommodations, stowage, heating, ventilation and air conditioning. The description shall also specifically address, by space name and compartment number, any impact (increase or decrease) in weight and heat dissipation. Alterations impacting SUBSAFE systems or equipment as defined in NAVSEA 0924-062-0010 (SUBSAFE Manual) shall include in the description field a statement identifying the systems and equipment as SUBSAFE. An explanation of how the SUBSAFE boundaries are impacted and how the SUBSAFE integrity will be maintained shall also be included in this field. Mandatory

locations and interface requirements shall be supported by sketches and/or referenced documentation. This field is to be completed by the SAR Preparer.

The description shall be detailed enough to be used as a starting point for detailed design but need not be to the specific pipe/duct/cable level except in instances where this information is critical to the installation. Also, information as to equipment installation location should be detailed to an area of a compartment, not to a specific frame number or distance from the centerline, unless this level of detail is critical to the accomplishment of the SHIPALT. If required, a separate SHIPALT Guidance Document shall be referenced which provides a detailed description of the SHIPALT. In such cases, the referenced guidance document must be submitted to the SPM prior to the SAR approval.

For those ships indicated as scheduled to receive the intent of a SHIPALT during construction add the following to the description:

"NOTE: For those ships listed as applicable which have an asterisk (\*) next to the hull number, the intent of this alteration has been or is planned to be accomplished during new construction as part of Headquarters Modification Request (HMR) (or Field Modification Request (FMR). If the applicable HMR (or FMR) is verified to be completed in any of these ships, this SHIPALT is to be considered complete on the applicable ship and the hull number listed for record purposes only. If HMR (or FMR) cannot be verified as complete in any of these ships after construction, this SHIPALT can then be considered for accomplishment in these hulls.

**3.4.23 APPLICABLE SHIPS.** This field is a list of all of the ships in the ship class that the SAR is applicable to. This field is to be completed by the SAR Preparer.

**3.4.24 REFERENCES.** This field is a list of all of the documents referred to in the description (See Section 3.4.22). The documents shall be entered in the order of their occurrence in the description and designated with a numerical reference number. This field is to be completed by the SAR Preparer.

**3.4.25 ESTIMATED WEIGHT AND MOMENT IMPACT (WT & MOM).** The Weight and Moment Impact field shall provide an estimate of any weight and moment change caused by the SHIPALT (increase or decrease), including loads (ammunitions, provisions, stores, fuel oil, water, etc.). Weight shall be estimated to the nearest +/- 0.1 ton (the term "Negligible" shall not be used for the weight estimate); Vertical Center of Gravity (VCG) to the nearest foot, Longitudinal Center of Gravity (LCG) to the nearest foot forward or aft of the mid perpendicular of the ship, and the Transverse Center of Gravity (TCG) to the nearest foot port or starboard of the centerline. If the SHIPALT includes modification to a hull form or an appendage (bilge keel, sonar dome, etc.), a buoyancy impact of the weight of the displaced water volume shall also be estimated to the nearest +/- 0.1 ton. This field is to be completed by the SAR Preparer.

**3.4.26 ALTERATION MATERIAL LIST (AML).** This field shall be used for entering all logistically significant material required for the execution on the SHIPALT. This field is to be completed by the SAR Preparer.

**3.4.27 QUALITY ASSURANCE (Q/A CERTIFICATION REQUIREMENTS).** The Quality Assurance field shall identify any special quality assurance certification requirements, which must be used to assure successful accomplishment of the SHIPALT including requirements for technical documentation (technical manual verification/certification, etc.). Applicable testing and safety certification that is required shall be specifically addressed (e.g., requirement to adjust firing cams, conduct Structural Test Firings (STF), etc.). This field is to be completed by the SAR Preparer.

**3.4.28 SSR (SHIP SELECTED RECORD DOCUMENTATION).** The Ship Selected Records (SSR) field shall identify the types of Ships Selected Records (data and drawings) (TABS, DCB, CSTOM, SIB/SSM, SDI, CSAM, SSCB, SRD'S, COSAL, COSS, EOSS, SEPM) which are impacted by the accomplishment of this SHIPALT. This field is to be completed by the SAR Preparer.

**3.4.29 ILS CERTIFICATION FORM (Y/N).** This field indicates if the ILS Certification Form is required. This field is to be completed by the SAR Preparer.

**3.4.30 SPECIAL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL.** This field will contain a list of all removed material requiring special disposition and the disposition required. This field is to be completed by the SAR Preparer.

**3.4.31 INSTALLATION SUPPORT AND TEST EQUIPMENT.** This field will list all the Support and Test Equipment (S&TE) that is required to support the installation of the alteration (Jigs, Alignment, I/D level TE) (The S&TE required for ships force to trouble-shoot and maintain the equipment is listed in the ILS Cert). This field is to be completed by the SAR Preparer.

**3.4.32 SHIPBOARD STOWAGE DETAILS.** This field will list all general shipboard stowage requirements for the alteration. If there are any special requirements they should be listed in the Description (See Section 3.4.22). This data field is to be filled in by the SAR Preparer.

**3.4.33 SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS.** This field will list all special stowage requirements at the industrial activity installing the alteration. This section should include but not be limited to requirements such as environmental or security stowage. This field is to be completed by the SAR Preparer.

**3.4.34 PROOFING REQUIREMENTS.** The purpose of proofing is to ascertain that the intended purpose of the alteration is satisfied and to identify any deficiencies so that immediate corrective action can be initiated for the first time installation to preclude a repeat of the same problems on subsequent installations. If Proofing is required then the SAR Approver must enter the activity assigned to do the proofing in this field.

**3.4.35 REQUIRED PRIOR OR CONCURRENT ALTS.** This data field is to be used by the JCF submitter to list any prior or concurrent alts required by this proposal. This section should include but not be limited to SHIPALTs (both approved and pending), MACHALTs,

ORDALTs, Engineering Changes, Field Changes, SPALTs and Technical Directives. This field shall be copied from the JCF (See Tech Spec 9090-210B Section 2.24) by the SAR Preparer.

**3.4.36 OTHER SYSTEMS INTERFACE.** This field is for the JCF submitter to list any other interface to ships systems other than those covered in the Y/N check boxes above. This includes impacts such as Weapons storage (either temporary or permanent) or Fuel offload. This field shall be copied from the JCF (See Tech Spec 9090-210B) by the SAR Preparer.

**3.4.37 SHIPALT COST ESTIMATE RECORD SHEET.** Use this table to provide a per ship estimated cost for installation of the SHIPALT on the applicable hulls. Estimates should be broken down to segment pre-fabrication/installation/removal mandays and interference mandays for each of the production, service, and material cost categories shown in Figure 2. There is a field for explanation of the cost estimate if required and a field for entering the estimator's name and phone number. This field is to be completed by the Shipalt Preparer or other activity as designated by the SPM.

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QUALITY ASSURANCE (3.4.27)	
SSRs (3.4.28)	
ILS CERT FORM (Y/N): (3.4.29)	
SPCL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL (3.4.30)	
MATERIAL	DISPOSITION
(CONTINUE ON ADDITIONAL SHEETS AS REQUIRED)	
INSTALLATION SUPPORT AND TEST EQUIPMENT (3.4.31)	
SHIPBOARD STOWAGE DETAILS (3.4.32)	
SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS (3.4.33)	

**FIGURE 1**



**SHIPALT COST ESTIMATE RECORD SHEET  
(3.4.37)**

Class of Estimate \_\_\_\_\_

	Pre-Fab/Install /Removal	Interferences
<b>Production M/D's</b>		
Structural	_____	_____
Mechanical	_____	_____
Piping	_____	_____
Electrical/Electronics	_____	_____
Paint/Instl/Etc.	_____	_____
Testing	_____	
<b>Total M/D's</b>	_____	_____
<b>Services M/D's</b>	_____	
<b>Total Production M/D's</b>	_____	_____
<b>Material (Dollars)</b>		
LLT Material	_____	_____
Remaining Material	_____	_____
<b>Total Material Cost</b>	_____	_____

DSA Costs (Mandays) \_\_\_\_\_  
 Total SHIPALT Costs M/D's (Dollars) \_\_\_\_\_

**Explanation:**

This estimate is based as a stand alone work item. As such, neither interferences from competing work items nor benefits from packaging with other items are considered. Changes in the scope of work required can significantly change the SHIPALT estimate.

Estimator \_\_\_\_\_ (name) \_\_\_\_\_ (phone)

**FIGURE 2**

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## FIELD AUTHORITY TABLE

<b>FIELD</b>	<b>TITLE</b>	<b>RESPONSIBILITY</b>
3.4.1	SHIPALT IDENTIFICATION	SAR PREPARER
3.4.2	REV	SAR PREPARER
3.4.3	BRIEF	SAR PREPARER
3.4.4	NAVSEA/PEO LEAD TECH CODE CONCURRENCE	SAR APPROVER
3.4.5	ENGINEERING DIRECTORATE CONCURRENCE	SAR APPROVER
3.4.6	OTHER CONCURRENCES	SAR APPROVER
3.4.7	LEAD LCM (LOGISTICS)	SAR PREPARER
3.4.8	SAR APPROVER TPOC	SAR APPROVER
3.4.9	PLANNING YARD TPOC	PLANNING YARD
3.4.10	ESWBS	SAR PREPARER
3.4.11	3-M NOUN NAME	SAR PREPARER
3.4.12	EIC	SAR PREPARER
3.4.13	AIT CAPABLE	SAR PREPARER
3.4.14	SAFETY ALT	SAR PREPARER
3.4.15	SUBSAFE IMPACT	SAR PREPARER
3.4.16	ILS AFFECTED	SAR PREPARER
3.4.17	SHIPBOARD STOWAGE	SAR PREPARER
3.4.18	CATEGORY CODE	SAR PREPARER
3.4.19	INDUSTRIAL STOWAGE AFFECTED	SAR PREPARER
3.4.20	TOC	SAR PREPARER
3.4.21	TMA/TMI	SAR PREPARER
3.4.22	DESCRIPTION	SAR PREPARER
3.4.23	APPLICABLE SHIPS	SAR PREPARER
3.4.24	REFERENCES	SAR PREPARER
3.4.25	ESTIMATED WEIGHT AND MOMENT IMPACT	SAR PREPARER
3.4.26	ALTERATION MATERIAL LIST (AML)	SAR PREPARER
3.4.27	QUALITY ASSURANCE (Q/A/CERTIFICATION REQUIREMENTS)	SAR PREPARER
3.4.28	SSR	SAR PREPARER
3.4.29	ILS CERTIFICATION FORM	SAR PREPARER
3.4.30	SPECIAL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL	SAR PREPARER
3.4.31	INSTALLATION SUPPORT AND TEST EQUIPMENT	SAR PREPARER
3.4.32	SHIPBOARD STOWAGE DETAILS	SAR PREPARER
3.4.33	SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS	SAR PREPARER
3.4.34	PROOFING REQUIREMENTS	SAR PREPARER
3.4.35	REQUIRED PRIOR OR CONCURRENT ALTS	SAR PREPARER
3.4.36	OTHER SYSTEMS INTERFACE	SAR PREPARER
3.4.37	SHIPALT COST ESTIMATE RECORD SHEET	SAR PREPARER

FIGURE 3

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**TECHNICAL SPECIFICATION**

**TITLE: SHIP ALTERATION DRAWINGS PREPARATION**

**NO.: TS9090-600A**

**DATE: JUNE 2002**

**SUPERSEDES: TS9090-600, dated AUGUST 85**



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**Published By  
Commander, Naval Sea Systems Command**

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**Naval Sea Systems Command  
1333 Issac Hull Avenue S.E.  
Washington, D.C. 20376**

**Ship Alteration Drawing Preparation**

1. This specification is published to establish minimum requirements for preparation of Ship Alteration (SHIPALT) Drawings (SIDs). This specification should also be complied with, as practical, for other Alteration drawings.
2. Recommended corrections, additions, or deletions should be addressed to Commander, Puget Sound Naval Shipyard, 1400 Farragut Ave, Bremerton, WA 98314-5001, Attn: Code 270

## TABLE OF CONTENTS

1.	SCOPE .....	1
1.1	<u>General</u> .....	1
1.2	<u>Applicability</u> .....	1
1.3	<u>Exceptions</u> .....	1
2.	APPLICABLE DOCUMENTS.....	1
2.1	<u>General</u> .....	1
2.1.1	<u>Specifications, standards, and handbooks</u> .....	1
2.1.2	<u>Other Government documents, drawings, and publications</u> .....	2
2.2	<u>Other Publications</u> .....	3
3.	REQUIREMENTS .....	4
3.1	<u>Precedence</u> .....	4
3.2	<u>General</u> .....	4
3.2.1	<u>SHIPALT Drawings</u> .....	4
3.2.2	<u>Non-Expanded Planning Yard SHIPALT Drawings</u> .....	5
3.2.3	<u>Expanded Planning Yard SHIPALT Drawings</u> .....	5
3.2.4	<u>Restrictive Data</u> .....	6
3.2.5	<u>Computer Aided Design (CAD)</u> .....	7
3.3	<u>Responsibilities</u> .....	7
3.3.1	<u>Planning Yard</u> .....	7
3.3.2	<u>NAVSEA Engineering Directorates</u> .....	8
3.4	<u>Drawing Preparation Requirements</u> .....	8
3.4.1	<u>General</u> .....	8
3.4.1.1	<u>Quality</u> .....	8
3.4.1.2	<u>Quantity</u> .....	8
3.4.2	<u>Drawing Sheet Sizes and Format</u> .....	8
3.4.2.1	<u>Drawing Sheet Sizes</u> .....	8
3.4.2.2	<u>Drawing Sheet Formats</u> .....	9
3.4.3	<u>Drawing Block Formats</u> .....	19
3.4.4	<u>Line Conventions and Lettering</u> .....	19
3.4.5	<u>Multi and Sectional View Drawings</u> .....	19
3.4.6	<u>Dimensions and Tolerance Levels</u> .....	19
3.4.7	<u>Abbreviations</u> .....	19
3.4.8	<u>Reference Designations</u> .....	20
3.4.9	<u>Type Designations</u> .....	33
3.4.9.1	<u>Equipment Subdivisions</u> .....	33
3.4.10	<u>Hull, Structural and Mechanical Graphic Symbols</u> .....	33
3.4.11	<u>Electrical and Electronic Graphic Symbols</u> .....	34
3.4.12	<u>Security Classification</u> .....	34
3.4.13	<u>Drawing Scale</u> .....	34
3.4.13.1	<u>Arrangement Scale</u> .....	34
3.4.14	<u>Drawing Materials</u> .....	34
3.4.15	<u>Final Drawings</u> .....	34

3.4.16 Revisions and Modifications to and Superseding of Existing Drawings ..... 34

3.4.17 General Notes ..... 35

3.4.18 Test Notes..... 36

3.4.19 Modification/Supersedure Notes..... 36

3.4.20 Drawing Submittal and Approval ..... 36

    3.4.20.1 Submittal of Drawings for Approval..... 36

3.4.21 Drawing Distribution..... 37

3.5 Content and Format..... 37

    3.5.1 General ..... 37

        3.5.1.1 Level 3..... 37

        3.5.1.2 New drawing number ..... 37

        3.5.1.3 Separate views and notes..... 37

    3.5.2 Level of Detail..... 38

    3.5.3 Drawing Types ..... 38

    3.5.4 Data Elements ..... 38

        3.5.4.1 Title Block (Front Sheet)..... 38

        3.5.4.2 Title Block (Continuation Sheet) ..... 40

        3.5.4.3 Revision Block ..... 40

        3.5.4.4 Revision Status Block ..... 40

        3.5.4.5 Reference List Block..... 41

        3.5.4.6 Ship Applicability/Shipcheck Block ..... 41

        3.5.4.7 Dimensional Tolerance Block..... 41

        3.5.4.8 Weight Control Data Block..... 41

        3.5.4.9 Verification Shipcheck Block ..... 42

        3.5.4.10 Proofing Shipcheck Block..... 42

        3.5.4.11 List of Parts/Material/Equipment Blocks..... 42

    3.5.5 Parts/Material/Equipment Lists..... 42

        3.5.5.1 Additional drawings ..... 43

        3.5.5.2 Required information ..... 43

        3.5.5.3 Equipment lists..... 44

    3.5.6 Hull/Structural Drawings ..... 45

        3.5.6.1 Symbols..... 45

        3.5.6.2 List of Material..... 46

        3.5.6.3 General Content..... 46

    3.5.7 Machinery, Piping and Heating, Ventilation and Air Conditioning (HVAC) Drawings ..... 46

        3.5.7.1 Symbols..... 47

        3.5.7.2 List of Material..... 47

        3.5.7.3 General Content..... 48

    3.5.8 Electrical/Electronic Drawings ..... 48

        3.5.8.1 Symbols..... 48

        3.5.8.2 List of Material..... 49

        3.5.8.3 General Content..... 49

    3.5.9 Arrangement Drawings ..... 49

    3.5.10 Ripout drawings ..... 50

        3.5.10.1 Master Ripout Drawing..... 51

- 3.5.10.2 Weight Control Data ..... 51
- 3.5.10.3 List of material to be removed ..... 51
- 3.5.10.4 Support Drawings..... 51
- 3.5.10.5 Interference Control Drawings..... 51
- 3.5.10.6 Installation Control Drawings ..... 52
- 3.5.10.7 Engineering Data Drawing ..... 52
- 3.5.10.8 Special Drawings..... 52
- 4. QUALITY ASSURANCE PROVISIONS..... 53
  - 4.1 Responsibility for Inspection ..... 53
    - 4.1.1 Sampling..... 53
    - 4.1.2 Planning Yard's Drawing Control System ..... 53
    - 4.1.3 Availability of Supporting Data ..... 53
    - 4.1.4 Drawing Control Procedures..... 53
  - 4.2 Nonconforming Data Items..... 54
    - 4.2.1 Format Defects ..... 54
    - 4.2.2 Engineering/Technical Defects ..... 54
      - 4.2.2.1 Significant Engineering/Technical Defects..... 54
      - 4.2.2.2 Minor Engineering/Technical Defects ..... 54
      - 4.2.2.3 Numerous Engineering/Technical Defects..... 54
  - 4.3 Inspection of Preparations for Delivery ..... 54
- 5. PREPARATION FOR DELIVERY..... 54
  - 5.1 Packaging ..... 55
    - 5.1.1 Classified Material ..... 55
  - 5.2 Packing ..... 55
  - 5.3 Marking of Shipments..... 55
- 6. NOTES..... 55
  - 6.1 Intended Use..... 55
  - 6.2 Ordering Data..... 55
    - 6.2.1 Procurement Requirements ..... 55
    - 6.2.2 Data Requirements ..... 55
  - 6.3 Definitions..... 56

## SHIP ALTERATION DRAWING PREPARATION

### 1. SCOPE

1.1 General. This specification provides minimum requirements for the uniform preparation of non-nuclear Ship Alteration (SHIPALT) Drawings (hereafter referred to as *drawings*) used for the accomplishment of all non-nuclear SHIPALTs except as noted herein (see 1.3).

1.2 Applicability. This specification is applicable to surface ship and submarine engineering drawings and associated lists and shall be utilized by all Hull Planning Yards/Design Agents (hereafter referred to as *Planning Yards*) for preparation of all working drawings prepared for accomplishment of SHIPALT work except as noted herein (see 1.3).

1.3 Exceptions. This specification shall not be utilized for preparation of the following:

- a. Drawings prepared for Nuclear Propulsion Plant SHIPALTs under the cognizance of the Deputy Commander for Nuclear Propulsion, NAVSEA 08.
- b. Drawings prepared for installation of Special Project Alterations (SPALTs) issued by the Director, Special Strategic Project Office, NAVMAT PM-1.
- c. Drawings concerning aircraft launch and recovery equipment that are under the cognizance of the Commander, Naval Air Systems Command.
- d. Ship's Selected Record Drawings (SRDs).

### 2. APPLICABLE DOCUMENTS

2.1 General. The following documents, of the issue in effect on the date of invitation for bids or request for proposals (for private Planning Yards) or on the date of the tasking documentation (for public Planning Yards), or as specified in the data of the tasking correspondence, form a part of this specification to the extent specified herein.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks of the exact revision listed below form a part of this document to the extent specified herein.

### SPECIFICATIONS

#### **Federal**

L-P-519 CCC-C-531	Plastic Sheet, Tracing, Glazed and Matte Finish Cloth, Tracing
----------------------	---

#### **Military**

MIL-DTL-31000	Technical Data Packages, General Specifications for
MIL-PRF-5480	Data, Engineering and Technical, Reproduction Requirements for

MIL-D-23140

Drawings, Installation Control for  
Shipboard Electronics Equipment**NAVSEA**

Technical Specification 9090-100

SHIPALT Technical Liaison Services, Waivers and  
Deviations

Technical Specification 9090-500

Ship Alteration Record Preparation

**STANDARDS****Military**

DOD-STD-2003-5

Electric Plant Installation Standard Methods for  
Surface Ships and Submarines (Connectors)

MIL-STD-22

Welded Joint Design

MIL-STD-25

Ship Structural Symbols for Use on Ship Drawings

DOD-STD-100

Engineering Drawing Practices

MIL-STD-129

Marking for Shipment and Storage

MIL-STD-196

Joint Electronics Type Designation System

**HANDBOOKS**

MIL-HDBK-505

Definitions of Item Levels, Item Exchangeability,  
Modules and Related Terms

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications of the exact revision level shown form a part of this document to the extent specified herein.

**PUBLICATIONS****DEPARTMENT OF DEFENSE**

H4-1/H4-2 - Cataloging Handbook

CAGE Code for Manufacturers and  
Government, Name to Code and Code to Name**NAVAL SEA SYSTEMS COMMAND**

0900-LP-001-7000

Fabrication and Inspection on Brazed Piping Systems

0902-018-2010

General Overhaul

0902-LP-041-2010

Specification for Deep Diving Submarine

0948-LP-045-7010

Standard Specifications for U.S. Navy Craft

Material Control-Standard

S9040-AA-IDX-010/SWBS5D S9074-AQ-GIB-010/278	Ship Work Breakdown Structure Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels
S9AA0-AA-SPN-010/GEN-SPEC	General Specifications for Ships of the United States Navy [Last revision 1995 for internal NAVSEA use only]
S9AA0-AB-GOS-010	General Specifications for Overhaul of Surface Ships (GSO) Including the Aegis Supplement
S0005-AE-PRO-010/EDM	NAVSEA Engineering Drawing Life-Cycle Management Process Manual
SL720-AA-MAN-010	Fleet Modernization Program Management and Operations Manual
SECNAVINST 5510.30 SECNAVINST 5510.36	Department of the Navy Personnel Security Program Department of the Navy (DON), Information Security Program (ISP)
NAVSEAINST 9085.2	Engineering Drawing Acquisition and Life-Cycle Management Policy and Responsibilities
NAVSEA Drawing No. 53711-803-5001049	Piping System Symbols and abbreviations

2.2 Other Publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of the invitation for bids or request for proposal (for private Planning Yards) or the date of the tasking documentation (for public Planning Yards) shall apply.

#### **AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)**

ANSI/AWS A2.4	Symbols for Welding and Nondestructive Testing
ANSI / ASME Y14.1	Drawing Sheet Size and Format
ANSI / ASME Y14.2	Line Conventions and Lettering
ANSI / ASME Y14.3	Multi and Sectional View Drawings
ANSI / ASME Y14.5	Dimensioning and Tolerancing
ANSI Y14.15	Electrical and Electronic Diagrams
ANSI Y14.15a	Interconnection Diagrams
ANSI Y14.17	Fluid Power Diagrams
ANSI / ASME Y32.2	Graphic Symbols for Electrical and Electronics Diagrams
ANSI / ASME Y32.10	Graphic Symbols for Fluid Power Diagrams
ANSI Y32.16	Reference Designations for Electrical and Electronics Parts and Equipment
ANSI Y32.2.4	Redesignation of Graphic Symbols for Heating, Ventilating and Air Conditioning

(Application for copies should be addressed to the American National Standard Institute, 1430 Broadway, New York, New York 10018.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Y14.38

Abbreviations and Acronyms

ASME Y14.100

Engineering Drawing Practices

### 3. REQUIREMENTS

3.1 Precedence. In the event of conflict between the requirements of this specification and the documents referenced herein, the requirements of this specification shall apply except in the event of conflict between the requirement of this specification and the requirement of NAVSEA 0902-018-2010, NAVSEA 0902-LP-041-2010, NAVSEA S9AAO-AB-GOS-010, or NAVSEA S9AAO-AA-SPN-010/GEN-SPEC. In these cases, the requirements of those documents shall apply.

#### 3.2 General.

3.2.1 SHIPALT Drawings. SHIPALT drawings are those drawings which are utilized by a shipyard or other activity (including Ship's Force) for the accomplishment of all non-nuclear SHIPALT work. These drawings also provide a record of ship configuration after SHIPALT accomplishment, are used by Ship's Force in maintenance and casualty control, are used by material support activities in determining support requirements, and are used by NAVSEA to maintain system and compartment configuration control. These drawings include, as required, system drawings and diagrams, arrangement drawings, structural drawings, manufacturing drawings, assembly and detail drawings, removal drawings, temporary access/egress drawings, cabling sheets and special drawings and shall meet the following general criteria:

- a. Drawings shall be prepared to meet the requirements of this specification.
- b. Drawings shall be as complete as practicable; i.e., drawings should not rely on references to other drawings or other sources of technical data to provide information which would be more easily utilized by the installing activity if presented on the drawing. When reference to other data sources (technical manuals, specifications, standards, drawings, etc.) is required, the drawings shall not reference restrictive data (3.2.4) that would not be available at all installing activities.
- c. Unless otherwise approved by NAVSEA, drawings shall contain complete ordering information for all required parts, material and equipment. Any Standards referenced for manufacturing must be readily available.
- d. SHIPALT engineering design shall be applied to drawings either as revisions to existing drawings (see 3.4.16 (a)) or by creation of new drawings. New drawings can be in the form of modification drawings (see 3.4.16 (b)), superseding drawings (see 3.4.16 (c)), or *stand-alone* drawings (drawings which do not change or supersede information shown on other drawings, usually providing a new design or capability to the ship). If SHIPALT design is applied to an existing drawing, the revisions which applies to the design shall clearly indicate the changes caused by the SHIPALT without loss of essential information which describes ships which have not completed the SHIPALT or are not applicable to the SHIPALT. If the application of SHIPALT

design data by revision will cause confusion or changes more than 25% of the data on an existing drawing, a new drawing shall be prepared either modifying or superseding the existing drawing.

3.2.2 Non-Expanded Planning Yard SHIPALT Drawings. Planning Yards not designated as Expanded Planning Yards by NAVSEA SL720-AA-MAN-010 shall prepare SHIPALT drawings to support accomplishment of individual SHIPALTs. There are two types of SHIPALT drawings to support this effort, Basic Alteration Class Drawings (BACDs) and Supplemental Alteration Drawings (SADs).

- a. Basic Alteration Class Drawings (BACDs). BACDs are the first complete set of drawings developed for accomplishment of a SHIPALT that requires drawings. The drawings for accomplishment of an individual SHIPALT shall form a complete drawing package or set and shall be prepared based on conditions found during a shipcheck of the first ship scheduled to receive the SHIPALT. The drawings shall be generally applicable to the other ships of the class. If the shipchecks of follow ships reveal significant differences (less than 75% of a drawing is applicable) on a follow ship or series of follow ships, the Planning Yard may prepare a new drawing for that ship or series of ships. The cognizant NAVSEA Ship Logistic Manager (SLM) or Ship Acquisition Project Manager (SPM) must authorize preparing of the new drawing(s). If the differences found on follow ships are not significant (more than 75% of the BACD is applicable), Supplemental Alteration Drawings (SADs) may be prepared to adapt the design of the BACD to the specific ship or series of ships or the BACD may be revised to indicate the differences.
- b. Supplemental Alteration Drawings (SADs). SADs are drawings that adapt the design details developed on BACDs to provide applicability to follow ships of class. SADs do not modify the requirements or scope of a SHIPALT and shall only be prepared to the extent necessary to tailor the BACD design to a specific hull or series of hulls. (Departure from the technical requirements indicated on the parent BACD or changes which affect component selection, material specifications, stress levels, stress distribution (especially on structural and piping drawings), system integration and/or functional configuration, system operational and/or maintenance characteristics, structural integrity, or compartment/topside arrangements shall require cognizant NAVSEA Engineering Directorate approval and cognizant SLM or SPM authorization. They will normally be prepared as modification drawings (see 3.4.16 (b)) and the level of detail shall be equal to that of the BACD being modified. The area(s) of the BACD being modified shall be clearly identified. In cases where a shipcheck reveals significant differences (less than 75% of a BACD is applicable) on a ship, a new drawing shall be prepared for that ship. The new drawing shall have all of the BACD design details, including the engineering data (see 3.5.10.7), adapted for that ship that the BACD has for the other ships of the class.

3.2.3 Expanded Planning Yard SHIPALT Drawings. Expanded Planning Yards (as designated by NAVSEA SL720-AA-MAN-010) shall prepare complete drawing packages, SHIPALT Installation Drawings (SIDs), to support all non-nuclear SHIPALT work scheduled to be accomplished on specific ships during specific availabilities. The drawings, as a package shall provide complete design data for all non-nuclear SHIPALTs scheduled for specific availabilities.

The drawing package may include modification drawings, superseding drawings, stand-alone drawings and revised existing drawings which provide design data for individual SHIPALTs, and may also include integrated design drawings. Integrated design drawings represent work required by two or more SHIPALTs, usually to be accomplished in the same space or area of the ship and would be scheduled to be accomplished at the same time. These drawings may include rip-out drawings (see 3.5.10), temporary access/egress drawings, and arrangement drawings (see 3.5.9) and are generally applicable to only one ship. (Integrated design drawings shall not be prepared unless it is clearly advantageous to do so and the drawings shall clearly indicate the extent of work for each SHIPALT included on the drawing.)

3.2.4 Restrictive Data. Unless otherwise specified by NAVSEA, individual drawings in a drawing package shall not include the following:

- a. SHIPALT drawings shall invoke only Government or other universally accepted procedures, standards or specifications such as those specified in NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010. Planning Yard or other local procedures, standards or specifications may be invoked in conjunction with the applicable government specifications (such as in parenthesis following the government specification) only when all requirements of the government specification are invoked in the local specification. (Until such time as NAVSEA Standard and Type Drawings can be updated, the use of Planning Yard Standard Drawings shall be permitted as references on SHIPALT drawings, if they are listed as required references in the applicable Planning Yard-prepared Ship's Availability Drawing Schedule.)
- b. Original builder's specifications, contract drawings, and contract guidance drawings. These are not available at most activities and shall not be referenced directly on SHIPALT drawings.
- c. Reference to any specific availability or overhaul.
- d. Reference to the shipyard assignment for any ship.
- e. Reference to any miscellaneous information or Notes relating to operations or procedures peculiar to a specific shipyard or activity unless it is clearly delineated that the information pertains only to a specific activity. For example, following the miscellaneous information or Notes with '(for PSNS only)'.
- f. Material specifications based on the material's availability in the Planning Yard's shipyard stock. To the maximum extent possible, material shall be selected on the basis of its suitability and of its general availability, according to the best information held by the Planning Yard, to all installing activities.
- g. Specification of proprietary material, unless the Planning Yard determines that there is no generic equivalent. If proprietary material is required, complete ordering information shall be provided on the drawing.
- h. References to proprietary vendor drawings unless required for ordering information (see 3.2.4 (g)).
- i. Material part numbers or stock numbers which are peculiar to a given activity's stock system unless handled in a manner similar to e. above.

3.2.5 Computer Aided Design (CAD). In nearly all instances, SIDs will be developed using a CAD application. This provides significant benefits in efficiency and accuracy, as well as

reusability. When CAD files are generated they must follow a consistent set of CAD Standards with regards to layers, line weights, line fonts, and standard library parts inserted. Specific CAD Standards are not mandated as long as the CAD drawings are developed in a consistent manner. (The Planning Yards at PSNS, NNSY and NGNN have published a CAD Standard which is available for other activities to use.) The electronic drawing files must be backed-up and archived in accordance with NAVSEA requirements.

### 3.3 Responsibilities.

3.3.1 Planning Yard. The Planning Yard for each ship class, as designated by NAVSEA SL720-AA-MAN-010, is the engineering design agent for assigned specific classes of ships. Responsibilities assigned to the Planning Yard (both Expanded and Non-Expanded) in support of SHIPALT drawings include the following:

- a. Developing basic SHIPALT engineering design
- b. Developing detail design drawings for accomplishment of SHIPALTs as described in 3.2.2 and 3.2.3.
- c. Performing shipchecks, as required, to accomplish the following:
  1. Determine lead ship design (performed prior to or after actual drawing preparation, but must be conducted on applicable ships prior to issuance of the drawing) to support specific availabilities.
  2. Determine drawing adequacy and applicability to follow ships of a class (performed prior to or after actual drawing preparation, but must be conducted on applicable ships prior to issuance of the drawing) to support specific availabilities.
  3. Conduct proofing (Validation) of SHIPALT drawings (performed as part of proofing of SHIPALT design for SHIPALT records (SARs) which require proofing after SHIPALT accomplishment on the first ship to receive the SHIPALT).
  4. Verify the design and applicability of high risk or complex SHIPALT drawings. This is to be limited to those alterations that are high risk and where the Planning Yard has reason to believe that the drawings or the design presented on the drawings may be inadequate. The NAVSEA SLM/SPM is to be notified in advance of the shipcheck. This shipcheck may also be conducted by the installing activity/SUPSHIP when approved by the Planning Yard.
- d. Approve drawings.
- e. Providing resolution to problems with SHIPALT drawings encountered by overhaul yards via the liaison action record (LAR) procedure in accordance with NAVSEA Technical Specification 9090-100.
- f. Maintaining a central drawing file of all Master File Drawings, including CAD files, applicable to the ships for which the Planning Yard is responsible.
- g. Developing SHIPALT man-day and material cost estimates as part of BACD or SID preparation. A SHIPALT cost Estimate Record Sheet, Figure S4-4 of Section 4.6.3.3 of NAVSEA SL720-AA-MAN-010, shall be appropriately completed by the Planning Yard and submitted to the cognizant SLM or SPM within 30 days of completion of BACDs or SIDs.
- h. Maintain configuration control.

3.3.2 NAVSEA Engineering Directorate. NAVSEA Engineering Directorate (NAVSEA 05) is the activities responsible for the SHIPALT technical products. This includes:

- a. SHIPALT review and approval requirements will be established by the NAVSEA Engineering Directorate Office responsible for each SHIPALT, on a case basis or the requirements of NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010 shall be specified. Requirements will be specified in the SHIPALT Record (SAR) (see NAVSEA Technical Specification 9090-500).
- b. Conducting in-process reviews during the development of the technical products of major SHIPALTs. In-process reviews will be conducted when either the Engineering Directorate or the cognizant SLM/SPM determine such a review is required for a particular SHIPALT. Review requirements will be specified in the SAR.
- c. Performing technical review and approval of major changes, waivers and deviations to SHIPALT documentation in accordance with procedures for controlling engineering changes to SHIPALTs, NAVSEA Technical Specification 9090-100.

3.4 Drawing Preparation Requirements. Drawings and associated lists shall be prepared as engineering drawings in accordance with the general drafting practices outlined in DOD-STD-100, as defined herein, and as modified by NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010, as specified in the contract or tasking documentation.

#### 3.4.1 General.

3.4.1.1 Quality. Within the requirements of DOD-STD-100, MIL-DTL-31000, and the direction contained herein. Planning Yards shall provide drawings for SHIPALT accomplishment, as tasked, which are timely, accurate, and as suitable for direct use as a stand-alone drawing package by installing activities as possible. Installing activities are to use these drawings with a minimum of departure to promote standardization and reduce ship differences in a given class.

3.4.1.2 Quantity. When the SHIPALT design affects the configuration of other systems, compartments, or spaces adjacent to the system or area directly affected by the SHIPALT, sufficient drawings shall be prepared to reflect the rearrangement and reconfiguration of such systems, compartments or spaces. (For submarines only - For SHIPALTs included on approved Baseline Arrangement Drawings, arrangement drawings shall reflect the approved baseline or the Planning Yard shall request departures in accordance with NAVSEA 0902-018-2010. For SHIPALTs not included on baseline drawings, NAVSEA approval of arrangements drawings shall be as specified in the SAR.)

#### 3.4.2 Drawing Sheet Sizes and Format.

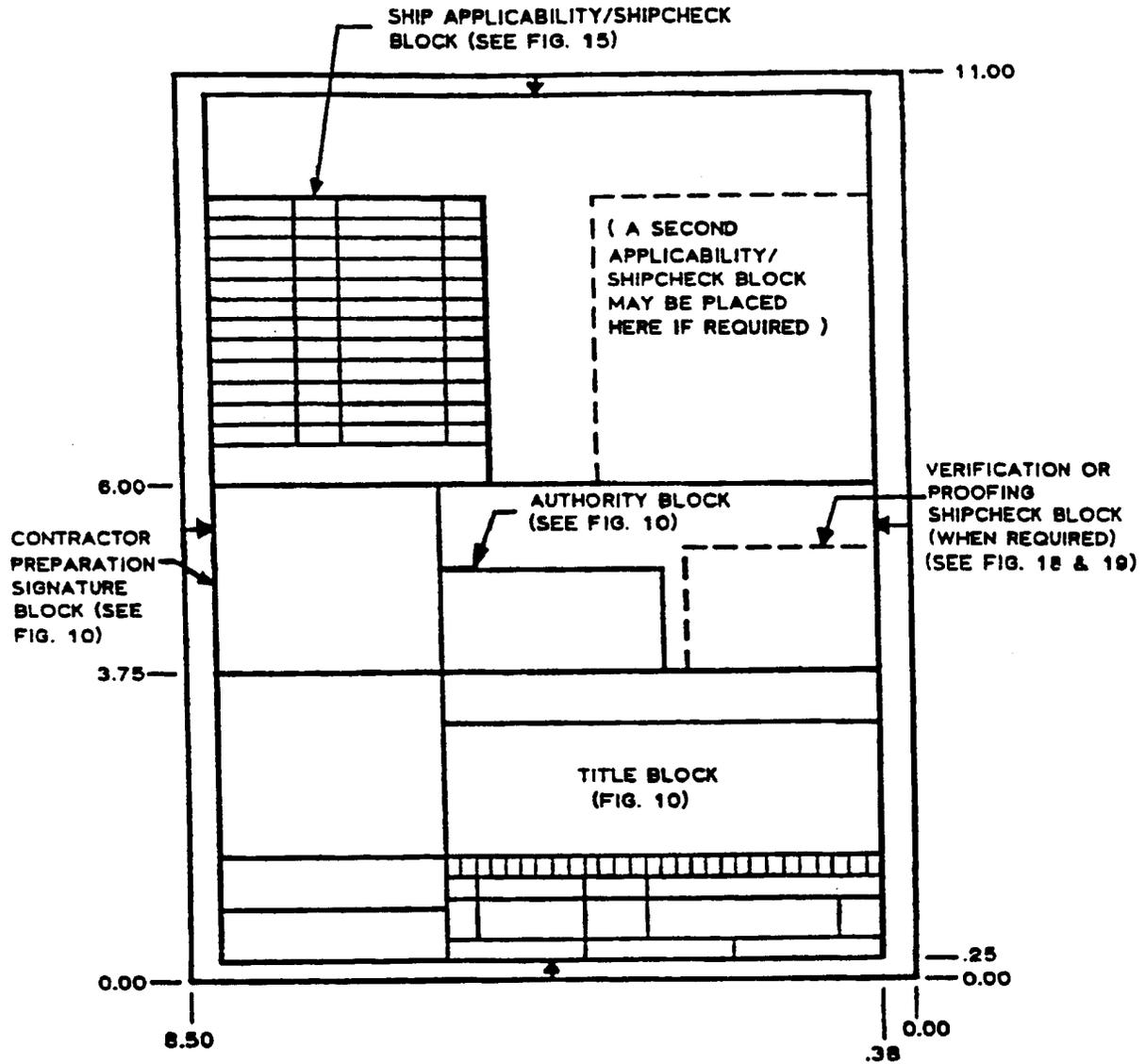
3.4.2.1 Drawing Sheet Sizes. Drawing sheet sizes shall be size "A", "B", "C", "D", or "F" as indicated in ANSI/ASME Y14.1. For specific drawings, such as some system diagrams which must be shown as one continuous drawing and will thereby exceed the length of a single size "F" sheet, "H" roll size sheets shall be utilized as described herein.

