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NAVAL SEA SYSTEMS COMMAND
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IN REPLY REFER TO
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Ser 04X/284
18 Sep 2018

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

Subj: INDUSTRIAL SHIP SAFETY MANUAL FOR SUBMARINES,
S9002-AK-CCM-010/6010; ISSUANCE OF REVISION LEVEL 1

Ref: (a) Naval Sea Systems Command Manual S9002-AK-CCM
-010/6010 Rev. 00
(b) Naval Sea Systems Command Manual 0905-485-6010,
Control of Testing and Ship Conditions
(c) Naval Sea Systems Command Manual 9092-AC-ADM-010,
Industrial Test Program Administration
(d) Naval Sea Systems Command ltr 4730 Ser 04X/080 of 9
May 06

Encl: (1) INDUSTRIAL SHIP SAFETY MANUAL FOR SUBMARINES,
S9002-AK-CCM-010/6010

1. Purpose. This letter issues the major rewrite of the new Industrial Ship Safety Manual for Submarines.

2. Discussion.

a. Enclosure (1) supersedes reference (a). Reference (b) is not cancelled due to the inability to implement reference (c) in the short term at private shipyards. The long term goal is to have private sector implement reference (c) and enclosure (1), and only then cancel reference (b).

b. The interpretation issues and expectations have been clarified, and standardized procedures have been incorporated into this revision.

c. Enclosure (1) will be hosted electronically at <https://www.submepp.csd.disa.mil/JFMM/index.htm> and at <https://mercury.tdmis.navy.mil>. Naval Systems Data Support Activity (NSDSA) is also providing initial distribution for new publications and revisions via Compact Disk(s) to all ships on a monthly basis.

Subj: Subj: INDUSTRIAL SHIP SAFETY MANUAL FOR SUBMARINES,
S9002-AK-CCM-010/6010; ISSUANCE OF REV LEVEL 1

3. Action.


a. Naval Shipyards. Replace reference (a) with enclosure (1) in its entirety.

b. Private Shipyards. The action taken by this manual rewrite is considered by Naval Sea Systems Command (NAVSEA) to be within the scope of existing contracts, and no change in contract delivery or completion dates or in current negotiated price or amount of any Government contract is authorized. If the Contractor considers that implementation of this manual rewrite requires a contract change, the Contractor should not implement such part but should promptly, and in any event within 30 days of receipt of this manual rewrite, notify the Contracting Officer in writing via the Supervisor of Shipbuilding of the facts and reasons for considering that a contract change is required. In addition to revising local instructions, contractors are requested to review all NAVSEA approved documents under their cognizance and determine if changes are needed to fully implement this manual rewrite. Changes to NAVSEA approved documents should be recommended to this contract change where the base document is used.

c. Request the Joint Fleet Maintenance Manual Manager at SUBMEPP and the NSDSA update applicable sites with this new manual, and NSDSA include it on the next edition of Monthly Ship Initial Distribution CD-ROMs. The electronic file will be emailed/uploaded separately.

4. Implementation. Naval shipyards shall implement the changed requirements within three months of receipt of this letter.

5. The Engineering Manager for the Industrial Ship Safety for Submarines and the Control of Testing and Ships Conditions is Mr. Bill Gembach, SEA 04X6, at (202) 781-4345 or William.gembach@navy.mil.


P. T. COLAHAN
By direction

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S9002-AK-CCM-010/6010; ISSUANCE OF REV LEVEL 1

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REVISION 01

NAVSEA TECHNICAL PUBLICATION

INDUSTRIAL SHIP SAFETY MANUAL FOR SUBMARINES



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NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET					1 of 18
Certification Applies to: New Manual <i>/</i> Revision 1 Change <i>/</i>					
Applicable TMINS/Pub. No. NAVSEA S9002-AK-CCM-010/6010					
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<i>Continue on reverse side or add pages as needed.</i>					
CERTIFICATION STATEMENT					
This is to certify that responsible NAVSEA activities have revised the above identified document for acquisition compliance, technical coverage, and printing quality. This form is for internal NAVSEA management use only, and does not imply contractual approval or acceptance of the technical manual by the Government, nor relieve the contractor of any responsibility for delivering the technical manual in accordance with the contract requirement.					
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NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

2 of 18

CHANGES AND REVISIONS:

Appendix A – Removed Appendix A from the List of Effective Pages.

List of Effective Pages: Updated page numbers.

Table of Contents: Updated page numbers and added Chapter II Attachment (1).

References – Updated reference (b) with the words, “or the NAVSEA approved test program administration requirements invoked by contract.” Current submarine building contracts do not invoke the ITPAM.

References – Delete reference (f) and update with new reference.

References – Updated reference (f) with the words, “or private shipyard equivalent.” Current submarine building and CNO availability contracts do not invoke NAVSEA TL855-AA-STD-010, Naval Shipyard Quality Program Manual on private shipyards.

References – Updated reference (g) to correct administrative error.

References – Renamed reference (p) to reference (m) to align references in the order they appear in this manual.

References – Renamed new reference (m) as NAVSEA T9041-AA-MAN-010/INACTSSO/AS/YRR, Maintenance Manual For Inactive Nuclear Powered Ships and Nuclear Support Ships and Service Craft.

References – Added new reference (p): NAVSEA S0570-AC-CCM-010/8010, Industrial Ship Safety Manual for Fire Prevention and Response. Corrected paragraphs 3.1.1, 3.1.2, and 3.1.4 to indicate new reference (p).

Chapter 1 – Paragraph 1.1 rearranged and edited for clarity and clarification. Deleted “...or requires interface with reactor plant work and testing” because reactor plant work and testing may affect Ship Safety but not all work or testing that interfaces with the reactor plant affects Ship Safety. Added inactivation and recycling to the list of availabilities. Deleted Submarine NR-1 requirements, as it has been inactivated.

Chapter 1 – Revised paragraph 1.2.1 as naval shipyards do not have “contracts” and private shipyard contracts use the Availability Work Package as a top tier specification. Added who makes the determination to invoke the requirements early.

Chapter 1 – Revised paragraphs 1.2.2 and 1.2.3, Ship Conditions and High Risk Evolutions are inclusive within Ship Safety.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

3 of 18

CHANGES AND REVISIONS:

Chapter 1 - Added to paragraph 1.2.4. Not all contracts in place for submarine construction, overhaul, conversion, or repair invoke reference (b). If reference (b) is not contractually invoked, then a contractually invoked NAVSEA approved test program shall be used and interface with the ship safety requirements of this revision of the 6010.

Chapter 1 – Revised paragraph 1.3, Combat Systems, to align the definition consistent with C3I and C4I definition which is used on newer classes of submarines.

Chapter 1 – Revised paragraph 1.3, Combat Systems Office (CSO), to make it consistent with Combat Systems (CS).

Chapter 1 – Revised paragraph 1.3, Delete Combat Systems Office (CSO) definition.

Chapter 1 – Revised paragraph 1.3, Modify Combat Systems (CS) definition.

Chapter 1 – Revised paragraph 1.3, added EPD Representative as the third member of the SSC and JTG to replace the NSRO member.

Chapter 1 – Deleted ‘Daily Test Schedule’ from paragraph 1.3 as it no longer applies.

Chapter 1 – Added Fire Safety Council (FSC) to paragraph 1.3.

Chapter 1 – Added HM&E acronym to paragraph 1.3 HULL, MECHANICAL AND ELECTRICAL

Chapter 1 – Revised paragraph 1.3, (CS) acronym to be consistent throughout the manual.

Chapter 1 – Deleted ‘Hull, Propulsion, and Auxiliaries’ from paragraph 1.3 as it no longer applies.

Chapter 1 – Revised paragraph 1.3, In-commission, to correct and expand the definition.

Chapter 1 – Revised paragraph 1.3, In-service, to correct and expand the definition.

Chapter 1 – Revised paragraph 1.3, List of Authorized Tests. Requirements for the LAT are addressed in the ITPAM.

Chapter 1 – Revised paragraph 1.3, Lead Maintenance Activity, to reference COMUSFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual (JFMM).

Chapter 1 – Revised paragraph 1.3, Maximum Calculated Draft (MCD) for clarification of which weight movements are applicable.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

4 of 18

CHANGES AND REVISIONS:

Chapter 1 – Revised paragraph 1.3, deleted NAVSEA Shipyard Representative's Officer (NSRO) due to disestablishment of the NSRO office.

Chapter 1 – Added NAVSEA 04X Shipyard Field Representative to paragraph 1.3.

Chapter 1 – Revised paragraph 1.3. Added the definition for Off-shipyard Coordinator (OSC) used in Chapter 5 and as a signature on the Sample SPOD.

Chapter 1 – Revised paragraph 1.3, Outside Activity (OA). AITs, FMAs etc. don't work FOR the LMA. They are contracted/tasked by PMR/AIT, MGR, or SUBFOR and work for their respective AIT Mgr or command.

Chapter 1 – Revised paragraph 1.3, Ship's Force, to provide definition to what "authority" can be delegated.

Chapter 1 – Revised paragraph 1.3, Simulated Waterborne Condition, for clarification through simplification and qualification that water is touching the hull.

Chapter 1 – Clarified paragraph 1.3, Tag-Out Users Manual, by adding the word, "proper."

Chapter 1 – Clarified paragraph 1.3, Technical Work Documents, verbiage.

Chapter 1 – Revised paragraph 1.3, Test Plan of the Day (TPOD). Added this term to define its use in this manual.

Chapter 1 – Revised paragraph 1.3, Test Program. Clarification that the Test Program is NAVSEA approved.

Chapter 1 – Revised paragraph 1.3, Waterline. Added and revised text to the definition of establishing the "Condition N" Waterline of paragraph 1.3. This manual currently defines but does not address the action of establishing the "Condition N" waterline. Past experience has shown that unplanned material failures have required ballasting the ship deeper than "Condition N." There are no discrete guidelines within the manual for requisite actions should it be required to ballast the ship deeper than the "Condition N" for the availability.

Chapter 1 – Editorial changes to paragraph 1.4.

Chapter 1 – Updated the reference in paragraph 1.5.

Chapter 1 – Revised the definition of Waterline.in paragraph 1.6.

Chapter 2 – Editorial changes to paragraphs 2.1, 2.2, 2.2.1.1, 2.2.1.2.[2], & [4], 2.2.2.1, 2.2.2.2.[2], [3], [4], [5] & [6], 2.2.3.1, 2.2.3.2.[2], [3], [6] & [7], 2.2.6.1, 2.2.6.2, 2.2.6.4.[2] &

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

5 of 18

CHANGES AND REVISIONS:

[4], 2.3.1, 2.3.2, 2.3.4, 2.4.1, 2.4.2, 2.5.1, 2.6.1, 2.6.4.1, 2.6.4.2, 2.6.4.3.1.[3] & [8], 2.6.4.3.2.[6], 2.6.4.6.[1] [d], [1].[f], [1].[g], [1].[h] & [3].[a], 2.6.4.7, and 2.6.5.

Chapter 2 – Revised paragraph 2.2.2.1. Renamed equivalent Operations Manager to Senior Shipyard Official in private shipyards. Organization breakdown structure at private shipyards is different. SSO's may not be assigned to the equivalent of the Operations Officer in private shipyards. Deleted reference to NSRO and added NAVSEA 04X Shipyard Field Representative. Inserted 'naval shipyards' after NAVSEA 04X Shipyard Field Representative because the NAVSEA 04X Shipyard Field Representative is not assigned to private shipyards. Replaced 'NSA' with 'SUPSHIP/RMC' to specify the activity rather than authority. Finally, added "if assigned (when a naval shipyard is the LMA)" after NAVSEA 04X Shipyard Field Representative.

Chapter 2 – Updated the reference in paragraph 2.2.2.2.[1].

Chapter 2 – Updated the reference in paragraph 2.2.2.2.[2].

Chapter 2 – Revised paragraph 2.2.2.2.[7], clarified guidance for SSW Log review.

Chapter 2 – Revised paragraph 2.2.2.2.[8], interjected the words, "Ship's Force Duty Officer" as an additional contact point.

Chapter 2 – Deleted from paragraph 2.2.3.1, "When assigned, the SSS is expected to inspect the ship at least twice on the shift assigned. The SSS should not be assigned to more than one submarine concurrently, unless their assigned ships are undergoing short availabilities where testing would permit such an assignment". The paragraph was changed back to the previous version of this manual.

Chapter 2 – Revised paragraph 2.2.3.1 to include 04X SFR to distribution.

Chapter 2 – Revised paragraph 2.2.3.1 to be consistent with 2.2.2.1

Chapter 2 – Added to paragraph 2.2.3.2.[1], duties for a backshift/weekend SSS to tour each waterborne ship at least once per shift assigned.

Chapter 2 – Added paragraph 2.2.3.2.[8] for the SSS to review SSW turnover logs/instructions for completeness, thoroughness, and accuracy; and initial next to the time for which the review took place.

Chapter 2 – Revised paragraph 2.2.4.1 to shift SSW general duties to the beginning of the paragraph for clarity. Grouped all shipyard SSW and Ship's Force SSW requirements together.

Chapter 2 – Revised paragraph 2.2.4.1 to be consistent with 2.2.2.1

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

__ 6 __ of __ 18 __

CHANGES AND REVISIONS:

Chapter 2 – Revised paragraph 2.2.4.2, made additional reference concerning SSW duties.

Chapter 2 – Added paragraph 2.2.5 to define duties and responsibilities of the EPD Representative. Renumbered follow on paragraphs.

Chapter 2 – Revised paragraph 2.2.5.1 to include NAVSEA 04X to be copied on the assignment of the EPD Representative.

Chapter 2 – Added clarification to paragraph 2.2.6.1 with the sentence, "When established, the SSC may be assigned the Fire Safety Council (FSC) duties and responsibilities set forth in reference (q)." to incorporate (NAVSEA 8010) new requirements.

Chapter 2 – Paragraph 2.2.6.2.(4) - Deleted NAVSEA Shipyard Representative's Office (NSRO) and replaced with EPD Representative.

Chapter 2 – Added Outside Activity Supervisors to paragraph 2.2.6.2. Outside Activities need to be engaged to ensure Ship Safety related evolutions under their cognizance are understood.

Chapter 2 – Added paragraph 2.2.6.5 to establish method for reporting disestablishment of SSC/FSC to NAVSEA 04X.

Chapter 2 – Revised paragraph 2.2.6.5 to add 04X SFR to distribution.

Chapter 2 – Deleted paragraph 2.3.2.1. The direction for JTG is now included in paragraph 2.4.2.e of S9092-AC-ADM-010/ITPAM, Industrial Test Program Administration Manual with the issuance of REV 02.

Chapter 2 – Revised paragraph 2.3.3.2 for clarification and correction.

Chapter 2 – Deleted "significant" from paragraph 2.3.3.3 and added, "...which affect Ship Safety."

Chapter 2 – Revised paragraph 2.3.4, replaced 'Shipyards' with 'the LMA shipyard'. Multiple shipyards may be assigned to work an availability. Only the LMA will manage the centralized Work Control Team.

Chapter 2 – Relocated Figure 2.1 under paragraph 2.5.1.

Chapter 2 – Revised Figure 2.1. Replaced NSRO with EPD Representative Naval Shipyards. Deleted Note 5 and placed the individual descriptions in the respective SUPSHIP and EPD Representative blocks.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

7 of 18

CHANGES AND REVISIONS:

Chapter 2 – Added to paragraph 2.6.4.2 more knowledge requirements for the SSS to capture major references that now contain prior 6010 requirements and references that support 6010.

Chapter 2 – Updated the reference in paragraph 2.6.4.2.

Chapter 2 – Deleted from paragraph 2.6.4.3.1.[6] “(Not applicable to ships with the Submarine Valve Regulated Lead Acid (SVRLA) battery)”. SVRLA batteries have 250 CFM minimum ventilation requirements while on service. The reference is Memorandum 9320 Ser 07T/0491 dated 05 Nov 2007.

Chapter 2 – Revised paragraph 2.6.4.3.1.2 to change to “firefighting”.

Chapter 2 – Revised paragraph 2.6.4.3.2 . Changed SF SSW training requirement from 30 calendar days to 45 calendar days prior to implementation of 6010 manual controls to allow more flexibility for completing training with current OPTEMPO constraints.

Chapter 2 – Expanded paragraphs 2.6.4.3.2.[1], [2], & [9] to include fire protection. Added, “Shipboard flooding prevention and control organization and control procedures” and “SPOD.” Fire protection is equally important as fire fighting. Flooding prevention and control is salient to SSW qualifications and familiarity with and understanding of the SPOD is required as part of watch standing duties.

Chapter 2 – Clarified paragraph 2.6.4.3.2 to specify calendar days as a requirement.

Chapter 2 – Added to paragraph 2.6.4.3.3 the words, “Ship’s Force”. As written would imply all SSWs would require refresher training. Shipyard SSW refresher training requirements are based on proficiency and not necessarily event based.

Chapter 2 – Clarified paragraph 2.6.4.3.3 to specify calendar days as a requirement.

Chapter 2 – Added paragraph 2.6.4.4 and renumbered follow on paragraphs to discuss EPD Representative qualification requirements.

Chapter 2 – Revised wording in paragraph 2.6.4.4 to be consistent with the rest of the manual.

Chapter 2 – Updated the reference in paragraph 2.6.4.5.

Chapter 2 – Added to paragraph 2.6.4.6.[1].[a], “...changes due to addition or removal of lead ballast or major equipment”, to specify other weight change possibilities.

Chapter 2 – Revised paragraph 2.6.4.6.[1].[d], Work Control Team, including duties and responsibilities to expand course coverage for work control to be similar to Ship Safety organization.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

8 of 18

CHANGES AND REVISIONS:

Chapter 2 – Revised paragraph 2.6.4.6.[1].[i], to clarify course requirements for personnel assigned to decommissioned ships.

Chapter 2 – Revised paragraph 2.6.4.6.[2].[a] to focus on class instruction related to Ship Safety.

Chapter 2 – Deleted paragraphs 2.6.4.6.[2].[b] & [2].[c]. The requirements in these two paragraphs are more specifically slanted toward an LTE (HM&E) and an LTE (W).

Chapter 2 – Revised paragraph 2.6.4.7 to include EPD Representative.

Chapter 2 – Updated the reference in paragraph 2.6.4.7.

Chapter 2 – Revised paragraph 2.6.4.8 to read, “OICs/Commanding Officers for In-service or In-commission ships.” Clarification that OICs of In-service submarines are responsible for maintaining records of Ship’s Force SSWs.

Chapter 2 – Added paragraph 2.6.4.8.[1] to specify that the NAVSEA 04X Shipyard Field Representative be invited to SSO boards.

Chapter 2 – Added to paragraph 2.6.4.9 requalification requirements for clarification.

Chapter 2 – Revised paragraph 2.2.4.9 to add 04X SFR to distribution.

Chapter 2 – Added paragraph 2.6.4.9.[5] to discuss EPD Representative requalification exam requirements.

Chapter 2 – Revised paragraph 2.6.4.10 to specify requalification requirements for disqualified personnel.

Chapter 2 – Updated the reference in paragraph 2.6.4.10.

Chapter 2 – Revised paragraph 2.6.4.11, added ‘shipyard SSW’ to the list of ‘Loans.’

Chapter 2 – Added to paragraph 2.6.5 the reference to private shipyards for clarification.

Chapter 2 – Added Attachment (1) to provide format for reporting disestablishment of SSC/FSC to NAVSEA 04X.

Chapter 3 – Editorial changes to paragraphs 3.2.1, 3.3.7.4.[1], 3.3.10, 3.3.10.[1], [2], [3], & [4], and 3.3.11.

Chapter 3 – Reformatted sub-paragraphs of 3.1.1 to conform to established manual format.

Chapter 3 – Revised paragraph 3.1.2. Reference (e) applicability is limited to CNO availabilities.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

9 of 18

CHANGES AND REVISIONS:

Chapter 3 – Revised paragraph 3.1.4. Reference (e) is not applicable to new construction whereas the detailed building specifications are applicable to new construction.

Chapter 3 – Revised paragraph 3.1.5 heading. The paragraph includes requirements for cold weather protection.

Chapter 3 – Revised paragraph 3.1.5, Cold Weather. Clarification of what needs to be protected against freezing weather.

Chapter 3 – Revised paragraph 3.1.5.[6]. Edited for clarity and provide focus on protecting the submarine. Changed “manning pump well/caissons” to an example of a method as not all docks have pump wells or caissons. Note this added requirement is redundant of paragraph 3.2.1.

Chapter 3 – Revised paragraph 3.1.5.[7], by adding a requirement to prevent ship’s systems and temporary systems from freezing.

Chapter 3 – Added to paragraph 3.1.7 “For In-service and In-commission submarines.” Providing a temporary AEB system during new construction is too costly. Added a broader scope to the temporary systems (e.g., SCBAs or temporary AEB system).

Chapter 3 – Revised paragraph 3.2.1. Edited for clarification that HRE criterion applies in dry dock also. Replaced ‘uncontrolled’ with more descriptive term and to clarify example given.

Chapter 3 – Reformatted sub-paragraphs of 3.2.1 to conform to established manual format.

Chapter 3 – Added to paragraph 3.2.1, (e.g., in-dock use of gravity fed, unvalved temporary seawater system supplies), to clarify which temporary systems are considered “un-isolable” to be consistent with pending TUM change to Appendix G for dry dock barrier criteria.

Chapter 3 – Revised paragraphs 3.2.1.[1] and 3.2.1.[2]. Isolation requirements should be based on medium, source, and end use rather than just mandated two-valve isolation.

Chapter 3 – Added new paragraph 3.3.1 for establishing the “Condition N” waterline. This manual currently defines but does not address the action of establishing the “Condition N” waterline. Past experience has shown that unplanned material failures have required ballasting the ship deeper than “Condition N.” Currently there are no discrete guidelines within the manual for requisite actions should it be required to ballast the ship deeper than the “Condition N” for the availability. Changes were made to align this paragraph to be more consistent with the Glossary of Terms – WATERLINE.

Chapter 3 – Revised the follow on paragraph numbers with the insertion of paragraph 3.3.1.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

10 of 18

CHANGES AND REVISIONS:

Chapter 3 – Added to paragraph 3.3.2 verbiage to clarify exceptions to double barrier protection and separate SSBN and SSN requirements.

Chapter 3 - Revised paragraph 3.3.2, the last sentence, to reflect the fact that Ship's Force may not have operational control of hull and backup valves on new construction submarines.

Chapter 3 – Revised paragraphs 3.3.2.2, 3.3.2.3, and 3.3.2.4.[2] by replacing 'Ship's Force' with 'the SSC'. For a ship in new construction, Ship's Force may not have operational control of the hull/backup valves and therefore the valve operability needs to be demonstrated to the SSC (shipyard, SUPSHIP, and Ship's Force).

Chapter 3 – Revised paragraph 3.3.2.5. Prior to In-service, the SUPSHIP is the government agent responsible for hull water tight integrity.

Chapter 3 – Revised paragraph 3.3.2.5. Added, "...Appendix G, for use of single barrier isolation in lieu of double barrier isolation." This wording was deleted from the previous version of the 6010. Current wording no longer defined what CO/OIC permission is being obtained and why.

Chapter 3 – Added clarification to paragraph 3.3.3.2. Added new sentences, to include Missile Tube Flood/Drain valves. Vertical Launch System (VLS) missile tubes do not have access doors but do have flood/drain and pressurization valves that, if left open, would result in flooding the ship's interior. Added an additional exception to the topside hatch requirements. The fly-through-diaphragm provides an adequate watertight barrier to prevent tube flooding.

Chapter 3 – Revised paragraph 3.3.3.3.[1].[b] to clarify this peculiar 'as built' condition as the USS JIMMY CARTER. Added, USS JIMMY CARTER (SSN-23) and USS North Dakota (SSN 784) and all follow on submarines of the VIRGINIA CLASS must have its free-flood structure dewatering capability or temporary equivalent available. The 784 and follow on submarines will have a large bathtub for two payload modules in lieu of VLS tubes. The freeflood grates for this bathtub are below N +4 and the bathtub is outfitted with temporary dewatering equipment for maintenance or replacement of the payload modules.

Chapter 3 – Added new paragraph 3.3.3.5 to address external cavity vents. Potential exists for uncontrolled draft increase due to flooding external topside recesses (e.g., VLS bathtub).

Chapter 3 – Reformatted sub-paragraphs of 3.3.5 to conform to established manual format.

Chapter 3 – Revised paragraphs 3.3.6.1. Added, "SPOD approval is required prior to adding or removing water from the Sonar Dome." Clarified the effects of the Sonar Dome in relation to ship's draft.

Chapter 3 – Revised paragraphs 3.3.6.2. Added, "Topside line lockers have been eliminated on current operational submarines. Virginia Class has cavity vents and drains that are open ended in

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

11 of 18

CHANGES AND REVISIONS:

the VLS bathtub which drains to the Sonar Dome.” More clearly defines the present day conditions.

Chapter 3 – Added to paragraph 3.3.7.1, the change in weight parameters for SSBN/SSGN, Seawolf Class, and Virginia Class submarines.

Chapter 3 – Changed paragraph 3.3.7.3 for clarification of bulkhead openings.

Chapter 3 – Revised paragraph 3.3.7.4 to clarify bilge alarm requirements. Installation and maintenance of a temporary bilge alarm system during new construction through In-service is too costly.

Chapter 3 – Deleted the word ‘trim’ from paragraph 3.3.8. The material in the sub paragraphs only speaks to List and Draft.

Chapter 3 – Revised paragraphs 3.3.8.2, 3.3.8.2.[2] & [3] to include the change in weight parameters for SSBN/SSGN, Seawolf Class, and Virginia Class submarines. Inserted additional clarification for weight changes.

Chapter 3 – Inserted new paragraph 3.3.8.3 on requirements to be met if MCD is allowed to exceed “Condition N” waterline. Past experience has demonstrated that certain material failures will require ballasting the ship deeper than ‘Condition N’.

Chapter 3 – Added to paragraph 3.3.8.4, “For In-service or In-commission ships, the OIC/ Commanding Officer,” to include new construction and decommissioning/inactivation phases.

Chapter 3 – Revised paragraphs 3.3.9.1, 3.3.9.2, 3.3.9.3, and 3.3.9.4. Changed dewatering capabilities and clarified that these values are the minimum requirements. SEA 05 has agreed that lower emergency dewatering requirements are needed for the current submarine fleet. Modified the beginning sentence of paragraph 3.3.9.2 to read, “If less than 500 GPM is started within three minutes...”

Chapter 3 – Revised paragraphs 3.3.9.3 and 3.3.9.4. Removed redundant wording stated in previous paragraphs.

Chapter 3 – Revised paragraph 3.3.9.4.[4] to allow for ship’s movement without an operational bilge alarm system.

Chapter 3 – Reworded paragraph 3.3.9.5 for clarification and qualification of prerequisites to relaxing the emergency dewatering system.

Chapter 3 – Reformatted sub-paragraphs of 3.3.10 to conform to established manual format.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

12 of 18

CHANGES AND REVISIONS:

Chapter 3 – Separated the ‘Drills’ section from the ‘Waterborne’ section into new paragraph 3.4 since fire drills are also accomplished in dry dock.

Chapter 3 – Clarified Initial Ship’s Force Training Drill, paragraph 3.4.2, for In-commission ships and within seven calendar days after acceptance of temporary damage control systems. Paragraph not applicable to new construction.

Chapter 3 – Revised ‘Fire Drills,’ paragraph 3.4.3 (old paragraph 3.3.10.3), to conform to new (NAVSEA 8010) requirements.

Chapter 3 – Revised ‘Flooding Drill,’ paragraph 3.4.4, to insert new construction requirements and differences. Added, “... and new construction”, to establish when flooding drills can be suspended during the new construction period.

Chapter 3 – Clarified paragraph 3.4.4 to specify calendar days as a requirement.

Chapter 3 – Revised paragraph 3.4.5 by referring to Attachment (2), “Drill Debrief/Grading” to Unsatisfactory Drills.

Chapter 3 – Clarified paragraph 3.4.5 to specify calendar days as a requirement.

Chapter 3 – Revised paragraph 3.4.6 to identify when Ship’s Force role is effective.

Chapter 3 – Revised paragraph 3.4.8 to ensure the CTE and SSO are engaged in the approval process. Defined the SSO’s role in the approval process.

Chapter 3 – Editorial and format changes to Attachment (1) and Attachment (2).

Chapter 3 – Attachment (1), added to paragraph 1, “The SSC shall be present at all drill briefs.” They are presently only required to be at the debrief.

Chapter 4 – Editorial changes to paragraphs 4.1, 4.2, 4.2.[1], 4.2.1, 4.3.1.[1], 4.3.2, 4.3.2.1.1.[6], 4.5, 4.5.[1], 4.5.[8], 4.6, 4.6.1.[1], 4.6.3, 4.8.2, and 4.8.2.[3], Attachment (2) 2.2.3, 2.2.3.[1], and 2.3.1.[b].

Chapter 4 – Reformatted sub-paragraphs of 4.2 to adjust for deletions and format changes.

Chapter 4 – Revised paragraph 4.2.[1] to include all work and testing. Clarification that all work and testing that affects Ship Safety should be listed on the SPOD.

Chapter 4 – Added to paragraph 4.2.[11] to include freeze protection.

Chapter 4 – Deleted paragraph 4.2.1. Requirements for the LAT are addressed in the ITPAM.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

___13___ of ___18___

CHANGES AND REVISIONS:

Chapter 2 – Revised paragraph SPOD APPROVAL to remove duplication of “as a minimum” use.

Chapter 4 – Added to paragraph 4.3.2 the process for new construction shipyards that are currently in use for Work Authorization.

Chapter 4 – Deleted from paragraph 4.3.2.1.1 [3], “...uncontrolled constant fluid supply,” as it is mentioned in paragraph 4.3.2.1.1.[6].

Chapter 4 – Added to paragraph 4.3.2.1.1.[5] systems that may impact fire/flooding prevention/control.

Chapter 4 – Added to paragraph 4.3.2.1.1.[6], “...including un-isolable continuous flow fluid systems as described in paragraph 3.2.1.”

Chapter 4 – Revised paragraphs 4.3.2.1.1.[7], [8], and [9] to add work affecting Ship Safety that is not currently listed or defined and include the change in weight parameters for SSBN/SSGN, Seawolf Class, and Virginia Class submarines.

Chapter 4 – Revised paragraphs 4.3.2.1.1. Added sub-paragraph 10, Work or testing on a sea connected system that is beyond the requirements of the Ship System Manual normal operating procedures, where the work is protected by mechanical or electrical interlocks. Interlocks provide adequate protection when the system is operated per approved SSM operating procedures however when the system is being worked or tested beyond the requirements of the SSM then the possibility exists that the interlocks may not be adequate.

Chapter 4 – Revised paragraphs 4.3.2.1.1. [7], [8], [9], and [10], Added, the caveat, “...when the ship is waterborne or in a simulated waterborne condition.”

Chapter 4 – Revised paragraph 4.3.2.2 to clarify acceptance to specify Operational Control Transfer. Replaced LTE with Work Control representative. Clarified that SSC approval of Ship Safety WAFs is not required until just prior to float off. Also replaced the last sentence with, “New construction shipyards may use a work authorizing document which, as a minimum, fulfills the requirements for a WAF contained in reference (g). ” JFMM WAFs are not used during construction and PSA.

Chapter 4 – Added to paragraph 4.4.1, NAVSEA approved test program administration requirements as invoked by the applicable new construction contracts. New construction building specifications follow the program’s Test and Evaluation Master Plan (TEMP) which is more detailed than reference (b).

Chapter 4 – Clarified High Risk Evolutions in paragraphs 4.5.[3], [4], [5], [6], & [10].

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

14 of 18

CHANGES AND REVISIONS:

Chapter 4 – Revised paragraph 4.5.5 acronym for AEOG.

Chapter 4 – Revised paragraph 4.6 to reflect new construction attributes as well as In-commission ships. It was focused on commissioned ships and did not cover new construction attributes.

Chapter 4 – Added to paragraph 4.6.1.[4], "...when battery is in service," and deleted reference to SVRLA battery. Per SEA07T ser 491 dtd 5 Nov 2007 letter paragraph 2.b states, "SVRLA batteries require ventilation for cooling purposes. 250 CFM is required when the battery is on service and 1000 CFM if in unrestricted operations." To prevent overheating and resultant failure of the battery, the SSW should continue to status battery ventilation.

Chapter 4 – Added to paragraph 4.6.1.[5], the change in weight parameters for SSBN/SSGN, Seawolf Class, and Virginia Class submarines.

Chapter 4 – Added to paragraph 4.6.2 the word, "WATCH/" to clarify applicability to Ship's Force as well as shipyard SSWs. Shift length is variable depending on location and demands.

Chapter 4 – Added to paragraph 4.6.2.[1], "...seals intact and no visible damage," for fire extinguishers. Provide condition attributes that need to be checked.

Chapter 4 – Added to paragraph 4.6.2.[2] the words, "top hat/" to provide for clarification of colloquial terms.

Chapter 4 – Added to paragraph 4.6.3 the words, "REPORTED AND/". These issues need to be reported primarily so corrective action can be taken.

Chapter 4 – Revised paragraph 4.6.4 for SSW Log reviews. Ship's Duty Officer or Duty Chief Petty Officer reviews are only applicable when Ship's Force is standing the watch.

Chapter 4 – Revised paragraph 4.7 references as private shipyards do not use uniform industrial process instructions.

Chapter 4 – Added to paragraph 4.8.2.[2], statement for NAVSEA approved test program administration requirements as invoked by the applicable new construction contracts. New construction test programs are contained in the detailed building specifications as prescribed by the Program Manager's Test and Evaluation Master Plan (TEMP). In most cases the TEMP is more detailed than reference (b).

Chapter 4 – Attachment (1) – Added list column to Total Draft (List) Changes, Actual Draft (List), and Maximum Calculated Draft (List). Added table to list 1st and 2nd Ship Safety Council Alternates and contact information. Replaced NSRO with EPD Representative in three places.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

15 of 18

CHANGES AND REVISIONS:

Chapter 4 – Attachment (1) page 2 & 3 – Changed categories to reflect specific paragraphs in manual. Added paragraph numbers in parenthesis.

Chapter 4 – Attachment (2) removed from paragraph 2.1.1, "...or customized SSW logs."

Chapter 4 – Attachment (2), revised paragraph 2.2.3.[m] to include the ICS system on Virginia Class submarines.

Chapter 4 – Attachment (2), added to paragraph 2.2.3.[o], "...or ship's Emergency Announcing System (MC)".

Chapter 4 – Attachment (2), deleted from paragraph 2.2.3.[s], the reference to SVRLA battery. Per SEA07T ser 491 dtd 5 Nov 2007 letter paragraph 2.b states, "...SVRLA batteries require ventilation for cooling purposes. 250 CFM is required when the battery is on service and 1000 CFM if in unrestricted operations." To prevent overheating and resultant failure of the battery the SSW should continue to status battery ventilation.

Chapter 4 – Attachment (2), revised paragraph 2.2.3.[x]. Replaced the word 'security' with the word 'status'. If the Sonar Dome is supposed to be open and pumped, then it is not secure.

Chapter 4 – Attachment (2), deleted from paragraph 2.2.3.[z], the word "Duty Chief" and added the word "EDO."

Chapter 4 – Attachment (2), deleted from paragraph 2.2.3.[bb] the word "Duty Officer," added the words "...SDO and/or EDO" and the change in weight parameters for SSBN/SSGN, Seawolf Class, and Virginia Class submarines.

Chapter 4 – Attachment (2), deleted paragraph 2.2.3.[ee], "Equipment damage and/or missing equipment protection."

Chapter 4 – Attachment (2), added to paragraph 2.2.5 the words, "...and/or EDO."

Chapter 4 – Attachment (2), paragraph 2.2.6, replaced the word, "Duty Chief" with the words, "...SDO and/or EDO".

Chapter 4 – Attachment (2) (Sample SSW Log) – deleted 'Kickboards' from Note (C) for waterborne ships. Kickboards were designed for and are only effective in dry dock.

Chapter 4 – Attachment (2) (Sample SSW Log) added a 'REMARKS' section at the bottom of the log.

Chapter 5 – Editorial changes to paragraphs 5.1.1, 5.1.3, 5.2.1, 5.2.2.1, 5.2.3, 5.2.6, 5.2.7, 5.4.1, 5.4.2, 5.5.2.[3], 5.5.3, and 5.5.6.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

16 of 18

CHANGES AND REVISIONS:

Chapter 5 – Revised paragraph 5.1.3 to be consistent with the rest of the manual.

Chapter 5 – Revised paragraph 5.2.2.1 concerning an alternate SSO. An alternate SSO should be at the option of the LMA.

Chapter 5 – Updated the reference in paragraph 5.2.2.1.

Chapter 5 – Revised paragraph 5.2.2.3 to clarify SSW requirements. Inport watch standers need to be trained and qualified in order to fulfill the requirements of this manual.

Chapter 5 – Revised paragraph 5.2.2.4 for clarification. NSRO is disestablished and SUPSHIP is a required SSC member.

Chapter 5 – Updated the reference in paragraph 5.2.2.4.

Chapter 5 – Revised paragraph 5.2.2.6 to include TYCOM/ISIC Availability Off-shipyard Coordinator (OSC) and Ship's Force are responsible for fleet maintenance activity (FMA) work.

Chapter 5 – Revised paragraph 5.2.3 by updating references and including Outside Activities. These are editorial and clarification changes that Outside Activities must comply with this manual too.

Chapter 5 – Revised paragraph 5.2.4 to require the OSC to keep the LMA apprised of authorized non-LMA/non-AIT work and testing.

Chapter 5 – Relocated Figure 5.1 under paragraph 5.2.6.

Chapter 5 – Revised Figure 5.1 Note 1, SUPSHIP is a required member. Replace NSRO with EPD Representative.

Chapter 5 – Added new paragraph heading 5.3 and 5.3.1, 'PREVENTION AND CONTROL OF FIRE,' public and private off-yard availabilities.

Chapter 5 – Changed paragraph 5.4 and follow on paragraph numbering due to inserting the new paragraph.

Chapter 5 – Revised paragraph 5.4.2. Inserted, "...and paragraph 3.4." which was inadvertently removed. Replaced the last sentence with, "For those CNO scheduled off-yard availabilities the waterline shall be established per paragraph 3.3.1." Paragraph 3.3.1 has been modified to the point that Naval Architects can use the most recent reference trim dive to establish the Waterline.

Chapter 5 – Revised paragraph 5.5.1. Deleted the word 'Coordinator'. LMA Coordinator is undefined.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

17 of 18

CHANGES AND REVISIONS:

Chapter 5 – Changed paragraph 5.5.2.[2], replaced the word, “...conditions” with “...safety.”

Chapter 5 – Revised paragraph 5.5.2.[5], corrected the referenced paragraph numbering.

Chapter 5 – Revised paragraph 5.5.6 to replace “HES” to “HRE”

Chapter 6 – Editorial changes to paragraphs 6.1.1, 6.1.2, 6.1.3, 6.2.1, 6.2.3, 6.2.5, 6.3.3.6, 6.3.3.10, 6.4.1, 6.4.3, 6.4.5, 6.4.6, and 6.4.7.

Chapter 6 – Removed “...storage following inactivation,” from paragraph 6.1.1 as it is covered by reference (n).

Chapter 6 – Added to paragraph 6.1.2 the words, “... during inactivation and/or recycling availabilities, except as noted,” for clarification.

Chapter 6 – Added to paragraph 6.1.2, “This chapter does not apply to removal of tow equipment following tow from inactivating shipyard (if applicable) and storage following inactivation.” Removal of tow equipment prior to placing it in long term storage does not require added controls of this manual since ship conditions are not affected.

Chapter 6 – Updated paragraph 6.2.2 to remove NSRO from SSC membership. The CTE is already required to be on the SSC once crew turnover occurs. A two person SSC is sufficient due to the minimal amount of ship’s conditions related evolutions that occur between crew release and boat tow.

Chapter 6 – Updated the references in paragraph 6.2.2.

Chapter 6 – Added new paragraph 6.2.4 specifying qualification requirements for a CTE assigned to a decommissioned submarine. These qualifications are currently not addressed in this chapter.

Chapter 6 – Renumbered paragraph from 6.2.4 to 6.2.5.

Chapter 6 – Updated Figure 6-1 to remove NSRO from SSC membership. Removed Note 2 and renumbered Note 3.

Chapter 6 – Reformatted sub-paragraphs of 6.3.3 to conform to established manual format.

Chapter 6 – Updated the references in paragraphs 6.3.2, 6.3.3.1, 6.3.3.2.[1] & [2], 6.3.3.3.[a], 6.3.3.5, 6.3.3.7, and 6.3.3.8.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

18 of 18

CHANGES AND REVISIONS:

Chapter 6 – Modified numbering convention in paragraph 6.3.3.2 (3) to be consistent with reference.

Chapter 6 – Added to paragraph 6.3.3.4 the change in weight parameters for SSBN/SSGN, Seawolf Class, and Virginia Class submarines.

Chapter 6 – Clarified paragraph 6.3.3.7 to specify calendar days as a requirement.

Appendix A – Deleted Appendix A. Any reference to Submarine NR-1 no longer applies.

LIST OF EFFECTIVE PAGES

	PAGES	REV	CHANGE #
Cover Sheet	---	01	Original
Certification Sheet	i thru xviii	01	Original
List of Effective Pages	xix	01	Original
Record of Changes	xxi	01	Original
Table of Contents	xxiii thru xiv	01	Original
List of Illustrations	xxv	01	Original
Chapter I	1-1 thru 1-6	01	Original
Chapter II	2-1 thru 2-16	01	Original
Chapter III	3-1 thru 3-16	01	Original
Chapter IV	4-1 thru 4-18	01	Original
Chapter V	5-1 thru 5-6	01	Original
Chapter VI	6-1 thru 6-8	01	Original
TMDER	Last Page	-	-

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RECORD OF CHANGES

CHANGE NO.	DATE OF CHANGE	TITLE OR BRIEF DESCRIPTION	ENTERED BY (INITIALS)

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TABLE OF CONTENTS

CHAPTER	PAGE
I GENERAL/REFERENCES	1-1
1.1 Purpose	1-1
1.2 Scope	1-1
1.3 Glossary of Terms/Acronyms Used	1-2
1.4 Responsibilities	1-6
1.5 Change Procedures	1-7
II ORGANIZATIONAL REQUIREMENTS AND PERSONNEL QUALIFICATIONS	2-1
2.1 General	2-1
2.2 Ship Safety Organization	2-1
2.3 Ship Test Organization	2-7
2.4 Relationship to Shipyard Production Organization	2-7
2.5 Summary of Organizational Relationships	2-8
2.6 Training and Qualification Requirements	2-10
Attachment (1): SSC Disestablishment Memo Example	2-16
III PREVENTION AND CONTROL OF FIRE AND FLOODING	3-1
3.1 General	3-1
3.2 Ship in Dry Dock	3-2
3.3 Ship Waterborne	3-3
3.4 Drills	3-11
Attachment (1): Drill Planning/Briefing	3-13
Attachment (2): Drill Debrief/Grading	3-15
IV REQUIREMENTS FOR DOCUMENTS AND PROCEDURES FOR TESTING AND SHIP SAFETY ASSURANCE	4-1
4.1 General	4-1
4.2 Ship Plan of the Day (SPOD)	4-1
4.3 Work Authorization	4-2
4.4 Testing Requirements	4-4
4.5 Prerequisite Lists for High Risk Evolutions (HREs)	4-5
4.6 Ship Safety Log	4-5
4.7 Trouble Report	4-6
4.8 Audit Plan	4-6
Attachment (1): Sample SPOD	4-9
Attachment (2): Sample SSW Log with Instructions for Use	4-13

CHAPTER	PAGE
V CONTROL OF WORK, TESTING, AND SHIP SAFETY DURING OFF-SHIPYARD AVAILABILITIES	5-1
5.1 General	5-1
5.2 Organizational Requirements and Personnel Qualifications	5-1
5.3 Prevention and Control of Fire	5-4
5.4 Prevention and Control of Flooding	5-4
5.5 Documents and Procedures	5-4
VI CONTROL OF WORK, TESTING AND SHIP SAFETY ON DECOMMISSIONED SUBMARINES	6-1
6.1 General	6-1
6.2 Organizational Requirements and Personnel Qualifications	6-1
6.3 Prevention and Control of Fire and Flooding	6-4
6.4 Documents and Procedures for Ship Safety Assurance	6-7

NAVSEA/SPAWAR Technical Manual Deficiency/Evaluation Report (TMDER)

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE
2.1	Ship Safety Council Functional Interface	2-9
5.1	Ship Safety Interface (Off-shipyard Availabilities)	5-3
6.1	Ship Safety Interface (Decommissioned Ship)	6-3

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CHAPTER I

GENERAL/REFERENCES

REFERENCES

- (a) NAVSEA 0989-028-5000, Manual for the Control of Testing and Plant Conditions
- (b) NAVSEA S9092-AC-ADM-010, Industrial Test Program Administration Manual (ITPAM) or the NAVSEA approved test program administration requirements invoked by contract
- (c) NAVSEAINST 4730.1, Shipyard Inspection and Required Conditions of Propulsion Plant Systems (Non-Nuclear) on Nuclear Powered Submarines
- (d) NAVSEA S0400-AD-URM-010/TUM, Tag-out Users Manual (TUM)
- (e) NAVSEA 0902-018-2010, General Overhaul Specifications For Deep Diving SSBN/SSN Submarines (DDGOS)
- (f) NAVSEA TL855-AA-STD-010, Naval Shipyard Quality Program Manual or private shipyard equivalent
- (g) COMUSFLTFORCOMINST 4790.3, Joint Fleet Maintenance Manual (JFMM)
- (h) Reserved For Future Use
- (i) MIL-STD-1625, Safety Certification Program for Drydocking Facilities and Shipbuilding Ways for U.S. Navy Ships
- (j) NAVSEAINST 4700.17, Preparation and Review of Trouble Reports
- (k) UIPI 0900-453, Critique and Problem Analysis Matrix Processes; Problem Identification and Investigation
- (l) NAVSEA S9213-26-MMA-000 (N), The Defueled Reactor Compartment Disposal Technical Manual
- (m) NAVSEA T9041-AA-MAN-010/INACTSSO/AS/YRR, Maintenance Manual For Inactive Nuclear Powered Ships and Nuclear Support Ships and Service Craft
- (n) NSTM S9086-CH-STM-010, Chapter 074, Volume 1, Welding and Allied Processes
- (o) NAVSEAINST 4740.9, Towing of Unmanned Defueled Nuclear Powered Submarines
- (p) NAVSEA S0570-AC-CCM-010/8010, Industrial Ship Safety Manual for Fire Prevention and Response

1.1 PURPOSE

The purpose of this manual is to provide specific requirements for the control of submarine shipboard operations, evolutions, work, testing, installations or removals, which could affect ship's buoyancy, list, trim, stability, watertight integrity, prevention/control of fire/flooding or is a High Risk Evolution (HRE), during periods of construction, conversion, overhaul, inactivation, recycling and other Chief of Naval Operations (CNO) scheduled availabilities.