- a. Size "A" sheets shall be used where information is primarily text or is limited to notes and small sketches. Except for tabular type drawings (e.g. cable running sheets or

- engineering calculations), size "A" drawings will be generally limited to ten data sheets or less. All size "A" drawings exceeding ten sheets shall also include an index sheet.
- b. Size "B", "C" and "D" sheets shall be used for intermediate size drawings where the data is not appropriate for size "A" sheets and has insufficient information to justify size "F" sheets.
  - c. Size "F" drawings shall be used for most large drawings. Drawings which must be prepared as a single continuous drawing (not multiple sheets) such as some system drawings and deck drawings of large ships and will therefore exceed the length of size "F" sheets, shall be prepared as size "H" drawings.
  - d. Size "H" drawings shall only be used for drawings which must display information on one continuous sheet which would exceed the length of a single size "F" sheet or would be confusing if prepared as a multiple sheet drawing. This would include complex piping and wiring system diagrams, arrangements of flight and hanger decks, arrangements of antennas and deck machinery, power and lighting wiring deck plans for large ships, etc. Size "H" drawings shall be prepared as single, continuous, multi-frame drawings with no single frame exceeding 44 inches in length. The final frame shall be 11, 23, 33 or 44 inches in length. There shall be no second sheets for "H" size drawings: the title block shall always indicate the sheet number as "SHEET 1 OF 1".

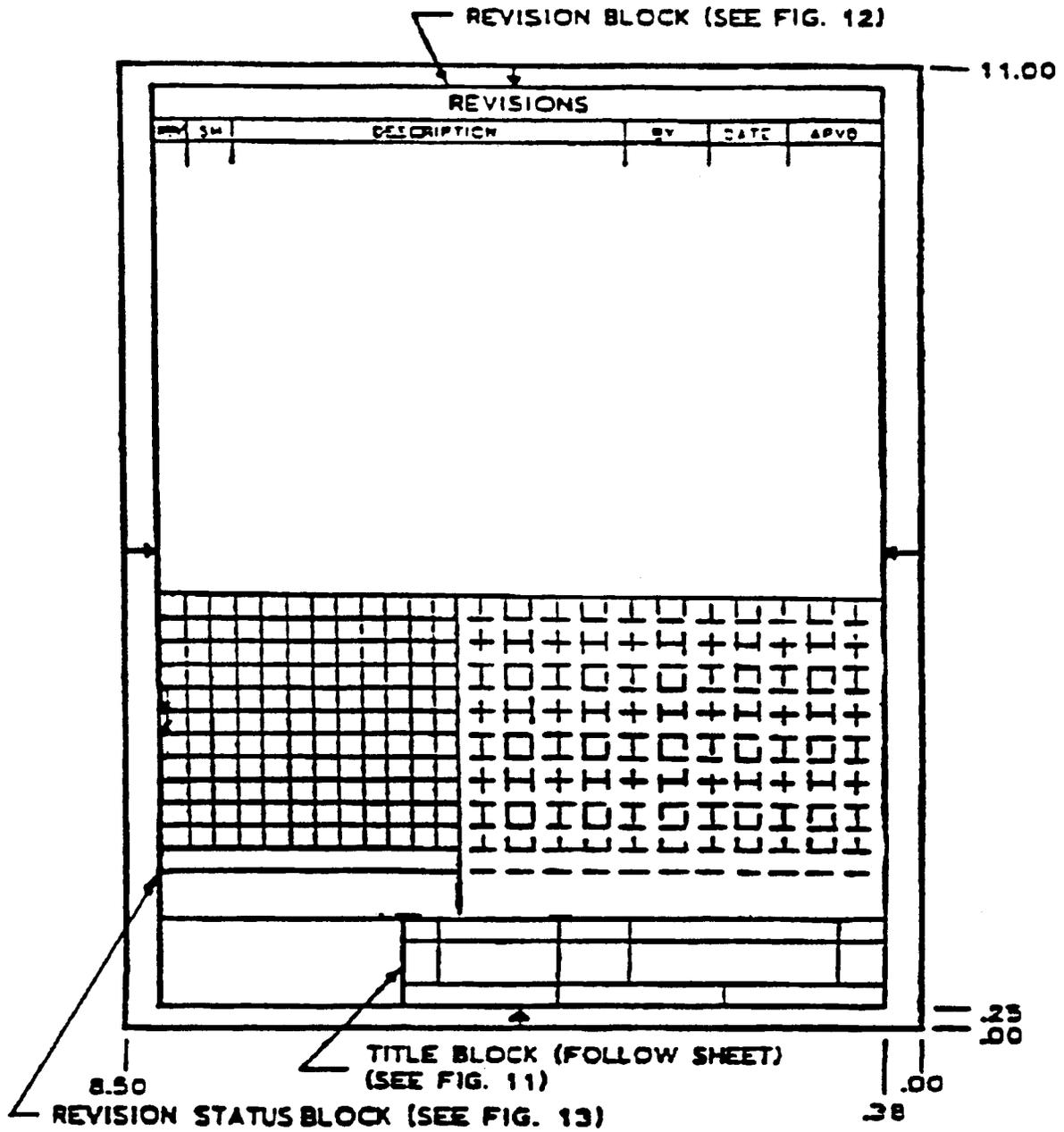
3.4.2.2 Drawing Sheet Formats. Figures 1 through 9 provide the basic drawing sheet formats to be used for non-nuclear NAVSEA drawings. In preparation of these formats, especially as reproducible format masters, the following guidance shall be utilized:

- a. **Margins.** The margin sizes shall be selected to permit reproduction of drawings on sheets that conform to this specification or international paper sizes.
- b. **Zoning.** Except for size "A" and "B" formats, all NAVSEA drawings shall include zones for reference purposes. Where used, zones are indicated by alphabetical and numerical entries in the format margins as indicated in figures 6, 7, 8 and 9. Horizontal zones on continuation sheets shall be lined in but not numbered as part of the format. (The numbering of zones on continuation sheets is provided as part of drawing preparation.)
- c. **Format Lettering.** The size and style of lettering printed on drawing formats shall be in accordance with ANSI/ASME Y14.2.
- d. **Format Lines.** Width of lines in format features shall conform to the following:
  1. Thick (approximately 0.030 in.) lines shall be utilized for borderlines, outlines of principal blocks and main division blocks.
  2. Thin (approximately 0.015 in.) lines shall be utilized for divisions of parts, material and equipment lists and revision and reference blocks, minor subdivisions of title blocks and supplementary blocks, and zone markers.

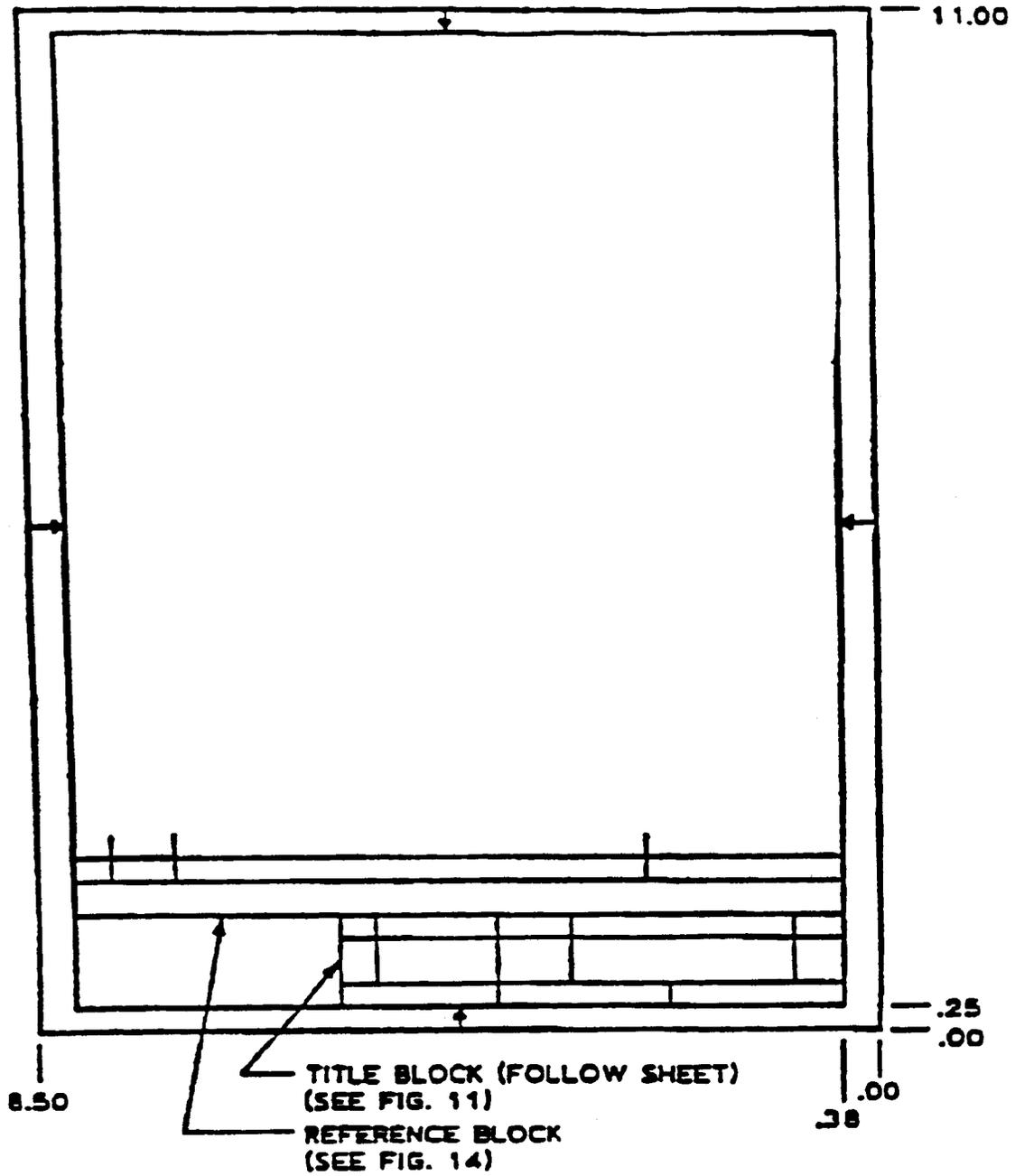


TITLE (FRONT) SHEET  
SIZE "A" FORMAT

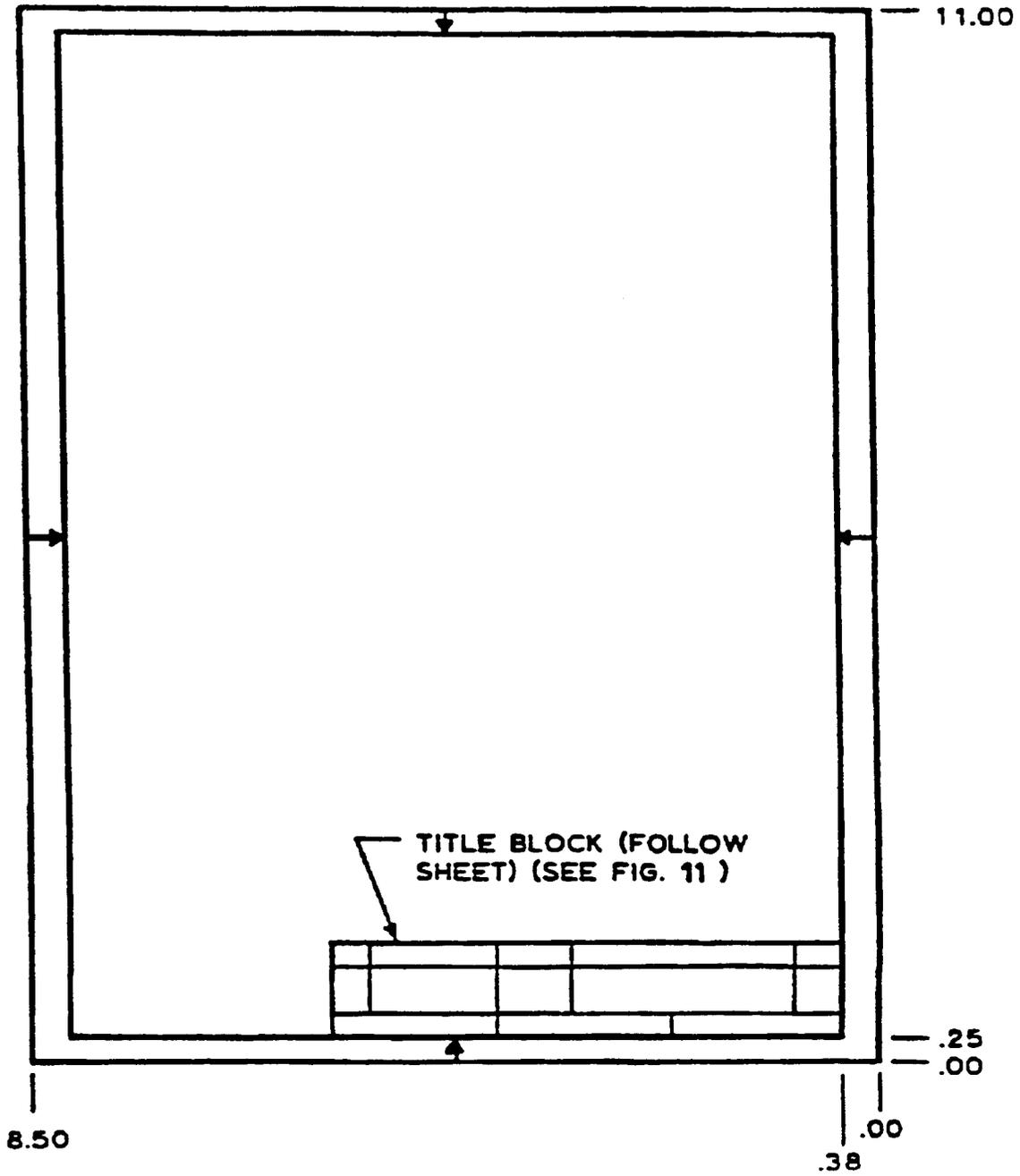
FIGURE 1



REVISION DESCRIPTION SHEET  
SIZE "A" FORMAT  
FIGURE 2



REFERENCE AND REVISION STATUS  
SIZE "A" SHEET FORMAT  
FIGURE 3



INFORMATION SHEET  
SIZE "A" FORMAT  
FIGURE 4

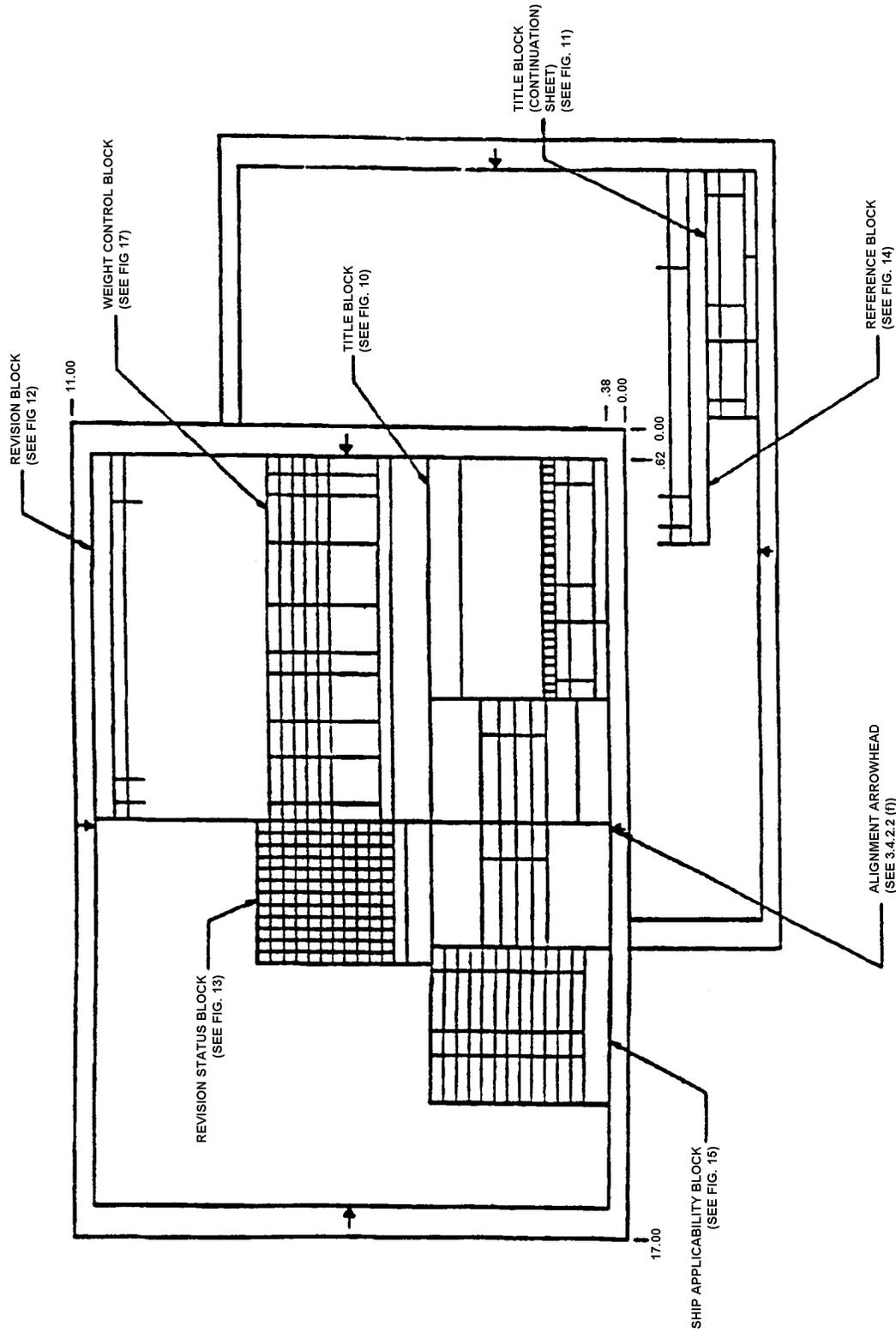


FIGURE 5

SIZE "B" SHEET FORMAT

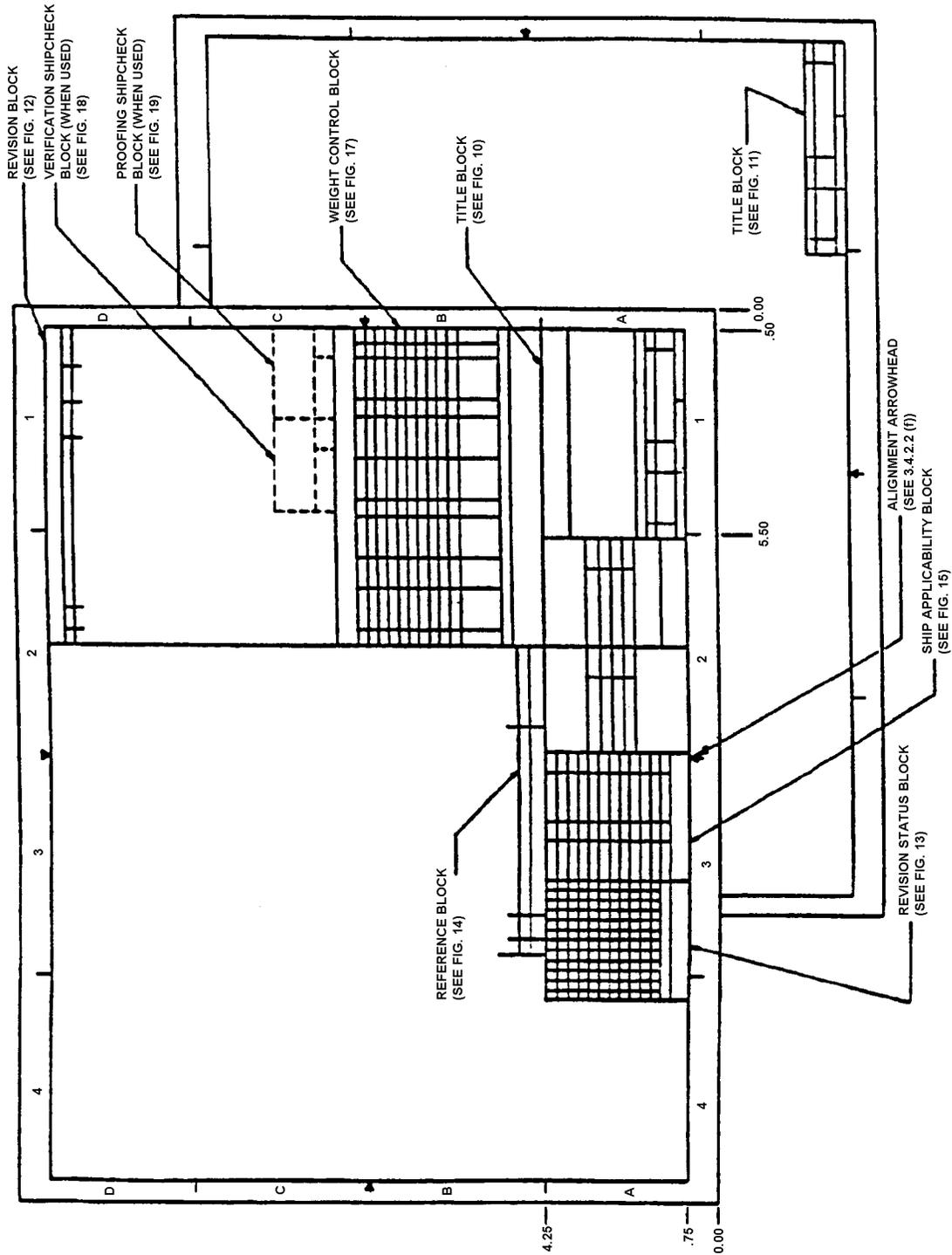


FIGURE 6

SIZE "C" SHEET FORMAT

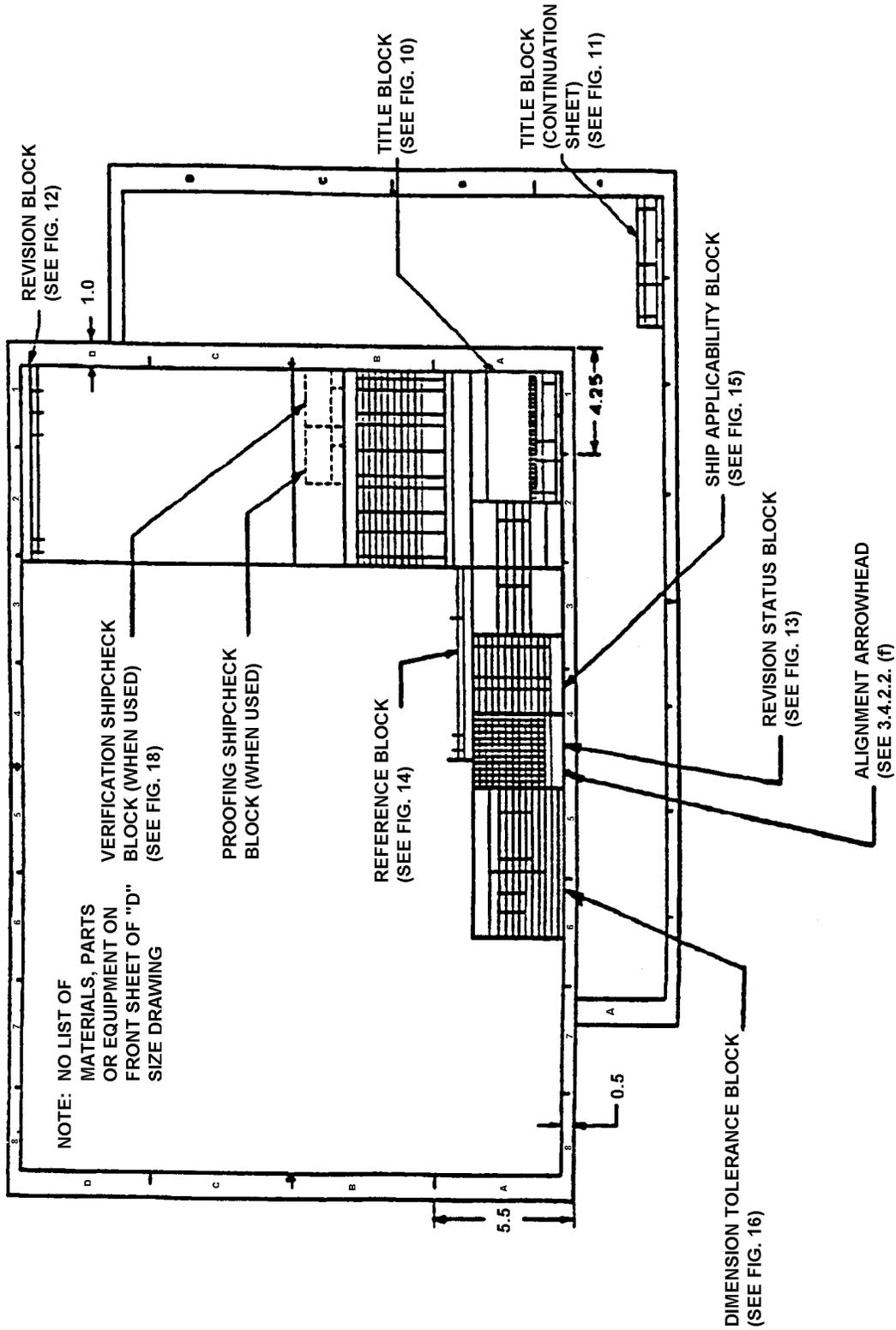


FIGURE 7

SIZE "D" SHEET FORMAT

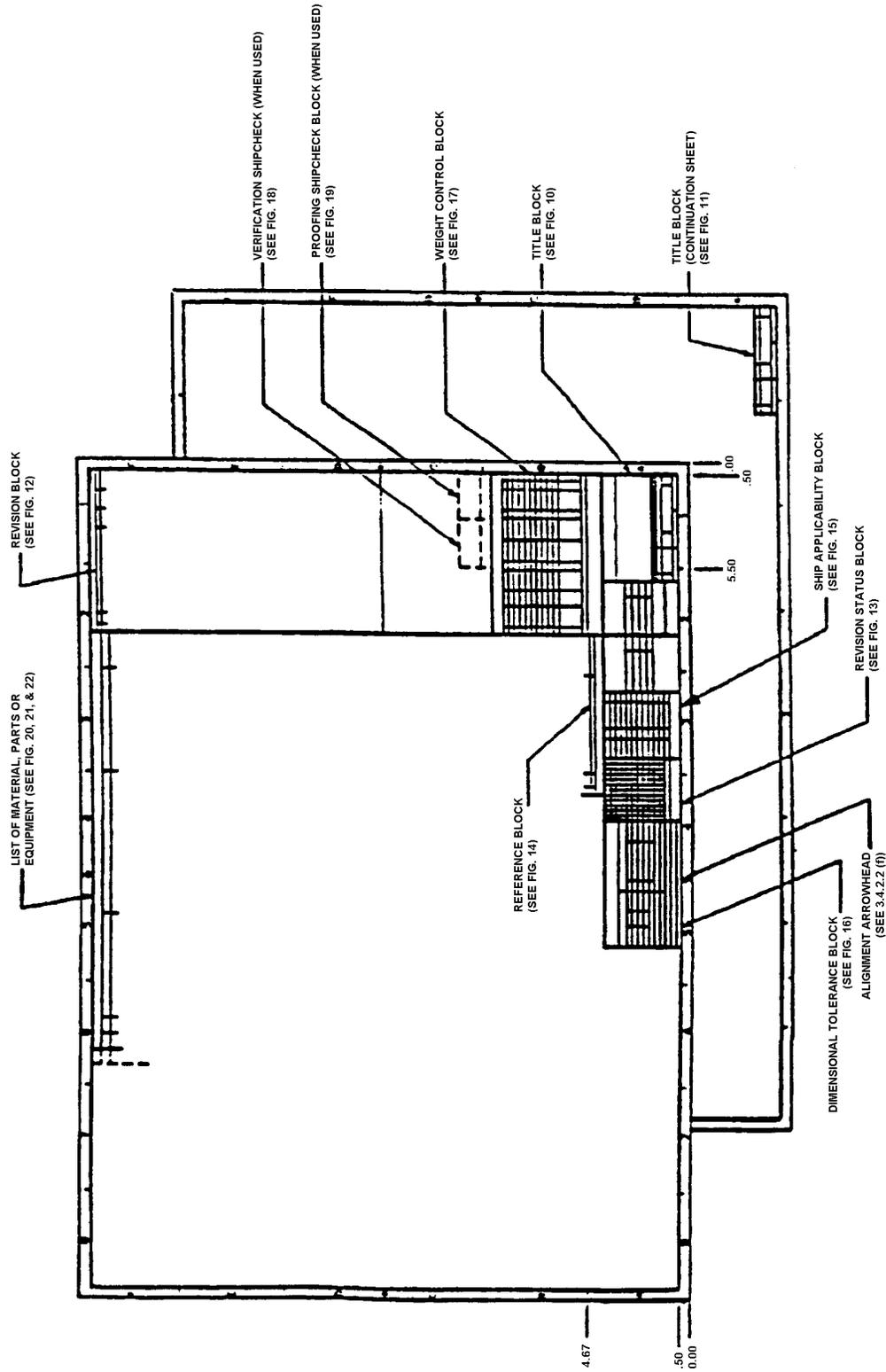


FIGURE 8

SIZE "F" SHEET FORMAT

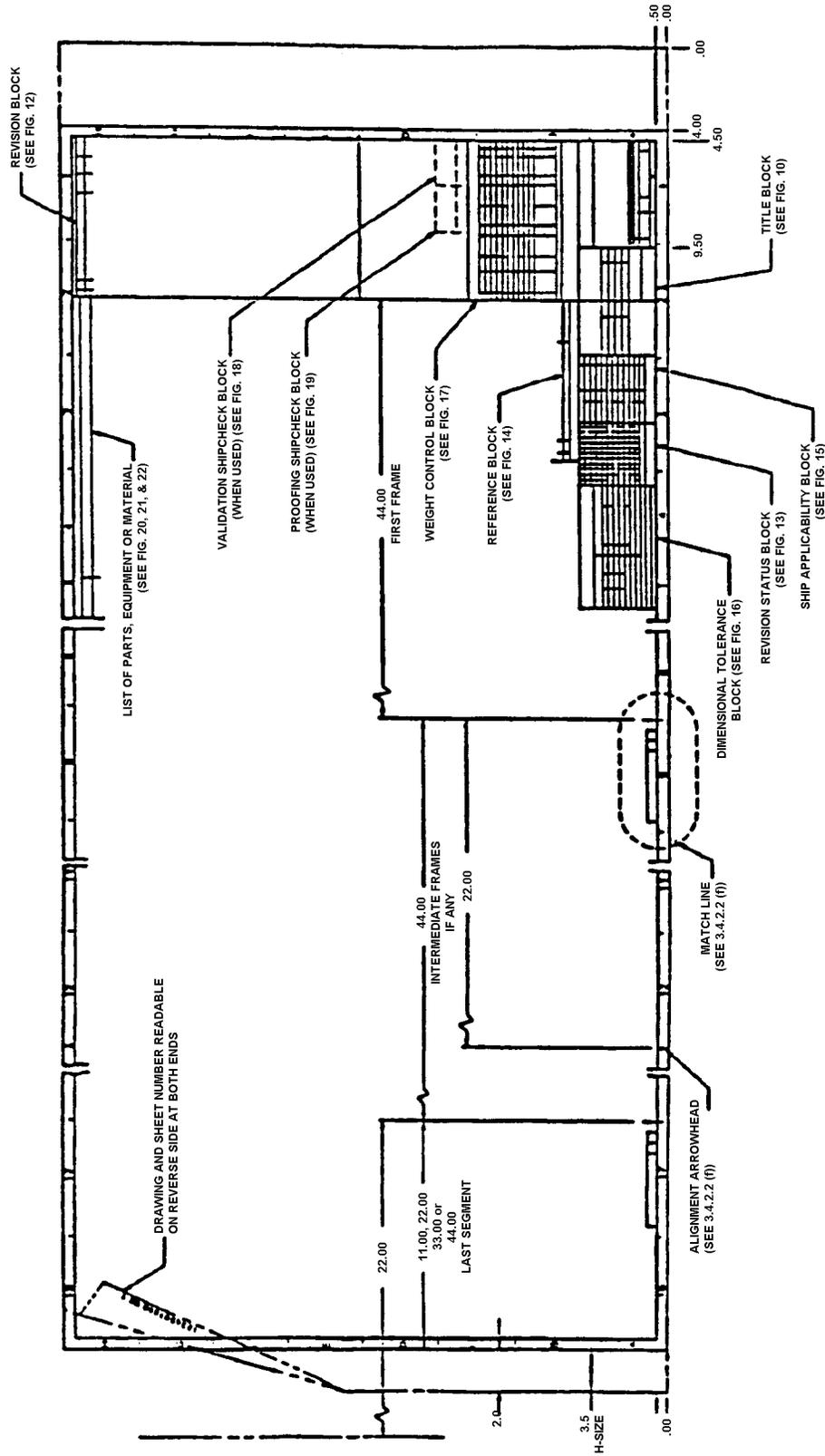
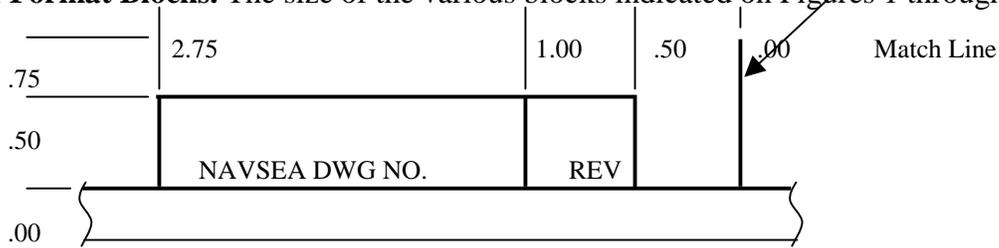


FIGURE 9

SIZE "H" DRAWING FORMAT

**Size of Format Blocks.** The size of the various blocks indicated on Figures 1 through 9 shall be



in accordance with 3.4.3 and Figures 10 through 22.

**3.4.3 Drawing Block Formats.** Drawing block formats shall be in accordance with the appropriate figures as follows:

- a. Title/signature block (front sheet) (Figure 10)
- b. Title block (continuation sheets) (Figure 11)
- c. Revision block (Figure 12)
- d. Revision status block (Figure 13)
- e. Reference list block (Figure 14)
- f. Applicability/shipcheck block (Figure 15)
- g. Dimensional tolerance block (Figure 16)
- h. Weight control block (Figure 17)
- i. Verification Shipcheck block (Figure 18)
- j. Proofing Shipcheck block (Figure 19)
- k. List of Parts block (Figure 20)
- l. List of Material block (Figure 21)
- m. List of Equipment block (Figure 22)

**3.4.4 Line Conventions and Lettering.** Line conventions and lettering shall be in accordance with the ANSI/ASME Y14.2.

**3.4.5 Multi and Sectional View Drawings.** Multi and sectional view drawings shall be in accordance with ANSI/ASME Y14.3. The application of space geometry and space analysis included as appendices in ANSI/ASME Y14.3 shall not be included in NAVSEA drawings unless otherwise specified in the contract or tasking documentation.

**3.4.6 Dimensions and Tolerance Levels.** Dimensions and tolerance levels of NAVSEA drawings shall be in accordance with ANSI/ASME Y14.5. Drawings shall utilize U.S. customary units (non-metric units) unless otherwise specified in the contract or tasking documentation (dual dimensions shall not be utilized). Use of fractional or decimal dimensions is left to the option of the Planning Yard, but shall be consistent throughout the drawing. Both decimal and fractional dimensions may be utilized on drawings that contain machining details (decimals) as well as structural/equipment/piping details (fractions). Graphic and architectural symbols specified in ANSI/ASME Y14.5 shall not be used. Requirements for these symbols are covered elsewhere in this specification.

**3.4.7 Abbreviations.** Abbreviations used on drawings shall be used only where the limitation of space or conservation of significant drafting time dictate. When required, abbreviations shall be

in accordance with ASME Y14.38. A note shall explain abbreviations not covered in this standard on the drawing.

3.4.8 Reference Designations. Reference designations for electrical and electronic equipment shall be in accordance with ANSI Y32.16.