1.2 SCOPE

1.2.1 The requirements of this manual apply during CNO scheduled availabilities, when specifically invoked by the Submarine Maintenance Engineering Planning and Procurement Activity (SUBMEPP) Availability Work Package (AWP) or applicable contracts, and will remain in effect until the start of Fast Cruise. When requested by the Naval Supervising

Authority (NSA) and agreed to by the Type Commander (TYCOM)/Immediate Superior in Command (ISIC) (as applicable), the requirements of this manual may also be invoked during pre-availability periods assigned to shipyards immediately prior to CNO scheduled availabilities to provide for an orderly transition to the CNO scheduled availability and to provide maximum training benefit for Ship's Force. For new construction ships, the full requirements of this manual shall be invoked not later than one week prior to initial float-off/launch. This manual may also be invoked, in whole or in part, for other availabilities, whenever the Program Office, Type Commander (TYCOM), NSA, and/or shipyard management determine that the scope of work and testing warrants implementation. For public shipyards, this is accomplished by an availability specific shipyard Memorandum of Agreement with the TYCOM. For private shipyards this is accomplished by contract.

1.2.2 It is the intent of this manual to include, within its scope, all shipboard nuclear and non-nuclear operations, evolutions, work, testing, installations or removals which could affect Ship Safety, as defined herein. The requirements of this manual, when invoked in whole or in part, are mandatory.

1.2.3 The requirements for reactor plant testing and evolutions are set forth in reference (a) and (c). Prior to the commencement of a reactor plant evolution that will affect Ship Safety, as prescribed herein, the Nuclear Chief Test Engineer (CTE-N) is required to obtain Ship Safety Council (SSC) approval on the Ship Plan of the Day (SPOD). Refer to Chapter IV for documentation requirements related to testing.

1.2.4 The requirements for non-nuclear testing during CNO availabilities are set forth in reference (b) with additional submarine requirements set forth in this manual. Where reference (b) is not contractually invoked, such as new construction, the requirements for non-nuclear testing are contained in the applicable contract Detailed Specifications and approved by NAVSEA. Where reference (b) is used in this manual, it is implied that the contractually invoked NAVSEA approved test program shall be used.

1.3 GLOSSARY OF TERMS/ACRONYMS USED

ASSISTANT CHIEF TEST ENGINEER (ACTE) – See reference (b).

ALTERATION INSTALLATION TEAM (AIT) – A unit (military, civilian, or contractor) under the direction of the AIT Manager or designated agent of the AIT Manager, that is trained and equipped to accomplish specific alterations on specific ships.

CHIEF TEST ENGINEER (CTE) – See reference (b).

CHIEF OF NAVAL OPERATIONS (CNO) – When used in the text of this manual in reference to CNO Availabilities: Regular Overhaul, Complex Overhaul, Engineered Overhaul, Refueling Overhaul, Refueling Complex Overhaul, Engineered Refueling Overhaul, Depot Modernization Period, Planned Incremental Availability, Docking Planned Incremental Availability, Selected Restricted Availability (SRA), Docking SRA, Phased Maintenance Availability, Docking Phased Maintenance Availability, Extended SRA, Extended Docking

SRA, Incremental SRA, Interim Dry Dock Availability (IDD), Pre-Inactivation Restricted Availability (PIRA), and Inactivation Availability.

COMBAT SYSTEMS (CS) – Shipboard command, control, computing, communication and intelligence (C4I) and weapon systems. Those systems normally in the 400 and 700 series Ship Work Authorization Boundaries (SWABs). Organizational positions refer to as WEAPONS (W)

ENGINEERING PLANNING DEPARTMENT (EPD) REPRESENTATIVE – When a naval shipyard is the LMA, an EPD Representative will be assigned in writing by the Chief Engineer or designated representative to the SSC with at least one alternate. In order to ensure independent review and assessment, the EPD Representative shall not be from the same branch as the Ship Safety Officer.

FIRE SAFETY COUNCIL (FSC) – See reference (q).

HIGH RISK EVOLUTION (HRE) – See paragraph 4.5.

HULL, MECHANICAL AND ELECTRICAL (HM&E) – Term used to describe the non-nuclear portion of the ship exclusive of CS and Strategic Weapons Systems. Covers those systems in the 100, 200, 300, 500 and 600 series SWABs.

IN-COMMISSION – The ship has been placed in active status and is a part of the operating forces following government final acceptance (delivery).

IN-SERVICE – Nuclear powered submarines in construction are assigned an active status of In-service approximately two to four weeks prior to the commencement of Sea Trials and maintain this status until commissioning.

JOINT TEST GROUP (JTG) – See paragraph 2.3.2.

LIST OF AUTHORIZED TESTS (LAT). A list of non-nuclear test procedures authorized for accomplishment during a specified period of time. See reference (b).

LEAD MAINTENANCE ACTIVITY (LMA) – Refer to reference (g) Volume II Part I Chapter 2 for the definition and responsibilities of an LMA.

LEAD TEST ENGINEER (LTE) – See reference (b).

MAXIMUM CALCULATED DRAFT (MCD) – The maximum draft, calculated based on the criteria of this manual, during the effective period of the SPOD. It represents the "worst case" effect at any one time on list or draft for all the proposed weight changes which are approved by the SSC on the SPOD. See paragraph 3.3.8.2.

NAVAL SUPERVISING AUTHORITY (NSA) – Refer to reference (g) Volume II Part I Chapter 2 for the definition and responsibilities of an LMA.

NAVSEA 04X Shipyard Field Representative – Representative from NAVSEA 04X assigned to each naval shipyard.

OFFICER-IN-CHARGE (OIC) – Where the term OIC is used, Prospective Commanding Officer (PCO) is implied for systems transferred to Ship's Force. For a new construction ship the PCO becomes the OIC when the ship's status changes to "active in-service."

OFF-SHIPYARD COORDINATOR (OSC) – TYCOM/Immediate Superior in Command Availability Coordinator who is a member of the Off-shipyard Ship Safety Council.

OPERATIONAL – The system is capable of performing its design function as necessary to support the specified event including appropriate indications, interlocks, alarms, instrumentation, etc.

OUTSIDE ACTIVITY (OA) – Any AIT, FMA, contractor, vendor, or another shipyard's personnel (e.g., TIGER TEAM), that is not contracted/tasked by the LMA to perform shipboard work during an LMA's industrial period.

PREREQUISITE LIST (PRL) – A list of requirements that must be satisfied/certified prior to performing an event or evolution. In the text of this instruction, a PRL is used for all HREs (see paragraph 4.5) and all nuclear/non-nuclear events of reference (c).

PROJECT SUPERINTENDENT – The single LMA representative, assigned by senior shipyard management, who is accountable and responsible for the overall safe and proper execution of the ship's availability.

REPAIR ACTIVITY/REPAIR ACTIVITY REPRESENTATIVE (RA/RAR) – Non Ship's Force Activity accomplishing work. In the context of work control, the RAR is the person qualified and designated to sign Work Authorization Forms (WAFs) and tag-outs for various critical steps.

SAFETY DRAFT MARK (SDM) – See paragraph 3.3.10.

SENIOR SHIPYARD OFFICIAL – Department/Division Head or equivalent that is the certifying official for positions related to this manual.

SHIP CLASS – The term "ship class" and "class of ship" refers to the general configuration groups (e.g., SSN 688 Class, SSBN Class, SSGN Class, SSN 774 Class, SSN 21 Class, etc.). For the purposes of qualification, replaces "type ship" (SSN/SSBN).

SHIP CONDITIONS – The status of the following ship parameters: Buoyancy, Trim, List, Watertight Integrity, and Stability.

SHIP PLAN OF THE DAY (SPOD) – See paragraph 4.2.

SHIP SAFETY – Maintaining the control of ship conditions, HREs, and prevention/control of fire and flooding.

SHIP SAFETY COUNCIL (SSC) – See paragraph 2.2.6.

SHIP SAFETY MANAGER (SSM) – See paragraph 2.2.1.

SHIP SAFETY OFFICER (SSO) – See paragraph 2.2.2.

SHIP SAFETY SUPERINTENDENT (SSS) – See paragraph 2.2.3.

SHIP SAFETY WATCH (SSW) – See paragraph 2.2.4.

SHIP'S FORCE (S/F) – Members of ship's company who are vested with authority, in accordance with OPNAVINST 3120.32, by the Commanding Officer (PCO/OIC/CO) of the ship, to direct or carry out designated tasks or evolutions.

SHIPYARD – Activity responsible for accomplishing work incident to construction, modernization, conversion, overhaul, or other availability of ships. In the text of this manual, "shipyard" means a private or public shipyard.

SIMULATED WATERBORNE CONDITION – A static condition where water is touching the ship's hull while the ship remains resting on the dock's keel blocks.

SYSTEM CONDITIONS – The status of principal system parameters and conditions (e.g., steaming, shutdown, drained, filled, fresh water lay-up, etc.).

SYSTEM STATUS – The compilation of individual system lineups in effect for a system at a specific time or for a specific reason. The specific lineup of system valves, circuit breakers, fuses, blank flanges, etc., in sufficient detail for each work item to be performed or to assure the scheduled testing or work can be accomplished safely.

TAG-OUT USERS MANUAL (TUM) – Reference (d) is used by all activities to ensure adequate system and equipment isolation so that work and testing may be safely performed.

TECHNICAL WORK DOCUMENT (TWD) – Task Group Instruction, Deficiency Log, Deficiency Report, Controlled Work Package, Formal Work Package, or other unique document that provides technical direction to perform work.

TELCON – Telephone Conversation. Documentation of TELCON approval shall be per local shipyard directive.

TEST DIRECTOR (TD) – See reference (b).

TESTING – When used in this manual, testing refers to equipment tests, system tests, and consolidated systems tests conducted on board the submarine.

TEST PLAN OF THE DAY (TPOD) – A list of nuclear tests, operations, plant conditions, and work authorized to be started or accomplished during a specified period to time. See reference (a).

TEST PROGRAM – A NAVSEA approved program for the administration and execution of any or all shipboard testing conducted on a submarine's systems/components.

TON – As defined in this manual always refers to a Long Ton (2240 lbs.).

WATERBORNE – Ship afloat, i.e., not resting on keel blocks.

WATERLINE – In the text of this manual, the term "waterline" refers to the "Condition N" Diving Trim waterplane. For operational submarines, this is established by the reference trim dive immediately preceding the availability or as established by a calculation of the maximum draft during the availability, whichever is greater. For new construction submarines prior to builder's trials, "Condition N" will be calculated and established by the Naval Architects."

WATERTIGHT INTEGRITY – The boundary between the ship and its outside environment, which protects the ship against flooding from the sea, or inadvertent or unauthorized introduction of water or other liquids across the boundary into the ship.

WORK CONTROL TEAM (WCT) – See paragraph 2.3.4.

WORK AUTHORIZATION FORM (WAF) – See paragraph 4.3.2.

1.4 RESPONSIBILITIES

The responsibility for Ship Safety is stated in U.S. Navy Regulations, OPNAV instructions, applicable Force Regulations, and NAVSEA instructions. During new construction, the process by which the Prospective Commanding Officer (PCO) assumes responsibility for a system, and eventually the entire ship, is described in paragraph 4.3.2.2. Additionally, the PCO is represented on the SSC and JTGs as a member for all systems transferred to the ship and as an advisor for systems not yet transferred. This manual has been developed to assist the Commanding Officer (OIC/PCO), Shipyard Commander, or Supervisor of Shipbuilding (SUPSHIP), in carrying out their assigned responsibilities regarding Ship Safety. The contents of this manual, however, should in no way be construed as relieving any activity from their assigned responsibilities for Ship Safety as invoked under the terms of the applicable contract.

1.5 CHANGE PROCEDURES

Conflicts with existing directives or proposed changes to this manual shall be submitted via the NAVSEA/SPAWAR TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER) in the back of this manual.

CHAPTER II

ORGANIZATIONAL REQUIREMENTS AND PERSONNEL QUALIFICATIONS

2.1 GENERAL

An organization shall be constructed as outlined herein to achieve and maintain the standards prescribed by this manual and to achieve individual responsibility and accountability for actions that must be taken to ensure the control of Ship Safety. Accordingly, authority commensurate with the assigned responsibilities shall be delegated to these personnel. In adhering to these policies, each shipyard should normally assign personnel from within existing shipyard organizations carrying out similar responsibilities.

2.2 SHIP SAFETY ORGANIZATION

The shipyard shall establish an organization with necessary implementing instructions for the control of Ship Safety as prescribed herein.

2.2.1 SHIP SAFETY MANAGER (SSM)

2.2.1.1 General. The SSM is the shipyard manager for Ship Safety matters, who is responsible for the administration and execution of the requirements of this manual.

2.2.1.2 Duties and Responsibilities:

1. Maintain the overall administration of the shipyard submarine fire and flooding drill program.
2. Provide direction and guidance to the Ship Safety Organization concerning the maintenance of Ship Safety.
3. Provide oversight of Ship Safety Program related critiques and concur on corrective actions for Ship Safety Program violations.
4. Provide oversight for the maintenance of Ship Safety on all availabilities.
5. Oversee the Ship Safety Surveillance Program.
6. Responsible for the implementation of the Ship Safety Program requirements into shipyard instructions.
7. Responsible for maintaining the qualification program, including the administration of tests and/or oral boards for SSO, SSS and shipyard SSW candidates, and maintenance of qualification record Objective Quality Evidence (OQE).

2.2.2 SHIP SAFETY OFFICER (SSO)

2.2.2.1 General. The shipyard responsibility for safe execution of work performed by their activity, as delineated in Navy Regulations or invoked by contract should normally be controlled at the working level by the SSO. An SSO, qualified in accordance with paragraph 2.6.4.1, shall be appointed in writing to each submarine by the Operations Officer in naval shipyards or by the Senior Shipyard Official in private shipyards. The SSO should not be assigned to more than one submarine concurrently, unless their assigned ships are undergoing short availabilities where the nature of the work and testing would permit such assignment. The SSO shall be responsible for implementing the safety requirements of this manual for their ship. In this regard, the shipyard directive (SSO Assignment Memorandum) assigning the SSO to a specific availability shall describe their duties and responsibilities, and be given adequate distribution to ensure that their authority in matters of Ship Safety is recognized. Adequate distribution of the SSO Assignment Memorandum shall be, at a minimum: Ship's Commanding Officer, SSM, Code 300N (Nuclear Production), Project Superintendent, Project CTEs, NAVSEA 04X Shipyard Field Representative (naval shipyards), SUPSHIP (private shipyards), and NRRO, or their equivalents. The assignment of an SSO in no way relieves the Commanding Officer of the ship of responsibilities as prescribed in Navy Regulations.

2.2.2.2 Duties and Responsibilities. The following are the duties and responsibilities of the SSO. Management may assign additional duties and responsibilities to the SSO, provided they do not conflict with those listed herein:

1. Act as chairman of the Ship Safety Council (SSC) (paragraph 2.2.6).
2. Maintain knowledge and administrative control of Ship Safety and related system status; provide for the preparation, issue, and maintenance of the SPOD (paragraph 4.2).
3. Ensure lines of communication exist between Ship's Force, Trade Supervisors, Chief Test Engineers, Outside Activities, and the shipyard scheduling activity to ensure that all nuclear and non-nuclear Technical Work Documents (TWDs), Test Procedures, Operating Procedures, HREs and PRLs which affect Ship Safety, are approved by the SSC. These lines of communication must be adequate to ensure the SSO is informed, in advance, of any production work or testing which could cause a change to Ship Safety.
4. Identify hazardous conditions created by proposed actions, resolve conflicts, and disapprove actions as necessary to maintain Ship Safety; submit proposed changes to Ship Safety to the SSC. SPOD changes may be documented via TELCON approval by SSC members in cases that arise after normal working hours.
5. Act as the shipyard point of contact with the Ship's Commanding Officer and representatives concerning Ship Safety except for nuclear plant conditions.

6. Be responsible for the actions of all Ship Safety Superintendents (SSS) assigned to their ship while they are on duty. Assume the duties and responsibilities of SSS when a separate SSS is not assigned.
7. Ensure SSW turnover logs/instructions are complete, thorough, and accurate. Initial next to the time for which the review took place.
8. Supervise the conduct of the SSW when shipyard personnel are assigned those duties. For ships In-service or In-commission, confer with the Ship's Force Duty Officer (SDO) and SSWs during routine inspections.
9. Schedule, supervise, and monitor scheduled fire and flooding drills to test the ability of Ship's Force and the shipyard organization to respond to shipboard emergencies.
10. Inspect the ship at regular intervals to ensure work and testing in progress are being performed in a safe manner.
11. Ensure that emergency communications systems and temporary damage control equipment/systems are inspected at intervals specified in the TWDs and reference (e).

2.2.3 SHIP SAFETY SUPERINTENDENT (SSS)

2.2.3.1 General. The SSS reports to the SSO and is the representative for the particular shift assigned. An SSS shall normally be assigned to each shift whenever the nature of scheduled work or testing is such that, in the opinion of the SSO, the assignment is warranted. When the nature of the scheduled work or testing does not warrant a dedicated SSS, the shipyard may assign a single SSS to cover Ship Safety issues on back-shifts and weekends for more than one submarine. In this case, all required WAF/SPOD changes and approvals will be made per TELCON with the SSO/SSC members and NAVSEA 04X Shipyard Field Representative (naval shipyards), as appropriate. During periods when an SSS is not assigned, there must be a designated point of contact within the shipyard who can respond to problems related to Ship Safety. In addition to the duties as described herein, the SSS may be assigned other functions, such as those related to ship production or testing, provided that such functions do not interfere with the primary responsibilities for Ship Safety. The SSS must be qualified as prescribed in paragraph 2.6.4.2.

2.2.3.2 Duties and Responsibilities. The following duties and responsibilities are mandatory when an SSS is assigned. The SSS shall:

1. Act as the direct representative of the SSO; carry out duties assigned by the SSO and monitor the conduct of HREs listed in paragraph 4.5 whenever the shipyard has not designated another qualified responsible person to perform this function for the specific evolution being executed. If assigned as a backshift or weekend SSS, each waterborne submarine shall be toured at least once per shift assigned and the other submarines

toured as necessary. The SSS shall review SSW turnover logs/instructions for completeness, thoroughness, and accuracy; and initial next to the time for which the review took place.

2. Ensure specified procedures are carried out as approved by the SSC on the SPOD and that all HRE PRL requirements are met prior to proceeding. Document unsatisfactory conditions found and actions taken per local shipyard directives.

3. Prevent or stop work or testing which jeopardizes watertight integrity, personnel, or Ship Safety, or which is not in accordance with procedures or HRE PRLs which have been approved by the SSC.

4. When work or testing has been stopped due to unsafe or potentially unsafe condition, the SSS has the responsibility to take all necessary steps to resolve the unsafe condition before work or testing may resume. If no change to the SPOD is required, the SSS shall authorize continuation of the work/testing as soon as safe conditions have been restored or potentially unsafe conditions eliminated.

5. When conditions are such that a change to the SPOD is required to ensure the safe and orderly execution of work or testing, obtain approval of the members of the SSC to change the SPOD as required.

6. Maintain a close liaison with the SDO and Engineering Duty Officer (EDO) (when assigned) for all matters affecting Ship Safety.

7. Act for the SSO in concurring in Ship Safety WAFs (see paragraph 4.3.2.1.1).

8. Review SSW turnover logs/instructions for completeness, thoroughness, and accuracy. Initial next to the time for which the review took place.

2.2.4 SHIP SAFETY WATCH (SSW)

2.2.4.1 General. The duties of this watch are related to Ship Safety. While on duty, the watch shall immediately report all deviations from prescribed procedures or other abnormalities to the SSO or SSS and to the Ship's Force Duty Officer. For each new construction ship, a shipyard SSW, qualified in accordance with paragraph 2.6.4.3, shall be continuously assigned starting at least 1 week prior to launch and continuing to In-service. The shipyard's SSW will not be assigned any other duties or responsibilities while on watch. Shipyard SSWs shall be assigned by the Operations Officer or Senior Shipyard Official for private shipyards when shipyard personnel are assigned these duties. For In-service or In-commission ships, SSWs shall be trained in accordance with paragraph 2.6.4.3.2 and the functions of the SSW should be carried out by the Ship's Force duty section as directed by the Ship's OIC/Commanding Officer in accordance with responsibilities delineated in Navy Regulations. The Casualty Control (CASCON) Station shall be manned at all times. The SSW shall not be secured prior to Fast Cruise without SSC approval.

2.2.4.2 Duties and Responsibilities. For duties and responsibilities and use of shipyard SSW Logs, see Chapter IV, paragraph 4.6 and Attachment (2).

2.2.5 EPD REPRESENTATIVE

2.2.5.1 General. The EPD Representative will be assigned in writing (when a naval shipyard is the LMA) by the Chief Engineer or designated representative to the SSC with at least one alternate and copy NAVSEA 04X Shipyard Field Representative (Naval Shipyards). In order to ensure independent review and assessment, the EPD Representative shall not be from the same branch as the Ship Safety Officer.

2.2.5.2 Duties and Responsibilities. A general outline of the EPD Representative SSC duties is listed below. This list is not all inclusive. A more detailed description of these responsibilities and authority may be found in references (a) through (d).

1. Sign and concur on all SPODs.
2. Sign and concur on all High Risk Evolution Prerequisite Lists.
3. Attend all SSC meetings.
4. Concur on resumption of work on a project after it has been secured by a member of the SSC or project team.
5. Concur on risk mitigation plan proposed by the SSO when the requirements of reference (a) through (d) are unable to be met.

2.2.6 SHIP SAFETY COUNCIL (SSC)

2.2.6.1 General. The Ship Safety Council (SSC) is a term used to describe collectively the persons assigned by their parent organizations to take required local approval actions for each specific submarine on TWDs/WAFs, HRE PRLs, schedules, etc., that affect the maintenance of Ship Safety. Decisions of this group shall be unanimous and in writing. The SSC shall convene at the call of the SSO, however, any member may request a meeting if a need exists. The initial meeting of the SSC shall not be later than one week prior to launch for new construction ships. After launch, the SSC shall meet as frequently as conditions dictate subject to agreement of the SSC. For commissioned ships, the initial meeting of the SSC shall be convened commencing with implementation of the requirements of this manual. A SPOD shall be issued as a result of the initial meeting of the SSC. The SPOD is described in greater detail in paragraph 4.2. Subsequent meetings shall be held as frequently as conditions dictate. The SSC may be disestablished upon commencement of Fast Cruise. When established, the SSC may be assigned the Fire Safety Council (FSC) duties and responsibilities set forth in reference (q).

2.2.6.2 Members. The SSC consists of one qualified member, designated in writing, from each of the following organizations (each organization represented on the SSC is further

required to designate in writing one or two qualified alternate(s) who can act in the member's absence):

1. Shipyard – the SSO for that ship, who serves as chairman.
2. Supervisor of Shipbuilding, Conversion, and Repair representative (when a private shipyard is the LMA).
3. Ship's Force – Commissioned officer, as designated by the Ship's Commanding Officer. For new construction ships, prior to in service, the Ship's Force representative serves in an advisory capacity and participates in SSC meetings, except that the Ship's Force representative is a member only for systems which have been transferred to the ship.
4. Shipyard – EPD Representative (when a naval shipyard is the LMA).

Other cognizant personnel (e.g. CTEs, Ship Scheduler, Zone Manager, Shop Supervisor, SSM, AIT managers/On-site installation coordinators, Outside Activity supervisors, etc.) may be requested to attend selected sessions to furnish expertise related to specific evolutions. Such persons may also request that they attend a specific meeting in order to present a specific question, problem, or proposal to the SSC. The attendance of these personnel does not constitute membership in the SSC.

2.2.6.3 Authority. Each member of the SSC has the authority to:

1. Stop an operation any time an unsafe condition exists; immediately inform the SSO of the unsafe condition, and recommend appropriate corrective action.
2. Request a meeting of the SSC.

2.2.6.4 Responsibilities. The members of the SSC have the responsibility to:

1. Approve the SPOD including changes thereto.
2. Approve PRLs (paragraph 4.5).
3. Witness and evaluate fire and flooding drills.
4. The Ship's Force representative on the SSC shall be responsible to provide input to the SPOD as a result of Ship's Force work that is to be accomplished, that could affect Ship Safety as described herein during the period covered by the SPOD.
5. Approve SSW logs for use.

2.2.6.5 Disestablishing. On the day the SSC is disestablished, the SSM will electronically submit a memo, in the format of Attachment (1) of this chapter, to NAVSEA 04.

This memo will be electronically submitted to NAVSEA 04X, 04X1, 04X6, and NAVSEA 04X Shipyard Field Representative (naval shipyards).

2.3 SHIP TEST ORGANIZATION

2.3.1 GENERAL. This paragraph prescribes, clarifies, and interfaces the requirements for a test organization beyond references (a) and (b). Prior to the commencement of any evolution that will affect Ship Safety as prescribed herein, the applicable Nuclear and/or Non-Nuclear cognizant CTE is required to obtain SSC approval on the SPOD. Refer to Chapter IV for documentation requirements related to testing.

2.3.2 JOINT TEST GROUP (JTG). It is the responsibility of the CTE to ensure testing that affects Ship Safety and HREs are presented to the SSC. JTGs must review Test Procedures that could affect Ship Safety. CTEs must ensure that any tests on the LAT that will affect Ship Safety are appropriately indicated and that SSC concurrence via the SPOD is received prior to the start of those tests and HREs. In addition, any test or HRE prerequisites which will affect Ship Safety must be identified and authorized for accomplishment on the SPOD.

2.3.3 SHIP'S FORCE. Reference (b) provides general responsibilities. In addition:

2.3.3.1 For CS/CCS and Strategic Weapons Systems Testing, the Overhaul Test Requirements Outline (OTRO), the Integrated Test Requirements Outline (ITRO), standardized class CS/CCS Test Program, and corresponding Test Procedures (as applicable) specify Ship's Force responsibilities for equipment operation and witnessing of tests.

2.3.3.2 For new construction ships, the shipyard will formally transfer operational control of systems to Ship's Force, in accordance with local procedures, when each system is completed and operational deficiencies are corrected. For systems not yet transferred, Ship's Force plays an advisory role in meetings of the JTGs.

2.3.3.3 The Ship's Force representative shall be responsible for providing information to the JTG relative to Ship's Force testing and to the SSO relative to Ship's Force operations, evolutions, work, testing, installations or removals which affect Ship Safety to be accomplished during the period covered by the LAT and/or SPOD.

2.3.4 WORK CONTROL TEAM (WCT). The LMA shipyard shall establish a centralized WCT to process work by the shipyard, Ship's Force, Outside Activities, and all Repair Activities during the availability and to ensure that Ship Safety, system status, and tag-outs are adequately controlled in accordance with the requirements of this manual. The LMA will lead the WCT. Ship's Force is an integral part of the centralized WCT and should man the team with experienced officers or senior petty officers. The existence of such an organization shall not waive any responsibilities of the SSC with regard to control of Ship Safety.

2.4 RELATIONSHIP TO SHIPYARD PRODUCTION ORGANIZATION

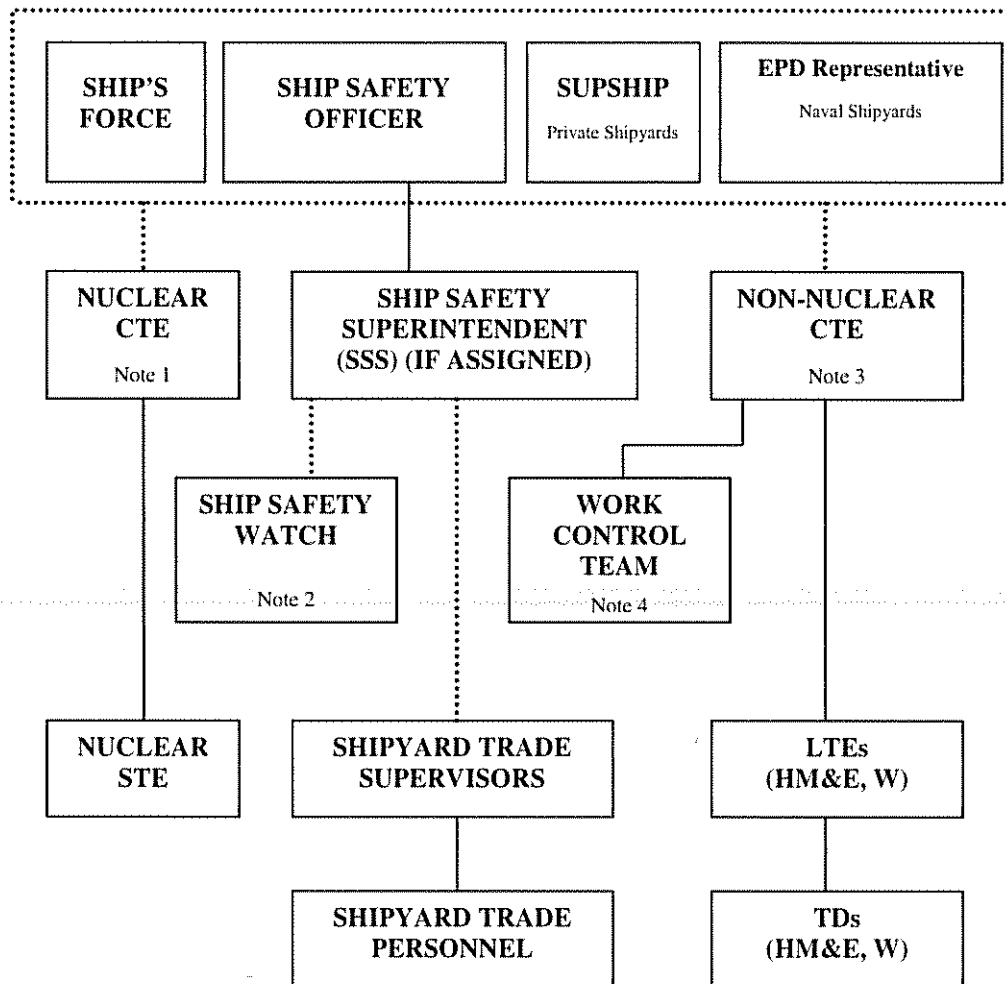
2.4.1 TRADE SUPERVISORS. Trade supervisors assigned to a ship shall be responsible to the SSO for work that could affect Ship Safety. The trade supervisors shall advise the SSO of the significant production events to be conducted during the period covered by the next SPOD.

2.4.2 PRODUCTION TRADE PERSONNEL. Only those experienced personnel, as determined by the cognizant shop superintendent, shall be assigned to shipboard work and/or testing that could affect Ship Safety. Other personnel may be assigned to assist the experienced personnel as required on the job site.

2.5 SUMMARY OF ORGANIZATIONAL RELATIONSHIPS

2.5.1 The organizational relationships of personnel who have responsibility for shipboard work, testing, safety, and watertight integrity, is shown in Figure 2.1. The solid line implies a direct relationship as defined by the responsibilities outlined herein. The dotted line implies a relationship that exists for matters pertaining only to Ship Safety.

SHIP SAFETY COUNCIL



Note 1 Reports to SSC for Ship Safety matters not including reactor safety.

Note 2 Reports to SSS/SSO and S/F Duty Officer for Ship Safety matters.

Note 3 Depicts situation where a single non-nuclear CTE covers both HM&E and Weapons functions.

Note 4 Provides input for work or isolations which could affect Ship Safety.

Figure 2.1 Ship Safety Council
Functional Interface

2.6 TRAINING AND QUALIFICATION REQUIREMENTS

2.6.1 GENERAL. This section establishes training and qualification requirements for SSO, SSS, SSW, and shipyard Work Control (WC) personnel, and indoctrination requirements for all personnel working on submarines. SSOs, SSSs, SSWs, and shipyard WC personnel assigned duties in accordance with this manual shall meet the qualification requirements of this section on the class of ship to which they are assigned. Each shipyard is responsible for the training and/or qualification of personnel assigned. The standards established by this section do not relieve the shipyard of responsibility for the personnel employed by the shipyard to ensure Ship Safety.

NOTE: See reference (b), Appendix C, for training and qualification requirements of test personnel.

2.6.2 PERSONNEL QUALIFICATION. Shipyard personnel assigned duties in accordance with this manual shall meet the qualification requirements of this section on the ship class to which they are assigned.

2.6.3 LIST OF CURRENTLY QUALIFIED PERSONNEL. Each shipyard is required to maintain current lists of shipyard personnel qualified in accordance with this manual. These lists shall indicate the ship class for which each person is qualified.

2.6.4 QUALIFICATION PROGRAM.

2.6.4.1 Ship Safety Officer (SSO). The SSO shall establish and maintain qualification as SSS for the class of submarine under their supervision. Additionally, training given to a candidate for SSO qualification shall provide adequate knowledge in the following areas:

1. Responsibilities of shipyard shops, codes and Ship's Force and their inter-relationships.
2. Knowledge of electrical safety, confined space safety, system isolation barrier criteria, shipboard and shipyard emergency procedures, freeze protection precautions (where applicable), shipboard security, service lead controls, destructive weather procedures and preparations for conducting HREs.
3. Knowledge of specifications and requirements dealing with submarines, specifically: Reference (e) or contract specifications for new construction project SSOs; Reference (g) (or private shipyard equivalent); Reference (c) for major CNO Availabilities; services, accesses and facilities for overhaul, steam plant cleanliness control, technical control and quality requirements.

2.6.4.2 Ship Safety Superintendent (SSS). A SSS candidate shall have a minimum of six months experience as either an Assistant Project Superintendent (APS), Zone Manager, Trade Supervisor, Test Engineer/Technician, shipyard WC Representative, or their equivalents in a private shipyard while assigned to shipboard work on the class of submarines assigned, or acting in a capacity directly under the supervision of a qualified SSS for six months, or hold a Navy

qualification in submarines. The SSS shall be knowledgeable of the characteristics, arrangement of compartments, tanks and accesses, and shipyard regulations, instructions, and orders pertaining to Ship Safety of the class of ship to which assigned. The SSS shall have satisfactorily completed the Ship Conditions, Safety, and Systems Course (paragraph 2.6.4.6) for the class of submarine to which assigned. In addition, the SSS shall have demonstrated by practical or oral examination, the ability to use onboard emergency communication systems, alarms, quick disconnects, emergency pumping systems, and knowledge of systems affecting Ship Safety. The SSS will also demonstrate acceptable knowledge of specifications and requirements dealing with submarines, specifically, contract specifications for new construction projects (if applicable), references (b), (d), (e) and (g) (or private shipyard equivalent), and reference (g) for CNO availabilities.

2.6.4.3 Ship Safety Watch (SSW)

2.6.4.3.1 Shipyard Personnel. The SSW shall have a minimum of two years' experience in work or testing involving submarine systems, or have held a Navy qualification in submarines. The SSW shall possess the physical capabilities (i.e., good eyesight, hearing, sense of smell, and agility) that are required to stand watch. Prior to certification, the SSW shall satisfactorily complete a course of instruction and written and practical examinations by the shipyard covering the following aspects of the ship class to which assigned:

1. Ship systems related to watertight integrity, including proper lineups to ensure such integrity.
2. Firefighting and damage control procedures.
3. Shipyard regulations pertaining to Ship Safety.
4. Shipboard and shipyard communication and alarm systems.
5. Shipboard pumping and blowing systems.
6. Ability to check the battery ventilation system for proper operation.
7. Electrical power and lighting distribution and isolation.
8. Ship's installed draft markings and SDM warning marks.
9. Ability to operate quick-disconnects.

2.6.4.3.2 Ship's Force Personnel. Ships' Commanding Officers should assign SSWs from personnel who have received their qualification in submarines. Ship's Force SSWs shall complete a course of instruction provided by the shipyard no more than 45 calendar days before implementation of the requirements of this manual, covering the following aspects:

1. Shipyard fire protection and fire fighting organization and damage control procedures.
2. Shipyard flooding prevention and control organization and procedures.
3. Shipyard regulations pertaining to ship safety.
4. Shipyard communications and alarm systems and their use, including the CASCON Station(s).
5. Shipyard provided temporary safety systems, including shipboard pumping and blowing systems.
6. Shipyard provided SDM warning marks.
7. Shipyard housekeeping and equipment protection procedures.
8. Ability to operate quick-disconnects.
9. SPOD.

2.6.4.3.3 Ship's Force SSW refresher training shall be conducted by the shipyard within 30 calendar days prior to undocking with emphasis on the procedures for controlling Ship Safety.

2.6.4.4 EPD Representative. The EPD Representative shall be knowledgeable of the characteristics, arrangements of compartments, tanks and accesses, and shipyard regulations, instructions, and orders pertaining to Ship Safety of the class of ship to which assigned. The EPD Representative shall have satisfactorily completed the Ship Conditions, Safety, and Systems Course for the class of submarine to which assigned. The EPD Representative shall have a minimum of two years' experience in work or testing involving submarine systems.

2.6.4.5 Work Control Team (WCT) Qualifications. Shipyard personnel assigned to the WCT defined in paragraph 2.3.4, who signify safe work boundaries on WAFs, shall establish qualification by satisfactorily completing the requirements of paragraph 2.6.4.6 on the class of submarine to which they will be assigned. Additional training shall emphasize work authorization and tag-out procedures per references (d) and (g). These requirements apply only to shipyard personnel. Shipyards should include WCT training as part of pre-availability training provided to Ship's Force. Commanding Officers/Officers-in-Charge should ensure Ship's Force members of the WCT have sufficient experience and understanding of the requirements of this manual prior to being assigned to the WCT.

2.6.4.6 Ship Conditions, Safety, and Systems Course. A training course, including a minimum of 40 hours of lecture presentation and class work, shall be given to provide a basic understanding of submarine systems, arrangements, and the requirements of this manual. The course shall cover the following areas:

1. Ship Conditions and Safety

a. Instruction on submarine buoyancy and stability so that trainees are able to predict changes in draft, trim and list which will result from changes in liquid levels of internal tanks, main ballast tanks, the Sonar Dome, or changes due to addition or removal of lead ballast or heavy equipment.

b. The Ship Safety Organization including duties and responsibilities.

c. The Ship Test Organization including duties and responsibilities.

d. The WCT, including duties, responsibilities, and Work Control processes.

e. Prevention and control of fire and flooding requirements, Chapter III.

f. Documents and procedures for testing and Ship Safety assurance, Chapter IV.

g. Lessons learned from significant incidents that have or could have affected Ship Safety of Navy ships in construction and maintenance availabilities.

h. For personnel assigned to CNO scheduled availabilities conducted off shipyard; the control of work, testing, and Ship Safety during Off-shipyard Availabilities, Chapter V.

i. For personnel assigned to work on decommissioned submarines, the control of work, testing, and Ship Safety on decommissioned submarines, Chapter VI.

2. Ship Systems and Arrangements.

a. The course shall cover the Ship Safety attributes of the function, location, arrangement, special requirements, and controls for ship systems and major components. It shall include: piping systems, ship machinery, electrical systems, weapons systems, hull, tanks, structural bulkheads, and nuclear/non-nuclear interface systems. A candidate that has had 6 months or more experience working on or testing the specific submarine systems listed, or hold a Navy qualification in submarines, may be exempted from attending the class instruction on ship systems and arrangements by written authorization of a senior shipyard official. The candidate must successfully complete the final examination prior to certification.

3. Shipyard Final Written Examination

a. A final comprehensive written examination shall be given after completing the course described above, to determine whether a candidate's knowledge and understanding of the design and operation of ship systems and administrative requirements related to maintaining Ship Safety and ship systems work control, are satisfactory.

2.6.4.7 Subsequent Qualification on Other Submarine Classes. SSO, SSS, EPD Representative, WCT, and SSW personnel who have qualified on one class of submarine may qualify for another class of submarine by satisfactorily completing the practical examination required for the class for which qualification is being sought. All other currently qualified personnel may extend qualifications to another class submarine by satisfactorily completing the portion of the requirements of paragraph 2.6.4.6 that are directly related to the ship systems and arrangement for the other class submarine and the written examination on the class for which the qualification is being sought.

2.6.4.8 Certification of Qualification. A senior shipyard official shall certify in writing that each successful shipyard candidate has met all requirements for qualification and is considered by the shipyard to be qualified to discharge the duties and responsibilities of the position for the submarine class assigned. The shipyard shall retain the results of written and oral examinations administered to individuals to qualify or to maintain qualification. Certification records shall be made available to NAVSEA or SUPSHIP personnel for audits as described in paragraph 4.8, or when requested. OICs/COs for In-service or In-commission ships shall maintain the training and certification records for Ship's Force SSWs.

1. The NAVSEA 04X Shipyard Field Representative will be informed/invited to attend qualification oral boards associated with paragraph 2.6.4.1.

2.6.4.9 Requalification. Requalification requirements are applicable only to shipyard personnel who have not actively engaged in the control of work on submarines for a period of greater than 6 months. This may be extended to one year if involved with work or testing on other ships. A senior shipyard official shall certify in writing that a candidate has met all the requirements for requalification as follows:

1. SSO. Each previously qualified SSO shall demonstrate by practical or oral examination, the requirements specified in paragraphs 2.6.4.1.[1], [2], & [3] and complete the written examination specified in paragraph 2.6.4.6.[3] to requalify.
2. SSS. Each previously qualified SSS shall demonstrate by practical or oral examination, the requirements specified in paragraph 2.6.4.2 and complete the written examination specified in paragraph 2.6.4.6.[3] to requalify.
3. SSW. Each previously qualified SSW (shipyard personnel) shall complete the written examination specified in paragraph 2.6.4.3.1 to requalify.
4. WC Personnel. Each previously qualified WC person shall complete the final written examination specified in paragraph 2.6.4.6.[3] to requalify.
5. EPD Representative. Each previously qualified EPD Representative shall complete the final written examination specified in paragraph 2.6.4.6.[3] to requalify.
6. The NAVSEA 04X Shipyard Field Representative will be informed/invited to attend qualification oral boards associated with paragraph 2.6.4.9.

2.6.4.10 Disqualification. If at any time the shipyard determines an individual is not qualified to discharge assigned duties and responsibilities, the qualification of that individual shall be revoked. Application for re-qualification may be made at any time after the cause for revoking qualification has been corrected, as determined by the applicable senior shipyard official. The local 04X SFR (Shipyard Field Representative) will be informed/invited attend requalification oral boards. Re-qualification requirements are per paragraph 2.6.4.9. Use reference (b) for test personnel.

2.6.4.11 Loans. A shipyard may use personnel qualified as SSO, SSS, WC, or shipyard SSW from another shipyard. In this case, the shipyard to which such personnel are assigned is responsible for ensuring they are adequately prepared to perform assigned duties at that shipyard. As a minimum, the shipyard using personnel on loan shall indoctrinate them on all administrative procedures and special casualty bills in effect. Any weaknesses identified by this indoctrination shall be corrected prior to their assignment of duty.

2.6.5 INDOCTRINATION PROGRAM. The shipyard shall ensure that all personnel working on submarines have received sufficient indoctrination on the purpose and applicable requirements of this manual, including a basic knowledge of tag-out and WAF (and/or private shipyard new construction equivalent, when applicable) procedures, are able to recognize and initiate alarms, and are familiar with actions they should take to evacuate the ship, assist in isolating flooding, fight fires, and report submerged SDM warning marks. Personnel shall receive Indoctrination Program Refresher training every two years at a minimum.

CHAPTER II

Attachment (1): SSC Disestablishment Memo Example

Date

MEMORANDUM FOR THE RECORD

From: Bill Manager, PSNS&IMF SHIP SAFETY MANAGER

Subj: DISESTABLISHMENT OF USS SUBMARINE (SSN XXX) SHIP SAFETY COUNCIL

Ref: (a) NAVSEA S0570-AC-CCM-010/8010 Industrial Ship Safety Manual for Fire
Prevention and Response.

(b) NAVSEA S9002-AK-CCM-010/6010 Industrial Ship Safety Manual for Submarines

(c) PSNS&IMFINST 5100.70F Ship Safety Manual.

1. The purpose of this memorandum is to document the disestablishment of the Safety Council on USS SUBMARINE (SSN XXX) at Pier J at Naval Base Coronado, CA, in accordance with references (a) through (c), as applicable.

2. Questions, concerns and comments may be directed to the Ship Safety Manager, Bill Manager at (XXX) XXX-XXXX or xxx.x.xxxxx@navy.mil

Safety Council Data Points	
Availability Type	CNO / Fleet / Voyage Repair
Availability Start Date	
Date FSC/SSC Established	
Date FSC/SSC Disestablished	
Availability End Date	
Reason for FSC/SSC Disestablishment	Commencement of Fast Cruise / Production Work Complete / End of Availability
Status of Shipboard Fire Fighting	Operational
Status of Ship Dewatering Systems	Operational
Status of Alarms and Communications	Operational

//s//

Bill Manager

Ship Safety Manager

PSNS&IMF

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CHAPTER III

PREVENTION AND CONTROL OF FIRE AND FLOODING

3.1 GENERAL

This chapter contains the minimum requirements for fire and flooding prevention and control.

3.1.1 CASUALTY CONTROL (CASCON) STATION. The shipyard shall provide a CASCON Station with the facilities and information at the CASCON Station as required by reference (p) or the Detailed Shipbuilding Specifications for New Construction Submarines. In addition, the following shall be at the station:

1. A drawing of all emergency systems installed by the shipyard for communications, lighting, and alarms, including location of operating switches.
2. Location of temporary fire fighting and pumping facilities.
3. The effective SPOD.

3.1.2 FIRE PREVENTION AND CONTROL. Fire prevention and control measures shall be in accordance with reference (p) or the Detailed Shipbuilding Specifications for New Construction Submarines.