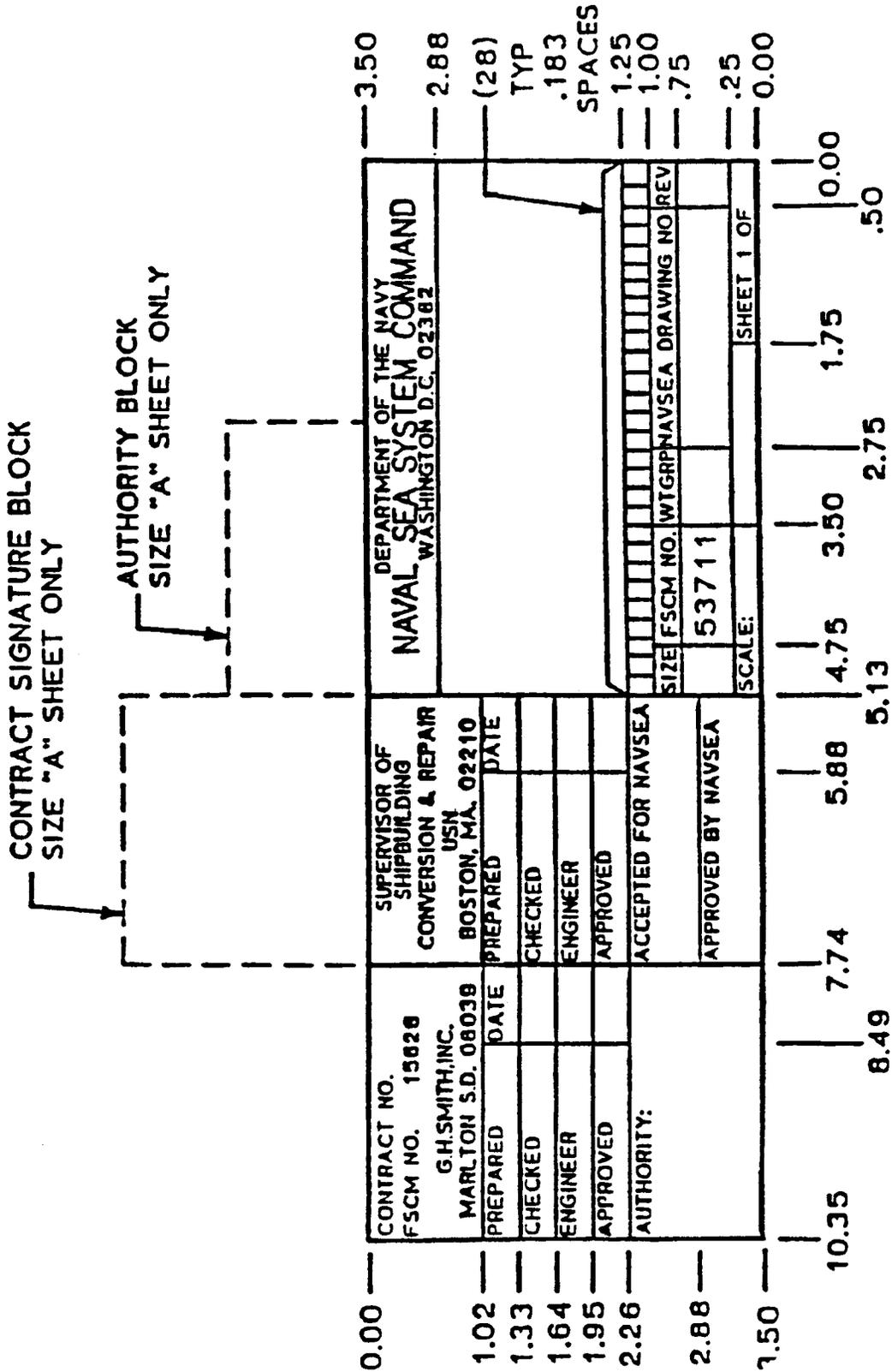


FIGURE 10

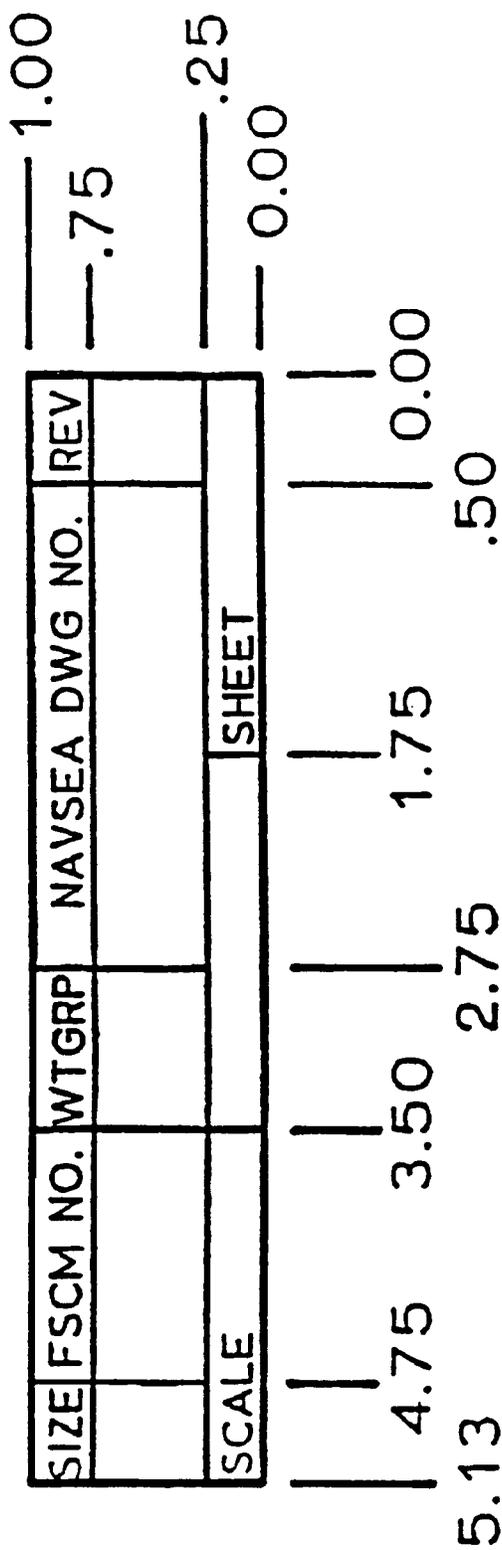


FIGURE 11

TITLE BLOCK CONTINUATION SHEETS

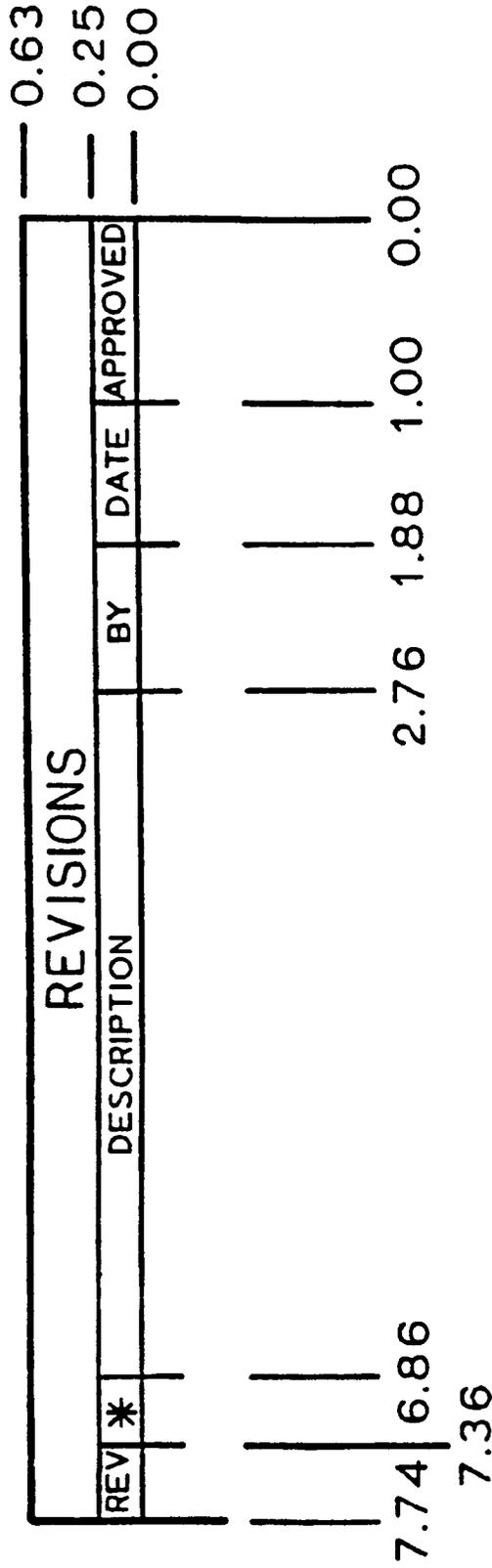


FIGURE 12

\* "SHEET" FOR SIZE "A" FORMATS  
 "ZONE" FOR SIZE "B"; "C"; "D"; "F" AND "H" FORMATS

REVISION BLOCK

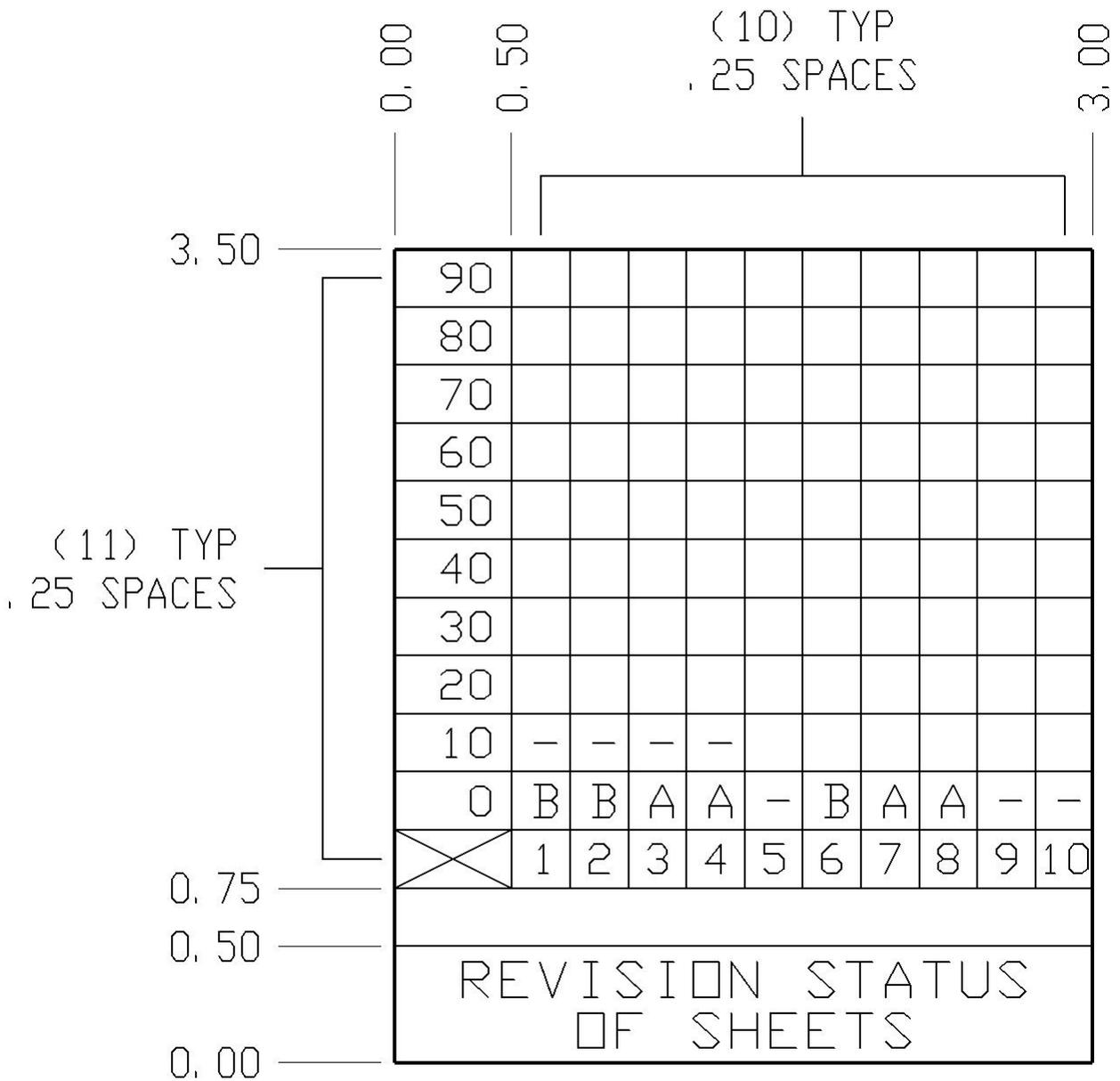


FIGURE 13

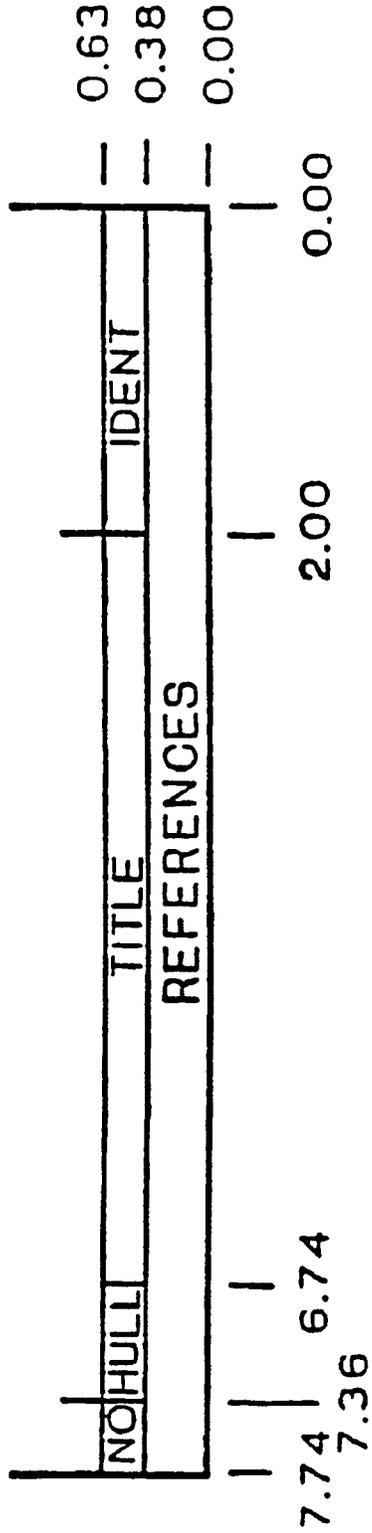
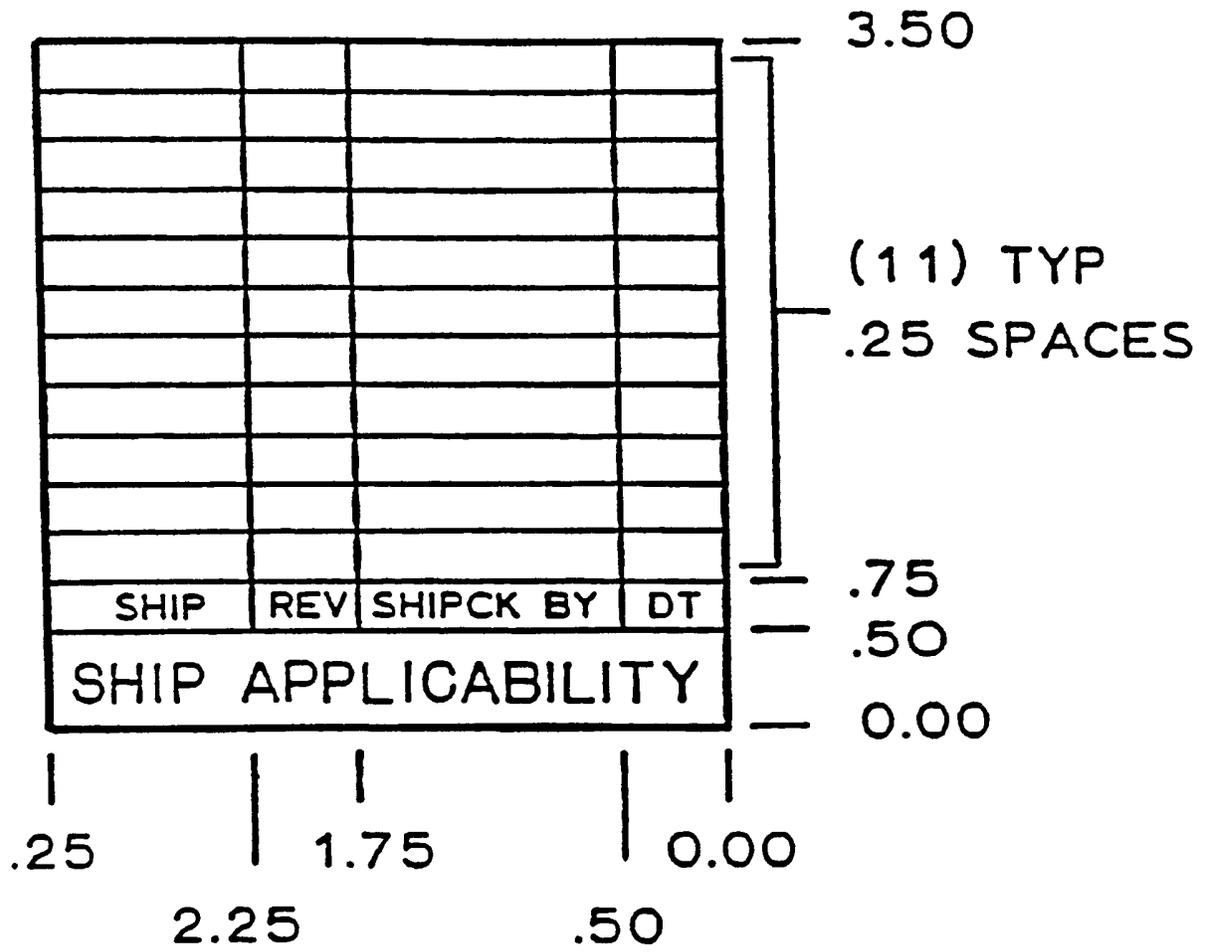


FIGURE 14

REFERENCE LIST BLOCK



SHIP APPLICABILITY/SHIPCHECK BLOCK  
 FIGURE 15

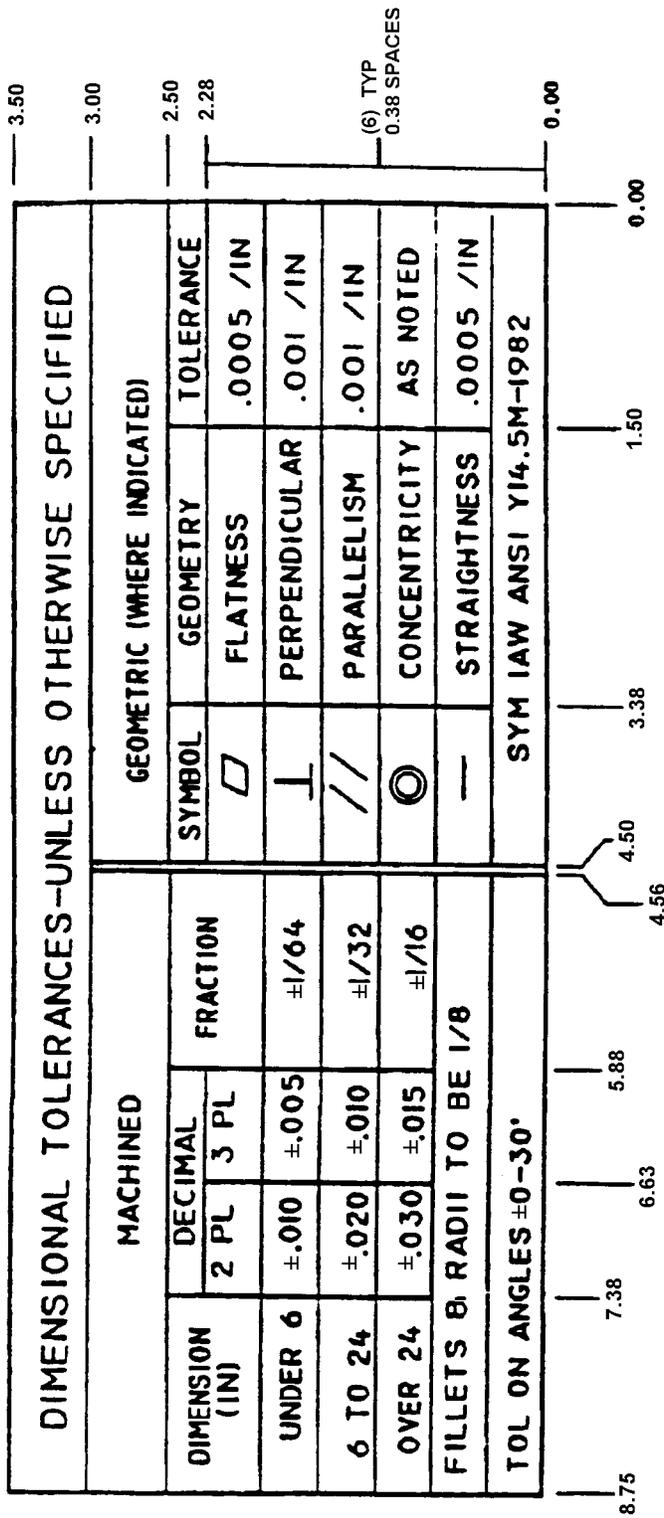
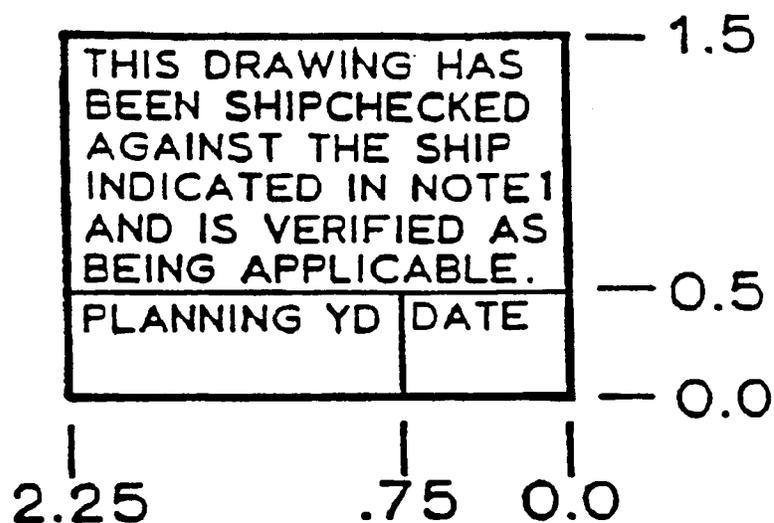


FIGURE 16

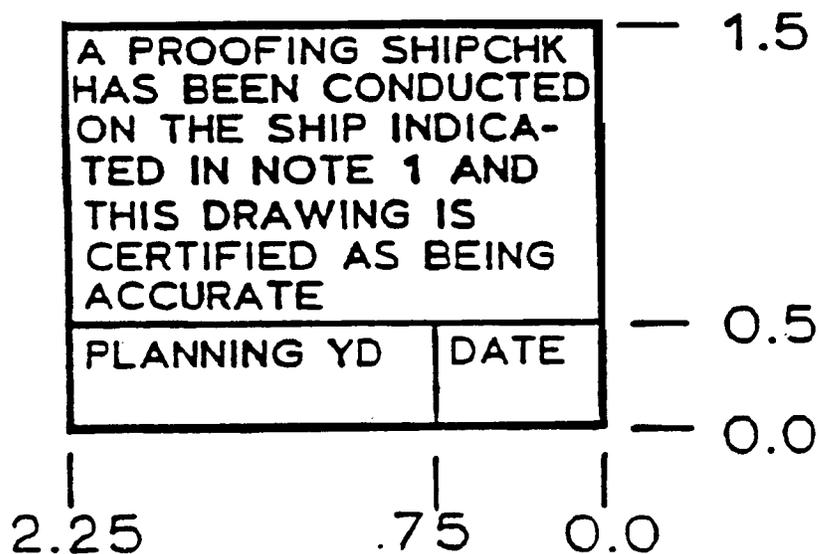
DIMENSIONAL TOLERANCE BLOCK





VERIFICATION SHIPCHECK BLOCK

FIGURE 18



PROOFING SHIPCHECK BLOCK

FIGURE 19

LIST OF PARTS FOR ONE ASSEMBLY

S/A NO.	ITEM NO.	QTY ROD	DESCRIPTION	MATERIAL SPECIFICATIONS	MATERIAL RECT	NSN OR MFR PART NO	SCE	A/L NO.	UNIT WT	REMARKS
20.75										
20.00										
19.25										
18.50										
13.50										
11.50										
10.25										
8.25										
7.75										
6.25										
5.50										
0.0										

FIGURE 20

LIST OF PARTS



**LIST OF EQUIPMENT (QUANTITY FOR ONE SHIP)**

S/A NO.	ITEM NO.	DESCRIPTION	QTY	RQD	SOURCE	M	E	R	A/I NO.	UNIT	NO. WATTS	REMARKS
			20.75									
			19.25									
			18.50									
			13.50									
			12.00									
			13.00									
			11.50									
			12.50									
			9.50									
			8.75									
			8.00									
												.00

**LIST OF EQUIPMENT**

**FIGURE 22**

**TABLE 1**  
**MINIMUM LETTER HEIGHTS FOR DRAWINGS**  
**(Extracted from ANSI/ASME Y14.2)**

USE	INCH (FREEHAND)	INCH (CAD)	DRAWING SIZE
Drawing Number in Title Block	5/16 (.312)	.290	Larger than 'C'
	1 / 4 (.250)	.240	'C' or Smaller
Drawing Title	1 / 4 (.250)	.240	All
Section and Tabular Letters	1 / 4 (.250)	.240	All
Zone Letters and Numerals in Borders	3/16 (.188)	.175	All
Dimensions, Tolerances, Limits, Notes, Subtitles for Special Views, Table, Revision, and General Lettering for the Body of the Drawing	5/32 ** (.156)	.120 *	'C' or Smaller
	5/32 ** (.156)	.140	Larger than 'C'

\* For CAD or computer generated lettering, .120" lettering is permitted; otherwise .140" lettering shall be the minimum letter height permitted.

\*\* In variance with ANSI/ASME Y14.2

3.4.9 Type Designations. Equipment type designations used on drawings shall conform to MIL-STD-196 for electronics equipment or other appropriate documents for other types of equipment (see DOD-STD-100).

3.4.9.1 Equipment Subdivisions. Equipment subdivisions shall be in accordance with MIL-HDBK-505.

3.4.10 Hull, Structural and Mechanical Graphic Symbols. Hull, structural and mechanical graphic symbols for use on all NAVSEA drawings shall be as follows:

- a. Structural graphic symbols shall be in accordance with MIL-STD-25.
- b. Welding graphic symbols shall be in accordance with MIL-STD-22 and ANSI/AWS A2.4. In case of conflict between these specifications, MIL-STD-22 shall take precedence.
- c. Fluid power graphic symbols for diagrammatic drawings shall be in accordance with ANSI/ASME Y32.10.

- d. Pipe fitting, valve and piping graphic symbols for diagrammatic drawings shall be in accordance with NAVSEA Dwg. No. 803-5001049, except for fluid power systems (see 3.4.10(c)).
- e. Heating, ventilation and air conditioning graphic symbols for diagrammatic drawings shall be in accordance with ANSI Y32.2.4.

3.4.11 Electrical and Electronic Graphic Symbols. Electrical and electronic graphic symbols for schematic diagrams shall be in accordance with ANSI/ASME Y32.2. Symbol numbers, where used for standard electrical equipment, shall be in accordance with MIL-HDBK-290.

3.4.12 Security Classification. Security classification for drawings shall be marked in accordance with SECNAVINST 5510.30 and SECNAVINST 5510.36.

3.4.13 Drawing Scale. Drawing scale, where utilized, shall be indicated using the architectural method (example: 1/2" = 1'-0, 6" = 1'-0) in lieu of the fractional method. To allow for overlaying and ease of interference control, drawings for the same SHIPALT shall, where feasible, be drawn to the same scale for drawings such as arrangements, foundations, ventilation, piping, etc. As an option, each sheet may have a bar scale (graphic scale) for each scale-utilized on that sheet. Bar scales shall show both vertical and horizontal dimensions.

3.4.13.1 Arrangement Scale. General and Machinery Arrangement drawing scales shall be not less than 1/4" = 1' 0".

3.4.14 Drawing Materials. Materials used in the preparation of NAVSEA drawings shall be of the type and quality that will assure legibility and reproducibility.

3.4.15 Final Drawings. Final drawings, whether an original tracing or an electronic file, must show all required approvals. For electronic drawing files, per NAVSEA guidance, a signature can be signified with '/s/' after the typed name of the signer.

3.4.16 Revisions and Modifications to and Superseding of Existing Drawings. Existing drawings, defined as those final drawings whose final copies are held by the Planning Yard, can be affected by design developed for SHIPALTs. All changes to existing drawings shall be in accordance with DOD-STD-100. The following criteria shall be utilized to determine the level of change required:

- a. **Drawing Revisions**. A revision of an existing drawing is authorized if all of the following conditions are met:
  - 1. The Master File Drawing (or 'as issued' electronic file) is held by the Planning Yard and reproduction quality is acceptable.
  - 2. Less than 25% of the existing drawing is affected.
  - 3. The revision will clearly show changes caused by the SHIPALT without loss of essential information that describes ships which have not completed the SHIPALT or are not applicable to the SHIPALT. (Use of cross-hatching over original information shall not be permitted unless the information is only applicable to one ship. Except for corrections, erasing or removal of original information shall not be permitted.)

- b. **Modification Drawing.** A modification drawing, defined as a drawing that, by modification of an existing drawing, defines the total change required for accomplishment of the SHIPALT. Preparation of a modification drawing is authorized when both of the following conditions are met:
1. The Master File Drawing is not available or a revision of the existing drawing would cause confusion.
  2. Less than 25% of the existing drawing is affected.
- c. **Superseding Drawing.** A superseding drawing, defined as a drawing that takes the place of and cancels an existing drawing, is authorized when more than 25% of an existing drawing is changed by a SHIPALT. The superseded drawing shall have a supersedure note added and shall be retained by the Planning Yard.

3.4.17 General Notes. Each drawing shall have general notes to explain its purpose and provide general information on procedures and methods of installation (not local process instructions), welding criteria, surface preparation and painting, etc. These notes are also used to provide cautionary and safety information and to bring attention to special controls or requirements imposed on the drawing or the work to be accomplished by the drawing. All notes shall be clear, concise and complete sentences. The notes provided herein shall apply to all drawings developed in accordance with this specification. Other notes which may be required shall be as specified by NAVSEA 0902-018-2010, NAVSEA SA9AA0-AB-GOS-010, or other documentation invoked by the contract or tasking documentation, or by the Planning Yard as determined during development of the drawing.

3.4.17.1 The first general note on all BACDs shall read as follows:

*"(1) THIS IS A BASIC ALTERATION CLASS DRAWING FOR ACCOMPLISHMENT OF SHIPALT \_\_ REV \_\_. IT WAS PREPARED BASED ON A SHIPCHECK OF USS (Ship Name and Hull Number). AN APPLICABILITY SHIPCHECK (IS/IS NOT) REQUIRED PRIOR TO ITS USE ON OTHER SHIPS"*

3.4.17.2 The first general note on all SADs shall read as follows:

*"(1) THIS IS A SUPPLEMENTAL ALTERATION DRAWING FOR ACCOMPLISHMENT OF SHIPALT \_\_ REV \_\_. IT WAS PREPARED BASED ON A SHIPCHECK OF USS (Ship Name and Hull Number). THIS DRAWING MODIFIES/REPLACES REF (Parent BACD) FOR (Hull Number(s)) ONLY FOR ACCOMPLISHMENT OF THIS SHIPALT. AN APPLICABILITY SHIPCHECK (IS/IS NOT) REQUIRED PRIOR TO ITS USE ON OTHER SHIPS."*

3.4.17.3 The first general note on all Expanded Planning Yard SHIPALT drawings shall read as follows:

*"(1) THIS DRAWING WAS DEVELOPED FOR ACCOMPLISHMENT OF SHIPALT(S) \_\_ REV \_\_. BASED ON A SHIPCHECK OF THE USS (Ship Name and Hull Number). AN APPLICABILITY SHIPCHECK (IS/IS NOT) REQUIRED PRIOR TO ITS USE ON OTHER SHIPS."*

3.4.17.4 The second general note on all drawings shall read as follows:

*"(2) THIS DRAWING IS BASED UPON THE REQUIREMENTS OF (NAVSEA 0902-018-2010 or S9AA0-AB-GOS-010 or other specification as applicable and provide effective date or revisions as appropriate) WHOSE PROVISIONS SHALL PREVAIL IN AREAS WHERE THIS DRAWING IS SILENT."*

3.4.17.5 The third general note on all drawings shall read as follows:

*"(3) EXCEPT WHERE OTHERWISE NOTED OR APPROVED BY NAVSEA, THE EFFECTIVE DATE OF FEDERAL OR MILITARY SPECIFICATIONS, PUBLICATIONS AND STANDARD/TYPE DRAWINGS AND REVISIONS AND CHANGES THERETO SHALL BE THE EFFECTIVE DATE OF (NAVSEA 0902-018-2010 or S9AA0-AB-GOS-010). LATER SPECIFICATION REVISIONS MAY BE USED PROVIDED THAT THEY MEET THE INTENT AND INTERFACE REQUIREMENTS OF THE SPECIFICATION INVOKED FOR THE SPECIFIC AVAILABILITY."*

3.4.17.6 If the engineering data required by 3.5.10.7 are not an integral part of the drawing, the fourth general note on all drawings shall read as follows:

*"(4) ENGINEERING DATA SUPPORTING THIS DRAWING IS FOUND ON REF\_\_."* (The drawing which contains the supporting data shall be the corresponding reference listed in the List of References.)

3.4.18 Test Notes. Test notes are to be placed on all drawings which install or alter structure, systems or equipment that require testing. The notes shall specify the type of test to be performed and the test criteria to be used. Test notes shall be separated from the general notes.

3.4.19 Modification/Supersedure Notes. All SHIPALT drawings shall contain a modification/supersedure note which states whether or not a drawing is being modified or superseded. One of the following notes shall be conspicuously placed to the left of the title block:

- a. *"THIS DRAWING MODIFIES REF \_\_ FOR APPLICABLE SHIPS UPON ACCOMPLISHMENT OF SHIPALT\_\_REV\_\_"*
- b. *"THIS DRAWING SUPERSEDES AND CANCELS REF \_\_ FOR APPLICABLE SHIPS UPON ACCOMPLISHMENT OF SHIPALT\_\_REV\_\_."*
- c. *"THIS DRAWING MODIFIES NO KNOWN DRAWING. "*

3.4.20 Drawing Submittal and Approval. SHIPALT drawings not developed by the cognizant Planning Yard will be submitted to the Planning Yard for review and approval prior to execution.

3.4.20.1 Submittal of Drawings for NAVSEA Approval. Drawings requiring approval by NAVSEA will be specified by the SHIPALT(s) designated in the contract or tasking documentation. Prints of the proposed final drawings shall be marked PRELIMINARY and submitted to NAVSEA for review and approval. (If there are drawing original tracings, they shall remain in the custody of the Planning Yard and shall not be forwarded to NAVSEA.) Two drawings prints shall be submitted to the designated NAVSEA Ship's Logistic Manager (SLM). Drawing submitted for approval shall be accompanied by a transmittal document identifying the drawings submitted, applicable SHIPALT(s), and the applicable contract or task number.

3.4.20.1.1 Proposed Departure(s) From Specifications. The Planning Yard shall request approval of any proposed departure(s) from specifications, contracts or tasking documentation as soon as possible. When the request is made concurrent with drawing submittal, it shall be accomplished by calling specific attention to the proposed departure(s) in the transmittal letter. In either case, the request for proposed departure(s) shall be submitted in accordance with

NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010. Approved departure(s) shall be listed on the drawing(s).

3.4.20.1.2 Resubmittal of Drawings. When drawings are disapproved, the reviewer may require resubmittal of the corrected drawings

3.4.20.1.3 Previously-approved Drawings. Drawings previously approved by NAVSEA will not require further NAVSEA approval unless revisions which change technical design details are made to the drawing (revisions which add ship applicability or correct reference listing, stock numbers, etc., and do not change technical design details will not require further NAVSEA approval).

3.4.20.1.4 Review and Comment. Where the applicable SHIPALTs do not specify the need for specific NAVSEA drawing approval as indicated in Section 4, NAVSEA may desire to review the Planning Yard's effort and may elect to comment thereon. The Planning Yard's authority to proceed will not be made contingent upon such review. Any comment made as a result of the review shall not be construed as indicating approval (or disapproval). Such comments will be limited to directing attention to possible departures from specified requirements. In most cases, a formal reply or notification of actions taken by the Planning Yard will not be required, except for reviews conducted in accordance with Section 4.

3.4.21 Drawing Distribution. Except for the general distribution of drawings made by the Naval Engineering Drawing Support Activity, the distribution of SHIPALT drawings shall only be made by and shall be controlled by the cognizant Planning Yard as directed by the contract or tasking documentation. Except as otherwise specified in the contract or tasking documentation, the type of drawing copy distributed shall be as follows:

3.5 Content and Format. Content and format of NAVSEA drawings shall be as specified herein.

3.5.1 General.

3.5.1.1 Product Drawings. All NAVSEA drawings shall be prepared as product drawings and associated lists as defined by MIL-DTL-31000 except as specified herein and in contract or tasking documentation.

3.5.1.2 New drawing number. When preparing a drawing, if a major portion is developed by reproducing an existing drawing, upgrading to this specification is not required. However, a new NAVSEA drawing number shall be assigned and a new title block (see 3.4.3) shall be applied. All new and revised drawings shall be processed to achieve the requirement of Master File Drawings (see 3.4.14.2).

3.5.1.3 Separate views and notes. Where drawings are specifically applicable to more than one ship, separate views and notes shall be utilized to reflect minor differences. Views and notes which are associated with a specific ship (or ships) shall be clearly identified as such and grouped together on the drawing(s) insofar as possible.

3.5.2 Level of Detail. The installation design shall be final, complete and accurate to allow installing activities to accomplish the industrial work involved without additional design work. Drawings shall be as self-sufficient as practicable; for example, to the maximum extent possible they shall include rather than reference information given on reference drawings (other than SHIPALT drawings for that SHIPALT and Standard or Type drawings).

3.5.3 Drawing Types. As specified in the contract or tasking documentation, final drawing shall consist of the following types of drawings, as applicable, and shall meet all requirements of this specification:

- a. Hull/Structural drawings (see 3.5.6)
- b. Machinery, piping and heating, ventilation and air conditioning (HVAC) drawings (see 3.5.7)
- c. Electrical/electronic drawings (see 3.5.8)
- d. Arrangement drawings (see 3.5.9)
- e. Removal drawings (see 3.5.10)
- f. Support drawings (see 3.5.11)

3.5.4 Data Elements. As specified in the contract or tasking documentation, final drawings (see 3.4.15.2) shall contain the following data elements, formatted as specified herein:

3.5.4.1 Title Block (Front Sheet). Front sheet title blocks shall be in accordance with 3.4.3 and as follows:

- a. Show drawing titles in the following form:  
SHIPALT DESIGNATION(S)  
AND APPLICABLE SHIP  
CLASS (OR INDIVIDUAL SHIP): (SHIPALT SSN1561 - SSN 637 CL)  
SYSTEM DESIGNATION: (60HZ AC POWER DISTR)  
TYPE OF DRAWING: (MOD TO WIRING DECK PLAN)
- b. An abbreviated title (not to exceed 28 characters, including spaces) shall be entered in the series of blocks between the title and the drawing identification blocks. (The SHIPALT and ship identification may be omitted from the abbreviated title.)
- c. The drawing sheet size (see 3.4.2) shall be entered in the drawing identification block marked *SIZE*.
- d. In accordance with NAVSEAINST 9085.2, the Commercial and Government Entity (CAGE) code CAGE number 53711 shall be placed in the drawing identification block marked *CAGE NO.* on all NAVSEA drawings.
- e. The weight group number (located in S9040-AA-IDX-010/SWBS5D) applicable to the drawing shall be placed in the drawing identification block marked *WT GRP*. (The weight group system chosen shall be the same as originally used on the new construction drawings for the applicable class of ships.)
- f. Each NAVSEA drawing shall have a unique drawing number assigned in accordance with NAVSEAINST 9085.2. This unique number shall be placed in the drawing identification block marked *NAVSEA DWG NO.*
- g. The latest revision of the drawing shall be indicated in the drawing identification block marked *REV*. The initial drawing issue shall be indicated as revision "-" and

the first change to the drawing shall be revision "A". Subsequent revisions shall be indicated as revisions "B", "C", "D", etc., in alphabetic sequence. Numeric ("1", "2", etc.) Or alphanumeric ("A1", "4B", etc.) designators shall not be used for revisions of NAVSEA drawings.