3.1.3 FLOODING PREVENTION AND CONTROL. Ship's Force and the shipyard shall protect the ship against flooding from the sea, and inadvertent or unauthorized introduction of water or other liquids into the ship. The initial means of controlling flooding on a submarine is to locate and secure the source. In parallel, the means of controlling progressive flooding is inter-compartment isolation.

3.1.4 ALARMS. The alarm systems required by reference (p), or the Detailed Shipbuilding Specifications for New Construction Submarines, shall be used for reporting fire or flooding. Alarm boxes shall be located in each compartment and not more than 50 feet from any point in the compartment. The public address system required by reference (p), or the Detailed Shipbuilding Specification for New Construction Submarines, shall be used after sounding the alarm to indicate the nature of the emergency and to provide follow-up instructions. The ship's installed alarm and announcing system may be used for these purposes, if operational.

3.1.5 PREPARATIONS FOR DESTRUCTIVE AND COLD WEATHER. The shipyard shall produce and maintain a Destructive Weather Procedure that shall be put into effect during times of predicted or actual abnormal conditions of wind and sea. In private shipyards this procedure shall be submitted to the SUPSHIP for approval. The shipyard shall also produce and maintain a procedure for protection of the ship's systems and temporary support systems against freezing weather, where applicable. The Destructive Weather Procedure shall cover, as a minimum:

1. Personnel assignments and responsibilities.
2. Doubling of mooring lines/cables and securing of the ship against wind and wave action.
3. Closing of hull openings where required.
4. Securing topside openings.
5. Removing any mooring lines/cables attached to caissons.
6. Methods to prevent/minimize inadvertent flooding of the submarine in dry dock, (e.g. manning pump well/caissons to operate pumping equipment as necessary).
7. Procedures necessary to prevent ship's systems and temporary support systems from freezing.

3.1.6 LIGHTING. The ship shall be provided with two sources of lighting to all spaces normally having two sources. The lighting may be the installed normal and emergency lighting systems or a combination of temporary and installed lighting, provided that separate power sources are utilized for each system. The removal of lighting from a space or compartment that could impede damage control efforts shall require SPOD approval as determined by the SSC.

3.1.7 EMERGENCY AIR BREATHING. For In-service and In-commission submarines, the Emergency Air Breathing (AEB) system shall be operational or temporary system(s) will be provided in sufficient quantity and locations (e.g., Maneuvering, Control, Crew's Mess) in support of watchstanders unable to evacuate immediately and/or those involved with combating the casualty. Temporary system(s) include but are not limited to a temporary AEB system, and/or self-contained breathing apparatus(es) stored in sufficient quantity for casualty response.

3.2 SHIP IN DRY DOCK

3.2.1 DRY DOCK DRY CONDITION. When the ship is in dry dock, Chapter 0872 of Navy Regulations requires the closing of all valves and other openings in the ship at the end of working hours when such closing is practicable. In situations where there is extensive disruption of watertight integrity, making daily closing of openings in the ship impracticable, it is prudent to protect the dry dock, rather than the ship, from inadvertent flooding. To this end, shipyards shall maintain dry docks in accordance with reference (j). Each shipyard shall produce and maintain procedures that shall be initiated as part of the shipyard's response to destructive weather (see paragraph 3.1.5), dry dock flooding (electrical/mechanical/minor structural failure or human error during the entire in-dock period), or HREs. In addition, any system affected by in-dock evolutions which could, through an un-isolable constant flow fluid supply, introduce the potential for flooding the ship's interior (e.g., in-dock use of gravity fed, unvalved temporary seawater system supplies), shall be controlled in accordance with the waterborne requirements of Chapter III, paragraphs 3.2.2.[1] and 3.3.2 for the affected penetrations, and Chapter III

paragraph 3.3.8 list and draft changes. A constant fluid supply shall be considered a controlled constant fluid supply provided the following controls are invoked as a minimum:

1. The temporary fluid supply shall require two in-line isolation valves, as required to meet the barrier criteria of reference (d), Appendix G, installed external to the hull, between the ship and the fluid source. The two in-line isolation valves shall be located to facilitate rapid isolation (i.e., close to the ship).

2. For In-service and In-commission ships, the temporary fluid supply, up to and including both off-hull isolation valves, shall be transferred, including operation, to Ship's Force. This transfer shall be formal in nature and include temporary system diagrams, valve identification, and operating instructions for Ship's Force use. Additionally, Ship's Force shall be trained on how to use the temporary system, and a shipyard point of contact shall be clearly designated.

3. Installation and removal of the temporary fluid supply shall be controlled in accordance with paragraph 4.3.2.

4. The ship's system, or portion of ship's system receiving the fluid, shall be operational and tested to temporary system operating pressure.

5. Installation of a temporary fluid system external to the pressure hull, outboard of the hull and backup valves, shall also have the hull joint tested to temporary system operating pressure.

3.2.2 DRY DOCK SIMULATED WATERBORNE CONDITIONS. During simulated waterborne conditions the following minimum requirements shall apply:

1. The event shall be authorized on the SPOD.

2. Hull openings, as listed on the SPOD, shall be controlled in accordance with the waterborne requirements of this manual.

3. Seawater valves should normally be operated using ship systems. A temporary system may be used to operate seawater valves. Use of temporary systems to operate seawater hull/backup valves shall be authorized by the SSC and listed on the SPOD.

4. A 200 GPM bilge pumping capability shall be provided (ship's trim/drain or temporary pump(s)).

3.2.3 DRY DOCK WATERBORNE CONDITIONS. Any in-dock evolution that requires operation of the dry dock floodgates shall be controlled in accordance with the waterborne requirements of this manual.

3.3 SHIP WATERBORNE

3.3.1 ESTABLISHING THE "CONDITION N" WATERLINE. The shipyard will establish the "Condition N" waterline for the waterborne period. For operational submarines this is established by the reference trim dive immediately preceding the availability or as established by a calculation of the maximum draft during the availability, whichever is greater. If it is determined that the draft of the ship must be adjusted to greater than the existing "Condition N" Waterline then a new availability "Condition N" draft must be established by the SSC. For new construction submarines prior to builder's trials "Condition N" will be calculated and established by the Naval Architects.

3.3.2 HULL PENETRATIONS BELOW THE WATERLINE. The double barrier protection requirements of reference (d) shall apply to hull penetrations located below the waterline. The principle of double barrier protection applies to all hull penetrations except for those mechanical and electrical penetrations (such as the Secondary Propulsion Motor (SPM) and cable penetrations) that are designed for single closure and those sea-connected systems below the waterline inboard of the back-up valve that are less than ½" NPS. Double barrier protection may be achieved by using installed valves, blank flanges, outside closure plates, or temporary shafting seals. Positive control shall be exercised to maintain closure (shut) through the use of tags, interlocks, gagging devices, chains, mechanical locks, hydraulic locks, blanks, etc., until work and testing on the associated system has been completed. For In-service and In-commission ships, Ship's Force maintains operation of all hull and backup valves below the Condition N+4' waterline, ballast tank blow and vent systems, and shipboard bilge pumping systems, while waterborne.

3.3.2.1 Operation of systems that have interlocks (such as torpedo tubes, signal ejectors/launchers, trash disposal unit, etc.), as long as all system testing specified in 3.3.2.2 is complete and interlocks are properly made-up, is not a violation of double barrier protection.

3.3.2.2 Prior to undocking, all sea-connected hull and backup valves below the waterline shall be installed, hydrostatic tests shall have been satisfactorily completed on these valves and interconnection piping, and local valve position indications shall have been proven correct and reliable to Ship's Force or the SSC for new construction ships.

3.3.2.3 Where schedule, resources, or other constraints prevent accomplishment of the above before undocking, a blank shall be installed and identified external to the hull penetration. Blanks shall be installed and tested per reference (g). The installation of the blank shall be noted on the SPOD. Removal of such blanks shall be approved on the SPOD by the SSC only after the required valves are installed and hydrostatically tested and the local valve position indications have been proven correct and reliable to Ship's Force or the SSC for new construction ships.

3.3.2.4 Regarding the connection of hydraulic actuator lines on hull/backup valves below the waterline when the inboard piping is not complete:

1. If an external blank is installed per reference (g), any additional precautions shall be resolved by the SSC.

2. If an external blank is not installed, then the hull and backup valves shall have been installed, hydrostatically tested, and local valve position indications proven correct and reliable to Ship's Force or the SSC for new construction ships.

a. If the ship's hydraulics systems are not available, a temporary source of hydraulic pressure shall be used to position these valves. When local valve position indication has been proven correct and reliable, the valve shall be in one of the following conditions:

(1) The temporary pressure source may be disconnected and valve actuator ports plugged.

(2) The temporary pressure source may be disconnected utilizing quick-disconnects in lieu of plugs.

(3) The temporary pressure source may remain connected for valve actuation.

b. Additional safety precautions should be used by the SSC to provide the assurance required to preclude the need for an external blank. These may include not working the actuators for a particular hull/backup valve combination concurrently, shutting and danger tagging both valves at all times, isolating and danger tagging the hydraulic pressure source to the control valve for the specific actuator being worked, and not pressurizing or operationally testing the actuators until the sea-connected system integrity has been reestablished.

3.3.2.5 Any required work or testing not compliant with the above requirements shall not start unless approved by the SSC on the SPOD. For In-service or In-commission ships, it is the responsibility of the Ship's Force SSC representative to obtain Commanding Officer/Officer-in-Charge permission per reference (d) Appendix G, for use of single barrier isolation in lieu of double barrier isolation. This will be documented by Ship's Force SSC representative signature on the SPOD.

3.3.3 HULL PENETRATIONS/OPENINGS FROM THE WATERLINE TO FOUR FEET ABOVE THE WATERLINE. All hull penetrations/openings from the waterline to four feet above the waterline that are not in their normal as-built condition, as shown on ship construction plans, shall be listed on the SPOD together with the authorized method of closure.

3.3.3.1 Topside Hatches. Topside hatches should be maintained so they can be shut and secured against flooding within three minutes of the initiation of an alarm. If this is not practical, they shall be protected with cofferdams as prescribed for hull access openings. It is preferred to maintain the hatch four feet above the waterline than to ensure closure in three minutes. Evolutions, during which the above criteria cannot be met, such as weapons handling, shall be approved by the SSC on the SPOD. Additionally, the shipyard shall have written procedures that provide formal control of temporary service lines that pass through topside

hatches, missile tube muzzle hatches, hull access openings, or watertight doors. In private shipyards this procedure shall be approved by SUPSHIP.

3.3.3.2 Missile Tube Muzzle Hatches. The requirements for topside hatches are applicable except when maintenance platforms or similar structures are installed in the missile tube which would prevent shutting of the hatches within three minutes or where the VLS (Vertical Launch System) “fly-through” diaphragm is installed and tested. In such cases, the missile tube access doors in the ship’s interior shall be shut and locked or be capable of being shut and locked within the required three minutes of the initiation of a flooding alarm. Additionally, the missile tube flood/drain and pressurization valves shall be shut and locked. It is preferred to maintain the hatch(es) four feet above the waterline than to ensure closure in three minutes.

3.3.3.3 Hull Access Openings

1. Cofferdams shall be installed around all hull access openings/temporary hull cuts that are less than four feet above the waterline at the opening.

a. Cofferdams shall be constructed so as to maintain watertight integrity to at least four feet above the waterline. They shall be attached to the hull by a suitable arrangement to provide a positive seal. They shall be designed to permit personnel access, temporary services, and equipment shipping, as applicable, without violating the required watertight integrity.

b. In utilizing a portion of the ship's topside freeflood structure to achieve the four-foot requirement, all openings to that freeflood structure shall be controlled in the same manner as the cofferdam itself. In this regard, positive control to maintain closure through the use of danger tags, gagging devices, mechanical locks, and/or blanks, shall be exercised by the shipyard for all hull access openings not in an as-built condition. USS JIMMY CARTER (SSN-23) and USS NORTH DAKOTA (SSN 784) and all follow on submarines (AFS) of the VIRGINIA CLASS must have their free-flood structure dewatering capability or temporary equivalent available. In addition, for SSN 784 AFS, the Virginia Payload Tubes (VPT) shall have louver covers installed to cover the VPT flood ports. If extended maintenance requires the VPT hatches to remain open, a cofferdam shall be used to protect the VPT to four feet above the waterline.

c. Cofferdams shall be installed and tested before the ship becomes waterborne or within 72 hours after arrival of the ship in the shipyard.

d. Removal or changes in status shall be approved by the SSC via the SPOD.

2. Any hull penetration, such as an electrical cable penetration, need not have a cofferdam installed if it is adequately blanked or plugged while the system is under repair.

3.3.3.4 Other Penetrations/Openings from the Waterline to Four Feet Above the Waterline. Penetrations and openings that do not meet the above criteria shall be isolated by type of single closure. If single closure is not practical, the penetration/opening shall be attended at all times and the conditions approved by the SSC on the SPOD.

3.3.3.5 External Cavity Vents From The Waterline To Four Feet Above The Waterline. Most recesses and cavities below the waterline are vented through piping to topside recesses and cavities. If the ship's draft were allowed to exceed the vent piping topside opening, then the recess or cavity could be flooded and result in an unplanned draft increase. Cavity and recess vent piping openings located in topside recesses between the waterline and four feet above the waterline shall be isolated by a type of single closure.

3.3.4 HULL PENETRATIONS/OPENINGS FOUR FEET OR MORE ABOVE THE WATERLINE. Penetrations/openings not in the normal as-built condition are not required to be watertight but should be provided with protection against fluid entry with status maintained on the SPOD.

3.3.5 MAIN BALLAST TANKS. The condition of the main ballast tanks shall be listed on the SPOD. Main ballast tanks shall be in one of the following conditions:

3.3.5.1 Flood ports maintained clear for blowing. Vent valves installed and locked shut with outside cover plates secured in place. Cover plates fitted with a blow connection suitable for attachment of a dockside air hose. At least two independent sources of air utilizing separate entry points shall be maintained available for blowing tanks.

3.3.5.2 Watertight cover plates installed over flood ports. An additional dewatering capacity of at least 500 GPM capable of being installed and operated in the main ballast tank within 15 minutes receipt of an alarm. A temporary main ballast tank flood alarm system installed near the bottom of the main ballast tank. All openings to any blanked main ballast tank shall be protected in the manner prescribed for hull access openings.

3.3.6 SONAR DOME

3.3.6.1 Sonar Dome status shall be maintained on the SPOD. Removal of the access cover cannot affect ships conditions. To affect ships conditions, water must be added or removed from the Sonar Dome. SPOD approval is required prior to adding or removing water from the Sonar Dome.

3.3.6.2 If the Sonar Dome is not completely flooded, then openings less than 4 feet above the waterline shall be protected by a cofferdam or other means as outlined in paragraph 3.3.3.3. This might, among other actions, require that cavity drain piping leading into the Sonar Dome access area be plugged or blanked, regardless of whether the manway accesses are secured or not. Topside line lockers have been eliminated on current operational submarines. Virginia Class has cavity vents and drains that are open ended in the VLS bathtub which drains to the Sonar Dome.

3.3.7 SHIP INTERIOR

3.3.7.1 Interior Tanks. An interior tank greater than (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) in capacity without an operational tank level indicating system shall be isolated and tagged as necessary to protect the tank from fluid sources, unless specifically approved by the SSC. Isolation/tag-out may be accomplished by including the tank within the boundaries of an existing tag-out that provides the required protection. Restoration of the tank's level indicating system shall be covered by appropriate Work Authorization Form (WAF).

3.3.7.2 Watertight Doors. Watertight doors shall be maintained so they can be shut and secured against flooding within three minutes of the initiation of an alarm. Temporary service lines without quick-disconnect devices should be installed through alternate accesses that meet the requirements of this manual. If no alternate access exists, then a watch shall be designated the responsibility to remove service lines without quick-disconnects. This watch may be a Ship's Force or shipyard person. The watch shall be capable of securing services to the line and removing it within three minutes, if required by an emergency situation. For lines that are constantly tended (i.e., brazing) the personnel operating the line shall be so designated to remove the line. In lieu of stationing a watch, a device may be staged to cut the temporary service line or lead when the device is in a central location, personnel are trained on the use of the device, and the temporary service line/lead tag indicates there is no quick-disconnect.

3.3.7.3 Bulkheads. Bulkhead ventilation valves shall either be operational and capable of being shut, or be made watertight with a blank. Other bulkhead penetrations shall either be in their normal condition or be made watertight if unattended. Temporary closures are permissible.

3.3.7.4 Bilge Alarms. For In-service or In-commission ships, the bilge alarms shall be operational while waterborne or simulated waterborne or temporary bilge alarms(s) will be provided. If bilge alarms are not operational and temporary bilge alarms are not installed:

1. Maintenance will be approved on the SPOD.
2. The SSW will increase the frequency of bilge inspections in the affected spaces to twice hourly, at a minimum.
3. Work will be sequenced to minimize the time the alarms are disabled.

3.3.8 CHANGE OF LIST OR DRAFT

3.3.8.1 When waterborne, any change involving main ballast tanks, Sonar Dome, or hull work associated with main ballast tanks or the Sonar Dome, shall be approved by the SSC.

3.3.8.2 No work, testing, installation or removal shall be undertaken which adds, removes, or shifts (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) of

weight on the ship without prior approval by the SSC on the SPOD. This includes the addition, removal, or shifting of weight such as liquids, lead ballast, temporary lead shielding, and temporary fixtures or equipment on the ship. The SSC shall review the proposed weight changes prior to approval to ensure they will not cause a SDM to enter the water or violate the MCD as listed on the SPOD. To substantiate the review, the following information shall be calculated and documented on the SPOD that authorizes any of the weight changes above:

1. The list and draft at the beginning of the SPOD period.
2. The effect on list and draft of each proposed weight change per paragraph 3.3.8.2.
3. The worst-case effect on list and draft, at any one time, of all proposed weight changes accumulating (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class).

3.3.8.3 The MCD shall not be allowed to exceed the "Condition N waterline" for the availability established in accordance with paragraph 3.3.1, without re-establishing closure of hull penetrations and openings to the requirements of paragraph 3.3.3 for the greater draft.

3.3.8.4 For In-service or In-commission ships, the OIC/Commanding Officer, or his designated representative, shall monitor the conduct of the operation where Ship's Force operation of equipment is specified. For ships not In-service or In-commission, the SSO is responsible except that, for changes not requiring ballast tank operations, the SSS may be delegated this authority and the PCO/OIC shall monitor these events.

3.3.9 PUMPING

3.3.9.1 Each compartment shall be capable of being dewatered at a rate of 200 (minimum) - 500 GPM or more with pumping action started within three minutes of the initiation of a flooding alarm at the CASCON or equivalent shipboard station. This may be accomplished using the trim pump, drain pump, or temporary dewatering pump(s). When 500 gpm or more dewatering rate is started within 3 minutes of the initiation of a flooding alarm no other requirement is necessary. Additional emergency dewatering requirements of paragraph 3.3.9.2 are required if less than 500 GPM is started within three minutes of the initiation of a flooding alarm.

3.3.9.2 If less than 500 GPM is started within three minutes of the initiation of a flooding alarm at the CASCON or equivalent shipboard station then, in addition to the requirements of paragraph 3.3.9.1 and to minimize water damage, the shipyard shall also maintain emergency dewatering equipment, in such a state of readiness that effective pumping can be applied at or below the deck plate in the lower level of the affected compartment with an additional dewatering capacity of 500 GPM in seven minutes or 1000 GPM or more within 15 minutes following receipt of a flooding alarm at the CASCON or equivalent shipboard station. The ability to meet this time requirement in each compartment is dependent on the status of the

nearest topside access hatch. It is preferred to maintain hatches four feet above the waterline rather than to ensure closure in three minutes.

3.3.9.3 For the pre-undocking flooding drill of paragraph 3.4.4 for each ship, the shipyard/Ship's Force shall demonstrate the operation of the shipyard provided emergency dewatering pump(s) within the time requirements of paragraph 3.3.9.1 and 3.3.9.2.

3.3.9.4 The requirement for emergency dewatering pumps may be relaxed during ships movement from berth to dock, dock to berth and berth to berth, with the following restrictions:

1. No work on sea-connected systems.
2. A temporary 200 GPM dewatering pump shall be operational shipboard during transit if ship's trim and/or drain pump isn't operational/capable of discharging overboard.
3. No system work allowed during transit that could impact flood recovery capability or affect watertight integrity of the ship.
4. Bilge alarm system in service or bilge levels are frequently monitored.
5. A contingency plan is developed and briefed that can be used to get the ship to a location where pumping can be performed in the minimum amount of time should flooding occur.
6. Exception approved by the SSC on the SPOD.

3.3.9.5 When the Trim and Drain Systems are fully operational after all sea water system or sea-connected system work and testing are complete, and no more work or testing affecting ship conditions is scheduled for the availability (e.g., Crew Certification, Fast Cruise), the emergency dewatering requirements of this manual may be relaxed as approved by the SSC.

3.3.10 SAFETY DRAFT MARK WARNING SYSTEM (SDM). A Safety Draft Mark Warning System is required in order to provide a visual method by which adverse, unpredicted changes in draft, trim, or list can be detected which could affect the safety of the ship. The requirements for SDMs are as follows:

1. Highly visible SDMs shall be applied fore and aft, both port and starboard. The bottom edge of the mark shall be a maximum of 12 inches above the MCD specified on the SPOD. The SSC shall authorize relocation of SDMs when performing evolutions that would result in an SDM entering the water. SDMs shall be readjusted when the trim, draft, or list of the ship has been changed which results in an SDM greater than 12 inches above the MCD shown on the SPOD.

2. The SDMs shall be applied prior to the ship becoming waterborne or within 72 hours after implementation of the requirements of this manual and shall not be removed earlier than 72 hours before the scheduled commencement of Fast Cruise.

3. The SDMs shall be located in the vicinity of the ship's installed draft marks.

4. Draft readings shall be recorded hourly by the SSW in the Ship Safety Log (paragraph 4.6) and compared with the pier side SDMs. SSWs shall be instructed on the purpose of the SDMs and applicable reporting procedures (paragraph 2.2.4.1).

3.3.11 EXCEPTIONS. Exceptions to the ship waterborne requirements of paragraph 3.3 shall be listed on the SPOD and approved by the SSC.

3.4 DRILLS

3.4.1 GENERAL. Shipyard drills shall be planned and scheduled by the SSO, and shall be witnessed and evaluated by the SSC. The SSC shall determine the drill grade and issue a formal report documenting the grade. The SSC shall also determine and assign corrective action, and ensure resolution.

3.4.2 INITIAL SHIP'S FORCE TRAINING DRILL. For commissioned ships, in a CNO availability, a satisfactory initial training drill shall be conducted within seven calendar days after Ship's Force acceptance of shipyard installed CASCON system, temporary fire fighting systems, or temporary pumping systems, as applicable. The purpose of this drill is to determine the adequacy of the CASCON, temporary/installed damage control systems/equipment and its use by Ship's Force, and to observe Ship's Force reaction to combat the casualty and interface with the shipyard and Fire Department.

3.4.3 FIRE DRILLS. Fire drills shall be conducted in accordance with the periodic fire drill requirements contained in chapter 12 of reference (p) or the Detailed Shipbuilding Specifications for New Construction Submarines. Fire drills are conducted in cooperation with Ship's Force to evaluate the response of shipyard personnel and the actions of Ship's Force and the Fire Department in combating the fire/associated casualties. A fire drill due after Phase I Crew Certification may be waived by the SSC.

3.4.4 FLOODING DRILLS. When waterborne, satisfactory flooding drills shall be conducted at periods not to exceed 90 calendar days, up to Fast Cruise. A flooding drill shall be conducted within 30 calendar days prior to Undocking/Simulating Waterborne. For new construction, a satisfactory flooding drill shall be conducted within 30 calendar days prior to Launch/Initial Float-Off. Compartments shall be randomly selected. The purpose of this drill is to determine the Ship's Force and shipyard's ability to stop and isolate the flooding source, effect proper inter-compartment isolation, and to apply the pumping and emergency dewatering capacity within the required time, while maintaining ship conditions. The shipyard shall demonstrate this requirement, including pumping capacity, during the NAVSEA audits of paragraph 4.8.2. A flooding drill due after Phase I Crew Certification for CNO availabilities and new construction, or Dock Trials for CNO minor availabilities may be waived by the SSC.

3.4.5 UNSATISFACTORY DRILLS. Unsatisfactory drills, as defined in Attachment (2), paragraph 2, should be re-conducted as soon as possible, but within 30 calendar days. Remedial drills may be commensurate with the reason for failure, as determined by the SSC.

3.4.6 DRILL BRIEFS. The SSO will lead the drill brief for shipyard drills, using the guide provided in Attachment (1), to detail shipyard and Ship's Force expectations and grading criteria. For In-service or In-commission ships, Ship's Force will brief specific details of the scenario, how the drill is initiated, simulations, monitor intervention points, and expected Ship's Force response.

3.4.7 DRILL DEBRIEFS. The SSO will lead the drill debrief for shipyard sponsored drills, immediately upon completion of the drill, using the guide provided in Attachment (2). Drill debriefs will be attended by all personnel necessary to properly evaluate the drill. The SSC shall make the final determination of drill results (pass/fail).

3.4.8 SHIP'S FORCE DRILLS FOR TRAINING. All arrangements and plans for drills to be conducted by Ship's Force will be coordinated with the Project Superintendent, CTEs, and SSO prior to the actual drill. The SSO will determine if the Ship's Force drill will affect Ship Safety, and, if so, ensure the drill is approved by the SSC and listed on the SPOD prior to approving any request. Drills should be commensurate with the situation, i.e., temporary cabling for power range testing or super shore power should not be disrupted during a drill. Ship's Force shall also notify the SSO, local fire department, and RADCON prior to commencement and at completion of the drill.

CHAPTER III

Attachment (1): Drill Planning/Briefing

1. **BRIEF EXPECTATIONS.** The SSO shall coordinate the planning of all drills with the SSC, using a Drill Request/Concurrence Form/Memorandum, or similar, to ensure all proper notifications are made and a common understanding exists for drill scenario and expectations. The SSC shall be present at all drill briefs.

1.1 The following items should be covered by the SSO during the drill brief, as applicable:

1. Extent of simulation expected, e.g., not simulate personnel evacuation, always simulate disconnecting temporary services through watertight doors, etc. Also, ensure that for a flooding drill, flooding is simulated to the extent that would require the use of the emergency dewatering pump(s).

2. That the drill be conducted in a manner that the casualty will be discovered by a shipyard person to "test" response and ability to use the CASCON/4MC.

3. Ship's Force CASCON (also Control and/or Damage Control Central Station if manned) Watch response(s).

4. Assignment of shipyard monitors.

5. Monitor intervention points, e.g., ensure work/test sites are properly secured including radiological and Hot Work areas. Document shop and badge numbers of personnel who don't actively participate in shipboard drills, for follow-up corrective action.

6. Specify which personnel, if any, are exempt from the drill.

7. Discuss expected Fire Department response.

8. Lessons Learned from previous drills.

9. Special Ship Safety considerations for the drill based on the unique condition of the ship.

10. Personnel safety considerations due to potentially hazardous conditions.

11. Preferred evacuation routes.

12. Evacuation and mustering of personnel.

13. Drill termination criteria.

14. Drill evaluation criteria.

S9002-AK-CCM-010/6010 REV LEVEL: 01
Attachment (1): Drill Planning/Briefing (Cont.)

1.2 This checklist is not all-inclusive and may be modified by the SSO as desired. It is up to the SSO's discretion to determine which attributes to brief, but as a guide, recent problems/lessons learned, including remedial actions, will be discussed, as well as other selected items on the list.

1.3 Request comments from Fire Department, shipyard monitors, or Ship's Force, etc.

1.4 Turn drill brief over to Ship's Force to discuss scenario and monitor intervention points.

2. DRILL EXPECTATIONS. All shipboard personnel are expected to participate in drills unless specifically exempted on the Drill Request/Concurrence Form/Memorandum, or similar. Shipyard and Contractor personnel are expected to put their work in a safe condition and evacuate promptly when an alarm is sounded. Fire Watch considerations must be taken into account. Drills will normally terminate once the drill criteria has been met as briefed.

CHAPTER III

Attachment (2): Drill Debrief/Grading

1. GENERAL. Drill debriefs will be conducted immediately after shipyard drills. Drill debriefs will be attended by all necessary personnel to properly evaluate the drill. The SSC shall be present at the drill debrief and will determine the drill grade and corrective actions, using a Fire/Flooding Drill Debrief Form, or similar.

2. DRILL GRADING. Failure to properly conduct particular aspects/expectations during a drill is not necessarily reasonable to consider a drill as unsatisfactory. It may be more effective to assign corrective/remedial actions for those deficiencies and ensure correction during the next drill cycle. Failure to execute the following attributes should be cause for an unsatisfactory grade.

2.1 Ship's Force fails to notify the emergency response personnel or fails to make announcements/alarms to the ship.

2.2 Source of fire/flooding not properly extinguished/stopped.

2.3 Compartment not isolated within three minutes of flooding alarm.

2.4 Dewatering efforts do not meet the requirements of paragraph 3.3.9.

2.5 Fire-fighting response not initiated in a timely manner. Fire hose(s) not at the scene within a reasonable amount of time, depending on location of casualty.

2.6 Demonstrated proficiency with Damage Control equipment.

S9002-AK-CCM-010/6010 REV LEVEL: 01

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CHAPTER IV

REQUIREMENTS FOR DOCUMENTS AND PROCEDURES FOR TESTING AND SHIP SAFETY ASSURANCE

4.1 GENERAL. The purpose of requiring the documents and procedures specified in this chapter is to provide a positive means for accounting for actions taken in preparation for, or in conjunction with, shipboard work and testing to provide the requisite degree of Ship Safety. The base requirements for shipboard testing are in reference (b). This should not preclude shipyard initiative to cover other areas not specified herein. The shipyard's administrative system shall provide Ship's Force copies of all current/revised Operating Procedures, Test Procedures, Work Instructions, etc., for shipboard work, in a timely manner.

4.2 SHIP PLAN OF THE DAY (SPOD). The SSO shall be responsible for the preparation and issue of the SPOD utilizing the LAT, work and test schedules, TPOD, input from the trade supervisors, input from the Ship's Force SSC representative for an applicable Ship's Force operation, evolution, work, testing, installation or removal that affects Ship Safety, WAFs, and test documents that affect Ship Safety, exceptions to Ship Safety, or HREs. These Ship Safety items must be approved on the SPOD prior to release for final authorization of the applicable operation, evolution, work, testing, installation or removal conduct. When a Ship Safety WAF is revised and the revised information is unrelated to the reason for the Ship Safety designation, no change to the SPOD to reflect the revision is required. The SPOD shall be in effect from the implementation of the requirements of this manual until commencement of Fast Cruise. The SSC shall determine if a SPOD is required after Fast Cruise or post repair trials. The SPOD shall include:

1. All applicable operations, evolutions, work, testing, installations or removals that affect Ship Safety.
2. Exceptions to ship waterborne requirements of Chapter III.
3. Exceptions to main ballast tank/Sonar Dome requirements of Chapter III.
4. Exceptions to ship interior requirements of Chapter III.
5. HREs listed in paragraph 4.5.
6. MCD for both fore and aft draft for the period of the SPOD.
7. Effect of proposed weight changes on list and draft, including environmental affects, as applicable.
8. Other evolutions as determined by SSC.
9. A drawing of shipyard installed emergency communications, lighting, and alarms, including locations of operating switches.

10. Location of temporary pumping facilities and temporary fire fighting systems, if used.

11. When freeze protection is in effect as a general note (where applicable).

4.2.1 SPOD APPROVAL. The SPOD indicates SSC approval to proceed with the conduct of the specific evolutions as scheduled. The SPOD may also be used to document minutes of SSC meetings. The SPOD, with approved changes or modifications, shall be reviewed and approved by all members of the SSC, (approval may be via TELCON after normal working hours) and be distributed by the SSO or SSS to the CASCON station, Ship's Duty Officer, Engineering Duty Officer, SSC Members, Project CTEs, Project Superintendent/Ship Manager (for private shipyards), Ship's Commanding Officer, 04 SFR and SSM, at a minimum, prior to the start of the listed evolutions.

4.2.1.1 See Attachment (1) of this chapter for a sample SPOD form. All shipyard SPODs shall be similar in format, with class exceptions, but must address the minimum applicable requirements contained in this manual.

4.2.1.2 SPOD changes can be filled in manually or computer generated. SSC approval is required for any changes under the same guidelines that exist for the original SPOD. The following guidelines apply:

1. Changes will be limited to cover emergent, unplanned work during the scheduled duration of the original SPOD.
2. Calculations for draft need only be modified if the work/test added to the change affects the draft shown on the original SPOD. If the draft is not affected, these columns shall be N/A.
3. Changes will be numbered using the serial number of the existing SPOD and CH 001, 002, etc.
4. The expiration date of any change must be the same as the expiration date of the original SPOD.
5. Separate change sheets or changing the existing SPOD and highlighting changes are allowed.
 - a. If separate change sheets are used, changes are to be added to the front of the existing SPOD by the SSO/SSS in a manner so CH 001 is placed over the existing cover sheet, CH 002 over CH 001, etc.
6. Changes shall get the same distribution as the original SPOD.

4.3 WORK AUTHORIZATION

4.3.1 GENERAL. This section describes documents that are required to preclude:

1. Unsafe operation of a system that could affect Ship Safety by the shipyard, Ship's Force, or Outside Activities when work or testing is in progress.
2. Violation of the integrity of completed testing on a system without provision for necessary retests.
3. Inadvertent operation of valves, motors, and other components, where such operation could affect ship and/or personnel safety.
4. Violation of watertight integrity when waterborne.

4.3.2 WORK AUTHORIZATION FORM (WAF). Reference (g) is the principal governing document for the use of WAFs on commissioned ships. This section amplifies reference (g) for work affecting Ship Safety. New construction shipyards may use a work authorizing document which, as a minimum, fulfills the requirements for a WAF contained in reference (g).

4.3.2.1 Provisions

4.3.2.1.1 "Safety of Ship" WAFs. All WAFs which affect Ship Safety shall be signed by the SSO/SSS (may be signed per TELCON) to signify concurrence to proceed with the work from an overall scheduling and safety standpoint and that the WAF is approved by the SSC on the SPOD. The SSO signs after the WAF is on the approved SPOD. WAFs shall be identified as "Safety of Ship" for the following cases:

1. Opening in the pressure hull when the ship is in a waterborne or simulated waterborne condition.
2. Work that violates the integrity of any watertight bulkhead when the ship is waterborne or in a simulated waterborne condition.
3. Work that violates double barrier isolation from sea (required below the waterline) (except those penetrations designed for single closure and those sea-connected systems below the waterline inboard of the backup valve less than 1/2" NPS).
4. Opening any sea-connected tank not double-barrier isolated from sea when the ship is waterborne or in a simulated waterborne condition (includes main ballast tanks and Sonar Dome).
5. Any operation that disables the operation of a system supporting fire or flooding prevention and control requirements identified in Chapter III, e.g. shipboard lighting, casualty alarms, general announcing systems, fire fighting, Trim/Drain system, AEB system (In-service or In-commission ships only), hull/backup valves and their actuators.
6. Connecting or disconnecting test equipment or shipyard support systems to ship systems, including un-isolable continuous flow fluid systems as described in

paragraph 3.2.1, which could affect Ship Safety, where the connection or disconnection is not a specific step in a TWD.

7. Disabling the Tank Level Indicator for a tank with capacity of 10 long tons or more (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) when the ship is waterborne or in a simulated waterborne condition.

8. Work, testing, installation or removal which causes an individual weight change of 10 long tons or more (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) when the ship is waterborne or in a simulated waterborne condition.

9. Work or testing which disables, removes or deactivates interlocks that prevent simultaneous opening of muzzle and breech on sea connected systems such as torpedo tubes, trash disposal unit, counter-measure launchers, etc.; when the ship is waterborne or in a simulated waterborne condition.

10. Work or testing on a sea connected system that is beyond the requirements of the Ship System Manual normal operating procedures, where the work is protected by mechanical or electrical interlocks; when the ship is waterborne or in a simulated waterborne condition.

4.3.2.2 New Construction Ships. For submarines under construction, the use of WAFs shall commence after the system/equipment/area has been accepted by shipyard quality assurance and for items affecting watertight integrity (as required by paragraph 3.3.1) at launch and whenever waterborne. Prior to Operational Control Transfer acceptance by the Ship's Force, the appropriate Work Control representative shall act for Ship's Force in authorizing WAFs. SSC approval as specified in Chapter III is required for all Safety of Ship WAFs beginning one week prior to Launch/Initial Float-Off. New construction shipyards may use a work authorizing document which, as a minimum, fulfills the requirements for a WAF contained in reference (g).

4.3.2.3 WAF Review. The shipyard shall reevaluate open WAFs whenever ship status changes (e.g., prior to floating the ship, conducting in-dock evolutions that simulate a waterborne condition, etc.) to ensure correct "Safety of Ship" designation.

4.4 TESTING REQUIREMENTS

4.4.1 TEST PROCEDURES. All Test Procedures shall be prepared in accordance with reference (b) or other NAVSEA approved test program administration requirements as invoked by the applicable contract(s).

4.4.2 Prior to going waterborne, all Test Procedures, which were written for accomplishment in dry dock, and which will be outstanding at undocking, shall be comprehensively reviewed by the JTG to ensure each test can be safely conducted waterborne.

4.5 PREREQUISITE LISTS FOR HIGH RISK EVOLUTIONS (HREs). Required PRLs may be included in any official shipyard directive (e.g. process instruction, shipyard instruction, etc.) and shall include steps to ensure the degree of Ship Safety and watertight integrity as specified elsewhere in this manual. The PRLs shall be approved by the SSC, and these evolutions scheduled on the SPOD. HREs may affect Ship Safety and should be treated as such. The shipyard shall prepare PRLs for the following HREs:

1. Launching/Undocking (refer to paragraph 3.3.2).
2. Docking.
3. Flooding the dry dock with submarine in dock. (Simulated waterborne conditions).
4. Propulsion testing of Main Engines including Emergency Propulsion Motor (EPM), SPM, and thrusters.
5. Oxygen charging/discharging including onboard installed equipment e.g., Electrolytic Oxygen Generator (EOG), Automated EOG, and Integrated Low Pressure Electrolyzer operations.
6. Battery charging.
 - a. Submarine Valve Regulated Lead Acid (SVRLA) battery charging is not an HRE. However, performing an SVRLA constant voltage or current charge where 2.45 volts per cell is achieved is an HRE
7. Diesel Fueling/De-fueling.
8. Evolutions/processes involving explosive, toxic, or hazardous materials, which constitute a danger or potential danger to Ship Safety.
9. Operations involving launching of dummy torpedoes.
10. Operation of Emergency Main Ballast Tank (EMBT) Blow system when waterborne (other than static blow).

4.6 SHIP SAFETY LOG. A Ship Safety Log constitutes an official record during the period of the ship's construction period or CNO availability and shall be developed by the shipyard and used by the SSW. Shipyard provided Ship Safety Logs shall be used from implementation of the requirements of this manual until Fast Cruise. Following the ship being placed In-service, the Ship's Force member of the SSC shall maintain these logs in an auditable format for the duration of the construction period or availability. The following records shall be kept:

4.6.1 RECORD ONCE EVERY HOUR:

1. Fore and aft drafts, and list, while waterborne. Readings shall be compared with the SDM and MCD.

2. Condition of bilges.

3. Condition of cofferdams, temporary hull blanks, hatches, watertight doors, and passageways, while waterborne.

4. Status of battery ventilation when battery is in service.

5. While waterborne, tank levels of those tanks whose capacity exceed 10 long tons (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) and are not isolated (refer to paragraph 3.3.7.1).

4.6.2 RECORD ONCE EACH WATCH/SHIFT:

1. Condition of all ready for use fire extinguishers located aboard ship and in the drydock. Fire extinguishers properly located, seals intact, and no visible damage.

2. Condition of temporary systems installed to support or maintain Ship Safety (e.g. top hat/bridle air system, temporary dewatering pumps, temporary fire fighting).

4.6.3 REPORTED AND RECORDED ON A CASE BASIS:

1. Fire hazards.

2. Fire incidents.

3. Flooding incidents.

4. Personnel injury.

5. Equipment damage.

4.6.4 See Attachment (2) of this Chapter for a sample of the SSW Log. All logs shall be similar in format with class exceptions, but must address the minimum applicable requirements contained in this manual. When Ship's Force is manning the SSW, the Duty Officer or Duty Chief Petty Officer initials the log to indicate review per periodicity of their Submarine Organization and Regulation Manual. When the shipyard is manning the SSW, the SSO/SSS initials the log to indicate review per periodicity requirements of local instructions.

4.7 TROUBLE REPORTS. For naval shipyards, and when contractually invoked at private shipyards, the requirements of reference (k), apply. For naval shipyards, reference (l) shall also be referred to for preparation of Trouble Reports.

4.8 AUDIT PLAN

4.8.1 LOCAL AUDITS. Shipyards shall audit compliance with the requirements of this manual every 12 months using an audit plan. The audit plan, with all attributes documented as reviewed, shall be maintained in an auditable format for a minimum of four years. Copies of these audits shall be made available for Government inspection in private shipyards.

4.8.2 NAVSEA AUDITS. NAVSEA shall conduct audits of each shipyard at 24-month intervals. As a minimum, the following areas of the manual and applicable references shall be examined:

1. Ship Safety organization, training, and qualifications.
2. Testing organization, training and qualifications per reference (b) or other NAVSEA approved test program administration requirements as invoked by applicable contracts.
3. Shipyard WCT organization, training, and qualifications.
4. Ship Safety Logs.
5. WAFs.
6. SPOD and LAT.
7. Tag-out procedures, active tag-out records, and available inactive tag-out records.
8. Prevention and control of fire and flooding (including fire and/or waterborne flooding drills).
9. Test Procedures.
10. Trouble Reports.
11. Other instructions and procedures related to implementation of this manual. A single, well defined set of shipyard wide instructions is recommended.

The audits shall also include actual inspection of Ship Safety conditions, conduct of testing, etc. Shipyards should keep records in auditable form and for the length of availability or new construction, or for the time required by other directives, if longer.

S9002-AK-CCM-010/6010 REV LEVEL: 01

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SHIP PLAN OF THE DAY				Ship/Hull Number (688 Class)				NO.		CHG		EFFECTIVE DATES			

DEWATERING EQUIPMENT STATUS						LIGHTING					
200 – 500 GPM		500 GPM		1000 GPM		NORMAL		EMER			
TRIM	DRAIN	TEMP	TEMP	TEMP	TEMP	SHIP	TEMP	SHIP	TEMP	SHIP	TEMP
ALARMS						EAB AIR					
SHIP		TEMP	SONAR DOME STATUS		ACCESS		OPEN		SHIP		TEMP
			FULL	EMPTY	SECURED						
FIRE FIGHTING						BILGE ALARMS					
SHIP		TEMP	SHIP	TEMP	SHIP	TEMP					

INTERNAL TANKS	ACTUAL	CAPACITY	AUTHORIZED CHANGE
FWD TRIM TANK			
AUX 1			
AUX 2			
AUX 3			
AUX 4			
AFT TRIM TANK			
RFT #1			
RFT #2			
PW #1			
PW #2			
ORGANIZATION	1ST ALTERNATE	PHONE	2ND ALTERNATE
SSO			
S/F SSC REP			
EPD REP/SUPSHIP REP			
OSC SSC REP			

MAIN BALLAST TANK STATUS – FLOOD PORTS CLEAR											
MBT	SY AIR	LP BLOW	EMBT	VENTS LOCKED SHUT W/COVERS							
1											
2											
3											
4											
5											
DRAFT CHANGES		INCHES		LIST							
POSITIVE=INCREASE		FWD	AFT								
SHIP'S N DRAFT											
TOTAL DRAFT & LIST CHANGES											
ACTUAL DRAFT & LIST											
MAXIMUM CALCULATED DRAFT & SSC MAXIMUM LIST LIMIT											
LOCATION OF SAFETY DRAFT MARKS											
ORGANIZATION	NAME		PHONE #								
SSO											
SF SSC REP											
EPD REP/SUPSHIP REP											
OSC SSC REP											
SHIP SAFETY COUNCIL APPROVAL											
SSO SIGNATURE & DATE											
SF SSC SIGNATURE & DATE											
OSC SIGNATURE & DATE											
EPD REPRESENTATIVE SIGNATURE & DATE											

NOTES:											

DISTRIBUTION: CASCON, SDO, EDO, SEM, EPD REPRESENTATIVE, CTE-N/W/HM&E, APS-NUC/NN, 246 WC, SSM, SHIP'S CO, OSC SSC REP, NAV/SEA 04X Shipyard Field Representative (naval shipyards)

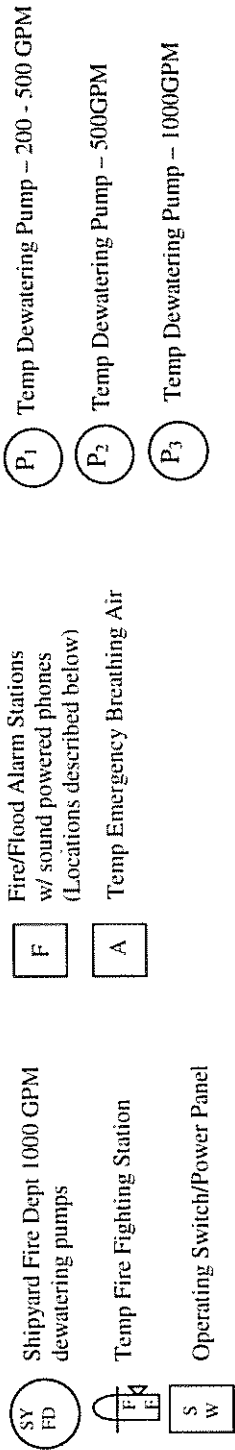
SHIP PLAN OF THE DAY		Ship/Hull Number (688 Class)	NO.	CHG	EFFECTIVE DATES
Item	SSC NOTES:	REMARKS			
Shop/Code Document	HIGH RISK EVOLUTIONS:	REMARKS			DRAFT CHANGES: FT-IN FWD AFT N/A N/A
Shop/Code Document	SAFETY OF SHIP WORK:	REMARKS			DRAFT CHANGES: FT-IN FWD AFT N/A N/A
Shop/Code Document	SAFETY OF SHIP TESTS:	REMARKS			DRAFT CHANGES: FT-IN FWD AFT N/A N/A
Shop/Code Document	HULL PENETRATIONS BELOW WATERLINE THAT VIOLATE DOUBLE CLOSURE. (3.3.2)	REMARKS			
Shop/Code Document	HULL PENETRATIONS/OPENINGS FROM THE WATERLINE TO 4 FEET ABOVE THE WATERLINE THAT VIOLATE SINGLE CLOSURE. (3.3.3)	REMARKS			

SHIP PLAN OF THE DAY	Ship/Hull Number (688 Class)	NO.	CHG	EFFECTIVE DATES	

Shop/Code Document	HULL PENETRATIONS/OPENINGS FROM THE WATERLINE TO 4 FEET ABOVE WATERLINE – TOPSIDE HATCHES, MISSILE TUBE MUZZLE HATCHES, HULL ACCESS OPENINGS, OTHER PENETRATIONS OR OPENINGS, EXTERNAL CAVITY VENTS (3.3.3.1, 3.3.3.2, 3.3.3.3, 3.3.3.4, 3.3.3.5)	REMARKS	
Shop/Code Document	HULL PENETRATIONS/OPENINGS GREATER THAN 4 FEET ABOVE WATERLINE, NOT AS BUILT (3.3.4)	REMARKS	
Shop/Code Document	SHIP INTERIOR – INTERIOR TANKS, WATERTIGHT BULKHEAD AND DOOR, BILGE ALARMS, SHIP'S ALARMS AND COMMUNICATIONS, EMERGENCY AIR BREATHING SYSTEM, LIGHTING (3.1.4, 3.1.6, 3.1.7, 3.3.7)	REMARKS	

SHIP PLAN OF THE DAY	Ship/Hull Number (688 Class)	NO.	CHG	EFFECTIVE DATES	

Location of Temporary Pumps, and/or Emergency Communications,
Lighting and Alarms with Operating Switches/Power Panel



CHAPTER IV

Attachment (2): Sample SSW Log with Instructions for Use

1. GENERAL

The requirements of this attachment are applicable to all nuclear submarines undergoing CNO availabilities except SRAs, at shipyards. The SSW Logs may be extended to SRAs, as determined by the SSC. SSW Logs for other class submarines, similar in format, meeting at least the minimum requirements of this attachment, shall be prepared by the shipyard. The Ship Safety Logs will be maintained by a qualified SSW and will constitute an independent official Ship's Force record during the period of the ship's availability. Ship Safety Logs are taken during the entire availability (including during Condition II in the Propulsion Plant), until Fast Cruise. Ship Safety Logs for new construction shall be issued/expanded by the SSC at the appropriate times as the ship construction proceeds.