- h. The scale of the drawing (not just of the first sheet) shall be indicated in the block marked *SCALE*. On drawings where more than one scale is used, the block shall indicate *AS SHOWN*. On drawings which are not to any particular scale, the block shall indicate *NONE*.
- i. The block marked "SHEET 1 OF" shall indicate the total number of sheets in the drawing ("SHEET 1 OF 5" for a five sheet drawing).
- j. The identification and signature blocks to the left of the main title area and above the *ACCEPTED FOR NAVSEA* block are for use by the Naval activity assigned the responsibility for the drawing, normally the Planning Yard. The complete name, address and CAGE number (from DOD Handbook H4-1/H4-2) of the activity responsible for the drawing shall be placed in the area above the signature/date blocks. The preparer (CAD operator), the drawing checker, the cognizant engineer and the approving official shall sign and date the appropriate blocks below the activity name and address. Per 3.4.15, the electronic files shall include the typed name and '/s/' to show who signed the drawing. (The Signature Blocks may be modified to include Code and Phone Number if desired.) These blocks shall be filled in on all NAVSEA drawings which are ready for issue even when the drawing is prepared by another activity (except the *PREPARED* block which shall be lined out or filled in with the preparing activity name).
- k. For those drawings prepared by activities other than the Planning Yard, an appropriate Planning Yard official shall sign and date *the ACCEPTED FOR NAVSEA* block after review and approval of the drawing by the Planning Yard (or other activity responsible for the drawing). (If the drawing is prepared by the Planning Yard, this block may be crossed out, corner to corner.)
- l. For those drawings which are required to be approved by NAVSEA, the document which provides specific NAVSEA approval of the drawing shall be referenced in the *APPROVED BY NAVSEA* block. (No actual signature shall be placed in this block.) For those drawings not requiring NAVSEA approval, *NOT REQUIRED* shall be entered in this block.
- m. The identification and signature blocks to the left of the Naval activity block and above the *AUTHORITY* block (above the Naval activity block on "A" size formats) are for the use of the activity actually preparing the drawing if other than the Planning Yard (or other activity responsible for the drawing). The complete name, address and CAGE number (from DOD handbook H4-1/H4-2) of the non-Planning Yard activity preparing the drawing (and contract number, if applicable) shall be placed in the area above the signature/date blocks. The preparer (CAD operator), the drawing checker, the cognizant engineer and the approving official shall sign and date the appropriate blocks below the activity name and address. (If the Planning Yard prepares the drawing, this block may be crossed out, corner to corner.)
- n. The *AUTHORITY* block below the non-Planning Yard signature block (to the right of the block on "A" size formats) is to provide reference to the documentation which authorized preparation of the drawing (not the SHIPALT number).

3.5.4.2 Title Block (Continuation Sheet). Continuation sheet title blocks shall be in accordance with 3.4.3 and shall contain the same drawing identification, revision, scale and sheet number data as that required for the Front Sheet (see 3.5.4.1) except as follows:

- a. The revision letter indicated in the REV block shall be the latest revision of that sheet. The revision letter shall only be changed when that sheet is revised.
- b. The scale of the information shown on that sheet shall be indicated in the *SCALE* block. On sheets where more than one scale is used, the block shall indicate *AS SHOWN*. On sheets which are not to any particular scale, the block shall indicate *NONE*.
- c. The block marked *SHEET* shall contain the specific sheet number of that sheet ("2", "3", "4", etc.) and shall not refer to the total number of sheets in the drawing (SHEET "2 OF 4", etc.)

3.5.4.3 Revision Block. Revision blocks shall be in accordance with 3.4.3 and shall contain a complete description of the revision as follows:

- a. The *REV* column shall contain the letter designation of the revision. (The initial drawing issue, revision "-" of the drawing, shall have no information in the revision block.) The first change to the drawing, revision "A", shall begin at the top of the revision block and shall proceed down the block (when the bottom of the block is reached the revision block shall be continued (using the same dimensions) on a continuation sheet. Subsequent revisions shall be indicated as revisions "B", "C", "D", etc., in alphabetic sequence. Numeric ("1", "2", etc.) or alphanumeric ("A1", "4B", etc.) designators shall not be used for revisions of NAVSEA drawings.
- b. The *ZONE* or *SHEET* column shall contain reference to each zone or sheet affected by the revision. The zones or sheets affected by each of the *ADDED*, *DELETED*, *CHANGED*, etc., descriptions shall be placed opposite that description.
- c. The *DESCRIPTION* column shall contain reference to the document or action which required the revision to be made and shall provide a description of the modifications which were made to the drawing. This information shall be provided in the form of - *ADDED*, *DELETED*, *CHANGED*, etc. When the complete description of the revision has been provided, a line shall be drawn across the revision block at the end of the description, signifying the end of the revision description.
- d. The *BY* and *DATE* columns shall contain the signature of the person actually making the revision to the drawing and the date.
- e. The *APPROVED* column shall contain the signature of the Planning Yard official responsible for the system design. This signature shall be placed on the drawing only after the revision has been reviewed and is found to be acceptable.

3.5.4.4 Revision Status Block. Revision Status Blocks shall be in accordance with 3.4.3. The block will show the current revision status for each sheet (up to 100 sheets) (see Figure 13). The initial issue of the drawing shall indicate a "-" above the applicable sheet number indicating that all sheets are in their initial issue. As revisions are made to the drawing, the Revision Status Block is updated to reflect the current revision of each sheet. Because the first sheet is changed by every revision, the first sheet shall always show the current revision of the drawing and each sheet will always reflect the current revision status of that sheet.

**3.5.4.5 Reference List Block.** Reference list blocks shall be in accordance with 3.4.3 and shall list all sources of technical data referenced on the drawing. The references shall be numbered from the bottom up and a line shall be drawn across the block between each reference to avoid confusion. References on drawings are to provide details of manufacturing, detail procedures or methods, drawings being modified or superseded, pertinent information regarding the ship's structural or system configuration, and other information, as required, which will better enable the accomplishing activity to complete the work. (When referencing information or details shown on other drawings or documentation, consideration shall be given to including the information on the drawing being prepared rather than referencing it. Generally, if the referenced information has any options or decisions which must be made by the user, the information should be shown on the drawing rather than referenced. (Or if the referenced material is beyond the scope of what is expected as basic trade competency.) If the list of references exceeds the space available on the front sheet, the list may be continued (using the same dimensions) on a continuation sheet. If a listed reference is only applicable to a single ship or is being referenced for only one ship, the ship hull number shall be indicated in the column marked *HULL*, otherwise, this column shall be left blank. (If the reference is applicable to a series of ships, but not all of the ships the drawing is applicable to, a General Note shall be referenced and the applicable ships listed in the Note.)

**3.5.4.6 Ship Applicability/Shipcheck Block.** The ships which are applicable to a drawing and the revision of the drawing which provided applicability shall be listed in the appropriate columns of the ship applicability/shipcheck block (See 3.4.3). The shipcheck data shall be filled in when the actual applicability shipcheck takes place. (When the Planning Yard determines that an applicability shipcheck is not required for a specific drawing, the *SHIPCK BY and DATE* columns shall be crossed out, corner to corner, and *NOT RQD* shall be written across them.)

**3.5.4.7 Dimensional Tolerance Block** The dimensional tolerance block shall be in accordance with 3.4.3 and shall provide the dimensional tolerances for matching and geometric alignment of surfaces, parts and equipment. On drawings which do not require a dimensional tolerance block, this block shall be crossed out, corner to corner (or may be omitted).

**3.5.4.8 Weight Control Data Block.** The weight control data block shall be in accordance with 3.4.3. (Weight control data shall only be calculated on drawings with material lists or equipment lists which order material, not parts lists, or for Removal drawings.) The data shall be calculated in accordance with the instructions in NAVSEA 0902-018-2010, NAVSEA S9AA0-AB-GOS-010, or other documentation invoked in the contract or tasking documentation. The following entries shall be made for each SHIPALT reflected on the drawing:

- a. Drawing revision that the calculations support.
- b. SHIPALT number. If more than one SHIPALT is shown on the drawing, the weight calculations for each SHIPALT shall be shown on separate lines.
- c. Weight group (located in S9040-AA-IDX-010/SWBS5D). (Weight group system shall be the same as originally used on the new construction drawings for the applicable class of ships.)
- d. Weight added (in pounds, to the nearest pound). E. Weight removed (in pounds, to the nearest pound).

- e. Vertical center of Gravity (VCG) above the ship baseline (in feet, to the nearest tenth of a foot).
- f. Longitudinal Center of Gravity (LCG) from a specified reference point (longitudinal center of buoyancy, if known) (in feet, to the nearest tenth of a foot).
- g. Transverse Center of Gravity (TCG) identified with an (S) for starboard, a (P) for port or (CL) for centerline (in feet, to the nearest tenth of a foot).

For drawings which do not order material, the weight control data block shall be crossed out, corner to corner, with the statement *NOT APPLICABLE* written over it.

**3.5.4.9 Verification Shipcheck Block.** The verification shipcheck block shall be in accordance with 3.4.3 and shall be prepared, signed and dated by a responsible Planning Yard official when a high risk or complex SHIPALT drawing is shipchecked against an applicable ship to verify applicability and adequacy of design. In those instances where complex or critical SAD preparation is an overhaul activity responsibility, a verification shipcheck may be performed at the discretion of the overhaul activity upon notification of the cognizant NAVSEA SLM/SPM. Drawings shall only be verified when the drawing may have significant impact on an availability and the Planning Yard (or overhaul activity for locally prepared SADs) has reason to believe that the drawing or the design presented on the drawing is inadequate. (See also 3.3.1(c).) (For drawings which have not had a verification shipcheck, this block shall be omitted.)

**3.5.4.10 Proofing Shipcheck Block.** The proofing shipcheck block shall be in accordance with 3.4.3 and shall be prepared, signed and dated by a responsible Planning Yard official when proofing of a SHIPALT is required by a SHIPALT Record. The shipcheck is normally conducted after completion of a specified first-time SHIPALT as part of the formal proofing requirements. The formal proofing demonstrates that the SHIPALT satisfies its intended purpose and the proofing shipcheck certifies that the successful SHIPALT is accurately reflected in the SHIPALT drawings. (For drawings which do not require a proofing shipcheck, this block shall be omitted.)

**3.5.4.11 List of Parts/Material/Equipment Blocks.** Blocks for parts, material and equipment lists shall be in accordance with 3.4.3 and 3.5.5.

**3.5.5 Parts/Material/Equipment Lists.** For purposes of NAVSEA drawings, parts lists, material lists and equipment lists shall be defined as follows:

- a. **Parts List** - Parts lists (Figure 20) shall be utilized on fabrication drawings only and shall list all items required to fabricate one assembly. They shall be utilized for ordering material but shall not be utilized for calculation of weight and moment changes.
- b. **Material List** - Material lists (Figure 21) shall be utilized on all drawings (except those listed in 3.5.5(a) and 3.5.5(c)) which order material. They shall list all material, equipment and assemblies required for one ship. Where assemblies are utilized, the assembly part and the fabrication drawing shall be listed as the material specification. Material lists shall be utilized for ordering material and for calculating weight and moment changes.

- c. **Equipment List** - Equipment lists (Figure 22) shall be utilized on arrangement drawings and machinery drawings and shall only list components except spares, support equipment, etc. (See 3.5.5.3).

3.5.5.1 Additional drawings. In order to prevent possible loss of information, parts, material and equipment lists shall be integrated into applicable drawings (see 3.5.5(a), 3.5.5(b) and 3.5.5(c)) to the maximum extent possible. If a material, parts or equipment list is too voluminous to be accommodated on a drawing, it may be prepared separately as a size "D", or "F" drawing provided that:

- a. The list is in the form of a separate drawing and is assigned a unique NAVSEA drawing number.
- b. A statement *SEE SEPARATE LIST OF MATERIAL/PARTS/EQUIPMENT, REF. \_\_\_\_\_*, shall be placed on the drawing in the space on the title sheet normally reserved for the material, parts or equipment list.
- c. The separate list is clearly identified by cross-referencing back to the parent drawing.

3.5.5.2 Required information. Parts and material lists (3.5.5(a) and (b)) shall contain all material required to accomplish the work shown on the drawing. The following information, as a minimum, shall be provided (other required data shall be as specified in 3.5.6 through 3.5.11.)

- a. **Item number**. Item numbers are assigned sequentially to each of the different items in the list, excluding electrical cables.
- b. **Quantity required**. The total quantity of each item for one ship shall be entered in the Quantity Required column. An effort shall be made to specify exact quantities, but in those where they cannot be derived, approximations shall be made and specified as such. Use of phrases such as '*as required*' shall not be used except for items such as cable clamps, paint, etc. If incidental items are covered by other drawings, those other drawings shall be referenced.
- c. **Description**. A complete description (noun name and size) as described in the material specification (as applicable) shall be provided. For items such as structural shapes, the overall dimensions (width and height) shall be provided and shall be referenced to detail sketches on the drawing or shall be assigned assembly numbers and referenced to an assembly or detail drawing in the Part Number Column.
- d. **Material Specification**. The applicable military or other approved specification for each item of material being ordered by the drawing shall be entered in this column. Do not list the specification revision letter or date unless only a specific revision is applicable. Do not indicate an item in this column as being *COMMERCIAL* or identify an item by a proprietary or commercial name or trademark unless it is found that no standard specification is available. In such cases, the *REMARKS* column may be used to indicate *SIMILAR OR EQUAL TO \_\_\_\_\_*.
- e. **Material Requirements**. Applicable type, grade, class, condition or other classification, as applicable, is shown in this column when a specification or standard is referenced and the specification lists alternate choices. If necessary to fully describe the material required, the *REMARKS* column shall provide the additional data or a General Note shall be referenced which shall provide such information.

- f. **National Stock Number or Manufacturer's Part Number.** Unless otherwise directed by NAVSEA, the National Stock Number (NSN) or manufacturer's part number for each item shall be entered into this column. Maximum effort shall be exerted to utilize standard stock items and to minimize or preclude the use of one-of-a-kind or unsupportable items.
- g. **Source.** The source of material ordered by the drawing shall be indicated as follows:
  - 1. **Existing Material.** When the parts or material list contains existing, relocated and/or modified items, identify each of these items by the use of one of the following symbols:
    - E - Existing item (not relocated)
    - R - Existing item relocated
    - M - Existing item modified (not relocated)
    - MR - Existing item modified and relocated
  - 2. **New Material.** Identify all new items in the parts or material list by use of the following symbols:
    - GFM - Government Furnished Material (provided as part of the SHIPALT)
    - IAF - Installing Activity Furnished (not long lead time)
    - CP - Centrally Procured (not long lead time)
    - LLTM(CP) - Centrally Procured Long Lead Time Material
    - LLTM(IAF) - Installing Activity Furnished Long Lead Time Material
  - 3. The source of all material required by the drawing (e.g. "2GFM" for two items, both Government Furnished Material, or "2R/IIAF" for three items, two relocated and one installing activity furnished, etc.) shall be accounted for. The total material in the SOURCE column must equal the total in the QUANTITY column.
- h. **Allowance Parts List.** (INCREASE COLUMN WIDTH) The Allowance Parts List (APL) number for each item, as applicable, shall be provided in this column when a standard APL is available. Where no standard APL exists or the APL is to be prepared during the ship's availability, this requirement shall be omitted and the column space left blank for each applicable item.
- i. **Unit Weight.** The operating weight, including required fluids (oil, water, etc.) (not ordering weight) in pounds for one item shall be provided. (For those items ordering in running feet, square feet, gallons, etc., the weight of one unit of measure shall be provided.)
- j. **Remarks.** Any clarifying statements shall be entered in this column.
- k. For multi-SHIPALT drawings (Integrated Designs), a column titled *SHIPALT* shall be added to the left of the Part Number column. This column shall indicate the authority responsible for the purchase of each item of new material in the List of Material. (Exception: Drawings utilizing many piece-parts common to more than one SHIPALT where separate identification of quantities is impractical (e.g., foundation drawings), may specify the quantities for the group of SHIPALTs.)

3.5.5.3 Equipment lists. Equipment lists (3.5.5(c)) shall contain all equipment in the compartment, space or area depicted on the arrangement drawing. The following information, as a minimum, shall be provided:

- a. **Item Number.** Item numbers are assigned sequentially, to each of the different equipment in the list.

- b. **Quantity.** The total quantity of each equipment shown on the drawing shall be entered.
- c. **Description.** A complete description of the item shall be provided (noun name and type designation, e.g., R-1051/URR HF RECEIVER).
- d. **Source.** The source of each item shown on the drawing shall be indicated in the three *SOURCE* columns, N (New), R (Relocated) and E (Existing), as appropriate. The appropriate quantity shall be entered into the applicable column for each equipment (columns which are not applicable to a specific item shall be left blank: do not enter a quantity of "0").
- e. **Ordered on reference.** The drawing(s) which order(s) the equipment shall be referenced. For spares, support equipment (fire extinguishers, furniture, etc.) and other miscellaneous equipment which may be ordered by the arrangement drawing, a General Note shall be referenced which states, *EQUIPMENT REFERENCED TO THIS NOTE IS ORDERED BY THIS DRAWING*.
- f. **Foundation shown on reference.** The drawing which provides the equipment's foundation shall be referenced. (For equipment not requiring foundations, "N/A" shall be entered in this column.)
- g. **Allowance Parts List.** The Allowance Parts List (APL) number for each item, as applicable, shall be provided in this column when a standard APL is available. When no standard APL exists or the APL is to be prepared during the ship's availability, this requirement shall be omitted and the column space left blank for each applicable item.
- h. **Unit Weight.** The installed operating weight (not ordering weight) in pounds for one item shall be provided. (For those items ordering in running feet, square feet, gallons, etc., the weight of one unit of measure shall be provided.) (This shall only apply to items, not ordered on another drawing (spares, support equipment, etc.).)
- i. **Heat dissipation.** The heat dissipation of one unit, in watts, shall be entered. (For those items not dissipating heat, a "O" shall be entered in this column.)
- j. **Remarks.** Any clarifying statements shall be entered in the Remarks column. For equipment being ordered by the arrangement drawing, the Remarks column shall provide ordering information (part/identification number, source etc.) or shall reference General Notes which shall provide such information.

3.5.6 **Hull/Structural Drawings.** Hull/structural drawings consist of structural, foundation, penetration, arrangement (outfitting), welding, painting, hull and compartment insulation, deck covering, stowage, inspection and weld documentation drawings. They shall provide for fabrication, installation, modification, or removal of such things as hull, deck and superstructure components, compartment arrangements, painting, accesses, ladders and stairs, rigging, fittings, equipment foundations, label plates, access cuts, masts, etc.

3.5.6.1 **Symbols.** Symbols used on hull/structural drawings shall be as follows:

- a. MIL-STD-25 provides structural symbols for use on ship drawings and is to be used to assure uniformity in the preparation of structural drawings.
- b. MIL-STD-22 provides symbols to be used for welded joint design.

- c. ANSI/AWS A2.4 provides symbols for welding and non-destructive testing. (In case of conflict between ANSI/ASW A2.4 and MIL-STD-22, MIL-STD-22 shall take precedence.)

3.5.6.2 List of Material. Lists of Material on all hull/structural design drawings ordering material shall provide the following data:

- a. All material required to accomplish the task shown on the drawing shall be identified by Item Number, Quantity Required, Description, Material Specification, Material Requirements, Stock or Part Number, Source and APL number (see 3.5.5.2).
- b. If split piece bubbles are used, the following information shall also be required:
  1. **Last Number Used**. Enter the total number of pieces to be cut from the Quantity Required (applies to sheets, plates and lengths of steel, aluminum, etc.).
  2. **Sizes Required**. Enter the total number of different sizes to be cut from the Quantity Required (applies to sheets, plates and lengths of steel, aluminum, etc.).

3.5.6.3 General Content. Hull/structural drawings shall be sufficiently detailed so that no decisions affecting the features or testing of the completed installation are required by production personnel. All construction dimensions and test requirements shall be controlled by realistic tolerances consistent with function and original ship fabrication and installation design tolerances. Foundation drawing requirements are as follows:

- a. Machinery equipment foundation. Complete details of foundations are required for all machinery equipment weighing fifty pounds or more. For machinery equipment weighing less than fifty pounds, complete foundation/mounting details are required if the foundation is fabricated or if the mounting requirements are critical, unusual or complex. The location of machinery foundations shall be referenced to the applicable machinery arrangement drawing which shall provide specific mounting dimensions for the foundations.
- b. Electrical/Electronic equipment foundations. Complete details of fabrications, mounting plates, racks, etc., are required for all electrical/electronic equipment. Complete locating dimensions/requirements shall be provided on the foundation drawing to enable shop fabrication and installation of foundations, plates, racks, etc., without referring to arrangement drawings. The outline of the equipment to be supported by the foundation, plate etc., shall be shown in phantom line if it does not confuse detail.

### 3.5.7 Machinery, Piping and Heating, Ventilation and Air Conditioning (HVAC) Drawings.

Machinery, (including all deck machinery) piping and HVAC drawings include piping, ventilation, , air conditioning and machinery arrangements, diagrams and manufacturing drawings for associated parts and assemblies. They shall provide for the installation, modification and removal of machinery, piping, hull and compartment insulation, and HVAC systems and associated equipment. Fluid power diagrams shall generally be in accordance with ANSI Y14.17. Other machinery, piping and HVAC drawings shall be in accordance with NAVSEA 0902-018-2010, NAVSEA S9AA0-AB-GOS-010 or other direction provided in the contract or tasking documentation.

### 3.5.7.1 Symbols.

- a. Pipe fitting, valve and piping graphic symbols for diagrammatic drawings shall be in accordance with NAVSEA Drawing No. 803-5001049, except fluid power systems, which shall be in accordance with ANSI/ASME Y32.10. A symbol legend shall be included for all fitting, valve and piping symbols used on the diagram.
- b. Welding graphic symbols shall be in accordance with MIL-STD-22 and ANSI/ AWS A2.4. In case of conflict between these specifications, MIL-STD-22 shall take precedence.
- c. Heating, ventilation and air conditioning graphic symbols for diagrammatic drawings shall be in accordance with ANSI Y32.2.4. A symbol legend shall be included for all symbols used on the drawing.

3.5.7.2 List of Material. List of material on piping drawings shall have material grouped by piping, valves and fittings, sequenced in that order, from the top of the list of material down. Each pipe size (for submarines - each pipe run) and each valve size shall be listed as a separate line item. Fittings shall be listed by type. Other lists for instruments, tanks, and hoses and flexible fittings, etc., may also be required and shall be kept on separate lists on submarine drawings, but may be placed in any sequence after the fittings list. (On surface ship drawings, these items may be included on the fittings list.) Machinery and HVAC drawings shall have one list of material. Lists of material on all machinery, piping and HVAC drawings ordering material shall provide the following data:

- a. All material required to accomplish the task shown on the drawing shall also be identified by Item Number, Quantity Required, Description, Specification, Material Requirements, Stock or Part Number, Source and APL Number (see 3.5.5.2).
- b. In addition, the following information shall also be required:
  1. **Classification.** All piping, machinery and pressure vessels shall be classified according to application in accordance with NAVSEA Pub S9074-AQ-GIB-010/278 and NAVSEA 0900-LP-001-7000.
  2. **Casting Category.** All castings which are to be used with piping, machinery and pressure vessels shall be categorized according to application in accordance with NAVSEA Pub S9074-AQ-GIB-010/278.
  3. **Material Identification and Control.** Piping system components, as applicable, shall be classified for Material Identification and Control (MIC) level in accordance with NAVSEA 0948-LP-045-7010. Any drawing which has Level I piping material indicated in the List(s) of Material shall so note above the Weight Control Data block (or title block of "A" size drawings) and shall have the following General Note added:

**ITEMS (list Item numbers) SHALL COMPLY WITH LEVEL I MATERIAL IDENTIFICATION AND CONTROL MARKINGS, INSPECTION, MATERIAL TESTING, PROCUREMENT AND DOCUMENTATION REQUIREMENTS OF NAVSEA 0948-LP-045-7010.**
  4. Service (Submarine Drawings only). Piping, valves and fittings shall identify the service use of each item. Items for piping runs shall provide descriptions similar to *RETURN DRAIN LP BEARING SSTG NO. 1*. Valves shall provide descriptions similar to *LOG-117 {Lube Oil, Generator (Valve Identification)} DRAIN SPEED CHANGER AND SERVO MTR LOW SPEED STBD*. Fittings shall be identified to the pipes and valves that they are applied to. If the quantity

of a fitting is shown as (4), then four applications must be indicated in the service column (P7, P8, P9, P10). If a pipe run or valve uses more than one of the same fitting item, the number of occurrences shall be placed in parenthesis (a gate valve using the same type of flange on both ports would be indicated as LOG-117(2) in the Service column). All components shall be accounted for in the service column.

5. **Test Pressure (Submarine Drawings only).** The test pressure for the specific pipe run shall be indicated.

3.5.7.3 General Content. Mechanical drawings shall be sufficiently detailed so that no decisions affecting the features or testing of the completed installation are required by production personnel. All dimensions and test requirements shall be controlled by realistic tolerances consistent with the original ship fabrication and installation design tolerances. Specific requirements are as follows:

- a. **General mechanical drawings.** Completed details, dimensions and tolerances shall be provided to allow installation of all required components as well as any required manufacture and/or assembly of components. Basic test criteria for all required testing and any special cautions and/or warnings shall also be noted.
- b. **Piping drawings.** Piping installation drawings shall be either line-type diagrammatic drawings or piping arrangement drawings. When pipe runs are complex or there are space constraints, a piping arrangement drawings shall be developed. For piping drawings, piping up to and including 2 inch I.P.S. (Iron Pipe Size), piping shall be represented as a single line. Piping greater than 2 inches I.P.S. shall be drawn to scale.. In complex or restricted area piping, piping arrangement drawings shall provide details of pipe, valve, hanger and fitting configuration as well as key dimensions to locate pipes, components, hangers and pipe bends whose locations are critical due to pipe stress, space constraints, etc. A tolerance of plus or minus 1/2 inch shall be applied to the dimensions unless otherwise specified and shall be so stated on the drawing.
- c. **HVAC drawings.** Except for simple duct runs in non-congested areas, duct installation drawings shall be prepared as two-line diagrammatic drawings and all complicated fittings and plenums shall be detailed on the drawings. (Simple duct runs may be represented by single lines.) Key dimensions and all critical hangers, fittings, etc. shall be detailed on the drawings.

3.5.8 Electrical/Electronic Drawings. Electrical and electronic drawings shall provide for the installation, modification and removal of electrical power and lighting distribution systems, fire control, interior communications, electronic systems such as radar, sonar, radio communications, IFF and electronic countermeasures, and control systems for various onboard machinery systems and equipment. Electrical/Electronics diagrams shall generally be in accordance with ANSI/ASME Y14.5, and ANSI Y14.15a, as applicable.

#### 3.5.8.1 Symbols.

- a. Electrical and electronic graphic symbols for use on schematic diagrams shall be in accordance with ANSI/ASME Y32.2.

- b. Symbols for electrical and interior communications (IC) circuit diagrams shall be in accordance with currently accepted industrial practices and each drawing shall have a symbol legend identifying each symbol used on the drawing. Symbol numbers, where used with standard electrical and IC equipment, shall be in accordance with MIL-HDBK-290.

3.5.8.2 List of Material. Lists of material on all electrical and electronic drawings ordering material shall provide the following data:

- a. All material required to accomplish the task shown on the drawing shall also be identified by Item Number, Quantity, Required, Description, Specification, Material Requirements, Stock or Part number, source and APL Number (see 3.5.5.2).
- b. In addition, the following information shall also be required:
  - 1. **Symbol Number**. Where items are identified on the body of the drawing by Symbol Number, the number shall be included in the description.

3.5.8.3 General Content. Electrical/Electronic drawings shall be sufficiently detailed so that no decisions affecting the features or testing of the completed installation are required by production personnel. All dimensions and test requirements shall be controlled by realistic tolerances consistent with function and original ship fabrication and installation design tolerances. Drawings shall be in accordance with NAVSEA 0902-018-2010 and S9AA0-AB-GOS-010 as applicable.

- a. General electrical/electronic drawings. Complete details, dimensions and tolerances shall be provided to allow installation of all required components as well as any required manufacture and/or assembly of components. Basic test criteria for all required testing and any special cautions and/or warnings shall also be noted.
- b. Power and lighting system drawings. Power and lighting system drawings shall generally be prepared as line-type diagrammatic drawings. These are to be prepared as cabling diagrams, elementary wiring diagrams, wiring deck plans and power distribution diagrams as required. Isometric wiring diagrams shall not be prepared for power and lighting system drawings unless specifically required by the contract or tasking documentation. . Where cableway modifications or new cableways or penetrations are required, they shall be designed in accordance with DOD-STD-2003-5, and cableway installation drawings shall be prepared. These drawings shall be based on all known cabling changes required as the result of S/A's to be accomplished during that availability. The drawings shall identify all material requirements to accomplish the installation (i.e. stuffing tubes, multiple cable penetrators, kickpipes, hangers, etc.).
- c. Electronic and interior communication (IC) system drawings. Electronic and IC system drawings shall generally be prepared as line-type diagrammatic drawings. These are to be prepared as cabling diagrams, elementary wiring diagrams, isometric wiring diagrams and schematic diagrams, as required. Electronic and IC system drawings shall not be prepared as wiring deck plans unless specifically required by the contract or tasking documentation.

3.5.9 Arrangement Drawings. Arrangement drawings are scale drawings (usually 1/4" = 1' or

larger) of the outline of, and components within a space, area or compartment. Arrangement drawings of machinery areas shall be referred to as *MACHINERY ARRANGEMENTS*, whereas arrangements of nonmachinery areas shall be referred to as *GENERAL ARRANGEMENTS*. Arrangements of piping, wireways, penetrations, antennas, etc., shall be referred to as such (*e.g., ARRANGEMENT OF PIPING*, etc.), but may be required to be shown in a smaller scale due to large areas of the ship which may be covered by the drawing. Arrangement drawings shall include, but are not limited to, the following:

- a. **Key plan.** The key plan shows the location of the compartment, space or area and it shows the area of the ship near the affected area, usually relative to the ship's centerline and frame numbers. On drawings showing more than one deck, a separate key plan is required for each deck. (Key plans are not required on arrangements of entire deck levels.)
- b. **Bar scale.** Bar Scales are optional. If used, each sheet shall have a bar scale (graphic scale) for each scale utilized on that sheet. Bar scales shall show both vertical and horizontal dimensions.
- c. **References.** The list of references shall include references to all drawings which provide equipment/material shown in the arrangement as well as any applicable foundation drawings.
- d. **Content.** Machinery and General Arrangements shall include, but are not limited to, machinery and/or equipment in the area, space or compartment, electrical equipment, main wireways, large pipes or piping banks, ladders and stairs, bilge line, accesses and pull space for equipment maintenance, removable plates for shipping and unshipping equipment, lifting or handling gear and trolley arrangements, major structures/foundations, manholes and reserved space. Knobs, handles, piping connections, and other permanently attached protrusions shall be included in the envelope depicting all equipment as well as access, service and operator areas, shock excursions and all critical dimensions. Machinery Arrangements shall also include all required information for installation of machinery foundations.
- e. **List of equipment.** Each arrangement drawing shall have a List of Equipment in accordance with 3.5.5.3.
- f. **Weight control data.** Arrangement drawings do not generally order material except for spares, support equipment (fire extinguishers, furniture, etc.) and other miscellaneous equipment which would not be ordered by a system or structural drawing. In instances where the arrangement drawing does not order any material, the weight control block shall be crossed out, corner to corner, with the statement *NOT APPLICABLE* written over it. Arrangement drawings shall not provide weight/moment calculations for any item, component or equipment ordered on any other drawing.

3.5.10 Removal drawings. Removal drawings shall be prepared only when it is necessary to depict removal of equipment and material in the way of new installations or when removal information is too complex to be discussed in removal notes on the installation drawing. The drawing shall usually be a mark-up of the existing system or arrangement drawing showing the specific components to be removed. A *LIST OF MATERIAL TO BE REMOVED* shall be included as part of the drawing and shall include disposition instructions for all removed material. These instructions shall be one of the following:

- a. **REMOVE & SCRAP.** This notation shall be used for all material to be disposed of locally by the installing activity. (For private shipyards, this material is to be turned over to the Property Administrator designated in the contract.)
- b. **REMOVE & FORWARD.** This notation shall be used for all material not being scrapped or retained for reinstallation. This material is to be removed and forwarded for disposition. Reference to General Note providing the name and address of the activity the material is to be forwarded to shall be provided in the Remarks column if a specific activity has been designated by the cognizant material manager. If no activity has been so designated, the General Note shall read, *MATERIAL REFERENCED TO THIS NOTE SHALL BE TURNED-IN TO THE NEAREST NAVAL PROPERTY ADMINISTRATOR.*
- c. **REMOVE & RETAIN.** This notation shall be used for all material to be removed and retained by the installing activity for reinstallation. Reference to a General Note providing reference to the drawing which will reinstall the material shall be provided in the Remarks column.

3.5.10.1 Master Removal Drawing. When foundation removal information is too complex to be discussed in removal notes on the drawing, but not complex enough to warrant a complete removal drawing (see 3.5.10), a Master Removal Drawing shall be prepared. The drawing shall list the foundations affected, the name of the equipment mounted on the foundation, the compartment and the location within the compartment, foundation installation drawing (if known), and extent of removal. Equipment status shall be designated as deleted or relocated. For relocated equipment, the arrangement drawing that reinstalls the equipment shall be listed along with the new arrangement item number.

3.5.10.2 Weight Control Data. A Weight Control Data Block shall be completed in accordance with 3.5.4.8 on all Removal Drawings or any drawing providing removal information.

3.5.10.3 List of material to be removed. As discussed in 3.5.10, all Removal Drawings shall have a *LIST OF MATERIAL TO BE REMOVED*. The format shall be the same as that of a *LIST OF EQUIPMENT* (see 3.5.5.3) except that *SCRAP*, *FORWARD*, AND *RETAIN* shall be used in lieu of *NEW*, *RELOCATED* and *EXISTING* under *SOURCE*.

3.5.10.4 Support Drawings. Support drawings (sometimes referred to as *non-working* drawings) are drawings which do not order material or provide specific installation data but are used as aids in design or records of design criteria which is vital to the development and accuracy of working drawings and logistic support. These drawings are not normally forwarded to production areas, but are used by designers and planners at installing activities, by stocking and material support activities for logistic support and by Ship's Force, Planning Yards and NAVSEA to maintain configuration control. Non-working drawings include, but are not limited to the following:

3.5.10.5 Interference Control Drawings. Interference Control Drawings shall be generally prepared as arrangement drawings and reflect all work to be accomplished in a space or compartment so that any interferences will become readily apparent. These drawings are not to

be considered *working drawings* in that they do not order or install material, but like arrangement drawings are to be used as guides to prepare other drawings. Interference Control Drawings shall only be prepared when required by the number or complexity of the SHIPALTs authorized for the availability as determined by the Planning Yard.

3.5.10.6 Installation Control Drawings. Installation Control Drawings are used to specify the form, fit and function of non-standard equipment to be purchased by the installing activity or by a central procurement activity such as SPCC. These drawings also provide information required to formulate an adequate Allowance Parts List (APL). (These drawings are not to be confused with Shipboard Electronics Equipment Installation Control Drawings (sometimes referred to as "RE" Drawings) which are controlled by the Naval Engineering Drawing Support Activity, Norfolk.) Installation Control Drawings shall be prepared generally in accordance with MIL-D-23140 except as modified herein, when specifically required by the SAR.

- a. Although MIL-D-23140 is intended for electronic equipment, sections 3.4.7, 3.4.8, 3.4.9, 3.4.10, 3.4.11, and 3.4.13 of MIL-D-23140 shall be applied to machinery and electrical equipment whereas 3.4.6 through 3.4.13 of MIL-D-23140 shall be applied to electronic equipment.
- b. Sections 1 through 3.4.5 and 4 through 6.4 of MIL-D-23140 do not apply to SHIPALT Installation Control Drawings.
- c. Drawing sizes and format specified in MIL-D-23140 shall not be used. Drawing size and format shall be in accordance with paragraph 3.4 of this specification.
- d. **Weight Control Data.** Installation Control Drawings do not order material and therefore shall not be utilized for calculation of weight and moment data. The weight control data block shall be prepared in the same manner as an Arrangement Drawing which does not order material (see 3.5.9(f)).
- e. **List of Equipment.** A List of Equipment shall be prepared in accordance with 3.5.5.3. This listing shall provide information on the basic equipment and material, including technical manuals, fittings, etc. A separate listing shall detail special equipment, fitting, etc., required by the installing activity to install the equipment.

3.5.10.7 Engineering Data Drawing. The SHIPALT drawing package shall contain and describe the engineering data/rationale used in preparing the drawings. This information shall normally be included on the individual drawings. However, when the data are of significant volume or when the drawing package is of significant size, the engineering data for the SHIPALT shall be placed on an Engineering Data Drawing. (For submarines - The engineering data shall be retained on a separate Engineering Data Drawing prepared for each SHIPALT.) The drawing shall be applicable to one SHIPALT and shall include, but is not limited to, the following:

- a. Engineering considerations (such as criticality on equipment location, EMI, corrosion/coating, special non-standard access closure required, etc.).
- b. Calculations (such as those associated with heat transfer, load flow stress, sizing, electrical feeder load, stability, etc.).
- c. Requirements necessary to demonstrate satisfactory installation and performance of the SHIPALT including any necessary prerequisite testing.

3.5.10.8 Special Drawings. Special drawings may be required for a particular system or

ship type. These drawings may be invoked by NAVSEA S9AA0-AA-SPN-UI0/GEN-SPEC, NAVSEA 0902-018-2010, NAVSEA 0902-LP-041-2010 or NAVSEA S9AA0-AB-GOS-010 as invoked by the contract or tasking document. It shall be incumbent on the Planning Yard to review these documents and the applicable Ship's Drawing Index to verify that special drawings such as *List of Motors, Controllers and Master Switches, Master Instrument List, Cargo Handling Flow Diagram, Storeroom Capacity*, etc., as applicable, are updated as required when SHIPALTs are accomplished.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Unless otherwise specified in the tasking documentation or contract, the Planning Yard shall be responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the tasking documentation or contract, the Planning Yard may use its own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by NAVSEA. NAVSEA reserves the right to perform any of the applicable inspections set forth in the documents referenced herein, which are deemed necessary to assure engineering drawings and associated lists conform to prescribed requirements.

4.1.1 Sampling. NAVSEA will normally perform inspection of drawings on a sampling basis and will normally use the evidence of this sampling as indicating conformance or nonconformance to these specifications.

4.1.2 Planning Yard's Drawing Control System. The Planning Yard shall provide and maintain a system for the detailed examination and technical review of all engineering drawings and associated lists to be supplied under the terms of the contract or tasking documentation. The system shall assure the conformance of the engineering drawings and associated lists to all requirements specified herein. The system, including the procedures, shall be documented and shall be subject to review by NAVSEA or its designated representative. The control system is subject to the disapproval of NAVSEA or its designated representative, whenever it can be demonstrated that it fails to assure conformance to the requirements specified herein.

4.1.3 Availability of Supporting Data. The Planning Yard shall permit NAVSEA to review the supporting data normally retained by the Planning Yard in the original format that the Planning Yard used to make its design decisions, in order to aid the NAVSEA representative in the review of the Planning Yard's design.

4.1.4 Drawing Control Procedures. The Planning Yard's drawing control procedures shall cover:

- a. Assignment of responsibility for detail examination, review, and signature authority of drawings for the Planning Yard.
- b. Required qualifications of personnel performing detail examination, review, and signature authority of drawings for the Planning Yard.
- c. Procedural flow of drawings and other associated documentation.
- d. Check lists to be used in the detail examination and review of drawings. The checklists shall specify each examination to be performed to verify conformance of

drawings to the applicable requirements of this specification and the contract or tasking documentation.

- e. Method of safeguarding classified information.
- f. Methods providing for the prevention and ready detection of discrepancies and for timely and positive corrective action.
- g. Method of safe storage of Master File Drawings, reference drawings, and other ship design documentation, as well as the electronic files for these items where applicable.
- h. Methods providing for control issue of drawing copies, both reproducible and nonreproducible.

#### 4.2 Nonconforming Data Items.

4.2.1 Format Defects ( See Glossary). There may be random sampling by NAVSEA for quality of drawing format of all Planning Yard drawings as they are issued. When numerous format defects are discovered on Planning Yard drawings, the Planning Yard shall correct its process to prevent recurrence of defects found, but need not correct or redraw drawings or portions of drawings already issued unless they are illegible, do not meet the reproducibility requirements, or affect usability.

4.2.2 Engineering/Technical Defects ( See Glossary). Selected drawings subordinate to each system diagram or system drawing may be reviewed by NAVSEA to determine whether they describe a system which will meet the specified requirements.

4.2.2.1 Significant Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains significant engineering/technical defects, such defects will be identified to the Planning Yard. The Planning Yard will then review all other drawings subordinate to the next higher level of drawing (for example, system diagram or system drawing), for similar defects and then correct promptly all defects found.

4.2.2.2 Minor Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains minor engineering/technical defects, such defects will be identified to the Planning Yard, which shall correct them.

4.2.2.3 Numerous Engineering/Technical Defects. Numerous engineering/technical defects, whether significant or minor, will be considered as an indication of poor Planning Yard quality control, and the Planning Yard shall correct its process. The Planning Yard shall advise NAVSEA of the results of its process review, including drawings examined, the number of like deficiencies found, and the steps taken to prevent recurrence.

4.3 Inspection of Preparations for Delivery. Packaging and packing of documents to be delivered under this specification shall be inspected to insure that the preparation-for-delivery requirements are met.

### 5. PREPARATION FOR DELIVERY

5.1 Packaging. All drawings and lists delivered under this specification shall be packaged for mailing or shipping in accordance with level A requirements of MIL-PRF-5480. Prints of size "D", "F" or "H" drawings (see 3.4.14.3) forwarded to NAVSEA, its designated representative or an installing activity, shall be folded, accordion fashion, to 8 1/2" by 11" height, with the title block completely visible.

5.1.1 Classified Material. Classified material shall be packaged in accordance with SECNAVINST 5510.36.

5.2 Packing. All drawings and lists delivered under this specification shall be packed in accordance with level C of MIL-PRF-5480.

5.3 Marking of Shipments. Identification and address markings for interior packages and shipping containers shall be in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended Use. Ship Alteration Drawings are intended for use by installing and support activities as well as Ship's Force and Headquarters to plan and carry out accomplishment of specific alterations to ships and ship systems, to support ships and ship systems, and to provide configuration records of work accomplished.

### 6.2 Ordering Data.

6.2.1 Procurement Requirements. Procurement documents should specify:

- a. Title, number and date of this specification.
- b. When Government design activity drawing numbers are to be assigned, identify the assigning activity, and if Government drawing formats are to be supplied, identify the source.
- c. The applicable Data Item Description (DID).
- d. That the metric system shall not be used.
- e. Whether company drafting standards are accepted.
- f. Kinds of associated lists required.
- g. Drawing assembly level at which associated lists will be prepared.
- h. Identify whether the mono-detail system will be used.
- i. Selection of types of engineering drawings if different than 3.4.3 of MIL-DTL-31000.
- j. Quantity and type of reproduction.
- k. Whether delivery of original drawings and undimensioned drawings are required.
- l. What special packaging of originals, when ordered, is required.
- m. Delivery schedule, and to whom the engineering drawings and supporting documents are to be delivered.

6.2.2 Data Requirements. When this specification is used in a contract procurement, the provisions of 52.277-7015 (Rights in Technical Data-Specific Acquisition) of the Department of Defense (DOD) supplement to the Federal Acquisition Regulation (FAR) shall be invoked and the data requirements identified below will be developed as specified by an approved Data Item

Description (DID) (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL) (DD Form 1423) incorporated into the contract. Deliverable data required by this specification is cited in the following paragraphs:

Paragraph	Data Requirements	Applicable DID
3.4.15.1	Proposed Final Drawings	DI-E-7031
3.4.15.2	Final Drawings	DI-E-7031

(Copies of Data Item. Descriptions required by the contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

6.3 Definitions. For the purpose of this specification, the following definitions shall apply:

6.3.1 Allowance Parts List. A list of parts developed by the Department of the Navy for specific components which are installed on Naval Ships (Allowance Parts Lists are not yet available for all components). The parts breakdown includes all parts allowed on board and other parts stocked in the supply system.

6.3.2 Approval. The act of formally acknowledging legal responsibility by the Government (the Planning Yard (or NAVSEA if required)) for the accuracy, adequacy, and completeness of the technical data (engineering drawings and associated lists) in question to the extent/limitation specified. If the extent/limitation is not specified, it is to be assumed that the approval applies to all information disclosed.

6.3.3 Assembly. A number of parts or subassemblies or any combination thereof joined together to perform a specific function, (examples: power shovel-front, fan assembly, audio-frequency amplifier). NOTE: The distinction between an assembly and a subassembly is determine by individual application. An assembly in one instance may be a subassembly in another where it forms a portion of a larger assembly.

6.3.4 Associated list. A tabulation of pertinent engineering information pertaining to an item depicted on an engineering drawing or on a set of engineering drawings.

6.3.5 Authorize. The act of sanctioning an action (as used in this specification, the act of directing (and funding) the preparation of drawings).

6.3.6 Baseline Arrangement Drawings (submarines). A series of submarine class drawings, controlled by NAVSEA 92, which depict the approved arrangement of components in specific compartments, spaces and areas which are used by Planning Yards to develop SHIPALT arrangement drawings. Any deviation from an approved baseline drawing must be approved by NAVSEA 92.

6.3.7 Basic Alteration Class Drawings (BACDs). The first complete set of drawings prepared for a SHIPALT; they are specifically applicable to the ship for which they are prepared and generally applicable to specific follow ships of a class.

6.3.8 Bulk material. Necessary constituents of any assembly or part such as oil, wax, solder, cement, ink, damping fluid, grease, powdered graphite, flux, welding rods, thread, twine and chain from which the quantity required is not readily determinable or if knowing the quantity, the physical nature of the material is such that it is not adaptable to depiction on a drawing; or which can be cut to finished size by the use of such hand bench tools as shears, pliers, knives, etc., without any further machining operations and the configuration is such that it can be fully described in writing without the necessity of pictorial representation. In addition, high usage, low cost items and hardware generally available, such as, hinges, locks, light bulbs, fan belts, clamps, rivets, terminals, sleeving, wire, nuts, bolts, screws and washers, etc., are considered bulk materials providing such material are normally available in commercial channels and are normally procured in bulk quantities.

6.3.9 Caution. An examining or testing procedure which must be followed or risk damage to, or destruction of, equipment. Cautions shall be short, concise and used only to emphasize important or critical data. Cautions may be worded positively or negatively and shall state hazard and result or reason, unless obvious.

6.3.10 Commercial item. A term which includes both supplies and services of a class of kind which (a) regularly are used for other than Government purposes and (b) is sold or traded in the course of conducting normal business operations. NOTE: Services, per se, normally are not subject to delineation on engineering drawings.

6.3.11 Contract. All types of agreements and orders for the procurement of supplies or services.' It includes awards and notices of award; contracts of a fixed-price, cost, cost-plus-a-fixed-fee; or incentive type; contracts providing for the issuance of job orders, task orders, or task letters thereunder; letter contracts, and purchase orders. It is also includes supplemental agreements with respect to any of the foregoing.

6.3.12 Contract drawing. A NAVSEA drawing identified as a *Contract Drawing* which delineates design features of a ship. No departure from a contract drawing is permissible without specific NAVSEA approval. Contract drawings are not modified by or referenced on SHIPALT drawings.

6.3.13 Contract guidance drawing. A NAVSEA drawing identified as a *Contract Guidance Drawing* which illustrates design features of a ship. A contract guidance drawing does not necessarily depict, nor is it intended to depict, all features and details of the system and structures to which it relates. It serves the purpose of providing information which, when utilized in conjunction with applicable specification requirements, contract drawings, project-peculiar documents, and other information, may assist in detail design. Contract guidance drawings will not necessarily be updated or revised to reflect modifications. Contract guidance drawings are not modified by or referenced on SHIPALT drawings.

6.3.14 Deficiencies. Deficiencies are of two types: (1) conditions of characteristics in any hardware/software which are not in compliance with specified configuration, or (2) inadequate

(or erroneous) configuration identification which has resulted, or may result, in configuration items that do not fulfill approved operational requirements.

6.3.15 Design activity. An activity having responsibility for the design of an item. The activity may be a Government activity or a contractor, vendor or others.

6.3.16 Design agent. An activity contracted or tasked to develop details of a design for which the design activity retains responsibility.

6.3.17 Engineering data. Engineering documents such as drawings, associated lists, accompanying documents, manufacturer specifications and standards, or other information prepared by a design activity and relating to the design, manufacture, procurement, test, or inspection of items or services.

6.3.18 Engineering drawing. An engineering document that discloses (directly or by reference) by means of pictorial and/or textual presentations the physical and functional end-product requirements of an item.

6.3.19 Engineering/technical defect. Defective drawing resulting from an error in engineering judgement, or data preparation, such as misinterpretation of a technical requirement in a specification or standard, producibility, assembly, installation, test, operation, maintenance or logistic support of an item.

6.3.19.1 A significant engineering/technical defect, as used in this specification, is defined as a defect in a drawing which, if reflected in the ship or equipment when built, could cause damage in either one, or would require more than five man-days of effort to correct in the ship or equipment.

6.3.19.2 A minor engineering/technical defect, as used in this specification, is defined as a defect in a drawing which, if reflected in the ship or equipment when built, would require an effort of five mandays or less to correct in the ship or equipment.

6.3.20 In-process review. A review of drawings in the process of preparation. The contractor or the Government or both may perform the review. In-process reviews are performed primarily to assure that drawings are being prepared in accordance with contract or tasking specification requirements. In-process reviews may be conducted at the contractor's (or Planning Yard's) facility (as applicable) at any time during the development of the drawing.

6.3.21 Installation Control Drawing (ICD). A drawing that sets forth information for an item in terms of parameters such as area, mass, weight, space, access clearance, drainage, mounting, ship service requirements, cleaning, testing, clearance, and pipe, waveguide and cable attachments required for the installation and co-functioning of the installed item with related items.

6.3.22 Installing activity. A generic term applying to any activity which may be called upon to install SHIPALTs. This includes, but is not limited to Shipyards, Intermediate Maintenance Activities (IMAs) and Ship's Force.

6.3.23 Integrated Design Drawings. See Multi-SHIPALT drawings.

6.3.24 Manufacturer's drawing. A ship equipment drawing identified by manufacturer's drawing number.

6.3.25 Master file drawing. A final, approved drawing which is designed to be the permanent file drawing.

6.3.26 Modification drawing. A drawing which modifies the engineering information presented on an existing drawing. Modification drawings are generally prepared instead of revising the existing drawing when the Master File Drawing is not available or revision of the existing drawing would cause confusion. Less than 25% of the existing drawing is affected by a modification drawing. (If more than 25% of the existing drawing is affected, a new, superseding drawing shall be prepared.)

6.3.27 Multi-SHIPALT drawings. Drawings prepared to incorporate more than one SHIPALT on one set of drawings in cases where SHIPALT interfaces are complex and render separate sets of drawings to support each involved interfacing SHIPALT impractical. These may also be referred to as Integrated Design drawings.

6.3.28 NAVSEA drawing. Contractor/Government-prepared original drawings acquired or revised by or for the Naval Sea Systems Command. These drawings are assigned a NAVSEA drawing number and may be modified by or referenced on SHIPALT drawings.

6.3.29 Notes.

- a. General Notes. Notes which state conditions under which a drawing was prepared and highlighting conditions, procedures or general information necessary for complete understanding of the work to be accomplished by the drawing.
- b. Removal Notes. Notes providing information on the removal and disposition of equipment components and/or structures which must be removed from a ship prior to the installation of other equipment, components and/or structures. Removal notes are normally placed after the General Notes on a drawing and sequentially numbered "R-1", "R-2", etc.
- c. Special Notes. Examining or testing procedures or conditions which should be highlighted. Special notes are included as part of general, removal or test notes which require special attention and are not normally listed separately. Special notes shall be short, concise and used only to emphasize important or critical data.
- d. Test Notes. Notes which state the testing criteria which must be met to certify the work to be accomplished by a drawing. Test notes shall not take the place of or reference specific test procedures but may invoke test criteria established by other documents such as 0902-018-2010, 0902-LP-041-2010, S9AA0-AA-SPN-101/GENSPEC or S9AA0-AB-GOS-010. Test notes are normally placed after the Removal Notes on a drawing and sequentially numbered "T-1", "T-2", etc. On drawings not having Removal Notes, Test Notes shall be placed after the General Notes.

6.3.30 Proofing. The process by which the Planning Yard assures the adequacy of the SHIPALT design by actual test of the hardware and the accuracy of associated drawings by actual comparison with the completed installation.

6.3.31 Review. The process wherein technical data is checked, inspected or examined for conformance to specified requirements.

6.3.32 Revision. A second or subsequent edition of a drawing or document which supersedes the preceding edition.

6.3.33 Revision symbol. An identifying letter which may be accompanied by a suffix number and enclosed in a circle or may be the printed letter in a revision column or block.

6.3.34 Right Reading. Term to describe an image which is directly readable as opposed to a mirror image.

6.3.35 Selected record drawings (SRDs). Drawings (usually structural or system diagrams) which have been selected because they contain basic information on hull, mechanical and electrical equipment and systems. These drawings are selected for their value for operational, maintenance, training and consulting purposes to Ship's Force, fleet commands, shipyard personnel, training centers and other naval activities. The drawings designated as Selected Record Drawings are maintained current and up-to-date throughout the life of the ship. The SRDs applicable to each class of ship are listed in NAVSEA SL720-AA-MAN-010.

6.3.36 Ship construction drawings. Drawings which are necessary for construction of the ship and other related drawings as required by Section 085 of NAVSEA S9AA0-AA-SPN-010/GENSPEC.

6.3.37 SLM. Ship Logistics Manager

6.3.38 SPM. Ship Acquisition Project Manager

6.3.39 Specification, government. A government document identified as a Federal Specification (Fed. Spec.), a Department of Defense Specification (DOD Spec.), a Military Specification (Mil. Spec.) or a NAVSEA Technical Specification (NAVSEA Tech. Spec.) which describes the technical requirements for items, materials or services, including the procedures by which it will be determined that the requirements have been met.

6.3.40 Standard. A document which establishes engineering and technical limitations and applications for items, materials, processes, methods, designs and engineering practices.

6.3.41 Standard drawing. A NAVSEA drawing designated as a *Standard Drawing* delineates arrangements or details of systems, equipment or components. No departure from details of a standard drawing shall be made without the specific written approval of NAVSEA. Departures

from a referenced standard drawing on a working drawing shall be noted on that drawing and the authority for the departure shall be indicated.

6.3.42 Standard, government. A standard developed by or for a Government activity.

6.3.43 Standard, non-government. A nationally recognized standardization document issued with intent to establish common technical requirements by a non-government organization which conducts professional standardization activities and which is not organized for profit. (Does not include *COMPANY STANDARDS*).

6.3.44 Superseding drawing. A drawing which is prepared to totally replace an existing drawing.

6.3.45 Supplementary Alteration Drawings (SADs). Drawings which modify design details presented on a BACD; required to depict individual ship differences or extend applicability of BACDs to specify follow ships.

6.3.46 System (electrical - electronics). A combination of two or more sets, generally physically separated when in operation, and such other assemblies and parts necessary to perform an operational function or functions. For example: AEW electronic system, antiaircraft defense system, telephone carrier system, GCA electronic system, fire control system including the tracking radar, computer, and gun mount.

6.3.47 System (general). A combination of parts, assemblies and sets joined together to perform a specific operational function or functions. (Examples: piping system, refrigeration system, air conditioning system).

6.3.48 Technical data, limited rights. The right to use, duplicate or disclose technical data, in whole or in part, by or for the Government, with the express limitation that, without the written permission of the party furnishing the data, such technical data shall not be:

- a. Released or disclosed in whole or in part outside the Government
- b. Used in whole or in part by the Government for manufacture, or in the case of computer software documentation, for preparing the same or similar computer software, or
- c. Used by a party other than the Government, except for:
  1. Emergency repair or overhaul work only, by or for the Government, where the item or process concerned is not otherwise reasonably available to enable timely performance of the work, provided that the release or disclosure thereof outside the Government shall be made subject to a prohibition against future use, release or disclosure; or
  2. Release to foreign government, as the interest of the United States may require, only for information or evaluation within such government or for emergency repair or overhaul work by or for such government under the conditions of (1) above.

6.3.49 Technical data, unlimited rights. The right to use, duplicate or disclose technical data or

computer software in whole or in part, in any manner and for any purpose whatsoever, and to have or permit others to do so.

6.3.50 Type drawing. A NAVSEA drawing designated as a *Type Drawing* which delineates or illustrates design features of systems or components. No departure from any feature identified as *Mandatory* shall be made without the specific written approval of NAVSEA. Departures from mandatory features of a referenced type on a working drawing shall be noted on that drawing and the authority for the departure shall be indicated. The illustrative features are subject to detail design development to assure full compliance with these specifications.

6.3.51 Validation. The process by which the Planning Yard or overhaul activity assures the technical accuracy and adequacy of a drawing and that it represents the current configuration of the applicable ship by actual inspection.

6.3.52 Warning. An examining or testing procedure or practice which must be closely observed or risk either loss of life or injury to personnel. Warnings may be worded positively or negatively and shall state the hazard and result or reason. Warnings shall be short, concise and used only to emphasize specific dangers. Warnings are generally included as part of a General or Test Note, view, etc., which requires special attention and are not normally listed separately.

6.3.53 Working drawing. Those drawings which enable the following key functions to be accomplished.

- a. Order material.
- b. Plan manufacturing, fabricating, assembly operations, tooling and manufacturing facilities.
- c. Estimate the cost of material and labor.
- d. Inspect and control quality and reliability.
- e. Perform fabrication, assembly and installation.
- f. Prepare system tests.

**TECHNICAL SPECIFICATION**

**TITLE: SHIP SELECTED RECORD DRAWINGS**

**NO.: TS9090-800A**

**DATE: JUNE 2002**

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## Table of Contents

1.	SCOPE .....	1
1.1	Introduction .....	1
2.	APPLICABLE DOCUMENTS .....	1
2.1	General .....	1
2.1.1	Government documents.....	1
2.1.2	Specifications, standards, and handbooks .....	1
2.1.3	Other Government documents, drawings, and publications .....	1
2.2	Precedence.....	2
3.	REQUIREMENTS .....	2
3.1	General .....	2
3.2	Responsibilities .....	3
3.3	Drawing Requirements and Guidelines.....	3
3.3.1	General .....	3
3.3.1.1	Format .....	3
3.3.1.2	"F" and "H" drawings.....	3
3.3.1.3	.....Level of detail	3
3.3.1.4	Component List.....	5
3.3.1.5	General notes.....	6
3.3.1.6	Ship Drawing Index (SDI) .....	6
3.3.1.7	Shipcheck block .....	6
3.3.2	Safeguarding Classified Information and Unclassified Information.....	6
3.3.3	Guidelines for Updating SRDs.....	6
3.3.3.1	Inactive Ships SRD Preparation.....	7
3.3.3.2	Nuclear-Powered Ship Docking Drawing.....	7
3.3.3.3	Reactor Plant SRD Requirements .....	7
3.3.3.4	Submarine Rescue and Salvage Drawings .....	7
3.3.4	SRD Revisions .....	8
3.3.4.1	General .....	8
3.3.4.2	Revision Methods.....	8
3.3.4.3	Identifying Revisions on SRDs.....	8
3.3.4.4	Multiple Changes .....	8
3.3.4.5	Required Revisions .....	8
3.3.4.6	Recording Revision Description on SRDs.....	8
3.3.4.7	Revision Of Multi.Sheet SRDs .....	8
3.3.5	Signature Responsibilities .....	9
3.3.5.1	Product quality .....	9
3.3.5.2	Overall quality.....	9
3.3.5.3	Submarines.....	10
3.3.6	SRD Distribution.....	10
4.	QUALITY ASSURANCE .....	10
4.1	Responsible For Inspection .....	10
4.1.1	Sampling.....	10

4.1.2	Planning Yard's Drawing Control System .....	10
4.1.2.1	Availability of Supporting Data .....	10
4.1.2.2	Drawing Control Procedures .....	10
4.2	Nonconforming Data Items .....	11
4.2.1	Format Defects .....	11
4.2.2	Engineering/Technical Defects .....	11
4.2.2.1	Significant Engineering/Technical Defects.....	11
4.2.2.2	Minor Engineering/Technical Defects .....	11
4.2.2.3	Numerous Engineering/Technical Defects.....	11
4.2.3	Microfilm .....	12
4.3	Inspection of Preparations for Delivery .....	12
5.	PREPARATION FOR DELIVERY.....	12
5.1	Packaging .....	12
5.1.1	Classified Material .....	12
5.1.2	Packing .....	12
5.2	Marking of Shipments.....	12
6.	NOTES .....	12
6.1	Intended Use.....	12
6.2	Ordering Data .....	12
6.2.1	Procurement Requirements .....	12
6.2.2	Data Requirements .....	13

## SHIPS SELECTED RECORD DRAWINGS

### 1. SCOPE

1.1 Introduction. This specification establishes the procedures for preparation of technically adequate Selected Record Drawings (SRDs) and consistent format and revision methodology for all active fleet ships of the U. S. Navy. This specification does not apply to Selected Record Drawings under the technical cognizance of NAVSEA 08.

### 2. APPLICABLE DOCUMENTS

2.1 General. The following documents of the issue in effect on the date specified in the data of the tasking correspondence form a part of this specification to the extent specified herein.

2.1.1 Government documents.

2.1.2 Specifications, standards, and handbooks. The following specifications, standards, and handbooks of the exact revision listed below form a part of this document to the extent specified herein.

### SPECIFICATIONS

MIL-DTL-31000	Technical Data Packages, General Specifications for.
NAVSEA Technical Specification 9090-600	Ship Alteration Drawing Preparation, Technical Specification

### STANDARDS

DOD-STD-100	Engineering Drawing Practices
MIL-STD-129	Marking for Shipment and Storage

2.1.3 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications of the exact revision level shown form a part of this document to the extent specified herein.

### MANUALS

NAVSEA 0902-018-2010	General Overhaul Specifications for Deep Diving SSN/SSBN Submarines
NAVSEA SL720-AA-MAN-010	Fleet Modernization Program Management and Operations Manual

NAVSEA 0924-LP-062-0010	Submarine Safety Requirements Manual
NAVSEA S9040-AA-IDX-020/SWBS 5D	Expanded Ship Work Breakdown Structure
NAVSEA S9AAO-AA-GSO-010	General Specifications for Overhaul of Surface Ships (GSO) Including the Aegis Supplement
NAVSEA 0902-LP-041-2010	Standard Specification for U. S. Navy Craft

## INSTRUCTIONS

NAVSEAINST 9085.2	Naval Sea Systems Command Engineering Drawing Management Program (EDMP): Policy and Responsibilities for
SECNAVINST 5510.36	Department of the Navy (DON), Information Security Program (ISP)
SECNAVINST 5510.30	Department of Navy Personnel Security Program
COMSCINST 9000.1	Preparation, Maintenance and Distribution of Selected Record Plans and Booklets for MSC Ships (USNS)

2.2 Precedence. In the event of conflict between the requirements of this specification and the documents referenced herein, the requirements of this specification shall apply; except that in the event of conflict between the requirements of this specification and the requirements of NAVSEA 0902-018-2010, NAVSEA 0902-LP-041-2010, or NAVSEA S9AA0-AB-GOS-010, the requirements of those documents shall apply.

## 3. REQUIREMENTS

3.1 General. SRDs are a group of ships drawings specifically selected for their reference value which illustrate important features, systems and arrangements applicable to an individual ship, which are maintained current throughout the life of the ship. Appendix A specifies the drawings required for each ship type.

The increasing sophistication of ships systems and equipment requires that the supporting SRDs be as clear, accurate and complete as possible. Figure I is an example of drawing detail required.

Ships Selected Record Drawings (SRDs) shall conform to the applicable documents listed and additional requirements specified herein. Within the requirements of DOD-STD-100,

MIL-DTL-31000, NAVSEA S9AA0-AB-GOS-010 (Sect 085), and the direction contained herein, Planning Yards shall provide Selected Record Drawings services as tasked.

Selected Record Data for ships operated by the Military Sealift Command shall be in accordance with COMSCINST 9000.1.

3.2 Responsibilities. The Planning Yard for each ship class is the Engineering Design Agent for SRDs. Unless otherwise directed by NAVSEA, the Planning Yard is responsible for the development, maintenance and update of SRDs.

### 3.3 Drawing Requirements and Guidelines.

3.3.1 General. Selected record drawings shall be prepared for each ship. Each drawing shall show the official number of that ship only. Individual NAVSEA drawing numbers shall be assigned to each drawing for each ship. Selected record drawings shall be validated to ensure they reflect the as-delivered configuration of the ship. SRDs shall be drawn to show the actual arrangement, configuration of systems, and other technical data, following a configuration validation trackwalk onboard the individual ship. (Some SRDs, such as Tank Capacity Drawings, may have to be developed from other documentation instead of trackwalked.)

SRDs shall be drawn for each specified propulsion plant system and arrangement and statements such as *Similar for Engine Room No. 2* or such an equivalent note or sketch are not acceptable.

SRDs shall be user oriented in that they provide sufficient detail and engineering support data for operational, testing, inspection, maintenance, training, and consulting purposes to individual ship's forces, fleet commands, shipyard personnel, and other activities.

3.3.1.1 Format. Physical layout shall be correct to the precision required for such a drawing; i.e., proper relationship of ships systems and equipment and include bulkhead numbers and compartment and deck identification, by name and number. The format for Title Blocks shall be in accordance with NSTS 9090-600, Sections 3.5.4.1 and 3.5.4.2 excepting drawing title information specified in Section 3.5.4.1(a). Drawing titles shall be in accordance with Appendix A of this specification.

3.3.1.2 "F" and "H" drawings. New SRDs of ships systems and arrangements shall be developed on size "F" (28" x 40") sheet(s) for most large drawings. Drawings which must be prepared as a single continuous drawing (not multiple sheets) such as some complex piping and wiring system diagrams, docking drawings, and compartment and access drawings which would exceed the length of size "F" sheets, shall be prepared as size "H" drawings. Size "H" drawings shall only be used for drawings which must display information on one continuous sheet or would be confusing if prepared as a multiple sheet drawing. Size "A" or "B" sheets may be used for intermediate size drawings, such as *Flexible Connections List*, where the data is not appropriate for, or the quantity of information does not justify size "F" sheets.

3.3.1.3 Level of detail. General guidelines for determining the level of detail required for development of SRDs shall be similar, but not limited to those indicated in example system categories listed below:

- a. **Piping.** A single-line drawing shall be used to depict the diagrammatic configuration of the system, showing valves, special fittings and components in their proper relationship. Additional features to be incorporated shall normally include the following:
1. Pipe size identification (e.g., 1 1/2", 2", 2 1/2", etc.)
  2. Component identification numbers (e.g. 1MS-V1, 1MS-F25, IMS-GA10, 1MS-TH15, etc.)
  3. Component List (See 3.3.1.4)
  4. Identification of all interface systems
  5. System flow arrows if appropriate (Not appropriate where system flow direction varies under different operating conditions.)
  6. List of Symbols
  7. List of Applicable References
- b. **Ventilation.** A single-line drawing shall be used to depict ventilation and air conditioning recirculation system showing locations of fans, heaters and cooling coils and areas served by the system. Additional features to be incorporated shall include the following:
1. Fan Data Table (with following)
    - a) Fan number and size
  2. List of Applicable References
- c. **Electrical.** A single-line diagram shall be used to depict the ships power system and shall also include enough specific data as follows:
1. **60 and 400 Hertz Power Systems.** Single-line diagram to power panels and distribution boxes with loads stubbed off.
  2. **60 and 400 Hertz Metering and Control.** Single-line diagram between switchboards and wiring diagram.
  3. Index of sheets
  4. List of Applicable References
- d. **Tank Capacity.** Curves of capacity, centers of gravity and moments of inertia for Main Ballast Tank, Bow Tank, Fuel Oil, Auxiliary, Trim, Negative, Water Around Torpedo Tubes (WRT), Hydraulic Oil, Lubricating Oil, Potable Water, Sanitary and Fresh Water shall be provided as follows for use in determining ship stability:
1. Capacity
  2. Vertical center of gravity
  3. Longitudinal center of gravity
  4. Transverse center of gravity

5. Moment of Inertia (where applicable)
  6. Residual Water including Items 1-4 inclusive (where applicable)
  7. Cavity Drain including items 1-4 inclusive (where applicable)
- e. **Naval Architecture Characteristics.** Various drawings that depict the principal static naval architectural characteristics of a submarine should include:
1. Displacement and Other Curves
  2. Lead Ballast stowage
  3. Moment Diagram
  4. Longitudinal *Flotational* Diagram
- f. **Hull/Structural.** Hull/Structural drawings shall provide such things as deck superstructure components, compartment arrangements, accesses, ladders, fittings, mast, etc. These drawings shall also include compartment/tank numbers, tank service identification, deck heights, etc.
- g. **Flexible Connections List.** Format shall be similar to Figure 3-3 of NAVSEA manual 0924-062-0010 and contain as a minimum the following:
1. Service and system in which installed
  2. Location (pipe" or equipment)
  3. Size (normal)
  4. Required replacement date
  5. Appropriate specifications
  6. Vendor model and part numbers for parts in assemblies.
- h. **Special Drawings.** Sub-Safe Certification mapping drawings, Sub-Safe Penetration drawings, Asbestos Removal drawings, Noise Review road maps, and other Special Drawings shall be as specified by NAVSEA 0902-018-2010, NAVSEA S9AA0-AB-GOS-010, or S9AA0-AA-SPN-010/GEN-SPEC, as applicable.
- i. **Arrangement Drawings.** Arrangement drawings shall be prepared in accordance with NAVSEA Technical Specification 9090-600, Section 3.5.9.

3.3.1.4 **Component List.** A Component List shall be incorporated into the applicable SRDs. This includes, functionally significant piping, valves, fittings, special fittings, instrument list, etc., as defined by NAVSEA S9040-AA-IDX-020/SWBS 5D.

- a. The format for the Component List shall include the following:
1. Piece number (ex. 1MS-V33A, 1MS-F42, 1MS-GA55)
  2. Quantity of pieces identified by quantity of one.
  3. Description of item size and noun name (ex. 5", gate valve)
  4. Expanded Ship Work Breakdown Structure (ESWBS) 5 digit number for configuration worthy items as identified in NAVSEAINST 4790. 1A.
  5. Functional description/service (1MS-33A Mn Stm COV. #1 Mn Fd Pmp)

\* When authorized and invoked by the Ships Logistics Manager (SLM) or Ship Acquisition Project Manager (SHM).

3.3.1.5 General notes. SRDs shall contain a complete list of General Notes. The first general note shall read similar to the following:

"This is a Selected Record Drawing developed from conditions existing on the USS (SHIP NAME & HULL NUMBER) during shipcheck on (DATE) and includes all modifications up to and including the FY (YEAR, TYPE of Availability)."

3.3.1.6 Ship Drawing Index (SDI). Each Selected Record Drawing shall be listed in the Ships Drawing Index (SDI) under BSCI/SWAB/SWBS number "000" in addition to the applicable BSCI/SWAB/SWBS number assigned to drawing.

3.3.1.7 Shipcheck block. As each Selected Record Drawing is updated, the Shipcheck Block on the drawing above the title block shall also be updated to indicate that the drawing has been checked and corrected to show conditions actually existing on the ship.

3.3.2 Safeguarding Classified Information and Unclassified Information. SRDs and associated lists containing classified information shall be marked in accordance with SECNAVINST 5510.36 and SECNAVINST 5510.30. Further, those drawings and associated lists containing Naval Nuclear Propulsion Information, as defined in Enclosure (1) of NAVSEAINST C5511.32, shall be marked pursuant to the requirements established in NAVSEAINST C5511.32.

3.3.3 Guidelines for Updating SRDs. The following guidelines should be followed to determine the action required in the updating of SRDs.

- a. A revised drawing is authorized if the following conditions are met: The original tracing of the drawing is available and reproduction quality is acceptable. In preparing the revision, the original tracing shall be revised if alteration changes can clearly be shown without the loss of existing clarity, detail and engineering support data and the original meets the drawing requirements specified herein.
- b. A superseding drawing is required if any of the following conditions apply:
  1. The original tracing of the drawing is missing or is not available.
  2. The original tracing does not meet the drawing requirements specified herein and changes to the drawing are required to suit the subject ship. SRDs are not to be redrawn for the sole purpose of meeting the drawing requirements specified herein.
  3. Whenever the original of an SRD, because of age, extensive corrections or other reasons, deteriorates so that legible prints cannot be made, a new drawing must be prepared. When preparing new drawings for any of the above reasons and the original does not meet the drawing requirements herein, they shall be developed in accordance with these requirements and the drawings assigned a new NAVSEA drawing number.

- c. A new drawing is authorized when alterations have been accomplished that would normally require correction of SRDs as specified herein, but where these drawings have not been previously prepared, the following procedures shall be adhered to:
  1. Where only a class drawing exists, a reproducible copy is to be made provided it can be corrected to meet the drawing requirements specified herein and to reflect the specific hull configuration (Class Docking Drawings excepted per NSTM, Chapter 997 - Docking Instructions and Routine Work in Drydock (NAVSEA S9086-7G-STM-000)). This drawing shall be assigned a new NAVSEA drawing number and designated as the SRD applicable only to the subject ship.
  2. When a specific SRD does not exist or was never provided by the Planning yard or the ship, a new original drawing shall be prepared in accordance with the drawing requirements specified herein by the Planning Yard (Class Docking Drawings excepted per NSTM, Chapter 997 - Docking Instructions and Routine Work in Drydock (NAVSEA S9086-7G-STM-000)).

3.3.3.1 Inactive Ships SRD Preparation. When inactive ships are being activated for assignment to the active fleet, the SRDs are to be corrected as necessary to suit requirements specified herein.

3.3.3.2 Nuclear-Powered Ship Docking Drawing. Docking drawing for nuclear-powered ships must be prepared and/or revised in conformance with the requirements of Naval Ships Technical Manual, Chapter 997 - Docking Instructions and Routine Work in Drydock (NAVSEA S9086-7G-STM-000) and additional requirements of FMP Manual SL720-AA-MAN-010.

3.3.3.3 Reactor Plant SRD Requirements. Requirements relative to Reactor Plant Selected Record Drawings are provided in Subsection 4.13 of FMP Manual SL720-AA-MAN-010.

3.3.3.4 Submarine Rescue and Salvage Drawings. The Salvage System Arrangement and Booklet of General Drawings for submarines are designated as Rescue and Salvage Drawings. These drawings must be accurate and available at all times for use in the event of a submarine disaster. The Booklet of General Drawings is to be modified to include a compartment flooding effect tabulation and bulkhead holding depths as follows:

- a. Each main watertight compartment
- b. Floodable volume of each compartment in gallons and tons
- c. Vertical and horizontal centers of gravity for specific flooding levels for each main compartment
- d. Maximum holding depth for which the internal main division bulkheads are designed

Whenever changes affecting the Rescue and Salvage Drawings are made by a shipyard, the shipyard will furnish prints of such drawings to the Commanding Officer of the submarine concerned. The Commanding Officer will be responsible for certifying that these prints either conform to the actual arrangement, or are marked up to show differences, and then return them to the shipyard. Prior to the submarine's departure, the shipyard will furnish the Commanding Officer two reproducible copies of the corrected drawing and additional prints as requested. If an

alteration is made by Forces Afloat, the Commanding Officer of the submarine will mark up his drawing accordingly, submit the drawing to the Planning Yard for update and distribution, and notify operational commands as specified by Type Commanders. To avoid confusion in identifying revisions by alteration number, the reproducible copies of Rescue and Salvage Drawings will not be altered except by shipyards.

### 3.3.4 SRD Revisions.

3.3.4.1 General. Revisions to SRDs shall be made in accordance with DOD-STD-100 with particular attention to areas amplified herein.

3.3.4.2 Revision Methods. Revisions shall be made by erasure, addition of information, or by redrawing. Revisions to CAD-generated drawings shall be developed by CAD systems only.

3.3.4.3 Identifying Revisions on SRDs. Revision locations shall be identified by all of the following methods:

- a. Revision symbols on field of drawing.
- b. Description in the revision block.
- c. Zone in the zone column within the revision block.
- d. Revision authorization document referenced on drawing.

3.3.4.4 Multiple Changes. All changes to a SRD incorporated at one time shall be identified by the same revision letter. The changes shall be numbered sequentially to permit ready identification of a specific change. In this case, the appropriate sequence number will appear as a suffix to the revision letter.

3.3.4.5 Required Revisions. Any change to an SRD shall be recorded as a revision. When security classification is changed on a drawing, this will also constitute a revision to the drawing.

3.3.4.6 Recording Revision Description on SRDs. Revision description shall be written as briefly and concisely to provide sufficient detail as necessary to accurately define the change in the description column.

3.3.4.6.1 Zoning. When changes are recorded by zoning, the zone in which each change is made shall be entered in the zone column on the same line as the description of the change.

### 3.3.4.7 Revision Of Multi.Sheet SRDs.

3.3.4.7.1 Requirement. Concurrent changes made upon any or all sheets of a multiple-sheet drawing shall be identified on each sheet so revised by the same revision letter. Each revision affecting any or all sheets shall be identified on the revision record sheet or status of sheets block.

### 3.3.4.7.2 Procedure.

- a. Revision upon any sheet of the drawing shall be made and recorded in the usual manner except that the sequence of revision letters and serial suffixes shall apply to the drawings as a whole rather than to each individual sheet. Sheet 1 shall include a tabulation to indicate the revision status of each sheet comprising the group. Whenever a change is made on any sheet, the revision letter applicable to that change shall be entered in the revision status block on Sheet 1, both in the column for the revised sheet and for Sheet 1 (regardless of whether there is any other change on Sheet 1). No revision symbols are required to indicate these entries in the revision status block. For each other sheet, the last applicable revision letter shall be entered in the appropriate column of the revision status block. For all sheets that have never been revised, a dash shall be entered in the appropriate columns.
- b. In the case of computer prepared multi-sheet drawings all sheets shall be identified by the same revision letter regardless of which sheet the revision applies to.