2. RESPONSIBILITIES

2.1 Commanding Officer

2.1.1 Ensures the Ship Safety Logs developed by the shipyard, are used on his ship. These logs constitute an official Ship's Force record during the period of the availability and shall be maintained by qualified SSW personnel.

2.1.2 Ensures Ship's Force watch standers understand the importance of Standard Naval Log Keeping practices, including the importance of log review for trends/anomalies, especially during watch relief.

2.1.3 Ensures SSWs attend and pass the shipyard's SSW training as well as determining any additional training, experience and qualification requirements prior to certification to stand SSW.

2.2 Ship Safety Watch (SSW) – Ship's Force. Immediately report any abnormal conditions that could affect Ship Safety to the SDO and/or EDO. The SDO will immediately report the abnormal condition to the SSO or SSS. The functions of the SSW shall normally be carried out by the Ship's duty section as directed by the Ship's Commanding Officer per his responsibilities specified in Navy Regulations. Specific mandatory duties and responsibilities include the following:

2.2.1 Maintain a continuous patrol (at least once every hour) of the ship, topside and below decks (Forward and Aft) and the areas adjacent thereto.

2.2.2 Maintain the Ship Safety Logs per this attachment.

2.2.3 Note and report all violations of prescribed procedures or other abnormalities pertaining to Ship Safety, security, and watertight integrity. Enter the reason for unsatisfactory

ATTACHMENT (2): Sample SSW Log with Instructions for Use

reading(s) on logs and the corrective action taken. Particular attention shall be given to the following:

- a. Evidence of smoke, fire, or abnormal temperatures.
- b. Leaks in ship or temporary service systems (air, oil, steam, water).
- c. Abnormal collection of water or oil in bilges.
- d. Abnormal odors such as fuel, oil, gas, etc.
- e. Door, hatch and passageway clearance, including quick-disconnects on cables, hoses or lines, where required.
- f. Operability of bilge pumps (Power available, hoses properly stowed and routed).
- g. Strange looking boxes, packages.
- h. Abnormal noises.
- i. Housekeeping, including accumulation of trash.
- j. Proper protection of ship's equipment from damage by work in progress.
- k. Proper utilization of fire watches during hot work.
- l. Fire extinguishers properly located, with up-to-date weight inspection record (once each shift). (Ship's Force permanent or Ship's Force replacement fire extinguishers only).
- m. Record testing of the Ship's AN/WIC, Integrated Communication System (ICS), and/or CASCON announcing system daily.
- n. Access/Egress board of reference (e) properly updated. Ensure these boards are properly updated immediately upon change in status of any entry/exit point, including the securing of topside areas.
- o. CASCON or ship's Emergency Announcing System (MC) remote stations operable and readily accessible.
- p. Exit routes adequately identified and passageways unobstructed for emergency egress.
- q. Verify proper security clearance/badges for personnel on board.

ATTACHMENT (2): Sample SSW Log with Instructions for Use

- r. Designated security locks in place.
- s. Status of battery ventilation.
- t. Ship properly moored.
- u. Air bubbles below the waterline.
- v. Brows secured safely.
- w. Main Ballast Tank vent covers properly positioned with no audible leaks.
- x. Sonar Dome status.
- y. Hoses or welding/electrical leads in the water.
- z. When waterborne - fore draft, aft draft and list. Each draft reading will be compared with the SDM locations and the MCD as specified by the current SPOD. The MCD is the maximum trigger-point for notifying the SDO and/or EDO. If the MCD is exceeded, there is a problem, regardless of how far the SDMs are from the actual waterline. (Ship's CO requires notification of ANY unexpected change to draft, trim or list, as invoked by SUBFOR CO Standing Orders.) Ensure Topside SSW Log (Ship Waterborne Section) is properly updated/ verified immediately upon issue of a new/revised SPOD, i.e., SDMs, cofferdam and hull blank information, etc.
 - aa. When waterborne - condition of cofferdams and temporary hull blanks listed on the current SPOD and the condition of watertight doors.
 - bb. When waterborne - tank levels of those tanks whose capacity exceeds 10 long tons (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) and are not isolated and danger tagged. Ensure the SDO and/or EDO is notified immediately of any out-of-specification tank level reading.
 - cc. Proper installation of safety lines and devices to prevent personnel from falling overboard.
 - dd. Personnel injury and hazards.
 - ee. Bilge temperatures and adequacy of freeze protection systems (where applicable).

2.2.4 In case of fire or flooding, the SSW detecting the casualty shall immediately sound the installed alarm to initiate reporting the casualty to shipyard emergency units

ATTACHMENT (2): Sample SSW Log with Instructions for Use

(CASCON Station, fire station, etc.) and the SDO. After reporting the emergency condition, the SSW shall, to the extent possible, take action to control or limit the spread of fire and/or flooding.

2.2.5 Immediately report all other hazardous conditions to the SDO and/or EDO. The SDO and/or EDO will report the hazardous condition to the SSO or SSS.

2.2.6 If the Actual Draft reaches the MCD (or earlier as required by Ship's CO Standing Orders), the SSW shall notify the SDO and/or EDO.

2.2.7 The SDMs should not be allowed to touch the water; corrective actions should be taken before this happens.

2.3 Ship Safety Watch (SSW) – Shipyard, Assigned to Inactivations

2.3.1 All the duties and responsibilities of the shipyard SSW are the same as listed for the Ship's Force SSW, except as follows:

a. The shipyard SSW, on an inactivation availability, shall immediately report any problem to the SSO or SSS.

b. The shipyard SSW shall be trained on the unique features of the inactivation Ship Safety systems/logs, as part of the Shipyard SSW training program.

c. The shipyard SSW Log shall be tailored to the unique requirements of the inactivation by the SSO.

d. The shipyard shall determine additional training, experience and qualification requirements prior to certification to stand SSW.

2.4 Ship Safety Officer (SSO). Ensures personnel within the Ship Safety organization monitor at least daily, the Ship Safety Logs for the ship, maintain contact with SSW personnel, and takes/initiates appropriate action to resolve hazards/discrepancies noted or reported. The SSO/SSS shall initial next to the time for which the review took place.

2.5 Ship Safety Council (SSC). Any problems with the information requested on the logs will be reviewed by the SSC. Deviations to the logs may be approved by the SSC, on the MASTER SSW Log(s), as long as the minimum recording requirements of this attachment are not violated.

SHIP SAFETY WATCH LOG (SHIP WATERBORNE)														SHIP		DATE									
TIME	DO/DCPO INITIAL (A)	FIRE FIGHTING EQUIP STATUS (B)	TOPSIDE SAFETY (C)	CONDITION OF HOSES/LEADS (D)	TOPSIDE CLEANLINESS (E)	FIRE WATCHES STATIONED WHERE REQ'D (F)	STATUS OF HATCHES/SONAR DOME WATER-TIGHT (G)	SONAR DOME STATUS (H)	TEST AND VERIFY SHIP/CASCON/IA SAT/UNSAT	ACTUAL DRAFT (FEET/INCHES)		MAX CALCULATED DRAFT APPROVED ON SPID (H)		LOCATION OF SAFETY DRAFT MARKER (FEET/INCHES) (I)		MCD-AD		MHT VV AIR SUPPLY PRESSURE		COFFERDAMS AND TEMPORARY HULL BLANKS (J)	SAT/UNSAT	MHT VENTS (K)	SAT/UNSAT	NO AIR BUBBLES BELOW THE WATER LINE SAT/UNSAT	
										FWD	AFT	FWD	AFT	FWD	AFT	FWD	AFT	FWD	AFT						FWD
0000																									
0100																									
0200																									
0300																									
0400																									
0500																									
0600																									
0700																									
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1900																									
2000																									
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LOG SAT OR UNSAT IN LOG. EXPLAIN IN REMARKS IF UNSAT.

NOTES:

(A) DO/DCPO INITIAL TO INDICATE REVIEW OF LOGS.

(B) FIRE HOSES INSTALLED ADJACENT TO HATCHES. FIRE EXTINGUISHERS TOPSIDE SECURED. SEALS UNBROKEN. WEIGHT CURRENT.

(C) NETTING, SAFETY LINES AND STAGING CORRECTLY PLACED. TOPSIDE LIGHTING ADEQUATE FOR WORK PASSAGE. BROWS SAFELY PLACED ON THE PIER, SHIP, AND BARGES. NO OBSTRUCTIONS ON BROWS THAT ARE PROVIDING PERSONNEL ACCESS. MOORING LINES NOT IN WATER. UNUSED LINES STOWED.

(D) NO LEAKS IN HOSES TOPSIDE. ALL HOSES, AND LEADS PASSING THROUGH TOPSIDE HATCHES ARE SECURE AND PERSONNEL SAFETY AND EVACUATION CONSIDERATIONS ARE NOT JEOPARDIZED. NO HOSES OR WELDING / ELECTRICAL LEADS ARE IN THE WATER AND ALL HOSES AND LEADS PASSING THROUGH TOPSIDE HATCHES HAVE AUTHORIZED HATCH TAGS AND QUICK DISCONNECTS WHEN REQUIRED. HOSES AND LEADS ARE NOT PINCHED.

(E) TOPSIDE AND FREE FLOOD CLEANLINESS / ACCESSIBILITY WILL NOT HAMPER CASUALTY CONTROL OPERATIONS. CLEANLINESS / ACCESSIBILITY CONDITIONS ARE NOT CREATING A FIRE HAZARD.

(F) WATER TIGHT HATCH CLEARANCE AND CLEANLINESS WILL NOT HAMPER CASUALTY OPERATION OF HATCHES.

(G) ACCESS TO SONAR DOME SECURED UNLESS WORK IS BEING DONE ON THE SONAR DOME. NO STRANGE BOXES, PACKAGES, OR ABNORMAL NOISES ARE PRESENT.

(H) MAX CALCULATED DRAFT TO BE COMPARED TO ACTUAL DRAFT. NOTIFY SSO IF ACTUAL DRAFT REACHES MCD.

(I) RECORD THE LOCATION OF THE SAFETY DRAFT MARKER BY COMPARING THE LOWER EDGE OF THE SAFETY DRAFT MARKER TO THE SHIP'S INSTALLED DRAFT MARKS.

(J) COFFERDAMS SECURED. TEMPORARY HULL BLANKS WATER TIGHT.

(K) MAIN BALLAST TANK COVERS POSITIONED IN ACCORDANCE WITH THE SPID AND ONGOING WORK. TEMPORARY MAIN BALLAST TANK BLOW SYSTEM INSTALLATION SAT (IF INSTALLED).

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CHAPTER V

CONTROL OF WORK, TESTING AND SHIP SAFETY DURING OFF-SHIPYARD AVAILABILITIES

5.1 GENERAL

5.1.1 PURPOSE. The purpose of this chapter is to provide specific requirements for the control of an operation, evolution, work, testing, installation or removal on submarines which could affect Ship Safety, for areas other than the reactor plant, and for HREs, during CNO scheduled availabilities, as defined in Chapter 1, conducted off-shipyard (e.g., Selected Restricted Availabilities).

5.1.2 SCOPE. Provisions of this chapter extend some of the requirements contained in Chapters I through IV to CNO scheduled availabilities conducted off-shipyard. Only requirements specifically contained or referred to in this chapter are mandatory for off-shipyard CNO scheduled availabilities less than six month durations as defined in paragraph 5.1.1. For CNO scheduled availabilities conducted off-shipyard for durations greater than six months, all the controls required in the previous chapters are required. If the SRA is not conducted at the LMA's home shipyard, the availability is considered to be off-shipyard. Reactor plant work and testing requirements are specified in NAVSEA 0989-037-2000. Terms used are defined in Chapter I.

5.1.3 RESPONSIBILITIES. The responsibility for the Ship Safety is stated in U.S. Navy Regulations, OPNAV instructions, NAVSEA instructions, and applicable Force regulations. This chapter delineates responsibilities of the Commanding Officer/Officer-in-Charge (hereafter referred to as the CO) and the shipyard, regarding Ship Safety during CNO scheduled availabilities conducted outside a shipyard.

When shipyard personnel perform maintenance and repair work outside the shipyard, controls are required to ensure the work is properly coordinated. When work is also being performed by other activities, such as Ship's Force and Industrial Maintenance Activities (IMAs), coordination between participating activities is more complex. Since it is neither practical nor necessary to transfer the entire organizational structure and practices which exist within the shipyard, necessary controls shall be included in a written agreement(s) which defines functions, assignments, and responsibilities of the various participating activities. The shipyard shall be responsible to prepare and obtain the necessary concurrences to such an agreement. This agreement(s) shall be between the Ship, shipyard (and SUPSHIP for private shipyard availabilities), and concurred in by other participating activities (e.g., Squadron and IMA).

5.2 ORGANIZATIONAL REQUIREMENTS AND PERSONNEL QUALIFICATIONS

5.2.1 SHIP'S FORCE. For ships In-service or In-commission, the Ship's CO is responsible for Ship Safety and inspection of work as prescribed by U.S. Navy Regulations, Submarine Force Regulations, Maintenance and Quality Assurance Manuals, and applicable OPNAV instructions. The Ship Safety Organization, as defined in paragraph 5.2.2 and formalized in the

written agreement(s) of paragraph 5.1.3, will support this effort. Ship's Force shall operate all ship's equipment except when "transfer including operation" is specified on a WAF for a specified area/system. (Note: The TYCOM must approve the use of system transfers during off yard CNO scheduled availabilities.) Ship's Force shall be notified by the shipyard in advance of impending shipboard tests required to recertify shipyard work so that the ship can schedule personnel as required.

5.2.2 SHIP SAFETY ORGANIZATION. The Ship Safety Organization shall be in accordance with paragraph 2.2, with the following exceptions:

5.2.2.1. The shipyard shall appoint a Ship Safety Officer (SSO) who will perform the duties of paragraphs 2.2.2.2.1 through 2.2.2.2.6. The SSO shall be qualified in accordance with paragraph 2.6.4.1 and designated in writing. An alternate SSO may be designated in writing per paragraph 2.2.6.2.1. The alternate SSO is not required to be on site.

5.2.2.2. The shipyard may appoint Ship Safety Superintendents (SSSs) as necessary. The SSO or the SSS, when appointed, is responsible for the duties and responsibilities specified in paragraphs 2.2.3.2.1 through 2.2.3.2.7.

5.2.2.3. Ship's Force will provide SSWs as required by paragraph 2.2.4 who are qualified in accordance with paragraph 2.6.4.3.2. The topside and in port watches below decks will fulfill this requirement in the normal performance of their duties. Use of the SSW logs provided in Attachment 2 may be used at the discretion of the SSC.

5.2.2.4. The Ship Safety Council (SSC) defined in paragraph 2.2.6.2.1 will be expanded to include the TYCOM/ISIC Availability Coordinator whose duties are defined in reference (g).

5.2.2.5. The SSC will meet and issue a SPOD to authorize work and testing from implementation of the requirements of this manual until Fast Cruise.

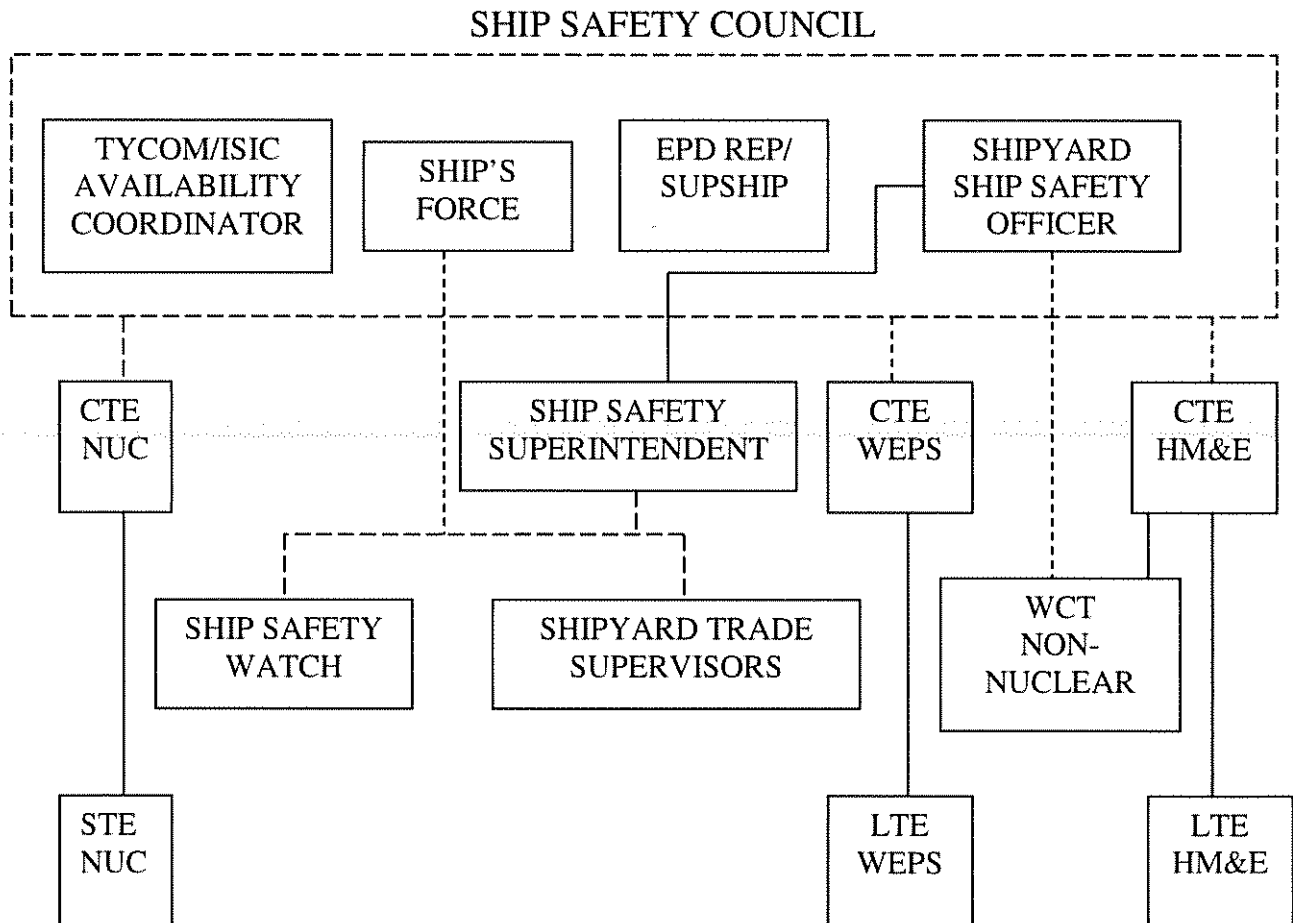
5.2.2.6. The TYCOM/ISIC Availability Off-shipyard Coordinator (OSC) and Ship's Force will be responsible for all FMA work and will sign the SPOD, described in paragraph 5.4.2, accordingly.

5.2.3 SHIP TEST ORGANIZATION. References (a) and (b) apply. Ship's Force, all Outside Activities, AITs, FMAs, and the CTE(S) shall obtain approval via the SPOD prior to commencing any testing which affects Ship Safety, and prior to commencing any HRE.

5.2.4 CENTRAL AVAILABILITY COORDINATION. The LMA will coordinate all operations, evolutions, work, testing, installations or removals during the availability. The OSC will keep the LMA apprised of authorized non-LMA/non-AIT operations, evolutions, work, testing, installations or removals.

5.2.5 RELATIONSHIP OF SHIPYARD PROJECT PERSONNEL. Relationships are as defined in Section 2.4.

5.2.6 SUMMARY OF ORGANIZATIONAL RELATIONSHIPS. Organizational relationships of personnel who have responsibility for ship testing, safety and watertight integrity are defined in paragraphs 5.2.1 through 5.2.5 and are shown in Figure 5.1. The dotted line implies the minimum relationship necessary for matters pertaining to Ship Safety and watertight integrity.



Note 1 – EPD Representative

Figure 5.1 Ship Safety Council
Functional Interface
(Off-shipyard Availabilities)

5.2.7 TRAINING AND QUALIFICATION REQUIREMENTS. Training and qualification requirements will be as outlined in paragraph 2.6.

5.3 PREVENTION AND CONTROL OF FIRE

5.3.1 Fire prevention and control measures shall be in accordance with reference (q) for public shipyards and reference (e) or the Detailed Shipbuilding Specifications for New Construction Submarines, as applicable, for private shipyards.

5.4 PREVENTION AND CONTROL OF FLOODING

5.4.1 SHIP IN DRY DOCK. When the ship is in dry dock, Chapter 0872 of Navy Regulations requires the closing of all valves and other openings in the ship at the end of working hours when such closings are practicable. In situations where there is extensive disruption of watertight integrity, making daily closings of openings in the ship impracticable, it is prudent to protect the dry dock, rather than the ship, from inadvertent flooding. To this end, (floating and graving) dry docks shall be maintained in accordance with reference (g). The activity responsible for the dry dock shall produce and maintain procedures that shall be initiated as part of the response to destructive weather (see paragraph 3.1.5), dry dock flooding (electrical/mechanical/minor structural failure or human error during the entire in-dock period), or HRE that could affect Ship Safety.