3.3.5 Signature Responsibilities. SRDs shall have (as a minimum) the signature entries listed below in the title block region of the drawing as delineated by NAVSEA Technical Specification 9090-600. The person signing for each of the signature entries is responsible for the following functions:

- a. Drawn or Prepared by. This shall consist of the printed name of the person who prepared the drawing.
- b. Reviewed or Checked by. This shall consist of the printed name of the person who reviewed or checked the drawing and the responsible Technical Code Number.
- c. Approved by. This shall consist of the signature of the person responsible for the lead on the project in the Planning Yard Technical Code (i.e., Lead Engineer, Group Leader, or Supervisor). This person shall: (a) be responsible for properly invoking the engineering and technical requirements (i.e., MIL-STD, MIL-SPECS, etc.); (b) ensure compliance with engineering drawings standards; (c) be knowledgeable of the ships system configuration validation shipcheck and initial drawing preparation; and (d) perform the final independent review of the completed SRD for all aspects of quality (i.e., procedural, technical, engineering, and incorporation of shipcheck information).

If the SRD is prepared by a Contractor, the approval line shall be signed by the senior Navy person responsible (see (c) above) for the content of the drawings. In all cases a Navy Title Block shall be used.

3.3.5.1 Product quality. Personnel responsible for SRD preparation, reviewing or checking and approval shall utilize drawing checklists and audits, as necessary, to ensure product quality in accordance with specifications herein and established procedures for other drawings in consonance with governing requirements (e.g., NAVSEA TL855-AA-STD-010 - Shipyard Quality Program Manual).

3.3.5.2 Overall quality. In the event that SRD preparation is performed by an activity (Government or Private) other than the cognizant Planning yard, the overall quality of the SRD effort remains the responsibility of the Planning Yard.

3.3.5.3 Submarines. For submarines, the above does not relieve the overhaul shipyard of the responsibility, as set forth in NAVSEA 0902-018-2010, to:

- a. furnish the ship prior to fast cruise with one full sized print of each selected record drawing reflecting the end of overhaul configuration.
- b. provide written certification, prior to fast cruise, to the submarine commanding officer, with copies to the appropriate Type Commander and Squadron Commander and NAVSEA, that the selected record drawings affected during overhaul/conversion have been updated and reflect, as a minimum, all accomplished SHIPALTs and all changes wrought by the Ship's Force.

3.3.6 SRD Distribution. SRDs shall be distributed in accordance with NAVSEA SL720-AA-MAN-010.

#### 4. QUALITY ASSURANCE

4.1 Responsible For Inspection. Unless otherwise specified in the tasking documentation or contract, the Planning Yard shall be responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the tasking documentation or contract, the Planning Yard may use its own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by NAVSEA. NAVSEA reserves the right to perform any of the applicable inspections set forth in the documents referenced herein, which are deemed necessary to assure engineering drawings and associated lists conform to prescribed requirements.

4.1.1 Sampling. NAVSEA will normally perform inspection of drawings on a sampling basis and will normally use the evidence of this sampling as indicating performance or nonconformance to these specifications.

4.1.2 Planning Yard's Drawing Control System. The Planning Yard shall provide and maintain a system for the detailed examination and technical review of all engineering drawings and associated lists to be supplied under the terms of the contract or tasking documentation. The system shall assure the conformance of the engineering drawings and associated lists to all requirements specified herein. The system including the procedures shall be documented and shall be subject to review by NAVSEA or its designated representative. The control system is subject to the disapproval of NAVSEA or its designated representative, whenever it can be demonstrated that it fails to assure conformance to the requirements specified herein.

4.1.2.1 Availability of Supporting Data. The Planning Yard shall permit NAVSEA to review the supporting data normally retained by the Planning Yard in the original format that the Planning Yard used to make its design decisions, in order to aid the NAVSEA representative in the review of the Planning Yard's design.

4.1.2.2 Drawing Control Procedures. The Planning Yard's drawing control procedures shall cover:

- a. Assignment of responsibility for detail examination, review, and signature authority of drawings for the Planning Yard.
- b. Required qualifications of personnel performing detail examination, review, and signature authority of drawings for the Planning Yard.
- c. Procedural flow of drawings and other associated documentation.
- d. Check lists to be used in the detail examination and review of drawings. The check lists shall specify each examination to be performed to verify conformance of drawings to the applicable requirements of this specification and the contract or tasking documentation.
- e. Method of safeguarding classified information.
- f. Methods providing for the prevention and ready detection of discrepancies and for timely and positive corrective action.
- g. Method of safe storage of Selected Record Drawings, reference drawings, and other ship design documentation.
- h. Methods providing for controlled issue of drawing copies, both reproducible and non-reproducible.

#### 4.2 Nonconforming Data Items.

4.2.1 Format Defects. There may be random sampling by NAVSEA for quality of drawing format of all Planning Yard drawings as they are issued. When numerous format defects are discovered on Planning Yard drawings, the Planning Yard shall correct its process to prevent recurrence of defects found, but need not correct or redraw drawings or portions of drawings already issued unless they are illegible, do not meet the reproducibility requirements, or affect usability.

4.2.2 Engineering/Technical Defects. Selected drawings subordinate to each system diagram or system drawing may be reviewed by NAVSEA to determine whether they describe a system which will meet the specified requirements.

4.2.2.1 Significant Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains significant engineering/technical defects, such defects will be identified to the Planning Yard, which shall review all other drawings subordinate to the next higher level of drawing (for example, system diagram or system drawing), for similar defects and then correct promptly all defects found.

4.2.2.2 Minor Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains minor engineering/technical defects, such defects will be identified to the Planning Yard, which shall correct them.

4.2.2.3 Numerous Engineering/Technical Defects. Numerous engineering/technical defects, whether significant or minor, will be considered as an indication of poor Planning Yard quality control, and the Planning Yard shall correct its process. The Planning Yard shall advise NAVSEA of the results of its process review, including drawings examined, the number of like deficiencies found, and the steps taken to prevent recurrence.

4.2.3 Microfilm. Those microfilm system elements described herein which, after inspection by NAVSEA or its designated representative, are found not to be in compliance with specification requirements shall be replaced at no additional cost to the Government.

4.3 Inspection of Preparations for Delivery. Packaging and packing of documents to be delivered under this specification shall be inspected to insure that the preparation for-delivery requirements are met.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging. All drawings and lists delivered under this specification shall be packaged for mailing or shipping in accordance with Level A requirements of MIL-PRF-5480, except that blue-line prints of size "D", "F" or "H" drawings forwarded to NAVSEA, its designated representative, or an installing activity shall be folded, accordion fashion, to 8 1/2" by 11" height, with the title block completely visible.

5.1.1 Classified Material. Classified material shall be packaged in accordance with SECNAVINST 5510.36.

5.1.2 Packing. All drawings and lists delivered under this specification shall be packed in accordance with level C of MIL-PRF-5480.

5.2 Marking of Shipments. Identification and address markings for interior packages and shipping containers shall be in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended Use. Ship Selected Record drawings are used to provide a record of important features, systems and arrangements applicable to an individual ship, which are maintained current throughout the life of the ship.

6.2 Ordering Data.

6.2.1 Procurement Requirements. Procurement documents should specify:

- a. Title, number and date of this specification.
- b. When Government design activity drawing numbers are to be assigned, identify the assigning activity, and if Government drawing formats are to be supplied, identify the source.
- c. The applicable Data Item Description (DID).
- d. That the metric system shall not be used.
- e. Whether company drafting standards are accepted.
- f. Kinds of associated lists required.
- g. Drawing assembly level at which associated lists will be prepared.
- h. Identify whether the mono-detail system will be used.

- i. Selection of types of engineering drawings if different from MIL-DTL-31000.
- j. Quantity and type of reproduction.
- k. Whether microfilm is required, and if so, what type is required.
- l. Whether delivery of original drawings and undimensional drawings are required.
- m. What special packaging of originals, when ordered, is required.
- n. Delivery schedule, and to whom the engineering drawings and supporting documents are to be delivered.

6.2.2 Data Requirements. When this specification is used in a contract procurement, the provisions of 52.277-7015 (Rights in Technical Data-Specific Acquisition) of the Department of Defense (DOD) supplement to the Federal Acquisition Regulation (FAR) shall be invoked and the data requirements identified below will be developed as specified by an approved Data Item Description (DID) (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL) (DD Form 1423) incorporated into the contract. Deliverable data required by this specification is cited in the following paragraphs:

<b>Paragraph</b>	<b>Data Requirement</b>	<b>Applicable DID</b>
3.3	Selected Record Drawings	DI-E-7031

(Copies of Data Item Descriptions required by the contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)



APPENDIX A TO NSTS 9090  
SELECTED RECORD DRAWINGS FOR SHIP CLASSES

**Table I**  
**Section A**  
AOE-AS

**Section B**  
CG-DDG

**Section C**  
LCC-MHC

**Table II**  
CV, CVN

**Table III**  
SS, SSN, SSBN

**Table IV**  
Other Ships



**TABLE I, SECTION A  
SELECTED RECORD DRAWINGS**

(Note: For MSC operated ships, refer to COMSCINST 9000.1)

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>AOE 1</b>	<b>AOE 6(TBD)</b>	<b>ARS 50</b>	<b>AS /39</b>
Docking Drawings		X		X	X
Booklet of General Drawings		X		X	X
Schedules of Watertight Integrity Tests & Inspections		X		X	X
Tank Capacity and Vertical Center of Gravity Curves		X		X	X
Booklet of Tank Sounding Tables		X		X	X
Running, Signal and Anchor Lights (Location drawing) (To be included in Booklet of General Drawings.)		X		X	X
Main Steam Systems Diagrams		X			X
Auxiliary Steam System Diagram		X			X
High Pressure Steam Drain Systems Diagram		X			X
Condensate System Diagrams		X			X
Feed System Diagrams and Reserve and Makeup Feed		X			X
Main Sea Water Cooling System Diagrams		X			X
Auxiliary Sea Water Cooling System Diagrams		X			X
Steam Operated Distilling System		X			X

**TABLE I-A-1**

**TABLE I, SECTION A  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>AOE 1</b>	<b>AOE 6</b>	<b>ARS 50</b>	<b>AS 39</b>
Steering Gear Hydraulic Systems Diagram		X			X
High Pressure Air System Diagrams (Ind MP)		X		X	X
60HZ A.C. Power Distrn System Diagrams		X		X	X
400 HZ A.C. Power Distrn System Diagrams		X		X	X
Low Pressure Steam Drain System Diagrams		X			X
Fresh Water Drain Collecting System Diagrams		X			X
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)		X			X
Ships Service Auxiliary Cooling Water Diagrams		X			X
Ships Service Power Sources Diagram (Including equipments such as SSTGs, SSMGs, CTG, Diesel Generators, Batteries that are not included in Power Distribution Systems above)		X			X
Main Lube Oil System Diagrams		X		X	X

**TABLE I-A-2**

**TABLE 1. SECTION A  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>AOE 1</b>	<b>AOE 6</b>	<b>ARS 50</b>	<b>AS 39</b>
Lube Oil Fill, Transfer and Purification System Diagrams		X		X	X
Ships Service Circulating Water System Diagrams (Those portions associated with the Propulsion Plant)		X			X
Steam Plant Salinity Indicator System Diagrams		X			X
Service and Control Air Systems Diagrams (Those portions associated with the propulsion plant)		X			X
Asbestos Removal Drawings		X			X
HVAC Diagrammatic and System Control Drawings		X			X
Ordnance Handling Drawings		X			
Fire Fighting Systems Diagrams		X			X
Electronic Cooling Water Systems Diagrams		X			X
Helo Landing and Signal Lighting System Diagrams		X			X
H.P. Auxiliary Steam System Diagrams		X			X
Auxiliary Exhaust Steam System Diagrams		X			X

**TABLE I-A-3**

**TABLE I, SECTION A  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>AOE 1</b>	<b>AOE 6</b>	<b>ARS 50</b>	<b>AS 39</b>
Gland Sealing Steam System Diagrams		X			X
Auxiliary Gland Leak-Off System Diagrams		X			X
Air Vent Piping System Drawings		X			X
LP Air System Diagrams		X			X
Flooding Effect and Liquid Loading		X			X
Sub-Division First Platform and Below		X			X
Sub-Division Main Deck and Above		X			X
JP-5 Filling, Transfer, and Overflow Systems		X			X
Casualty Power Supply Systems		X			X
Casualty Communications Systems		X			X
Vital DMG CTL Elect Eqpt and Power Supply Chart		X			X
Communications Directory		X			X
Potable (Propulsion Plant) Support Water Fill, Transfer Service and Purification System		X			X
Chilled Water Systems Drawings		X			X

**TABLE I-A-4**

**TABLE I, SECTION A  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>AOE 1</b>	<b>AOE 6</b>	<b>ARS 50</b>	<b>AS 39</b>
Main and Secondary Drainage System Drawings		X			X
Oily Water Transfer System Drawings		X			X
CIC Arrangement of Eqpt		X			X
Boiler Blow System Diagrams		X			X
Pilot House and Bridge Wing Arrangement of Eqpt		X		X	X
Computer Room Arrangement of Eqpt					X
Communications Central Arrangement of Eqpt		X		X	X
Topside Arrangement Drawings		X		X	X
Compartment and Access Drawings		X			X
Topside Ant Sys Arrangement		X			X
Deep Submergence System (DSS) Drawings (as specified in Certification Milestones)				X	
Fuel Oil Transfer Systems Diagrams		X			X
Fuel Oil Stripping System Diagrams		X			X
Fuel Oil Service System		X			X
Electrical Load Analysis		X			X

**TABLE I-A-5**

**TABLE I, SECTION A  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>AOE 1</b>	<b>AOE 6</b>	<b>ARS 50</b>	<b>AS 39</b>
Pumping, Drainage and Ballasting System Drawings		X			X
H.P. Air Start System Drawings (Gas Turbine and Diesel Propulsion Only)					
Dirty Oil Drain System Drawings (Gas Turbine and Diesel Propulsion Only)					
Air Inlet System Drawings (Gas Turbine and Diesel Propulsion Only)					
Air Inlet Separator System Drawings (Gas Turbine and Diesel Propulsion Only)					
Muffler System Drawings (Gas Turbine and Diesel Propulsion Only)					
ACC/FWC Systems Diagrams		X			X
Underway Replenishment Drawings (AO, AOR, AOE, AFS,AE)		X			

**TABLE I A-6**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Docking Drawings		X	X	X
Booklet of General Drawings		X	X	X
Schedules of Watertight Integrity Tests & Inspections (except service craft)		X	X	X
Tank Capacity and Vertical Center of Gravity Curves		X	X	X
Booklet of Tank Sounding Tables		X	X	X
Flexible Connections List		X	X	X
Running, Signal and Anchor Lights (Location drawing) (To be included in Booklet of General Drawings)		X	X	
Main Steam Systems Diagrams				
Auxiliary Steam System Diagrams				
High Pressure Steam Drain Systems Diagrams				
Condensate System Diagrams				
Feed System Diagrams and Reserve and Makeup Feed				
Main Sea Water Cooling System Diagrams		X	X	
Auxiliary Sea Water Cooling System Diagrams	X	X	X	

**TABLE I-B-1**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Steam Operated Distilling System		X	X	
Steering Gear Hydraulic Systems Diagrams		X	X	X
High Pressure Air System Diagrams (Incl MP)		X	X	X
60 HZ A.C. Power Distrn System Diagrams		X	X	X
400 HZ A.C. Power Distrn System Diagrams		X	X	X
Low Pressure Steam Drain System Diagrams				
Fresh Water Drain Collecting System Diagrams				
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)				
Ships Service Auxiliary Cooling Water Diagrams				
Ships Service Power Sources Diagram (Including equipments such as SSTGs, SSMGs, CTG, Diesel Generators, Batteries that are not included in Power Distribution Systems above)		X	X	X

**TABLE I-B-2**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Electric Plant Temperature Monitoring System Diagrams				
Electric Plant Control System Diagrams (Including Electric Plant Control Panel and Benchboard)		X	X	X
Main Lube Oil System Diagrams		X	X	X
Lube Oil Fill, Transfer And Purification System Diagrams		X	X	X
Propulsion Plant Temperature Monitoring System Diagrams				
Propulsion Speed Indicator System Diagrams				
Steam Plant Alarm System Diagrams				
Steam Plant Salinity Indicator System Diagrams				
Air Conditioning System and Ventilation Diagrams (Those portions associated with propulsion spaces less reactor compartment)				
Steam Plant Pneumatic Control Air System Diagrams				

**I-B-3**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Service and Control Air Systems Diagrams (Those portions associated with the propulsion plant)				
Displacement And Other Curves				
Tank Capacity Curves, Curves of Center of Gravity, and Curves of Moments of Inertia				
Asbestos Removal Drawings		X	X	
HVAC Diagrammatic and System Control Drawings		X	X	X
Ordnance Handling Drawings		X	X	
Fire Fighting Systems Diagrams		X	X	
Electronic Cooling Water Systems Diagrams		X	X	X
Helo Landing and Signal Lighting System Diagrams		X	X	X
H.P. Auxiliary Steam System Diagrams				
Dirty Drain System Diagrams				
Auxiliary Exhaust Steam System Diagrams				
Gland Sealing Steam System Diagrams				

**TABLE I-B-4**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Auxiliary Gland Leak-Off System Diagrams				
Air Vent Piping System Drawings				
LP Air System Diagrams			X	X
Flooding Effect and Liquid Loading		X	X	
Sub-Division First Platform and Below		X	X	
Sub-Division Main Deck and Above		X	X	
JP-5 Filling, Transfer, and Overflow Systems		X	X	X
Casualty Power Supply Systems		X		
Casualty Communications Systems		X	X	
Vital DMG CTL Elect Eqpt and Power Supply Chart		X	X	
Communications Directory			X	
Potable (Propulsion Plant) Support Water Fill, Transfer, Service and Purification System (Mchry Space)		X	X	
Chilled Water Systems Drawings		X	X	X
Main and Secondary Drainage System Drawings			X	X

**TABLE I-B-5**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Oily Water Transfer System Drawings		X	X	
Auxiliary Boiler Support System Drawings		X	X	
Reboiler Systems Diagrams				
CTC Arrangement of Equipment		X	X	X
Boiler Blow Systems Diagram			X	
Pilot House and Bridge Wing Arrangement of Eqpt		X	X	X
Computer Room Arrangement of Eqpt		X	X	
Communications Central Arrangement of Eqpt		X	X	X
Topside Arrangement Drawings		X	X	
Compartment and Access Drawings		X	X	X
Topside Ant Sys Arrangement		X	X	X
Ships Service Circulating Water System Diagrams (Those portions associated with the Propulsion Plant)				
Deep Submergence System (DSS) Drawings (as specified in Certification Milestones)				
Lead Ballast Stowage Arrangement Drawings		X	X	

**TABLE I-B-6**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
Propulsion Control System Diagrams		X	X	
Service Air System Diagrams (Those Portions Associated with the Propulsion Plant)		X	X	
150 #Auxiliary Steam System Diagrams		X	X	
Fuel Oil Transfer Systems Diagrams		X	X	
Fuel Oil Stripping System Diagrams		X	X	
Fuel Oil Service System		X	X	
Prairie/Masker Compressed Air System Drawings		X	X	
Waste Heat Hot Water Circulating System Drawings		X	X	
Electrical Load Analysis		X	X	X
Equipment Removal Route and Instructions Drawings		X	X	X
Pumping, Drainage and Ballasting System Drawings		X	X	
Auxiliary Thrust Bearing Assembly and Detail Drawings		X	X	
Bleed Air System Drawings (Gas Turbine Propulsion Only)		X	X	

**TABLE I-B-7**

**TABLE I, SECTION B  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CG 47</b>	<b>DD 963</b>	<b>DDG 51</b>
H.P. Air Start System Drawings (Gas Turbine and Diesel Propulsion Only)		X	X	
Dirty Oil Drain System Drawing (Gas Turbine and Diesel Propulsion Only)		X	X	
Air Inlet System Drawings (Gas Turbine and Diesel Propulsion Only)		X	X	X
Air Inlet Separator System Drawings (Gas Turbine and Diesel Propulsion Only)		X	X	X
Muffler System Drawings (Gas Turbine and Diesel Propulsion Only)				
Seawater service systems (firemain, sprinkling, washdown SSGTG cooling) systems diagrams				X
Machinery Centralized Control System major function drawings				X
Door, hatch and scuttle list				X
SSGTG cooling system diagrams				X
Gas turbine mounts and measurements list				X
Potable water (propulsion plant support) and vital space protection support, fill, transfer, service and purification systems diagrams				X

	X
PRAIRIE/MASKER, bleed, anti-icing and starting air systems diagrams	
Fill connection drawing	X
Sonar dome pressurization system control panel drawings	X
Remote monitoring and control panel mimic and indicator layout drawing for fuel transfer	X
Hose list drawing	X
Centralized seawater cooling systems drawings	X
Oily waste drain collecting system diagram	X
Oily waste transfer system drawing	X
Chart Room – arrangement of equipment	X
Radio communication system block diagram	X
CSER #1 and Sonar Control Room – arrangement of equipment	X
CSER # 2 and TOMAHAWK Equipment Room – arrangement of equipment	X
CSER #3 – arrangement of equipment	X
Sea connections drawings	X
Ships fuel fill, transfer, service and compensating systems diagram	X
Panama canal drawing	X
Ships Signal Exploitation Space (SSES) – arrangement of equipment	X

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Arrangement of special coating materials	X
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**TABLE I-B-8**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD 1(TBD)</b>	<b>LHD 8(TBD)</b>	<b>LPD</b>	<b>LPD 17(TBD)</b>	<b>LSD 36</b>	<b>LSD 41/49</b>	<b>MCM</b>	<b>MHC (TBD)</b>	<b>MSO</b>
Docking Drawings	X	X			X		X	X	X		X
Booklet of General Drawings	X	X			X		X	X	X		X
Schedules of Watertight Integrity Tests & inspections	X	X			X		X	X	X		X
Tank Capacity and Vertical Center of Gravity Curves	X	X			X		X	X	X		X
Booklet of Tank Sounding Tables	X	X			X		X	X	X		X
Running, Signal and Anchor Lights (Location Drawing) (To be included in Booklet of General Drawings.)	X	X			X		X	X	X		X
Main Steam Systems Diagrams	X	X			X		X				
Auxiliary Steam System Diagrams	X	X			X		X	X			X
High Pressure Steam Drain Systems Diagrams	X	X			X		X				
Condensate System Diagrams	X	X			X		X				
Feed System Diagrams and Reserve and Makeup Feed	X	X			X		X				
Main Sea Water Cooling System Diagrams	X	X			X		X	X	X		X
Auxiliary Sea Water Cooling System Diagrams	X	X			X		X	X	X		X
Steam Operated Distilling System	X	X			X		X	X			X

**TABLE I-C-1**

**LEGEND: X = Required by FMP Manual**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD 1</b>	<b>LHD 8(TBD)</b>	<b>LPD 17</b>	<b>LPD 17</b>	<b>LSD 36</b>	<b>LSD 41/49</b>	<b>MCM</b>	<b>MHC</b>	<b>MSO</b>
Steering Gear Hydraulic Systems Diagrams	X	X				X	X	X			X
High Pressure Air System Diagrams (Inci MP)	X	X				X	X	X			X
60 HZ A.C. Power Distrn System Diagrams	X	X				X	X	X	X		X
400 HZ A.C. Power Distrn System Diagrams	X	X				X	X	X	X		X
Low Pressure Steam Drain System Diagrams	X	X				X	X				
Fresh Water Drain Collecting System Diagrams	X	X				X	X				
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)	X	X				X	X				
Ships Service Power Sources Diagram (Including equipments such as SSTGs, SSMGs, CTG, Diesel Generators, Batteries that are not included in Power Distribution Systems above)	X	X				X	X	X	X		X
Main Lube Oil System Diagrams	X	X				X	X	X			X
Lube Oil Fill, Transfer And Purification System Diagrams	X	X				X	X	X			X

**TABLE I-C-2**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD 1</b>	<b>LHD 8(TBD)</b>	<b>LPD 17</b>	<b>LPD 17</b>	<b>LSD 36</b>	<b>LSD 41/49</b>	<b>MCM</b>	<b>MHC</b>	<b>MSO</b>
Ships Service Circulating Water System Diagrams (Those Portions associated with the Propulsion Plant)	X	X				X	X	X			X
Steam Plant Salinity Indicator System Diagrams	X	X				X	X				
Service and Control Air Systems Diagrams (Those portions associated with the propulsion plant)	X	X				X	X	X			
Asbestos Removal Drawings	X	X				X	X	X			X
HVAC Diagrammatic and System Control Drawings	X	X				X	X	X	X		X
Ordnance Handling Drawings		X				X	X	X			
Fire Fighting Systems Diagrams	X	X				X	X	X	X		X
Electronic Cooling Water Systems Diagrams	X	X				X	X	X			
Helo Landing and Signal Lighting System Diagrams	X	X				X	X	X			
H.P. Auxiliary Steam System Diagrams	X	X				X	X	X			X
Dirty Drain System Diagrams											
Auxiliary Exhaust Steam System Diagrams	X	X				X	X	X			X
Gland Sealing Steam System Diagrams	X	X				X	X				

**TABLE I-C-3**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD</b>	<b>LHD 8(TBD)</b>	<b>LPD 17</b>	<b>LPD 17</b>	<b>LSD 36</b>	<b>LSD 41/49</b>	<b>MCM</b>	<b>MHC</b>	<b>MSO</b>
Automated Assault System Drawings (All LHA Ships Only)		X									
Automated Propulsion System Drawings (All LHA Ships Only)		X									
Auxiliary Gland Leak-Off System Diagrams	X	X			X		X				
Air Vent Piping System Drawings	X	X			X		X	X			
LP Air System Diagrams	X	X			X		X	X			X
Flooding Effect and Liquid Loading	X	X			X		X	X			X
Sub-Division First Platform and Below	X	X			X		X	X			X
Sub-Division Main Deck and Above	X	X			X		X	X			X
JP-5 Filling, Transfer, and Overflow Systems	X	X			X		X	X			
Casualty Power Supply Systems	X	X			X		X	X			X
Casualty Communications Systems	X	X			X		X	X			
Vital DMG CTL Elect Eqpt and Power Supply Chart	X	X			X		X	X			
Communications Directory	X	X			X		X	X			

**TABLE I-C-4**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD</b>	<b>LHD 8(TBD)</b>	<b>LPD</b>	<b>LPD 17</b>	<b>LSD 36</b>	<b>LSD 41/49</b>	<b>MCM</b>	<b>MHC</b>	<b>MSO</b>
Potable (Propulsion Plant) Support Water Fill, Transfer, Service and Purification System (Mchry Space)	X	X			X		X	X	X		X
Chilled Water Systems Drawings	X	X			X		X	X			
Main and Secondary Drainage System Drawings	X	X			X		X	X			
Oily Water Transfer System Drawings	X	X			X		X	X			X
CIC Arrangement of Eqpt	X	X			X		X	X	X		
Boiler Blow System Diagram	X	X			X		X	X			X
Pilot House and Bridge Wing Arrangement of Eqpt	X	X			X		X	X	X		X
Computer Room Arrangement of Eqpt	X	X									
Communications Central Arrangement of Eqpt	X	X			X		X	X	X		X
Topside Arrangement Drawings	X	X			X		X	X	X		X
Compartment and Access Drawings	X	X			X		X	X	X		X
Topside Ant Sys Arrangement	X	X			X		X	X	X		X
Propulsion Control System Diagrams									X		
150 # Auxiliary Steam System Diagrams											

**TABLE I-C-5**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD</b>	<b>LHD 8(TBD)</b>	<b>LPD 17</b>	<b>LSD 36</b>	<b>LSD 49</b>	<b>MCM</b>	<b>MHC</b>	<b>MSO</b>
Fuel Oil Transfer Systems Diagrams	X	X			X	X	X			X
Fuel Oil Stripping System Diagrams	X	X			X	X	X			X
Fuel Oil Service System	X	X			X	X	X			X
Prairie/Masker Compressed Air System Drawings										
Electrical Load Analysis	X	X			X	X	X	X		X
Bleed Air System Drawings (Gas Turbine Propulsion Only)										
H.P. Air Start System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Dirty Oil Drain System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Air Inlet System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Air Inlet Separator System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Muffler System Drawings (Gas Turbine and Diesel Propulsion Only)							X			

**TABLE I-C-6**

**TABLE I, SECTION C  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: LCC 19</b>	<b>LHA</b>	<b>LHD</b>	<b>LHD 8(TBD)</b>	<b>LPD</b>	<b>LPD 17</b>	<b>LSD</b>	<b>LSD 36</b>	<b>LSD 41/49</b>	<b>MCM</b>	<b>MHC</b>	<b>MSO</b>
Sonar, MNV and Electronics Room Arrangement of Equipment											X	
Degaussing Coils Location Drawings											X	
Mine Countermeasures Handling											X	
ACC/FWC System Diagrams	X	X				X		X				

**TABLE I-C-7**



**TABLE II  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CV ALL</b>	<b>CVN ALL</b>
Docking Drawings		X	X
Booklet of General Drawings		X	X
Tank Capacity and Vertical Center of Gravity Curves		X	X
Booklet of Tank Sounding Tables		X	X
Steering Gear Hydraulic System Diagrams & Related I.C. Systems Diagrams		X	X
High Pressure Air System Diagrams (Including MP)		X	X
60HZ A.C. Power Distribution System Diagrams (From Load Center Boards to Vital Service Panels)		X	X
400HZ A.C. Power Distribution System Diagrams & Aircraft Servicing Diagram		X	X
Ships Service Power Sources Diagram (Including equipment such as SSTGs, SSMGs, CTGs, Diesel Generators, Batteries that are not included in Power Distribution Systems above. Generators to Main Boards to Load CTR Boards)		X	X
Electric Plant Control System Diagrams (Including Electric Plant Control Panel and Benchboard)		X	X
Main Lube Oil System Diagrams		X	X
Control Air System Diagrams (Steam Plant)		X	X
Asbestos Removal Drawings		X	X

**TABLE II-1**

**TABLE II  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>CV ALL</b>	<b>CVN ALL</b>
HVAC Diagrammatic & System Control Drawings		X	X
JP-5 Service Diagram (From Service Pump Disch to Aircraft Fuel Stations)		X	X
Firemain System Diagram		X	X
Firefighting System Diagrams (Fixed Systems including AFFF, Flight Deck Conflagration, Hangar Deck Sprinkling, Mchry Space Halon Systems and C02 Hose Reel w/50# Bottles)		X	X
Visual Landing Aids & Signal Lighting System Diagrams		X	X
Auxiliary Steam System Diagrams (CV; Propulsion Plant Support, no hotel services. CVN: Includes reduced pressure steam and auxiliary exhaust, escape & extraction steam)		X	X
LP Air System Diagrams		X	X
Fuel Oil Service System Diagram		X	
CIC Arrangement of Equipment		X	X
CATCC (ICA) Arrangement of Equipment		X	X
Pilot House & Bridge Wing Arrangement of Equipment		X	X
Communication Central Arrangement of Equipment		X	X
Fly Control Arrangement of Equipment		X	X
Tactical Flag Command Center Arrangement of Equipment (TFCC)		X	X
Aircraft and Weapons Elevator System Hydr & Elect Control Diagrams		X	X

**TABLE II-2**

**TABLE II  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CV CLASS: ALL</b>	<b>CVN ALL</b>
Catapult Steam System Diagram	X	X
Catapult Blowdown Steam Drain/Steam Blowdown System Diagram	X	X
Catapult Fill Valve Control System Diagram	X	X
Lifeboat Arrg't & Stowage Drawing	X	X
Ordnance Handling Diagrams (Including Stowage in space and route of weapons in/out)	X	X
Most Recent Catapult Slot Expansion Data	X	X
Low Pressure Steam Drain System Diagrams		X X
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Switch Boards)	X	X
Electric Plant Temperature Monitoring System Diagrams	X	X
Shaft Lube Oil System Diagrams	X	X
Propulsion Plant Temperature Monitoring System Diagrams	X	X
Propulsion Speed Indicator System Diagrams	X	X
Steam Plant Alarm System Diagrams	X	X

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Steam Plant Salinity Indicator System Diagrams	X	X
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**TABLE II-3**

**TABLE II  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CV CLASS: ALL</b>	<b>CVN ALL</b>
Topside Antenna Arrangement Diagram	X	X
Electric Load Analysis	X	X
Displacement & Other Curves		X

**TABLE II-4**



**TABLE III  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>SSBN 726</b>	<b>SSN /637</b>	<b>SSN 688/21/774</b>
Docking Drawings		X	X	X
Booklet of General Drawings		X	X	X
Compartment and Tank-Testing Requirements		X	X	X
Tread Ballast Stowage Arrangement Drawings		X	X	X
Salvage System Drawings and Diagrams		X	X	X
Escape and Rescue Arrangement (Note: Where this information is duplicated by a corresponding diagram in the General Information Book (GIB) or Ship Information Book (SIB) this drawing is not required)		X	X	X
SUBSAFE Mapping Drawings		X	X	X
Flexible Connections List		X	X	X
Consolidated Hull Zinc List		X	X	X
Running, Signal and Anchor Lights (Location drawing) (To be included in Booklet of General Drawings.)		X	X	X
Main Steam Systems Diagrams		X	X	X
Auxiliary Steam System Diagrams		X	X	X
High Pressure Steam Drain Systems Diagrams		X	X	X
Condensate System Diagrams		X	X	X
Feed System Diagrams		X	X	X
Main Sea Water Cooling System Diagrams		X	X	X

**TABLE III-1**

**LEGEND: X = Required by FMP Manual**  
\* = SUBSAFE

**TABLE III  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>SSBN 726</b>	<b>SSN 637</b>	<b>SSN 688/21/774</b>
Auxiliary Sea Water Cooling System Diagrams		X	X	X
Steam Operated Distilling System Diagrams		X	X	X
Test Data On Items Subject To Sea Pressure		X	X	X
Hydraulic System Diagrams (Main Vital and External)		X	X	X
Hydraulic System Diagrams Missile (SSBNs Only)		X		
Steering and Diving Gear Hydraulic Systems Diagrams		X	X	X
Main Oxygen System Diagrams		X	X	X
Trim and Drain Systems Diagrams		X	X	X
High Pressure. Air System Diagrams		X	X	X
High Pressure Ballast Tank Blow System Diagrams		X	X	X
60 HZ A.C. Power Distrn System Diagrams		X	X	X
400 HZ A.C. Power Distrn Systems Diagrams		X	X	X
DC and Propulsion Power Distrn System Diagrams		X	X	X
Low Pressure Steam Drain System Diagrams		X	X	X
Fresh Water Drain Collecting System Diagrams		X	X	X
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)		X	X	X

**TABLE III-2**

**LEGEND: X = Required by FMP Manual**

**TABLE III  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>SSBN 726</b>	<b>SSN 637</b>	<b>SSN 688/21/774</b>
Ships Service Circulating Water System Diagrams (Those portions associated with the Propulsion Plant)		X	X	X
Engine Room Fresh Water Coolant System (Auxiliary Fresh Water) Diagrams		X	X	X
Ships Service Power Sources Diagrams (Including equipments such as SSTGs, SSMG, CTGs, Diesel Generators, Batteries that are not included in Power Distribution Systems above)		X	X	X
Electric Plant Temperature Monitoring System Diagrams		X	X	X
Electric Plant Control System Diagrams (Including Electric Plant Control Panel and Benchboard)		X	X	X
Main Lube Oil System Diagrams		X	X	X
SSTG Lube Oil System Diagrams		X	X	X
Shaft Lube Oil System Diagram's		X	X	X
Clutch Control Oil System Diagrams		X	X	X
Lube Oil Fill, Transfer and Purification System Diagrams		X	X	X
Propulsion Plant Temperature Monitoring System Diagrams		X	X	X
Propulsion Speed Indicator System Diagrams		X	X	X

**TABLE III-3**

**TABLE III  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>SSBN 726</b>	<b>SSN 637</b>	<b>SSN 688/21/774</b>
Steam Plant Alarm System Diagrams		X	X	X
Steam Plant Salinity Indicator System Diagrams		X	X	X
Air Conditioning System and Ventilation Diagrams (Those portions associated with reactor compartment and other propulsion spaces)		X	X	X
Service Air System Diagrams (Those portions associated with the Propulsion Plant)		X	X	X
Steam Plant Pneumatic Control Air System Diagrams		X	X	X
Depth Detecting System Diagrams		X	X	X
Noise Review Road Map for Noise Critical Systems		X	X	X
Control Air Systems Diagrams (Those portions associated with the propulsion plant)		X	X	X
Moment Diagram and Ship's Polygon		X	X	X
Displacement and Other Curves		X	X	X
Tank Capacity Curves, Curves of Center of Gravity and Curves of Moments of Inertia		X	X	X
Asbestos Removal Drawings(except 21 & 774 cl)		X	X	X
Propulsion Lube Oil Diagrams			X	
Gland Seal and Exhaust Diagrams		X		X
Composite Hull Penetration Drawings		X		X

**TABLE III-4**

**LEGEND: X = Required by FMP Manual**

**TABLE III  
SELECTED RECORD DRAWINGS**

<b>DRAWING TITLE</b>	<b>SHIP: CLASS:</b>	<b>SSBN 726</b>	<b>SSN 637</b>	<b>SSN 688/21/774</b>
Missile Tube Capacity and Other Curves		X		X
List of Resilient Mounts		X		X
List of Grease Fittings		X		
List of Throated Plugs in Sea Connected Systems		X		X
Defensive Weapon Handling and Launching Systems		X		
Strategic Weapon Fluid System Diagrams		X		
Strategic Weapon Electrical System Diagrams		X		
Strategic Weapon Electrical System Wiring Tables		X		
Low Pressure Ballast Tank Blow Diagrams		X		X
Diesel Generator Sea Water Cooling Diagrams		X		X
Potable Water Diagrams		X		
Electronics and Auxiliary Fresh Water Cooling Diagrams		X		
Refrigeration Diagrams		X		
Chilled Water Diagrams		X		
Fuel Oil Diagrams		X		
Compensating Systems Diagrams		X		
Plumbing Diagrams		X		
Vertical Launch System Flood and Drain System Diagram				X
Towed Sonar Array Stowage Tube Arrangement				X

**TABLE III-5**



**TABLE IV**  
**SELECTED RECORD DRAWINGS FOR**  
**ALL SHIPS NOT SPECIFIED IN TABLES I THRU III**

Docking Drawings	X
Schedules of Watertight Integrity Tests and Inspections (except service craft)	X
Tank Capacity and Vertical Center of Gravity Curves	X
Booklet of Tank Sounding Tables	X
Booklet of General Drawings	X
Asbestos Removal Drawings	X
Underway Replenishment Drawings (UNREP)*	X



**APPENDIX B**  
**PLANNING YARD ASSIGNMENT**  
**MATRIX**

**APPENDIX B  
PLANNING YARD ASSIGNMENT MATRIX**

<b>SHIP TYPE</b>	<b>SHIP CLASS</b>	<b>PLANNING YARD</b>	<b>SPM</b>
AFDB	0009	PUGET SOUND BOSTON DETACH	PMS325
AFDL	ALL	NORFOLK NAVAL SHIPYARD	PMS325
AGF	0003	PUGET SOUND BOSTON DETACH	PMS470
AGF	0011	PUGET SOUND BOSTON DETACH	PMS470
AGSS	0555	PORTSMOUTH NAVAL SHIPYARD	PMS395
AOE	ALL	PUGET SOUND NAVAL SHIPYARD	PMS325
APL	ALL	PUGET SOUND BOSTON DETACH	PMS325
ARDM	ALL	NORFOLK NAVAL SHIPYARD	PMS325
ARS	0050	PUGET SOUND NAVAL SHIPYARD	PMS325
AS	0039	NORFOLK NAVAL SHIPYARD	PMS325
CG	0047	NORTHROP GRUMAN SHIP SYSTEMS	PMS400
CV	0063	PUGET SOUND NAVAL SHIPYARD	PMS312
CV	0067	NORFOLK NAVAL SHIPYARD	PMS312
CVN	0065	PUGET SOUND NAVAL SHIPYARD/ NEWPORT NEWS SHIPBUILDING(R)	PMS312
CVN	0068	NORFOLK NAVAL SHIPYARD/ NEWPORT NEWS SHIPBUILDING(R)	PMS312
DD	0963	NORTHROP GRUMAN SHIP SYSTEMS	PMS400
DDG	0051	BATH IRON WORKS	PMS400
DSRV	ALL	PORTSMOUTH NAVAL SHIPYARD	PMS395
DSV	ALL	PORTSMOUTH NAVAL SHIPYARD	PMS325
FFG	0007	BATH IRON WORKS	PMS400
IX	ALL	PUGET SOUND BOSTON DETACH	PMS325
LCAC	ALL	PUGET SOUND BOSTON DETACH	PMS470
LCC	0019	PUGET SOUND BOSTON DETACH	PMS470
LHA	0001	NORFOLK NAVAL SHIPYARD	PMS470
LHD	0001	NORFOLK NAVAL SHIPYARD	PMS470

SHIP TYPE	SHIP CLASS	PLANNING YARD	SPM
LPD	ALL	PUGET SOUND BOSTON DETACH	PMS470
LSD	ALL	PUGET SOUND BOSTON DETACH	PMS470
LST	1179	PUGET SOUND BOSTON DETACH	PMS470
MCM	0001	PUGET SOUND NAVAL SHIPYARD	PMS490
MHC	0051	PUGET SOUND NAVAL SHIPYARD	PMS490
NR	0001	ELECTRIC BOAT GROTON	PMS395
PC	ALL	PUGET SOUND BOSTON DETACH	PMS325
SSBN	0726	ELECTRIC BOAT GROTON/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0021	NEWPORT NEWS SHIPBUILDING/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0637	PUGET SOUND NAVAL SHIPYARD/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0642	PORTSMOUTH NAVAL SHIPYARD/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0671	ELECTRIC BOAT GROTON ELECTRIC/ BOAT GROTON(R)	PMS392
SSN	0688	NEWPORT NEWS SHIPBUILDING/ ELECTRIC BOAT GROTON(R)	PMS392
TAE	0026	MILITARY SEALIFT COMMAND	PMS325
TAFS	ALL	MILITARY SEALIFT COMMAND	PMS325
TAG	0195	MILITARY SEALIFT COMMAND	PMS325
TAGM	0023	MILITARY SEALIFT COMMAND	PMS325
TAGOS	ALL	MILITARY SEALIFT COMMAND	PMS325
TAGS	ALL	MILITARY SEALIFT COMMAND	PMS325
TAH	0019	MILITARY SEALIFT COMMAND	MSC
TAKR	ALL	MILITARY SEALIFT COMMAND	MSC
TAO	0187	MILITARY SEALIFT COMMAND	PMS325
TARC	0007	MILITARY SEALIFT COMMAND	PMS325
TATF	0166	MILITARY SEALIFT COMMAND	PMS325

SHIP TYPE	SHIP CLASS	PLANNING YARD	SPM
YC	ALL	PUGET SOUND BOSTON DETACH	PMS325
YCF	0014	PUGET SOUND BOSTON DETACH	PMS325
YCV	0007	PUGET SOUND BOSTON DETACH	PMS325
YD	ALL	PUGET SOUND BOSTON DETACH	PMS325
YDT	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFD	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFN	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFNB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFND	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFNX	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFP	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFU	ALL	PUGET SOUND BOSTON DETACH	PMS325
YLC	ALL	PUGET SOUND BOSTON DETACH	PMS325
YNG	ALL	PUGET SOUND BOSTON DETACH	PMS325
YOGN	ALL	PUGET SOUND BOSTON DETACH	PMS325
YON	ALL	PUGET SOUND BOSTON DETACH	PMS325
YOS	ALL	PUGET SOUND BOSTON DETACH	PMS325
YP	ALL	PUGET SOUND BOSTON DETACH	PMS325
YPD	ALL	PUGET SOUND BOSTON DETACH	PMS325
YR	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRBM	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRDH	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRDM	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRR	ALL	PUGET SOUND BOSTON DETACH	PMS325
YSD	ALL	PUGET SOUND BOSTON DETACH	PMS325

<b>SHIP TYPE</b>	<b>SHIP CLASS</b>	<b>PLANNING YARD</b>	<b>SPM</b>
YTB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YTL	ALL	PUGET SOUND BOSTON DETACH	PMS325
YTT	ALL	PUGET SOUND BOSTON DETACH	PMS325
YWN	ALL	PUGET SOUND BOSTON DETACH	PMS325



**APPENDIX C**  
**SHIP SELECTED RECORDS**

## TABLE OF CONTENTS

C.1	SCOPE.....	C-1
C.2	APPLICABLE DOCUMENTS.....	C-1
C.3	REQUIREMENTS.....	C-2
C.3.1	SELECTED RECORD DRAWINGS (SRDS).....	C-2
C.3.1.1	General.....	C-2
C.3.1.2	Expanded Drawing Baselines.....	C-2
C.3.2	SELECTED RECORD DATA.....	C-3
C.3.2.1	General.....	C-3
C.3.2.2	Updating Selected Record Data.....	C-3
C.3.2.2.1	Numbering of Selected Record Data.....	C-3
C.3.2.2.2	Updating Existing Selected Record Data.....	C-4
C.3.2.2.3	New Selected Record Data.....	C-7
C.3.2.3	Selected Record Data Characteristics.....	C-7
C.3.2.3.1	Ship Information Books (SIBs), General Information Books (GIBs) and Ship System Manuals (SSMs).....	C-7
C.3.2.3.1.a	Updating SIBs/GIBs/SSMs.....	C-7
C.3.2.3.1.b	SIBs/GIBs for Surface Ships.....	C-7
C.3.2.3.1.c	SIBs for SSN 637 Class Submarines .....	C-8
C.3.2.3.1.d	SSMs for SSN 21 Class, SSN 688 Class and SSN 774 Class Submarines.....	C-8
C.3.2.3.2	Damage Control Books.....	C-8
C.3.2.3.3	Training Aid Booklets (TABs).....	C-9
C.3.2.3.4	Posted Information Plates(PIPs).....	C-9
C.3.2.3.5	Propulsion Operating Guide (POG).....	C-9
C.3.2.3.6	Technical Manuals (TMs).....	C-9
C.3.2.3.7	Index of Technical Publications.....	C-10
C.3.2.3.8	Ship's Drawing Index (SDI) and Modified Ship's Drawing Index (MSDI).....	C-10
C.3.2.3.8.a	SDI Content.....	C-10
C.3.2.3.8.b	Updating the SDI.....	C-10
C.3.2.3.8.c	Arrangement and Status of SDI Data.....	C-11
C.3.2.3.8.d	Superseding or Modifying Existing Drawing in the SDI.....	C-11
C.3.2.3.8.e	Conversion and Update of SDIs to ADP Format.....	C-11
C.3.2.3.8.f	Special SDI Requirements for Nuclear-Powered Ships.....	C-12
C.3.2.3.9	Submarine Safety Certification Boundary (SSCB) Book.....	C-12
C.3.2.3.10	Ship Service Motors and Controllers Manual (SSMC).....	C-12
C.3.2.3.11	Ship Valve Technical Manual (SVTM).....	C-12
C.3.2.3.12	Combat System Technical Operations Manual (CSTOM) .....	C-12
C.3.2.3.13	Propulsion Plant Manuals (for 1200 PSI ships).....	C-12
C.3.2.3.14	Engineering Operational Sequencing System (EOSS).....	C-13
C.3.2.3.15	Combat System Alignment Manual (CSAM).....	C-13

C.3.2.3.16	Combat System Operational Sequencing System (CSOSS).....	C-13
C.3.2.3.17	Aviation Fuel Operational Sequencing System (AFOSS).....	C-13
C.3.2.3.18	Cargo Fuel Operational Sequencing System (CFOSS).....	C-13
C.3.2.3.19	Fuel Oil Operational Sequencing System (FOSS).....	C-13
C.3.2.3.20	Sewage Disposal Operational Sequencing System (SDOSS).....	C-13
C.3.2.3.21	Ballasting Operational Sequencing Systems (BOSS). ....	C-13
C.3.2.3.22	Catapult Operational Sequencing System (CATOSS).....	C-13
C.3.2.3.23	Weapons Elevator Operational Procedures System (WEOPS). ....	C-13
C.3.2.3.24	Auxiliary Operational Sequencing System (AUXOSS).....	C-13
C.3.2.4	Inactive Ship's Selected Record Data Preparation.....	C-14
C.3.2.5	Funding and Expenditures.....	C-14
C.3.3	ALLOWANCE LISTS.....	C-14
C.3.3.1	General.....	C-14
C.3.3.2	COSAL/Configuration Efforts Not Covered Under DSA.....	C-14

## SHIP SELECTED RECORDS

### C.1. SCOPE

Ship Selected Records (SSRs) comprise hull level system technical documentation, specifically designated by the Chief of Naval Operations (CNO), which is maintained current throughout the life of the ship. SSRs consist of three major categories; Selected Record Drawings (SRDs), Selected Record Data, and Allowance Lists. Each of these major SSR categories contains information of significant value to ships operations, maintenance, modernization, training, and logistics requirements.

This appendix is applicable to other than Reactor Plant SSR requirements. The identification and description of specific SSRs in each category as well as detailed specifications and procedures for other than Reactor Plant SSR maintenance are discussed in Section 4-11 of this manual. Reactor Plant SSR requirements are contained in Section 4-12 of this manual.

The Planning Yard (PY) is responsible for all SSRs. It maintains a master file containing a final reproducible copy of SSR and updates the Selected Record Drawings and Data. The PY/Technical Manual Maintenance Activity (TMMA) shall maintain a current list of all SSR Technical Manuals (TMs). The PY/In-Service Engineering Agent (ISEA) shall maintain a current list of all SSR drawings. NAVICP shall maintain the master file of the allowance lists.

The Naval Supervising Activity (NSA) is responsible for marking-up PY provided SSRs of surface nuclear ships and submarines undergoing availabilities to reflect installed configuration changes and all changes reported by forces afloat. This mark-up is provided to the PY who, with the support of the appropriate TMMA/ISEA updates the final reproducible copy and prints and distributes at the End Of Availability (EOA+3).

Additions and deletions to the SSR listed herein can only be made with the approval of CNO. Recommendations for additions or deletions to the SSR listings shall be submitted to CNO via the Naval Sea Systems Command (NAVSEA). Upon approval by CNO, NAVSEA will promulgate appropriate changes.

### C.2. APPLICABLE DOCUMENTS

MIL-DTL-24784	Manuals, Technical; General Acquisition and Development Requirements
MIL-M-38761/2	Microfilm and Tabulating Cards used for Recording Engineering Drawings and Associated Data
MIL-STD 1916	DOD Preferred Methods For Acceptance of Product
NAVSEA 0902-LP-018-2010	General Overhaul Specifications for Deep Diving SSN/SSBN Submarines
NAVSEA 0902-LP-002-2000	Consolidated Index, Drawing, Conversion
NAVSEA 0924-LP-062-0010	Submarine Safety Requirements Manual
NAVSEA SL105-AA-PRO	ILO Policy and Procedures Manual (010 through 070 Series)

NAVSEA S0000-00-IDX-000/TMINS	Description and Application Guide for NAVSEA Standard Technical Manual Identification Numbering System (TMINS)
NAVSEAINST 4160.3	Technical Manual Management Program (TMMP)
NAVSHIPS 0900-LP-002-2000	Ship Work Breakdown Structure
OPNAVINST 4441.12, Series	Retail Supply Support of Naval Activities and Operating Forces
OPNAVINST 4790.4	Ship's Maintenance and Material Management (3-M) Manual; Promulgation of
Plan for Managing Logistic Technical Data (LTD) Products and Services in Support of NAVSEA Task 145	
Plan for Managing Logistic Technical Data (LTD) Products and Services in Support of SSN 688 Class Submarine Depot Modernization Periods (DMPs)	
NAVSEA S9AA0-AB-GOS-010	General Specifications for Overhaul of Surface Ships
T0005-AA-GYD-020/PTII-MAN-MOD ACT	Procedures for Maintaining Non-Reactor Plant System Manuals and Equipment/Component Technical Manuals.
T0005-AA-GYD-010/PTI-MAN	Holder (Part I - Responsibilities)
Technical Specification 9090-700	Ships Configuration and Logistics Support Information System.
Technical Specification 9090-800	Selected Record Drawings, Appendix A
Technical Specification 9090-810	Damage Control Drawings Computer Aided Drafting Requirements
Technical Specification 9090-820	Preparation and Revision of Damage Control Books and Diagrams for U.S. Navy Surface Ships;
Technical Specification 9090-821	Promulgation of Preparation and Revision of Damage Control Books and Diagrams for U.S. Navy

### C.3 REQUIREMENTS

#### C.3.1 SELECTED RECORD DRAWINGS (SRDs)

**C.3.1.1 General.** SRDs consist of important basic hull, mechanical, equipment, and related information about the ship and are selected for their value for operational, maintenance, modernization, training, and consulting purposes to individual ship's forces, Fleet commands, shipyard personnel, PY personnel, training centers, and other naval activities. The drawings designated as SRDs are to be maintained current and up-to-date throughout the life of the ship.

Appendix A of NAVSEA Technical Specification 9090-800 identifies the hull-level requirements by ship class for the drawings currently designated as SRDs. Recommendations for additions or deletions to the list of SRDs shall be submitted to the CNO via NAVSEA. Upon approval by CNO, NAVSEA will promulgate a change to the specification.

**C.3.1.2 Expanded Drawing Baselines.** The number of SRDs required for each ship varies with

the ship class. The required size of the drawing baseline has been increased for most ships. The PYs will produce the additional drawings on a ship-by-ship basis as tasked by the Ship Program Manager (SPM). The PY shall assume the full maintenance responsibility in accordance with Section 4 of this manual for each ship's total SRD suite upon completion of the expanded baseline. Thereafter, the PY will document configuration changes occurring during the ship's availabilities and operational intervals. For other ships, the maintenance and update action shall be performed in accordance with Section 4 of this manual.

### **C.3.2 SELECTED RECORD DATA**

**C.3.2.1 General.** Selected Record Data is that important basic technical information relative to certain shipboard arrangements, equipment, and systems under the cognizance of NAVSEA that is selected for its value for operational, maintenance, modernization, training, and consulting purposes, to an individual ship's force, fleet commands, PYs, NSAs, training commands, and other naval activities. The data items designated as Selected Record Data are to be maintained current and up-to-date throughout the life of the ship concerned.

Table C-I is a listing of data currently designated as Selected Record Data. Recommendations for additions or deletions to the List of Selected Record Data shall be submitted to the CNO via NAVSEA. Upon approval by CNO, NAVSEA will promulgate a change to Table C-I.

**C.3.2.2 Updating Selected Record Data.** The requirements of individual activities relative to maintaining and updating Selected Record Data shall be in accordance with Section 4 of this manual. NAVSEAINST 4160.3 provides NAVSEA policy for the maintenance of NAVSEA TMs. Specific requirements for Selected Record Data are detailed in Table C-I. Maintenance of Selected Record Data for SSN 21 Class, SSN 688 Class AND SSN 774 Class submarines shall be in accordance with the procedures of T0005-AA-GYD-020/PTII-MAN-MOD ACT, T0005-AA-GYD-010/PTI-MAN, the plans for managing LTD Technical Products and Services in support of NAVSEA Task 145, and SSN 21 Class, SSN 688 Class and SSN 774 Class submarine Depot Modernization Periods (DMPs).

TABLE C-I. Selected Record Data.

## KEY:

Column 1 - Surface Ships (Non-nuclear powered)

Column 2 - Surface Ships (Nuclear powered)

Column 3 - SSN Submarines

DATA TITLE	1	2	3
Ship Information Book (SIB) or General Information Book (GIB) or Ship System Manual (SSM) or System Operation and Onboard Maintenance Manual (SOOMM)	X	X	X
Technical Manuals for Systems (MIL-M-15071 Type III Manuals)	X	X	X
Damage Control Books and Plates (not applicable to SSN Classes)	X	X	X
Combat System Technical Operations Manual (CSTOM) (5)	(1)		
Combat System Alignment Manual (CSAM) (4)	X	X	
Training Aid Booklet (TAB) or Propulsion Operating Guide (POG)	X	X	X
Ship's Drawing Index (SDI) or Modified Ship's Drawing Index (MSDI)	X	X	X
Index of Technical Publications (ITP)	X	X	X
Engineering Operational Sequencing System (EOSS) (3)	X		
Propulsion Plant Manuals (for 1200 PSI Ships) (3)	X		
Steam and Electric Plant Manuals (for nuclear-powered ships) and TM's IAW NAVSEAINST 9890.29		X	(2)
Submarine Safety Certification Boundary (SSCB) Book			X
Ship Valves Technical Manual		X	X
Ship Service Motors and Controllers Technical Manual		X	X
Technical Manuals for Components in Systems Listed Below:			
Main Steam System		X	X
Auxiliary Steam System		X	X
High Pressure Steam System		X	X
Combat System Operational Sequencing System (CSOSS) (4)	(5)		
Aviation Fuel Operational Sequencing System (AFOSS) (3)	X	X	
Cargo Fuel Operational Sequencing System (CFOSS) (3)	X		
Fuel Operational Sequencing System (FOSS) (3)	X		
Sewage Disposal Operational Sequencing System (SDOSS) (3)	X	X	
Ballasting Operational Sequencing System (BOSS) (3)	(7)		
Catapult Operational Sequencing System (CATOSS) (3)	(8)		
Weapons Elevator Operational Procedures System (WEOPS) (3)	(9)		
Auxiliary Operational Sequencing System (AUXOSS) (3)	X	X	
Condensate System		X	X
Feed System		X	X
Main Sea Water Cooling System		X	X
Auxiliary Sea Water Cooling System		X	X
Steam Operated Distilling System		X	X
Hydraulic System (Main, Vital and External)		X	X
Steering and Diving Gear Hydraulic System			X
Main Oxygen System			X
Trim and Drain System			X
High Pressure Air System		X	X
High Pressure Ballast Tank Blow System			X
60 Hz A.C. Power Distribution System		X	X

DATA TITLE	1	2	3
400 Hz A.C. Power Distribution System			X
D.C. Propulsion Power Distribution System			X
Low Pressure Steam Drain System		X	X
Fresh Water Drain Collection System		X	X
Steam Plant Control System (including Steam Plant Control Panel and Benchboard)		X	X
Ships Service Circulating Water System		X	X
Engine Room Fresh Water Coolant System		X	X
Ships-Service Power Sources including: SSTGs		X	X
SSTGs		X	X
Diesel Generators		X	X
Batteries		X	X
Magnetic Material Control Drawing		(6)	
Electromagnetic Interference (EMI) Control Booklet		(6)	
Hull/Structural Repair Configuration Control Document		(6)	
Electric Plant Temperature Monitoring System			X
Electric Plant Control System (including Electric Plant Control Panel and Benchboards)			X
Propulsion Turbines, Reduction Gears, and Associated Control System		X	X
Main Lube Oil System		X	X
SSTG Lube Oil System		X	X
Shaft Lube Oil System		X	X
Clutch Control Oil System		X	X
Lube Oil Fill, Transfer and Purification System		X	X
Propulsion Plant Temperature Monitoring System		X	X
Propulsion Speed Indicator System		X	X
Steam Plant Alarm System		X	X
Steam Plant Salinity Indicator System		X	X
Electric Propulsion System		X	X
Air Conditioning System (those portions associated with reactor compartment and other propulsion spaces)		X	X
Service Air Systems (those portions associated with the Propulsion Plant)		X	X
Control Air Systems (those portions associated with the Propulsion Plant)		X	X
Steam Plant Pneumatic Control Air System		X	X
Emergency Propulsion Motor		X	X
Depth Detecting System			X

## NOTES:

- (1) CG-47, DD-963, and FFG-7 Classes
- (2) SSN 21, SSN 688 and SSN 774 Classes
- (3) Under the technical cognizance of NSWCCD-SSES Philadelphia
- (4) Under the technical cognizance of NSWC Port Hueneme
- (5) CG-47, DD-963, and DDG-51 Classes
- (6) MCMs and MHCs
- (7) LHAs, LHDs, LPDs, and LSDs.
- (8) CVs and CVNs
- (9) Combatant ships with weapon elevators only

**C.3.2.2.1 Numbering of Selected Record Data.** NAVSEA TM numbers, revision numbers and change numbers, as applicable, shall be utilized in accordance with NAVSEA S0000-00-IDX-000/TMINS for Selected Record Data. NAVSEA numbers may be obtained from the Naval Sea Data Support Activity (NSDSA). Each volume of a multi-volume document shall be considered as an individual document and numbered accordingly. A unique NAVSEA number shall be assigned, on an individual basis, to each Selected Record Data item listed below:

- a. Ship Information Book (SIB), General Information Book (GIB) or Ship System Manuals (SSMs) or System Operation and Onboard Maintenance Manual
- b. Technical Manuals for Systems (MIL-DTL-24784) Type III Manuals
- c. Damage Control Books and Plates (not applicable to SSN classes)
- d. Training Aid Booklet (TAB) or Propulsion Operating Guide (POG)
- e. Ship's Drawing Index (SDI) or Modified Ship's Drawing Index (MSDI)
- f. Index of Technical Publications (ITP)
- g. Steam and Electrical Plant Manuals (for nuclear powered ships) and Technical Manuals (TMs)
- h. Submarine Safety Certification Boundary (SSCB) Book
- i. Ships Valves Technical Manual
- j. Ship Service Motors and Controllers Technical Manual
- k. Other Type III System Manuals

**C.3.2.2.2 Updating Existing Selected Record Data.** The PY will provide the NSA two sets of SSRs (Drawings and Data) reproducibles updated to the authorized EOA configuration, upon request from the NSA/IA at about A-4. The NSA is required to mark-up the reproducibles to show changes authorized for installation subsequent to the PY update, data submitted by Ship's Force in the pre-availability package or during the availability, and to incorporate all changes required to interface with other update actions. The NSA will provide one set of marked-up SSRs to the PY and an identical set to the ship as interim SSRs. Between availabilities, the PY will update data masters in accordance with Section 4 of this manual.

Tabular data are to be updated as required. Illustrations are to be updated by overlay or replacement and limited to one text page. Plate diagrams are to be updated as required.

A change is comprised of corrected pages to the basic manual. It consists of information that updates the manual without requiring rewriting or reorganization of the technical content of the basic manual. Changes are to be issued when 25 percent or less of the pages in the document are affected. All changes require change numbers assigned by NSDSA. (see C.3.2.2.1.)

A revision is a subsequent edition of a document which supersedes the preceding edition. A revision shall be issued when more than 25 percent of the pages contained in a document have been changed. A revision shall incorporate all existing changes, and is identified by the Technical Manual Identification Numbering System (TMINS) number obtained from the NSDSA. (see C.3.2.2.1 and C.3.2.2.3.)

For SSN 21 Class, SSN 688 Class AND SSN 774 Class submarines, NSAs are required to submit appropriate change documents (Manual Change Requests (MCRs) or Technical Manual

Deficiency/Evaluation Reports (TMDERs)) to the PY. These change documents will then be processed in accordance with T0005-AA-GYD-020/PTII-MAN-MOD ACT and changes to the TMs shall be produced to meet the availability schedule.

**C.3.2.2.3 New Selected Record Data.** When alterations have been accomplished that would normally require correction of Selected Record Data as listed in Table C-I, but where these data have not been previously prepared, or where changes to Table C-I are promulgated, the following procedures shall be adhered to:

- a. Unless otherwise authorized, where only a class data item exists, the data item will be corrected to reflect specific ship conditions. The data item will be assigned a unique NAVSEA number (see C.3.2.2.1 above) and designated as the Selected Record Data applicable to the subject ship only. Acquisition of the new data item shall be in accordance with NAVSEAINST 4160.3.
- b. When a specific Selected Record Data item does not exist, or when such data are missing and not available from the PY, or ship, a new original data item is to be prepared (Type I TMs excepted) by the PY.
- c. Whenever the original of a Selected Record Data item (less Type I TMs), because of age, extensive correction, or other reasons, deteriorates, so that legible prints cannot be made, a new data item must be prepared retaining the same NAVSEA number. Problems with Type I TM originals will be processed in accordance with NAVSEAINST 4160.3.

**C.3.2.3 Selected Record Data Characteristics.** The following paragraphs describe specific Selected Record Data items together with their general updating requirements.

**C.3.2.3.1 Ship Information Books (SIBs), General Information Books (GIBs) and Ship System Manuals (SSMs).** The SIB and its older counterpart, the GIB, provide a source of technical information concerning shipboard arrangements and systems. The SSN 21 Class, SSN 688 Class AND SSN 774 Class SSM is the primary intra-system and inter-system information and operations manual for all areas except the reactor and propulsion plants.

- a. **Updating SIBs/GIBs/SSMs.** The SIB, GIB and SSM will be updated after any availability during which alterations are accomplished which affected the system, functions, or procedures therein, in accordance with the following guidelines:
  1. In the event that equal or better information is readily available on board a ship in other SRDs, Selected Record Data, or publications, the information should not be duplicated in the SIB/GIB. Instead, the SIB/GIB should be simply annotated to indicate that a change has been accomplished, and reference the source of updated information.
  2. A shipcheck may be required to verify the accuracy of the SIB/GIB following work performed by an NSA.
  3. SIBs for all deep diving SSN submarines shall be updated in accordance with NAVSEA 0902-LP-018-2010 unless otherwise specified under applicable NAVSEA contract.
  4. The SSM shall be updated in accordance with T0005-AA-GYD-020/PTII-MAN-MOD ACT and T0005-AA-GYD-010/PTI-MAN.
- b. **SIB/GIB for Surface Ships.** The SIB for surface ships will normally consist of the following separately bound volumes or portions of volumes. Only those volumes of a ship's

SIB/GIB currently provided will be updated as Selected Record Data. No volume of a SIB is to be added or deleted except by direction of NAVSEA.

1. Volume 1. Hull and Hull Mechanical Systems
2. Volume 2. Machinery Plant
  - Part 1. Propulsion Plant, General Design, and Operating Procedures
  - Part 2. Auxiliary Machinery, Piping, Air Conditioning, Ventilation, and Heating Systems
3. Volume 3. Power and Lighting Systems
  - Part 1. General Description and Design Information of Systems
  - Part 2. General Description of Electric Equipment and Electrically Operated Auxiliaries
4. Volume 4. Electronics Systems
5. Volume 5. Interior Communications Systems
  - Part 1. Interior Communications Systems
  - Part 2. Sound-Powered Telephone Systems, Voice Tubes, and Message Passing Facilities
6. Volume 6. Weapons Control Systems
7. Volume 7. Ballasting Systems

c. **SIB for SSN 637 Class Submarines.** The SIB shall consist of separately bound volumes. No volume is to be added or deleted except by direction of NAVSEA.

- Volume 1. General Information
- Volume 2. Tactical Facilities
- Volume 3. Ship Control System
- Volume 4. Steam and Diesel Propulsion
- Volume 5. Electrical Power System
- Volume 6. Ship Service System
- Volume 7. Hull, Mechanical and Ship Emergency Systems

d. **SSMs for SSN 21 Class, SSN 688 Class AND SSN 774 Class Submarines.** The SSM is organized into seven volumes to facilitate their use. These volumes are broken down into parent chapters, Operating Procedures (OPs), Casualty Procedures (CPs) and Operating Instructions (OIs).

- Volume 1. General Information
- Volume 2. Combat Systems
- Volume 3. Ship Control Systems
- Volume 4. Ship Service Systems
- Volume 5. Principles of Casualty and Damage Control
- Volume 6.
  - Part 1 - System Operating Procedures (OPs)
  - Part 2 - Casualty Procedures (CPs)
  - Part 3 - Operating Instructions (OIs)
- Volume 7. Principles of Ship Control

C.3.2.3.2 **Damage Control Books.** Damage Control Books shall be prepared, corrected, and duplicated in accordance with Section 086 of NAVSEA S9AA0-AB-GOS-010 General Specifications for Overhaul of Surface Ships, and NAVSEA Technical Specifications 9090-810,

9090-820 and 9090-821. The SSN 21 Class, SSN 688 Class and SSN 774 Class submarine does not have a Damage Control Book. For SSN 21 Class, SSN 688 Class and SSN 774 Class, this information is contained in Volumes 5 through 7 of the SSMs (see Section 4 of this manual).

**C.3.2.3.3 Training Aid Booklets (TABs).** TABs are pocket-sized volumes using functional diagrams and drawings of the ship to depict piping, electrical, and electronic systems. TABs consist of two volumes: (1) Volume 1, Piping Systems, and (2) Volume 2, Electrical and Electronic Systems. For SSN 21 Class, SSN 688 Class and SSN 774 Class submarines, TABs are a collection of selected illustrations taken from the SSM and is furnished for use in conjunction with the SSM. TABs are issued to ship's force for precommissioning training, for personnel qualification, and for operational reference purposes. TABs are generally provided only for submarines. Only those TABs provided for submarines will be updated as Selected Record Data. At EOA+6.

**C.3.2.3.4 Posted Information Plates (PIPs).** PIPs are selected illustrations and instructions taken from the SSM and equipment technical manuals for SSN 21 Class, SSN 688 Class and SSN 774 Class submarines. They are furnished for training and identification purposes. There are approximately 200 PIPs laminated and affixed directly to or located near the piece of equipment, component, or system involved.

**C.3.2.3.5 Propulsion Operating Guide (POG).** POGs are pocket-sized documents providing information in summary form of start-up, normal operations, shut-down, damage/casualty control, and trouble shooting procedures and data for the propulsion plant and major auxiliary systems. They are used for familiarization, training, and operation of the main systems by ship's personnel.

**C.3.2.3.6 Technical Manuals (TMs).** TMs separately describe equipment (Type I manuals) and systems (Type II manuals) where such equipment or systems are of sufficient importance and complexity as to require separate documentation.

While TMs are important items of documentation, not all such TMs are considered as SSR. Only those TMs specifically identified in Table C-I fall within the category of documentation identified as SSR. For the methods of documenting and maintaining TMs that do not qualify as SSR refer to Section 8 of this manual.

Unless otherwise directed by the SPM, only those TMs identified as SSR will be routinely updated under Design Services Allocation (DSA) funding. Manuals to be updated will be identified in Ship Alteration (SHIPALT) Authorization Letters. Activities concerned should review SHIPALT Authorization Letters and advise the SPM of manuals meeting the criteria identified in Table C-I believed to require updating because of actual or planned accomplishment of SHIPALTs and not specifically identified for updating.

When, at any time, a Type I TM is known or suspected to be deficient, the deficiencies should be immediately brought to the attention of NSDSA for initiation of corrective action, in accordance with NAVSEAINST 4160.3.

TMs will be prepared and updated in accordance with NAVSEAINST 4160.3 and the Military Specification used for original preparation.

**C.3.2.3.7 Index of Technical Publications (ITP).** The ITP is a guide to facilitate the identification of TMs used onboard a ship. The ITP is tailored to the configuration of a specific ship. It lists TMs needed to operate, maintain, and repair a ship's systems and equipment. It also lists any other general and ship related TMs needed by the crew.

The ITP is produced from the Technical Documentation Management Information System (TDMIS), NAVSEA's automated technical manual management information system. TDMIS is operated and maintained by NSDSA. Requests for copies of the ITP should be forwarded to NSDSA with a copy of the request provided to the Type Commander (TYCOM).

For SSN 21 Class, SSN 688 Class and SSN 774 Class submarines, the ITP lists all technical publications related to the operation and maintenance of onboard equipment. It does not include Defense Communications Material Systems (DCMS) equipment TMs, nor does it include tactical, administrative, medical, supply or training publications. The ITP includes the effective changes and revisions of each publication with the exception of Reactor Plant Manuals. Specific onboard allowances can be found in the "Hull Applicability-Quantity Required" lines. The ITP shall include an introduction describing the contents and instructions on its use. Inquiries concerning requests for copies of ITP reports should be made to NSDSA. At 30 days prior to Fast Cruise, the PY shall provide the ship a copy of the preliminary ITP. At EOA+3 the PY shall provide the ship with a final ITP updated to reflect the ship's post-availability configuration. For a more detailed discussion of the ITP refer to Section 8 of this manual.

**C.3.2.3.8 Ship Drawing Index (SDI) and Modified Ship Drawing Index (MSDI).** The SDI and MSDI are lists of ship's drawing and related design reference information compiled in accordance with Section 085 of NAVSEA S9AA0-AB-GOS-010 General Specifications for Overhaul of Surface Ships and recorded on NAVSHIPS Forms 9020/17 and 9029/19 as shown in Figure 4 of OPNAVINST 4790.4. SDIs or portions thereof prepared in Automated Data Processing (ADP) format are to be considered as part of the Master SDI. Submarine SDIs shall be maintained in accordance with NAVSEA 0902-LP-018-2010.

A MSDI has been supplied to some ships not originally intended to receive a standard SDI. The MSDI lists only the title, NAVSEA drawing and numbers of applicable drawings revisions. For the purpose of this manual, the terms SDI and MSDI are synonymous.

- a. **SDI Content.** The SDI is a listing of all drawings applicable to the ship including Reactor Plant drawings (see C.3.2.3.8.f.). Working drawings, systems diagrams, SRDs having a NAVSEA drawing number assigned, all manufacturing equipment drawings designated as certification data sheets, equipment drawing lists, and assembly drawings which list detail drawings shall be included in the SDI. Alteration drawing numbers, SHIPALT Number, NAVSEA drawing numbers of drawings used to prove systems and/or equipment installed or otherwise affected by the overhaul, will be included. Alteration drawings will not be listed until after the alteration has been accomplished.
- b. **Updating the SDI.** The updated SDI will be provided by the PY to the NSA for correction to reflect subsequent changes through the availability. Since the SDI is the

sole source of identification of all drawings applicable to a ship, the NSA and the PY will ensure that all applicable drawings are included in the SDI. Corrections may be made by typewritten mark-up of the SDI pages and/or appropriate correction to SDIs in ADP format. Ships, or other activities updating the SDI during an availability, other than a regular overhaul, will mark-up the appropriate page(s) of the ship's SDI. A marked-up "Ship's Master Copy" of the SDI will be forwarded to the PY with a request for correction and appropriate distribution. Particular attention shall be directed to ensuring the accomplishment and verification of SDI corrections required as a result of equipment and configuration changes accomplished during restricted availabilities, tender availabilities and voyage repairs. The NSAs are responsible for furnishing all new drawing identification arising from work other than authorized SHIPALTs, such as vendor drawings for items or material installed as part of the ship availability repair packages. The NSA will mark-up the copy of the SDI to indicate the EOA configuration and deliver it to the PY by EOA. The updated SDI will be returned to the ship within 60 days of receipt.

- c. **Arrangement and Status of SDI Data.** (Not applicable to Part II of nuclear powered surface ship, SSN 637/Maintenance Trainer System (MTS) and AS Tenders with nuclear support facility SDI see C.3.2.3.8.f.). The SDI shall have a TM number assigned in accordance with Section 086 of NAVSEA S9AA0-AB-GOS-010 General Specifications for Overhaul of Surface Ships. Revision control shall be in accordance with NAVSEA S0000-00-IDX-000/TMINS. The title page shall indicate the name of the ship and the hull number. Each page of the SDI shall contain the hull number to which it applies, in accordance with MIL-M-38761/2. Pages of the SDI shall be numbered consecutively. All drawings having the same "S" group or 3-digit Consolidated Index Group (NAVSEA 0902-LP-002-2000) Number of NAVSHIPS 0900-LP-002-2000, as applicable, shall be listed on one or more sheets as necessary, grouped by subject matter and listed consecutively. Where more than one page is required in order to add new drawings under a particular group, the supplemental pages shall be numbered the same as the original page, followed by an alphabetical suffix (e.g., 42a, 42b, 42c, etc.). A notation shall be made at the bottom of each page which has been revised, indicating the revision number and date of revision. Each page of the original SDI shall be stamped "ORIGINAL" in green ink. The SDI shall be marked-up to clearly indicate which drawings are SRDs. SDIs that have not been marked-up in the above manner are to be appropriately annotated by PY prior to the providing to the NSA for the next scheduled availability.
- d. **Superseding or Modifying Existing Drawings in the SDI.** When existing drawings applicable to a ship are superseded by new drawings; or are no longer applicable to the ship, the listing of the cancelled or superseded drawing should be lined out, but not obliterated or rendered illegible. The number of the superseding drawings should be entered in the last column of the SDI, in line with the lined out or superseded drawing. When existing drawings applicable to a ship are modified by new drawings, the new drawings shall be listed in the last column in the SDI in line with the modified existing drawings. For ADP prepared SDIs superseded or cancelled drawings are to be listed in an addendum at the end of SDI.
- e. **Conversion and Update of SDIs to ADP Format.** For those ships having SDI in ADP

format, the PY will provide a copy of the SDI in ADP format (access database on CD) to the NSA for correction to reflect changes required to the SDI resulting from work accomplished during the availability, and changes previously accomplished and identified by Ship's Force. After EOA, the corrected SDI will be returned to the PY. Between availabilities, the PY will correct the SDI to reflect changes reported by the ship or other activities when changes are accomplished between availabilities. For those ships not having SDI in ADP format, the NSA will, as directed by the SPM, prepare the SDI in ADP format. Upon completion of the availability, the NSA will transfer the SDI in the new ADP format to the PY. The NSA will also provide a copy of the SDI in ADP format (usually magnetic tape) to the NAVSEA Microfilm Repository, Portsmouth Naval Shipyard.

- f. **Special SDI Requirements for Nuclear-Powered Ships.** Requirements relative to Nuclear-Powered Ships SDI are contained in Section 4 of this manual. For Nuclear Powered Surface Ships, SSN 637 Class submarines, and tenders with nuclear support facilities, the SDI is two parts:
1. Part I - Non-Reactor Plant SDI: Lists all drawings except Reactor Plant systems drawings which are in Part II. In particular, Part I of the SDI does include Reactor Plant Equipment vendor drawings. Part I of the SDI is maintained by the Hull PY.
  2. Part II - Reactor Plant Supplement to the SDI (Cumulative Booklet): Lists all Reactor Plant systems drawings. Part II of the SDI is maintained by the Reactor Plant PY in accordance with Section 4 of this manual.

C.3.2.3.9 **Submarine Safety Certification Boundary (SSCB) Book.** The SSCB identifies, in diagrammatic form, the boundaries of material certification as delineated in NAVSEA 0924-LP-062-0010. The SSCB shall be the single source document which identifies all the material certification boundaries for a submarine.