5.4.2 SHIP WATERBORNE. Ship's Force and the shipyard shall protect the ship against flooding. The primary means of controlling flooding on a submarine is to locate and secure the source. In parallel, the means of controlling progressive flooding is inter-compartment isolation. For CNO scheduled off-yard availabilities, Ship Safety requirements shall be the same for simulated waterborne conditions as for waterborne conditions. Controls for shipboard work and testing will be in accordance with paragraph 3.3 while the ship is waterborne, except that the requirements of paragraphs 3.3.9.2 through 3.3.9.5 and paragraph 3.4 do not apply. The shipyard shall provide the MCD as defined in paragraph 1.3 on the SPOD. SSO/SSS shall maintain the SDMs required by paragraph 3.3.10. Paragraph 3.3.10 does not apply if the waterborne period is projected to be less than four weeks. The ship conditions, as listed in the current SPOD, shall be included in the Topside Log so the Topside Watch can report changes in draft, trim, or list beyond the limits specified. Exceptions to paragraph 3.3 requirements, other than paragraphs 3.3.9.2 through 3.3.9.5, paragraph 3.3.10, and paragraph 3.4, as applicable, shall have prior specific approval of the SSC, with rationale, via the SPOD. For those CNO scheduled off-yard availabilities, the waterline shall be established per paragraph 3.3.1.

5.5 DOCUMENTS AND PROCEDURES. The purpose of requiring the documents and procedures specified in this chapter is to provide a positive means of accounting for actions that shall be taken in preparation for, or in conjunction with, shipboard work and testing, to provide the minimum requisite degree of safety assurance. This list should not preclude shipyard initiative to cover other areas not specified herein.

5.5.1 PLAN OF THE DAY (POD). The LMA shall prepare and issue a POD listing significant shipboard work and test items which are scheduled to be accomplished during the availability, utilizing input from the shipyard, Ship's Force, IMA, dry dock, and any other

Outside Activities with authorized work or testing. The POD shall be in effect from the start of the availability until commencement of Fast Cruise.

5.5.2 SHIP PLAN OF THE DAY (SPOD). The SSO shall be responsible for the preparation, issue, and maintenance of the SPOD utilizing input via the WAF/TWD from nuclear and non-nuclear shipyard organizations, Ship's Force, IMA, Squadron, and other Outside Activities participating in the availability. The SSC shall convene from implementation of the requirements of this manual until Fast Cruise to issue and maintain a SPOD. The SSC shall review all work (by all activities) in progress and planned to start for inclusion on the SPOD. The review will take place at a time that is sufficient to allow the review to be completed and a new SPOD written and approved prior to undocking. The SPOD indicates the SSCs approval to proceed with the conduct of the specific evolutions as scheduled. The SSO must ensure the time spent in excepted conditions is minimized. Meetings of representatives from the activities involved in the availability shall be held as necessary to coordinate work and testing, propose changes and modifications to the SPOD, and improve communication among the various activities. The SPOD, with approved changes or modifications, shall be reviewed and signed by all members of the SSC. The SPOD shall include:

1. Ship conditions in effect for shipyard and Ship's Force work.
2. All evolutions that affect Ship Safety.
3. Exceptions to requirements of paragraph 5.4.
4. HREs listed in paragraph 4.5.
5. MCD for authorized evolutions, for both forward and aft, per paragraph 3.3.8 calculations.

5.5.3 WORK AUTHORIZATION. Same as specified by paragraph 4.3.

5.5.4 TAG-OUT PROCEDURES. All activities shall comply with the requirements of this manual and reference (d).

5.5.5 TEST REQUIREMENTS. Same as specified by paragraph 4.4.

5.5.6 PREREQUISITE LISTS FOR HIGH RISK EVOLUTIONS. PRLs for HREs shall be prepared by the activity with authorized responsibility for accomplishing the evolution. PRLs shall include steps to ensure the degree of Ship Safety and watertight integrity specified elsewhere in this Chapter. PRLs may be derived from any official shipyard or Submarine Force directive. PRLs shall be signed by all activities supporting the evolution. The activity signature indicates that the status of all work and systems under its cognizance will support the specified HREs are defined in paragraph 4.5. PRL's shall be approved by the SSC and these evolutions scheduled on the SPOD. It is recognized that not all of the evolutions listed in paragraph 4.5 will be executed in a particular CNO scheduled off-shipyard availability. Only those evolutions that are applicable to the availability in progress are covered under the provisions of this paragraph.

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CHAPTER VI

CONTROL OF WORK, TESTING AND SHIP CONDITIONS ON DECOMMISSIONED SUBMARINES

6.1 GENERAL

6.1.1 PURPOSE. This chapter establishes requirements for the control of an operation, evolution, work, testing, installation or removal which could affect Ship Safety of decommissioned submarines during inactivation and/or recycling availabilities, except as noted.

6.1.2 SCOPE. This chapter applies to all operations, evolutions, work, testing, installations or removals which could affect Ship Safety on decommissioned submarines during inactivation and/or recycling availabilities, except as noted. The requirements of this manual, when invoked by the work package, are mandatory. This chapter is an adaptation of the requirements of Chapters I through IV to provide the appropriate measures to control Ship Safety on decommissioned submarines during inactivation, storage following inactivation, and/or recycling availabilities. The requirements of Chapters I through IV shall apply to decommissioned submarines only as specified in this chapter. This chapter does not apply to operations, evolutions, work, testing, installations or removals performed during inactivation prior to decommissioning which is governed by Chapters I through IV of this manual. This chapter does not apply to operations, evolutions, work, testing, installations or removals performed during Reactor Compartment Disposal (RCD) or ship recycling availabilities in dry dock if the ship will not be re-floated. Reference (l) and local procedures (submitted to NAVSEA for information), specify requirements for RCD and ship recycling work in dry docks. This chapter does not apply to removal of tow equipment following tow from inactivating shipyard (if applicable) and storage following inactivation. These requirements are found in reference (m).

6.1.3 RESPONSIBILITIES. The responsibility for the safety of ships is stated in U.S. Navy Regulations, and NAVSEA Instructions. This chapter has been developed to assist the Shipyard Commander in carrying out responsibilities for work on decommissioned submarines. Following decommissioning, the shipyard is solely responsible for Ship Safety, until turned over to the tow OIC (if applicable), or until the ship is recycled.

6.2 ORGANIZATIONAL REQUIREMENTS AND PERSONNEL QUALIFICATIONS

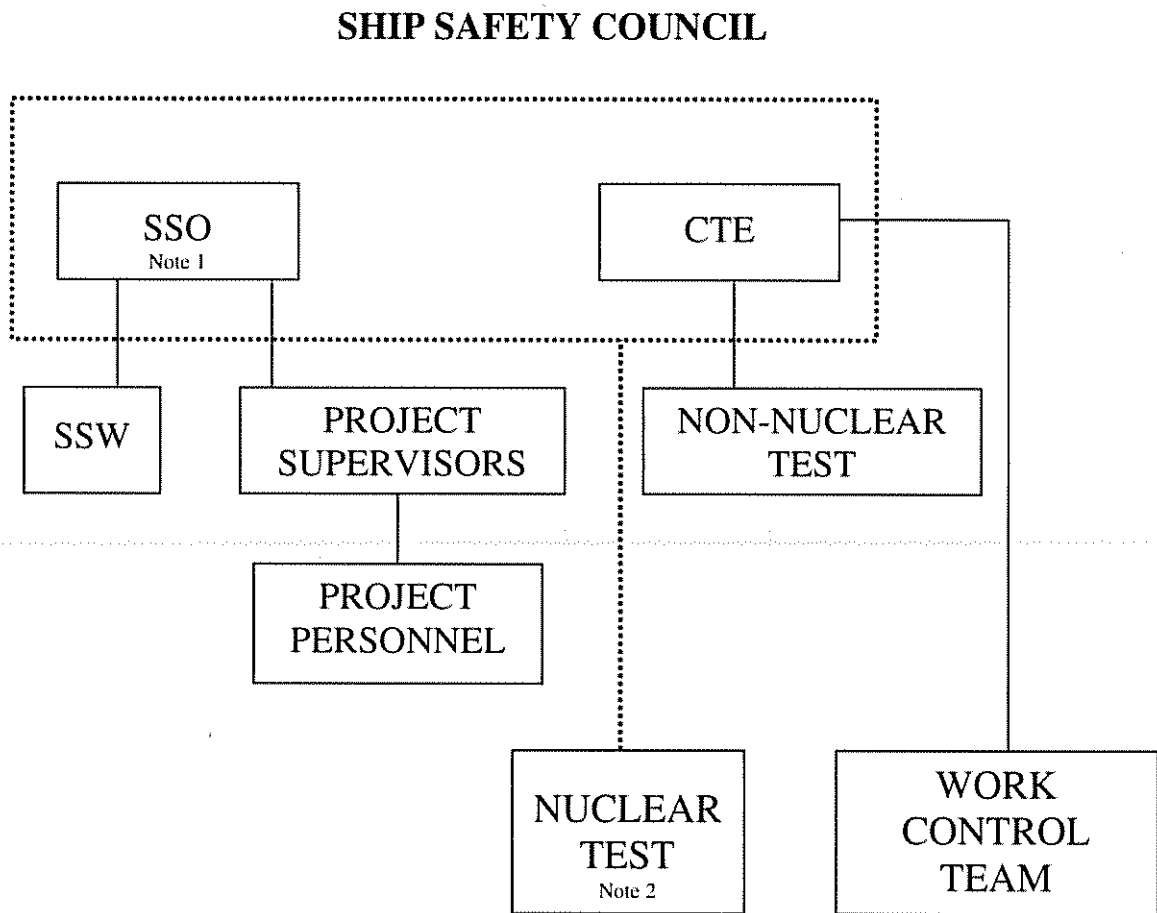
6.2.1 SHIP SAFETY OFFICER (SSO). An SSO, qualified on any class submarine, shall be assigned by the Operations Officer/Operations Manager in private shipyards, to decommissioned submarine(s) undergoing waterborne work and to decommissioned submarine(s) in dry dock that will be re-floated while in an inactivation/recycling availability. The SSO must have knowledge and understanding of all permanent or temporary systems used to maintain Ship Safety. The SSO may be assigned to more than one ship at the discretion of the Operations Officer/Operations Manager. The SSO shall be responsible for implementing the safety requirements of this manual on each assigned ship. Formal assignment of the SSO shall be per paragraph 2.2.2.1. Duties and responsibilities of the SSO are identified in paragraph 2.2.2.2.

6.2.2 SHIP SAFETY COUNCIL (SSC). Upon decommissioning, an SSC consisting of the SSO and CTE, officially designated in writing, shall be established for each submarine that will undergo waterborne work or testing. The SSC may disband when the inactivation availability is complete and the ship is placed in waterborne storage, turned over to the tow officer-in-charge, or the ship is dry docked for recycling and will not be re-floated. Basic duties and responsibilities of the SSC are identified in paragraph 2.26.

6.2.3 SHIP SAFETY WATCH (SSW). At least one SSW is required whenever the submarine is waterborne and open for access. While waterborne and open for access, the SSW will patrol the ship topside and below decks and areas adjacent to the ship, at least once every four hours. While in dry dock, for submarines that will be re-floated, the SSW will conduct a below decks inspection at least once every four hours. The SSW will be assigned from shipyard personnel or from the assigned tow crew (if applicable). The SSW will be qualified in accordance with paragraph 2.6. Basic duties and responsibilities of the SSW are identified in paragraph 2.2.4. For storage following inactivation, and/or recycling availabilities, the SSW will be qualified in accordance with paragraph 2.6.4.3.1.[1 – 5]. [7], [8], & [9].

6.2.4 CHIEF TEST ENGINEER (CTE). A non-nuclear CTE shall be assigned to the SSC for each decommissioned submarine that will undergo waterborne work and testing. The CTE shall be a qualified Lead Test Engineer (LTE) on any class submarine per reference (b). The CTE may be assigned to more than one ship to support multiple inactivations and/or recycling availabilities. The CTE shall represent the shipyard on work control and tag-out issues relating to Ship Safety.

6.2.5 SUMMARY OF ORGANIZATIONAL RELATIONSHIPS. The organizational relationships of personnel who have responsibility for Ship Safety are shown in Figure 6.1.



Note 1 Reports directly to the Operations Officer/Manager on matters of Ship Safety.

Note 2 Matters other than reactor safety.

Figure 6.1 Ship Safety Council
Functional Interface
(Decommissioned Ship)

6.3 PREVENTION AND CONTROL OF FIRE AND FLOODING

6.3.1 CASUALTY REPORTING AND RESPONSE

6.3.1.1. CASUALTY CONTROL (CASCON) STATION. A CASCON Station shall be located near and in sight of the ship, whenever the ship is open and shipboard work is being performed. The station may serve more than one ship provided individual ship information is clearly identified. This station shall be equipped with all facilities necessary to report a fire or flooding and shall include, but not be limited to the following:

- a. Voice communications between the CASCON station and remote CASCON stations.
- b. Means of identifying which alarm box is reporting a casualty.
- c. Means of initiating alarms to the shipyard fire department.
- d. Simplified ship drawings showing compartments and access.
- e. Direct control of, or communications with, those persons who have control of the ship fire alarm, hot work alarm and evacuate ship alarm systems.
- f. Copy of the current SPOD.
- g. A current file of shipyard safety directives and casualty control procedures.
- h. A public address system microphone with the capability of transmitting announcements to all topside and interior parts of the ship. The communication system shall be tested daily whenever the ship is open and shipboard work is being performed.

6.3.1.2. ALARMS. Alarm systems shall be provided for reporting fires and flooding, for warning personnel to cease hot work, and for evacuating the ship. Alarm boxes shall be properly marked and designated with indicator lights. Each box on the circuit shall produce a clear and distinctive audible signal that can be heard above ship work noise throughout the ship, and in the CASCON station. Each alarm box shall also produce a visible signal. Alarm boxes shall be located in each compartment so that the maximum travel distance to an alarm box from any point on the ship is not more than fifty (50) feet. After sounding the alarm, the public address system located in the CASCON station shall be used to indicate the nature of the emergency and to provide follow-up instructions.

6.3.1.3. EGRESS. Brows, gangways or ramps from ship-to-shore or ship-to-dry dockside, shall be provided in sufficient number to permit the rapid egress, under emergency conditions, of all persons aboard. At least two separate means of egress from the ship, and at two different locations on the ship, shall be maintained. Routes of escape leading to exits shall be clearly marked and illuminated.

6.3.1.4. LIGHTING. Temporary lighting shall be provided throughout the ship to provide illumination for safe personnel egress and inspection of bilge areas. Emergency lighting will also be installed to provide safe egress in the event of a power failure.

6.3.2 FIRE PREVENTION AND CONTROL. Carbon dioxide (CO₂) fire extinguishers of 15-pound capacity or water or Aqueous Film Forming Foam (AFFF) fire extinguishers of 2-1/2 gallon capacity shall be installed so that the maximum travel distance to a fire extinguisher from any interior point on the ship is not more than fifty (50) feet. The shipyard shall have a procedure for inspecting and maintaining CO₂ fire extinguishers in accordance with current NAVSEA directives. Hot work fire protection requirements shall be in accordance with reference (o).

6.3.3 FLOODING PREVENTION AND CONTROL. The requirements of Chapter III of this manual shall be invoked for decommissioned submarines undergoing a waterborne operation, evolution, work, testing, installation or removal, as modified below. Any exceptions to the requirements of Chapter III not listed below shall have prior approval of the SSC and be listed on the SPOD with an explanation.

6.3.3.1. FLOODING ALARMS. For decommissioned ships being prepared for at sea tow, flooding alarms in accordance with reference (o) series shall be installed and operational whenever the ship is waterborne or in a simulated waterborne condition. For decommissioned ships that will not be towed, flooding alarms in accordance with reference (m), shall be installed and operational whenever the ship is waterborne or in a simulated waterborne condition.

6.3.3.2. HULL PENETRATIONS/OPENINGS BELOW THE WATERLINE. Whenever waterborne or in a simulated waterborne condition, hull penetrations/openings below the waterline shall be in one of the following conditions:

1. Hull penetrations/openings below the waterline on submarines being prepared for at sea tow shall be blanked in accordance with the requirements of reference (o). This is also satisfactory for waterborne storage following tow completion.
2. Hull penetrations/openings below the waterline on submarines being prepared for long-term storage shall be blanked in accordance with the requirements of reference (m).
3. Hull penetrations/openings below the waterline on submarines not covered by sub-paragraphs [1] or [2] above that will have waterborne work performed prior to final dry docking for recycling shall have double closure established per reference (d) (tagout users manual) or a single welded blank per reference m (stowage manual).
4. Hull penetrations/openings below the waterline shall be considered satisfactorily blanked upon successful completion of testing in accordance with NAVSEA Drawing 126-5792666 series. Positive control shall be exercised by the shipyard to maintain the above closure requirements until the ship is in dry dock for ultimate recycling with the dry dock dry.

6.3.3.3. MAIN BALLAST TANKS. Whenever waterborne or in a simulated waterborne condition, the condition of the Main Ballast Tanks (MBTs) shall be listed on the SPOD and be in one of the following conditions:

- a. All tank flood louvers and vents weld blanked as required in reference (o), or
- b. All tank flood louvers weld blanked and all vent valves or vent valve openings securely blanked.

6.3.3.4. INTERIOR TANKS. Adding or removing weight to an interior tank greater than 10 long tons in capacity (10 long tons or more for LOS ANGELES and SEAWOLF Class) (30 long tons or more for OHIO (SSBN/SSGN) Class) (5 long tons or more for VIRGINIA Class) shall be approved by the SSC and listed on the SPOD. The requirements of paragraph 3.3.7.1 apply.

6.3.3.5. INTERIOR WATERTIGHT BULKHEADS AND DOORS. Ships that are undergoing a recycling availability within the boundaries of one shipyard (i.e., not being prepared for tow or long term waterborne storage) do not need to maintain internal flooding boundaries. If internal flooding boundaries are not maintained and compartment air testing is not accomplished prior to undocking, a two-hour waiting period over the ship's docking cradle is required to verify lift-off list, trim, and draft are as predicted and holding as required. Ships being prepared for tow should maintain compartment integrity in accordance with reference (o). Long-term waterborne storage requirements are specified in reference (m).

6.3.3.6. CHANGE OF TRIM, LIST, OR DRAFT. The requirements of paragraph 3.3.8 shall apply to waterborne work on decommissioned submarines. The Engineering Division shall supply trim, list, stability, and buoyancy data prior to undocking and whenever requested by the SSO. Condition "N" is not a factor in determining MCD.

6.3.3.7. DRILLS. Flooding drills shall be conducted within 30 calendar days prior to undocking/simulated waterborne. Requirements for drills on submarines in long-term storage are specified in reference (n).

6.3.3.8. PUMPING. The dewatering system installed in each ship being prepared for tow in accordance with reference (o), shall be installed and operational whenever the ship is in a waterborne or simulated waterborne condition. For ships not being prepared for tow, whenever waterborne or in a simulated waterborne condition, each compartment, except the Reactor Compartment, shall be capable of being dewatered at a rate in excess of 200 GPM within three minutes or at a rate of 1000 GPM within 15 minutes of the initiation of an alarm.

6.3.3.9. HULL PENETRATIONS/OPENINGS ABOVE THE WATERLINE. All hull openings less than four feet above the waterline shall be listed on the SPOD, and be provided with at least single closure by blanking or a locked shut and danger tagged valve, or be protected to at least four feet above the waterline by a cofferdam. Prior to accomplishing a hull cut

waterborne near ballast tanks, the Engineering Division and the SSO shall inspect the site to ensure the cut lines are properly laid out.

6.3.3.10. SAFETY DRAFT MARK WARNING SYSTEM. An SDM warning system shall be in effect whenever the ship is in a waterborne or simulated waterborne condition.

6.3.3.11. UNDocking REPORTS. The requirements of Section 0872 of U.S. Navy Regulations and NSTM S9086-7G-STM-010, Chapter 997, shall be applied for the undocking of a decommissioned submarine. The Ship's Commanding Officer and Ship's Force duties and responsibilities listed in Section 0872 of U.S. Navy Regulations and NSTM S9086-7G-STM-010, Chapter 997, will be fulfilled by the SSO and shipyard personnel, respectively.

6.3.3.12. UNATTENDED WATERBORNE SUBMARINES. When no work is scheduled and a waterborne submarine is not attended by an SSW, all access points (hatches/hull cuts) shall be shut and locked, all unessential power to the interior of the submarine shall be secured and the fire and flooding alarms shall be operational to a central location within the shipyard which provides continuous monitoring.

6.4 DOCUMENTS AND PROCEDURES FOR SHIP SAFETY ASSURANCE

6.4.1 SHIP PLAN OF THE DAY (SPOD). A SPOD, in accordance with paragraph 4.2.2, shall be in effect on any decommissioned submarine whenever an operation, evolution, work, testing, installation or removal will be conducted while waterborne or simulated waterborne during the availability, until all waterborne operations, evolutions, work, testing, installations or removals are complete.

6.4.2 WORK AUTHORIZATION. The work authorization requirements of Chapter IV apply to decommissioned submarines except that for submarines that will not be towed, violations to watertight bulkhead integrity do not require a Safety of Ship WAF.

6.4.3 TAG-OUT PROCEDURES. Tag-outs are used to isolate systems and equipment to ensure Ship Safety is properly maintained and work and testing may be safely performed. All activities shall comply with the requirements of this manual and reference (d). Appendix C of reference (d) covers "Repair Activity Tag-outs" for use on decommissioned ships. Tag-outs for watertight integrity shall be concurred in by the SSO.

6.4.4 HIGH RISK EVOLUTIONS. HREs listed in paragraph 4.5 will be controlled in accordance with the requirements of paragraph 4.5.

6.4.5 SHIP SAFETY LOG. Ship Safety Logs will be used and maintained by the SSWs in accordance with paragraph 4.6. The periodicity for SSW patrols is specified for decommissioned ships in paragraph 6.2.3. The SSO, CTE or a SSS qualified Shipyard Duty Officer shall initial at least daily when ship is open for maintenance to indicate review of the patrol in accordance with the shipyard periodicity requirement.

6.4.6 TROUBLE REPORTS. Trouble Reports for decommissioned submarine problems shall be prepared and handled using the same process required by paragraph 4.7.

6.4.7 AUDITS. Controls for work, testing, and ship conditions on decommissioned ships shall be included in the local, SUPSHIP, and NAVSEA audits required by paragraph 4.8.

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			11. TMMA of Manual (NSDSA will complete)
12. SHIP OR ACTIVITY Name and Address (Include UIC/CAGE/HULL)		13. Phone Numbers:	
		Commercial () ____ - ____ DSN ____ - ____ FAX () ____ - ____	

FOLD HERE AND TAPE SECURELY
PLEASE DO NOT STAPLE

INCLUDE COMPLETE ADDRESS

USE
PROPER
POSTAGE

FOR OFFICIAL USE ONLY

**COMMANDING OFFICER
CODE 310 TMDERs
NAVSURFWARCENDIV NSDSA
4363 MISSILE WAY BLDG 1389
PORT HUENEME CA 93043-4307**

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