C.3.2.3.10 **Ship Service Motors and Controllers Manual (SSMC).** SSMC manuals provide descriptions, troubleshooting procedures, technical data, and scheduled and corrective maintenance procedures for all ship service motors and controllers.

C.3.2.3.11 **Ship Valves Technical Manual (SVTM).** The SVTM provides descriptive and maintenance-related information on all labeled non-Reactor Plant valves and selected small piping system components installed in the ship. The associated User Information Manual provides consolidated index cross-reference data to allow the user to locate valves in the SVTM.

C.3.2.3.12 **Combat System Technical Operations Manual (CSTOM).** CSTOM TMs will be updated by NSWC, Code 4B00 (non-AEGIS), or Code 4C00 (AEGIS), in response to direct funding by the cognizant SPM. NSAs do not have responsibility for CSTOM maintenance.

C.3.2.3.13 **Propulsion Plant Manuals (for 1200 PSI ships).** The NSA is responsible for updating and forwarding preliminary change data to Naval Surface Warfare Center, Carderock Division-Ship Systems Engineering Station (NSWCCD-SSSES), who will issue the final change to the Propulsion Plant Manual.

C.3.2.3.14 **Engineering Operational Sequencing System (EOSS).** NSWCCD-SSES is responsible for maintaining EOSS documentation under the direction of NAVSEA 04M. EOSS is the single authoritative source of operational and casualty control information relative to surface ship engineering plant operation. EOSS is updated to reflect SHIPALT configuration changes to propulsion and support equipments and systems. EOSS includes Engineering Operational Procedures (EOPs), Engineering Operational Casualty Control (EOCC), and operational procedures for selected support systems.

C.3.2.3.15 **Combat System Alignment Manual (CSAM).** CSAM TMs will be updated by NSWCC, Code 4B00, in response to direct funding by the cognizant SPM. NSAs do not have responsibility for CSAM maintenance.

C.3.2.3.16 **Combat System Operational Sequencing System (CSOSS).** NSWCC Dahlgren is responsible for maintaining CSOSS documentation under the direction of NAVSEA 05 for non-AEGIS ships and NAVSEA PMS400 for AEGIS ships. NSAs do not have responsibility for CSOSS maintenance.

C.3.2.3.17 **Aviation Fuel Operational Sequencing System (AFOSS).** The AFOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for AFOSS development or maintenance.

C.3.2.3.18 **Cargo Fuel Operational Sequencing System (CFOSS).** The CFOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for CFOSS development or maintenance.

C.3.2.3.19 **Fuel Operational Sequencing System (FOSS).** The FOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for FOSS development or maintenance.

C.3.2.3.20 **Sewage Disposal Operational Sequencing System (SDOSS).** The SDOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for SDOSS development or maintenance.

C.3.2.3.21 **Ballasting Operational Sequencing Systems (BOSS).** The BOSS documentation will be updated by NAVSSES in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for BOSS development or maintenance.

C.3.2.3.22 **Catapult Operational Sequencing System (CATOSS).** The CATOSS documentation will be updated by NAVSSES 9431 in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for CATOSS development or maintenance.

C.3.2.3.23 **Weapons Elevator Operational Procedures System (WEOPS).** The WEOPS documentation will be updated by NAVSEA 05L4 in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for WEOPS development or maintenance.

C.3.2.3.24 **Auxiliary Operational Sequencing System (AUXOSS).** The AUXOSS

documentation will be updated by NSWCCD-SSES in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for AUXOSS development or maintenance

**C.3.2.4 Inactive Ship Selected Record Data Preparation.** When inactive ships are being reactivated for assignment to the active fleet, the SSRs listed in Table C-I are to be corrected by the activity performing the activation. Such corrections will be a proper charge against Activation Funds.

**C.3.2.5 Funding and Expenditures.** Corrections to Planned Maintenance System (PMS) documentation required in accordance with OPNAVINST 4790.4 are not chargeable to DSA. When inactive ships are being reactivated for assignment to the active fleet, the Selected Record Data listed in Table C-I are to be corrected or prepared as appropriate by the activity performing the activation. Such corrections will be a proper charge against Activation Funds.

### C.3.3 ALLOWANCE LISTS

**C.3.3.1 General.** The Shipboard Non-Tactical ADP Program (SNAP) contains the ship's configuration, allowance and onboard inventories in computerized form. The Coordinated Shipboard Allowance List (COSAL) is based upon information contained in the Weapon Systems File (WSF) and maintained and published by Naval Inventory Control Point-Mechanicsburg (NAVICP-M). Within the COSAL, all repair parts and equipage for individual components are listed in Allowance Parts Lists (APLs) or Allowance Equipage Lists (AELs). The quantity of each repair part and/or equipage item authorized to be carried onboard is determined by a computation for each item listed in the Stock Number Sequence List (SNSL). The computed quantities meet the operational endurance requirements specified by OPNAVINST 4441.12 for the type of ship involved.

The publication of an updated COSAL for ships undergoing availabilities is authorized by the TYCOM. Since automated ships maintain all Maintenance and Material Management (3-M) requirements, ships inventory and requisitioning functions in the SNAP database, the COSAL is considered a backup document required in case of catastrophic computer failure.

Ship's configuration records are maintained ashore by the Ship Configuration and Logistics Support Information System (SCLISIS) in accordance with Technical Specification 9090-700. Because configuration determines logistics and allowance support, there is a direct correlation between the data in the configuration database and the data in the WSF and the COSAL. A more detailed description of SCLISIS and the relationship of SCLISIS with the Fleet Modernization Program (FMP) are found in Technical Specification 9090-700, and Section 8 of this manual. During a ship's availability, the SPM may authorize the performance a logistics review to ensure that only the appropriate logistics support is onboard by EOA. These reviews are known as Integrated Logistics Overhauls (ILOs) or Integrated Logistics Reviews (ILRs). The procedures for conducting an ILO/ILR are addressed in NAVSEA SL105-AA-PRO-010 through 070 series. One of the products of an ILO/ILR review is an updated SNAP database. An availability that involves a full ILO produces an updated SNAP database and an updated COSAL.

During the operating cycle, the SNAP database is updated once a month by way of an electronic transmission from NAVICP-M to the ship. However, a new COSAL is published only during

selected availabilities and only at the direction of the TYCOM.

The SPM is responsible for tasking and funding the PY to perform Configuration Overhaul Planning (COP). COP represents the genesis of configuration record changes that are planned to be made during a ship's availability. COP is submitted to the ship's Configuration Data Manager (CDM). The CDM uses the planning data as a tool for the quality review of its database, as a data feed to the NSA and ILO site and as a baseline from which the ILO site begins their reviews. COP must not be viewed as a primarily logistics support effort. Proper preparation of COP allows timely Configuration Management. Proper logistics support is directly dependent upon that management. Responsibilities and timeframes for generating COP are addressed in Section 8 of this manual.

The NSA has the responsibility for updating the COSAL. However, this effort is accomplished by the direct interface with the CDM and the ILO site doing the logistics review (refer to OPNAVINST 4441.12, NAVSEA SL105-AA-PRO-010 through 070 series, and Section 8 of this manual).

**C.3.3.2 COSAL/Configuration Efforts Not Covered Under DSA.** The following COSAL maintenance efforts are not authorized under DSA funding.

- a. Support of the supply availability material processing points (Shipyard Supply Department, Fleet and Industrial Supply Center (FISC), etc.), which include material handling, necessary supervision, technical assistance, packaging and re-preservation, transportation/per diem, and other necessary material costs (normally Naval Supply Systems Command ((NAVSUP) funded).
- b. Shipboard configuration validation assistance services, for installations other than those planned for or installed as part of the overhaul or availability (incident to Title "K", "K-P", "D", or "F" SHIPALT installation). However, a sample of 10 percent of the Configuration Change Forms (CCFs) submitted by the ILO Teams will be validated by the NSA. If the results of the validation of the CCFs do not comply with MIL-STD-105, then follow-on validation of samples, in accordance with MIL-STD-105 will be chargeable to the appropriate TYCOM.



**APPENDIX G**  
**ALTERATION FUNCTIONAL**  
**IDENTIFICATION NUMBERS**

**APPENDIX G**  
**ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS**

**TABLE 1**  
**ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS (ALTFIN, NS)**

**FUNCTIONAL AREA - FIRST THREE DIGITS**

<b>CODE</b>	<b>FUNCTIONAL AREA</b>
<b><u>100</u></b>	<b><u>AAW-GENERAL</u></b> (including ASMD, SMS, BPD, SMS, For C3 see 400)
101	ASMD
110	AAW SENSORS
111	AIR SEARCH RADARS (REVERT)
112	IFF AIMS
120	CV-TSC
130	AAW ELECTRONIC WARFARE/DECEPTION
131	ACTIVE ECM, CHAFF, FLARES, ECCM, ETC.
132	PASSIVE ECM
140	AAW WEAPONS
141	SURFACE TO AIR MISSILE SYSTEMS
142	GUN SYSTEMS
150	AAW SPECIAL PROGRAM
151	CIWIS
152	DESIGN TO PRICE EW
<b><u>200</u></b>	<b><u>ASW-GENERAL</u></b>
210	ASW SENSORS-GENERAL
211	SONAR - HULL MOUNTED
212	OTHER SONAR-VDS, TASS, ETC.
213	BQQ-5
214	SQS-23
230	ASW WEAPONS-GENERAL
231	SUBROC SYSTEMS
232	ASROC SYSTEMS
233	ASW TORPEDOES
250	ASW SPECIAL PROGRAMS
251	MK 48 TORPEDO
252	LAMPS

**APPENDIX G**  
**ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS**  
**TABLE 1 (Continued)**

<b>300</b>	<b><u>OTHER WARFARE AREAS-GENERAL</u></b>
301-309	GENERAL SENSORS (SURFACE SEARCH RADARS, ETC.)
310	SURFACE WARFARE GENERAL
311	SURVIVABILITY
315	MAJOR CLIBER GUN SYSTEMS
320	ANTI-SHIP MISSILE SYSTEMS
321	NATO SEA SPARROW
322	HARPOON
330	SHIP CONTROL-GENERAL
331	NAVIGATION ELECTRONIC (LORAN, OMEGA, ETC.)
332	NAVIGATION INERTIAL/GYRO (SINS, ETC.)
340	SUBMARINE WARFARE
341	TYPE 18 PERISCOPE
350	MINE WARFARE
351	SENSORS (SONAR, TV, ETC.)
352	MINE LAYING
353	MINE DESTRUCTION (SEEP, MAGNETIC, ACOUSTIC, ETC.)
360	AMPHIBIOUS WARFARE-GENERAL
361	AMPHIBIOUS BOATS, DAVITS, ETC.
370	STRATEGIC WARFARE SYSTEMS
380	SPECIAL PROGRAM
381	NIXIE
<b>400</b>	<b><u>COMMAND &amp; CONTROL-GENERAL</u></b>
402	DATA LINKS
405	SECURITY-GENERAL
406	SECURE VOICE
410	SATCOM
450	SPECIAL PROGRAMS-GENERAL
451	IACS
452	TACS/TADS
453	NAVMACS
454	MUTE

**APPENDIX G**  
**ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS**  
**TABLE 1 (Continued)**

<b>500</b>	<b><u>AVIATION SUPPORT-GENERAL (For LAMPS see ASE Code 200)</u></b>
511	AIRCRAFT HANDLING CATAPULTS (ARRESTING GEAR, ETC.)
512	JET BLAST DEFLECTORS
515	AIRCRAFT SUPPORT, SHOPS, ETC.-GENERAL
516	SUPPORT: F14/A3A/ECL
517	SUPPORT: A7E/A6E/BA6B
520	AIRCRAFT WEAPONS HANDLING/STORAGE-GENERAL
530	LANDING SYSTEMS-GENERAL
531	ACLS
532	VISUAL AIDS
550	SPECIAL PROGRAMS
551	VAST
<b>600</b>	<b><u>COMBAT LOGISTIC SUPPORT-GENERAL</u></b>
610	UNREP
650	SPECIAL PROGRAMS
<b>700</b>	<b><u>HULL, MECHANICAL, ELECTRICAL -GENERAL</u></b>
710	HULL/MACHINERY-GENERAL
711	WEIGHT, MOMENT, BALLAST, ETC.
712	PROPULSION MACHINERY-GENERAL
713	GAS TURBINES
714	STEAM PLANT IMPROVMENTS
715	AUXILIARY MACHINERY
716	TENDERS/REPAIR SHIP FACILITIES
717	GROUND TACKLE, WINDLASS, ETC.
718	BOATS, DAVITS, ETC.
720	ELECTRICAL-GENERAL
721	SHIPS' SERVICE POWER
722	AUXILIARY POWER
730	FIREFIGHTING-GENERAL
731	AFFF
732	HALON
740	OUTFITTING AND FURNISHING
750	SPECIAL PROGRAMS

**APPENDIX G**  
**ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS**  
**TABLE 1 (Continued)**

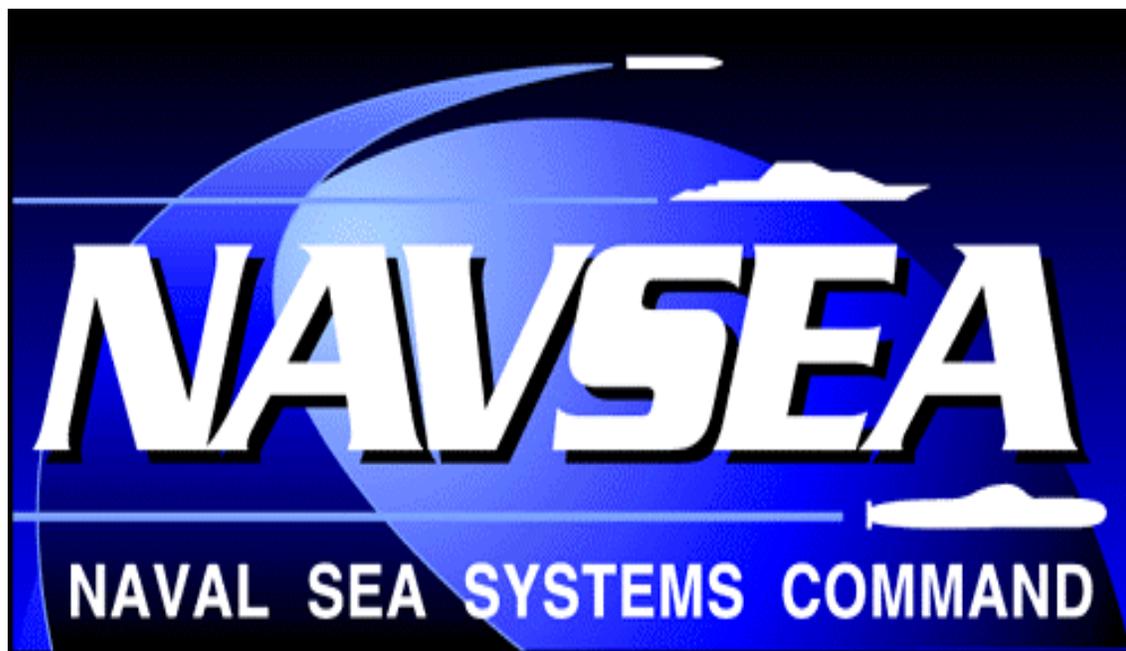
<b>800</b>	<b>PERSONNEL/LOGISTIC SUPPORT-GENERAL</b>
810	HABITABILITY
811	HABITABILITY FOR LIVING/BERTHING
812	HABITABILITY FOR SANITARY
813	HABITABILITY FOR MESSING AND FOOD SERVICE
814	HABITABILITY FOR LAUNDRY
815	HABITABILITY FOR MISCELLANEOUS
820	MEDICAL/DENTAL FACILITIES
830	FLAG FACILITIES
840	LOGISTICS IMPROVEMENTS, SUPPLY (EXCEPT CARGO, ETC.)
850	SPECIAL PROGRAMS
<b>900</b>	<b>SPECIAL IMPROVEMENTS (Includes Directed Programs)</b>
910	TASK LIGHTS
920	POLLUTION ABATEMENT (LESS CHT)
921	POLLUTION ABATEMENT (CHT)

**APPENDIX G**

**TABLE 1**  
**ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS (ALTFIN, NS)**

**PURPOSE CODES - LAST TWO DIGITS**

<b>CODE</b>	<b>MEANING</b>
<b><u>01-05</u></b>	
<b><u>SAFETY</u></b>	
01	SHIP/SYSTEM/EQUIPMENT
02	PERSONNEL
03	GENERAL SUBSAFE
04	
<b><u>06-10</u></b>	
<b><u>MAINTAINABILITY/RELIABILITY</u></b>	
07	DART
<b><u>50-60</u></b>	
<b><u>CAPABILITY</u></b>	
50	IMPROVED CAPABILITY
51	NEW CAPABILITY
52	HABITABILITY
<b><u>61-70</u></b>	
<b><u>SPECIAL PURPOSE</u></b>	
61	POLLUTION ABATEMENT (GENERAL)
62	SERVICE FLIFE EXTENSION
<b><u>80-89</u></b>	
<b><u>SURVIVABILITY</u></b>	
80	FIREFIGHTING ACTIVE
81	FIREFIGHTING PASSIVE
82	DAMAGE CONTROL
83	SHOCK
84	FRAGMENTATION
85	NUCLEAR HARDENING EMP
86	NUCLEAR HARDENING BALST
87	MAGAZINE PROTECTION
88	CHEMICAL/BIOLOGICAL WARFARE
89	SURVIVABILITY MISCELLANEOUS



**APPENDIX H  
SHIP ALTERATION RECORD (SAR)  
ALTERATION MATERIAL LIST (AML)  
PREPARATION GUIDE**

**APPENDIX H**  
**SHIP ALTERATION RECORD (SAR)**  
**ALTERATION MATERIAL LIST (AML)**  
**PREPARATION GUIDE**

**1. Scope.** This guide is intended to clarify/supplement guidance available for SAR AML preparation (reference (a)) and shall be used for all SARs prepared. In addition, this guide provides guidelines for quality assurance of SAR AML data. Exhibit (1) identifies source codes and Exhibit (2) provides Unit of Issue definitions. Per Chief of Naval Operations (CNO) direction to ensure effectiveness of Modernization efforts, all must adhere to established policies to provide new equipment only when proper support is in place. Less than full adherence to Integrated Logistics Support (ILS) and Life Cycle Management policies results in reduced reliability, maintainability, and readiness.

**2. References.**

- a. Appendix A, Subj: NAVSEA Technical Specification 9090-500c, Ship Alteration Preparation
- b. Defense Integrated Data System (DIDS) Procedures Manual (DOD 4100.39-M). Volume 10, Chapter 4, Table 53

**3. General Guidance.** Material items that should be included in the SAR AML are:

- All Centrally Provided Material (CPM) including Headquarters CPM (HCPM), non-standard material, material with design unique to the Ship Alteration (SHIPALT), material of unusual quantity, high dollar value items (\$15,000 or more), material with a history of procurement problems, Long Lead Time Material (LLTM) (Material considered to have a high probability of not being obtainable in a timeframe greater than six months per subparagraph 7-2.2.2 of Volume 1 of this manual), all Logistically Significant Material (LSM) (requires development of new/revised logistics (Provisioning Technical Documentation (PTD), Allowance Parts List (APL), Training, Planned Maintenance System (PMS), Technical Manuals, Test Equipment)), and Level 1 Submarine Safety (SUBSAFE) material. CPM items not to be included are On Board Repair Parts (OBRPs) and anything readily available from shop stores or tender load lists, or that can be locally purchased (e.g., piping, bolts, fasteners, outfitting material, standard material plates).
- Material to be discussed in the SAR text should be included in the SAR AML. All NAVSEA Data Environment – Navy Modernization (NDE-NM) (formerly FMPMIS) should be included.
- If no NDE-NM material is required, add a statement similar to the following on the SAR AML page: "ALL INCIDENTAL MATERIALS REQUIRED FOR THIS SHIPALT TO BE PROVIDED BY THE NSA/IA."

**4. For Each Item on the AML:**

- Assign a separate "Item Number" for each material item beginning with "1" and list in numerical order.
- Different items to be procured together as a system, assembly or kit shall also have a single item number with the words "CONSISTING OF" and alpha-numeric sub-

numbering included in the material item identification area.

#### **5. Procuring Activity Column.**

- The SAR developer should enter the procuring activity into the "Procuring Activity" column on the SAR AML (e.g., "Defense Logistics Agency (DLA)").
- Procuring activity is defined cognizant inventory manager purchasing material that is dependent on SHIPALT requirements in NDE-NM (e.g., Acquisition Manager (NAVSEA 93), Life Cycle Manager (NAVSEA 03), Naval Inventory Control Point – Mechanicsburg (NAVICP-M), DLA). See Exhibit (1).

#### **6. Description.**

- For standard stock material, provide the following information on the SAR AML:
  - Noun name and technical characteristics, including type, size, capacity, shock requirements, etc.
  - Military Specification (MILSPEC)/Military Standard (MILSTD)/Standard Drawing (STD DWG), etc. with all applicable options identified.
  - National Stock Number (NSN) or Navy Item Control Number (NICN) including cognizance code.
- For non-standard material, provide the following ordering data information on the SAR AML:
  - MILSPEC/MILSTD.
  - Manufacturer's name and Commercial and Government Entity (CAGE) number.
  - Manufacturer's model or part number.
  - Manufacturer's drawing or piece number.
  - Navy Standard Drawing or piece number.
  - Standard ordering data per paragraph 6.1/6.2 of the applicable MILSPEC.
  - Physical characteristics.
- To help reduce costs to the Navy, every effort should be made to utilize existing standard stock material. Utilization of Navy supported equipment or components which are identified in the Hull, Mechanical and Electrical (HM&E) Equipment Data Research System (HEDRS) should be considered first.

**7. Unit of Issue.** The unit of issue for each item on the SAR AML must match the unit of issue code as specified in Exhibit (2). Unit of issue codes and definitions contained in Exhibit (2) are in accordance with reference (b).

**8. Quantity Required (Per Ship).** Identify quantities required. If uncertain, identify the largest quantity that may be needed.

**9. Applicable ship(s).** The Ship Program Manager (SPM) has final authority over the SHIPALT but will notify PYs of changes made during their final review.

## COGNIZANT ACTIVITY LISTING

### COG/ROUTING IDENTIFIER

### COGNIZANT ACTIVITY

OA Q11	Field Command/DNA (Defense Nuclear Agency)
OE N23	NAVSEA (Naval Sea Systems Command)
OI R92	NAVICP-P Phila., PA
OJ N35	NAVICP-M Mechanicsburg, PA
OK N36	CNET (Chief of Naval Education and Training)
OL N77	SPAWAR/ NAVICP-M (Space and Naval Warfare Systems Command/Naval Inventory Control Point - Philadelphia)
OM N35	NAVICP-M Mechanicsburg, PA
ON R41	Civil Engineering Support Office
OO N35	NAVICP-M Mechanicsburg, PA
OQ N32	NAVICP-P Philadelphia, PA
OR N32	NAVICP-P Philadelphia, PA
OS N35	NAVICP-M Mechanicsburg, PA
OT MHQ	CMC (Commandant of the Marine Corps)
OU N35	NAVICP-M Mechanicsburg, PA
OV PPZ	NAVAIR (Naval Air Systems Command)
OX Q6D	DCMS (Defense Communications Material Systems)
1B N22	NAVSUP (Naval Supply Systems Command)
1H N35	NAVICP-M Mechanicsburg, PA
1I R92	NAVICP-M Mechanicsburg, PA
1Q Q27	NRSO (Naval Resale and Service Support Office)
1R N32	NAVICP-P Philadelphia, PA
1V N47	FMSO (Fleet Material Support Office)
1X N47	FMSO (Fleet Material Support Office)
2B N325	NAVICP-M Mechanicsburg, PA
2C R41	Civil Engineering Support Office in lieu of NAVFAC
2D Q81	Joint Cruise Missile Project Office
2E NCB	NAVICP-M Mechanicsburg, PA
2F N23	NAVSEA (Naval Sea Systems Command)

**COG/ROUTING  
IDENTIFIER****COGNIZANT ACTIVITY**

2J N23	NAVSEA (Naval Sea Systems Command)
2L Q6D	DCMS (Defense Communications Material Systems)
2M N21	NAVAIR (Naval Air Systems Command)
2O N45	NTSC (Navy Training Support Center)
2P RCZ	NAVPRO (SPG), Pittsfield, MA (SPG)
2Q N35	NAVAIR/ NAVICP-M Mechanicsburg, PA (Naval Air Systems Command/ Naval Inventory Control Point - Philadelphia)
2S N23	NAVSEA (Naval Sea Systems Command)
2T NCB	NAVICP-M Mechanicsburg, PA
2V N21	NAVAIR (Naval Air Systems Command)
2W N21	NAVAIR (Naval Air Systems Command)
2X RAZ	NAVPRO (SPL-60), Sunnyvale, CA
2Z N77	SPAWAR (Space and Naval Warfare Systems Command)
3H N35	NAVICP-M Mechanicsburg, PA
4E NCB	NAVICP-M Mechanicsburg, PA
4K N21	NAVAIR (Naval Air Systems Command)
4M N77	SPAWAR (Space and Naval Warfare Systems Command)
4P R31	NAVPRO (SPL (W)), Sunnyvale, CA
4R N32	NAVICP-P Philadelphia, PA
4T NCB	NAVICP-M Mechanicsburg, PA
4V N21	NAVAIR (Naval Air Systems Command)
4X RKZ	NAVPLANTTECHREP (SPI), Anaheim, CA
4Y N35	NAVICP-M Mechanicsburg, PA
4Z N32	NAVICP-P Philadelphia, PA
5L B56	Army Communications Security Logistics Agency
5M B46	Army Security Agency
5N FPD	San Antonio Air Logistics Center, Kelly AFB, TX
5P FPZ	San Antonio Air Logistics Center, Kelly AFB, TX
5R N32	NAVICP-P Philadelphia, PA
6A N35	NAVICP-M Mechanicsburg, PA
6B N35	NAVICP-M Mechanicsburg, PA

**COG/ROUTING  
IDENTIFIER****COGNIZANT ACTIVITY**

6C N35	NAVICP-M Mechanicsburg, PA
6D N35	NAVICP-M Mechanicsburg, PA
6H N35	NAVICP-M Mechanicsburg, PA
6K N32	NAVICP-P Philadelphia, PA
6L N35	NAVICP-M Mechanicsburg, PA
6M N35	NAVICP-M Mechanicsburg, PA
6P RAZ	NAVPRO (SPL-60), Sunnyvale, CA
6R N32	NAVICP-P Philadelphia, PA
6T N79	NMEF (Naval Mine Engineering Facility)
6V N52	NALC (Naval Aviation Logistics Center)
6X N35	NAVICP-M Mechanicsburg, PA
6Y N35	NAVICP-M Mechanicsburg, PA
7E N35	NAVICP-M Mechanicsburg, PA
7G N35	NAVICP-M Mechanicsburg, PA
7H N35	NAVICP-M Mechanicsburg, PA
7N N35	NAVICP-M Mechanicsburg, PA
7R N32	NAVICP-P Philadelphia, PA
7Z N35	NAVICP-M Mechanicsburg, PA
8A N21	NAVAIR/NAVSEA (Naval Air Systems Command/Naval Sea Systems Command)
8E N21	NAVAIR (Naval Air Systems Command)
8M N21	NAVAIR (Naval Air Systems Command)
8N N32	NAVICP-P Philadelphia, PA
8P R29	NAVPLANTECHREP, Sperry, Great Neck, NY
8S N24	NAVSEA (Naval Sea Systems Command)
8T N24	NAVSEA (Naval Sea Systems Command)
8U NCB	NAVICP-M Mechanicsburg, PA
8X R33	NAVPLANTECHREPO (SPA), Anaheim, CA
9A AKZ	ATAC (Army Tank-Automotive Command)
9C S9C	DSCC (Defense Supply Center Columbus)
9D S9T	DSCP (Defense Supply Center Philadelphia)

**COG/ROUTING  
IDENTIFIER****COGNIZANT ACTIVITY**

9E B17	Army Troop Support Command
9F FLZ	Warner-Robins Air Logistics Center, Robins AFB, GA
9G S9G	DSCR (Defense Supply Center Richmond)
9H B14	Army Armament Command
9I FGZ	Ogden Air Logistics Center, Hill AFB, UT
9J FHZ	Oklahoma Air Logistics Center, Tinker AFB, OK
9K FFZ	Sacramento Air Logistics Center, McClellan AFB, CA
9L S9M	DSCP (Defense Supply Center Philadelphia)
9M S9S	DSCP (Defense Supply Center Philadelphia)
9N S9E	DSCC (Defense Supply Center Columbus)
9O MAB	Marine Corps Logistics Base, Atlantic, Albany, GA
9P G13	National Weather Service
9Q GSA	Appropriate General Services Administration (GSA) Regional Office
9S B64	Army Missile Command, Redstone Arsenal, AL
9T G69	Federal Aviation Administration
9V FPZ	San Antonio Air Logistics Center, Kelly AFB, TX
9W B17	Army Troop Support and Aviation Material Readiness Command
9X S9F	DESC (Defense Energy Support Center)
9Y B16	U. S. Army Electronics Command
9Z S91	DISC (Defense Industrial Supply Center)

## UNIT OF ISSUE CODES

Note: Those terms preceded by an asterisk (\*) require a quantitative expression.

CODE	TERM	DEFINITION
<b><u>A</u></b>		
AM	*Ampoule	A small glass or plastic tube sealed by fusion after filling
AT	Assortment	A collection of a variety of items that fall into a category or class packaged as a small unit constituting a single item of supply. Use only when the term "assortment" is a part of the item name.
AY	Assembly	A collection of parts assembled to form a complete unit, constituting a single item of supply, e. g., hose assembly. Use only when the term "assembly" is part of the item name.
<b><u>B</u></b>		
BA	*Ball	A spherical-shaped mass of material such as twine or thread
BD	*Bundle	A quantity of the same item tied together without compression.
BE	*Bale	A shaped unit of compressible materials bound with cord or metal ties and usually wrapped, e. g., paper and cloth rags.
BF	Board Foot	A unit of measure for lumber equal to the volume of a board 12" X 12" X 1"
BG	*Bag	A flexible container of various sizes and shapes which is fabricated from such materials as paper, plastic or textiles. Includes "sack" and "pouch".
BK	*Book	A book-like package, such as labels or tickets, fastened together along one edge, usually between protective covers.
BL	*Barrel	A cylindrical container, metal or wood, with sides that bulge outward and flat ends or heads of equal diameter. Includes "keg".
BO	*Bolt	A flat fold of fabric having a stiff paperboard core.
BR	*Bar	A solid piece or block of various materials, with its length greater than its other dimensions, e. g., solder. Not applicable to items such as soap, beeswax, buffing compound.
BT	*Bottle	A glass plastic or earthenware container of various sizes, shapes and finishes such as jugs but excluding jars, ampoules, vials and carboys, with a closure for retention of contents.
BX	*Box	A rigid, three-dimensional container of various sizes and material. Includes "case", "carton", "tray", and "crate".
<b><u>C</u></b>		
CA	*Cartridge	Usually a tubular receptacle containing loose or pliable material and designed to permit ready insertion into an apparatus for dispensing the material. Usually associated with adhesives and sealing compounds.

<b>CODE</b>	<b>TERM</b>	<b>DEFINITION</b>
CB	*Carboy	A heavy duty, bottle-like container used for transportation and storage of liquids. Usually designed to be encased in a rigid protective outer container for shipment.
CD	Cubic Yard	A unit of cubic measure.
CE	*Cone	A cone-shaped mass of material wound on itself such as twine or thread, wound on a conical core.
CF	Cubic Foot	A unit of cubic measure.
CK	*Cake	A block of compacted or congealed matter. Applicable to such items as soap, buffing compound.
CL	*Coil	An arrangement of material such as wire, rope and tubing wound in a circular shape.
CN	*Can	A rigid receptacle made of fiber, metal, plastic or a combination thereof. Cans may be cylindrical or any number of irregular shapes. Restricted to items which cannot be issued in less than container quantity. Includes "pail" and "canister". Do not use when the packaged quantity equates to a unit of measure, i. e., pint, quart, gallon, ounce, pound.
CO	*Container	A general term for use only when an item is permitted to be packaged for issue in optional containers, e. g., bottle or tube for a single National Stock Number.
CS	Case	A box or receptacle for holding items. Intra-Navy use only for 9M cognizance items.
CT	Carton	A cardboard box or container. Intra-Navy use only for 9M cognizance items.
CY	*Cylinder	A rigid, cylindrical, metal container designed as a portable container for storage and transportation of compressed gasses, generally equipped with protective valve closure and pressure relief safety device.
CZ	Cubic Meter	A unit of cubic measure expressed in the metric system of measurement. Limited in application to locally assigned stock numbers used in the local procurement of items such as ready-mix concrete and asphalt in oversea areas where the metric system prevails.
<b><u>D</u></b>		
DR	*Drum	A cylindrical container designed as an exterior pack for storing and shipping bulk materials, e. g., fuels, chemicals, powders, etc. Drums may be made of metal, rubber, polyethylene or plywood, or fiber with wooden, metal or fiber ends.
<b><u>E</u></b>		
EA	Each	A numeric quantity of one item of supply. Do not use if a more specific term applies, such as kit, set, assortment, assembly, group, sheet, plate, strip or length.

<b>CODE</b>	<b>TERM</b>	<b>DEFINITION</b>
<b><u>F</u></b>		
FT	Foot	Unit of linear measurement, sometimes expressed as "linear foot".
FV	Five	Five of an item.
FY	Fifty	Fifty of an item
<b><u>G</u></b>		
GL	Gallon	Unit of liquid measurement.
GP	Group	A collection of related items issued as a single item of supply, e. g., test set group. Use only when the term "group" is part of the item name.
GR	Gross	One hundred forty-four (144) of an item.
<b><u>H</u></b>		
HD	Hundred	One hundred (100) of an item.
HK	*Hank	A loop of yarn or roping, containing definite yardage, e. g., cotton, 840 yards; worsted, 560 yards. See "skein" for comparison.
<b><u>I</u></b>		
IN	Inch	Unit of linear measurement, equivalent to 1/12 of a foot and sometimes expressed as "linear inch".
<b><u>J</u></b>		
JR	*Jar	A rigid container having a wide mouth and often no neck, typically made of earthenware or glass. Excludes "bottle".
<b><u>K</u></b>		
KT	Kit	A collection of related items issued as a single item of supply, such as the tools, instruments, repair parts, instruction sheets and often supplies typically carried in a box or bag. Also includes selected collections of equipment components, tools, and/or materials for the repair, overhaul, or modification of equipment. Use only when the term "kit" is a part of the item name.
<b><u>L</u></b>		
LB	Pound	A unit of weight measure equivalent to 16 ounces.
LG	*Length	Term applies to items issued in fixed or specific linear measurement, without deviation. This term no longer applies to random lengths which will be expressed in definitive units of linear measure such as foot or yard. Excludes "strip".
LI	Liter	A unit of liquid measure expressed in the metric system of measurement.
<b><u>M</u></b>		
MC	Thousand Cubic Feet	A unit of cubic measure expressed in one thousand (1,000) increments.

<b>CODE</b>	<b>TERM</b>	<b>DEFINITION</b>
MR	Meter	A unit of linear measure expressed in the metric system of measurement, equivalent to 39.37 inches. Limited in application to locally assigned stock numbers used in the local procurement of items such as pipe, lumber, tubing and hose in oversea areas where the metric system prevails.
MX	Thousand	One thousand (1,000) of an item.
<b><u>O</u></b>		
OT	Outfit	A collection of related items issued as a single item of supply, such as the tools, instruments, materials, equipment, and/or instruction manual(s) for the practice of a trade or profession or for carrying out a particular project or function. Use only when the term "outfit" is a part of the item name.
OZ	Ounce	A unit of liquid or avoirdupois weight.
<b><u>P</u></b>		
PD	*Pad	Multiple sheets of paper that are stacked together and fastened at one end by sealing.
PG	*Package	A form of protective wrapping for two or more of an item of supply. To be used only when a unit of measure or container type term is not applicable. Includes "envelope".
PK	Pack	A group or pile of related items. Intra-Navy use only for 9M cognizance items.
PR	Pair	Two similar corresponding items, e. g., gloves, shoes, bearings; or items integrally fabricated of two corresponding parts, e. g., trousers, shears, goggles.
PT	Pint	A unit of liquid or dry measure.
PZ	*Packet	A container used for subsistence items. Use only when "food packet" is part of the item name (Federal Supply Group [FSG] 89).
<b><u>Q</u></b>		
QT	Quart	A unit of liquid or dry measure.
<b><u>R</u></b>		
RA	Ration	The food allowance of one person for one day. Use only when "ration" (FSC 8970) is part of the item name.
RL	*Reel	A cylindrical core on which a flexible material, such as wire or cable, is wound. Usually has flanged ends.
RM	Ream	A quantity of paper varying from 480 to 516 sheets, depending on grade.
RO	*Roll	A cylindrical configuration of flexible material which has been rolled on itself such as textiles, tape, abrasive paper, photosensitive paper and film, and may utilize a core with or without flanges.
<b><u>S</u></b>		
SD	*Skid	A pallet-like Platform consisting of a load-bearing area fastened to

<b>CODE</b>	<b>TERM</b>	<b>DEFINITION</b>
		and resting on runner type supports.
SE	Set	A collection of matched or related items issued as a single item of supply, i. e., tool sets, instrument sets, and matched sets. Use Only when the term "set" is a part of the item name.
SH	Sheet	A flat piece of rectangular-shaped material of uniform thickness that is very thin in relation to its length and width, such as metal, plastic, paper, and plywood. Use of this term is not limited to any group of items or FSCs. However, it will always be applied when "sheet" is used in the item name to denote shape, e. g., aluminum alloy sheet, except items in FSC 7210.
SK	Skein	A loop of yarn 120 yards in length, usually wound on a 54-inch circular core. See "hank" for comparison.
SL	*Spool	A cylindrical form with an edge or rim at each end and an axial hole for a pin or spindle on which a flexible material such as thread or wire is wound.
SO	Shot	A unit of linear measurement, usually applied to anchor chain; equivalent to 15 fathoms (90 ft).
SP	*Strip	A relatively narrow, flat length of material, uniform in width, such as paper, wood, and metal. Use only when the term "strip" is part of the item name.
SX	*Stick	Material in a relatively long and slender, often cylindrical form for ease of application or use, e. g., abrasives.
SY	Square Yard	A unit of square measure (area).
<b><u>T</u></b>		
TI	Tin	A box, can, pan, vessel, or sheet made of tinplate.
TN	Ton	The equivalent of 2,000 lbs. Includes short ton and net ton.
TO	Troy Ounce	A unit of troy weight measure, based on 12 ounce pound, generally applied to weights of precious metals.
TU	*Tube	Normally a squeeze-type container, most commonly manufactured from a flexible type material and used in packaging toothpaste, shaving cream and pharmaceutical products. Also applicable as form around which items are wound, such as thread. It is not applicable to mailing tube, pneumatic tube, or cylindrical containers of a similar type.
<b><u>V</u></b>		
VI	*Vial	A small glass container, generally less than an inch in diameter. Vials are flat-bottomed and tubular in shape and have a variety of neck finishes.
<b><u>Y</u></b>		
YD	Yard	A unit of linear measure, equivalent to 3 feet and sometimes expressed as "linear yard".