



VSRA

Annual WAF Training

Student Workbook

Please check with your facility and the ship to see if they have any updates or additions to these forms.

Submit questions and comments to:
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INTRODUCTION

The forms in this supplemental handout are provided as a resource for students to use during the Annual WAF Training. It is not required that these forms be completed, nor submitted, to successfully complete the course. However, we highly encourage students to use them for note taking during the session and use them as a guide in the field. Although VSRA makes a substantial effort to always supply companies and facilities with any course updates published, VSRA cannot control the version of the course that a facility may be using. Always check with your facility or ship to ensure these are the most current versions of the documentation. In addition, always check to ensure the training you are taking is the most updated version available. VSRA always keeps the most updated version available on-line. Replacement DVD copies for classroom training are available through the VSRA training department at OTraining@VirginiaShipRepair.org

FORMS CONTENTS

WORK AUTHORIZATION PPROCESS FLOW CHART

WORK AUTHORIZATION FORM (WAF)

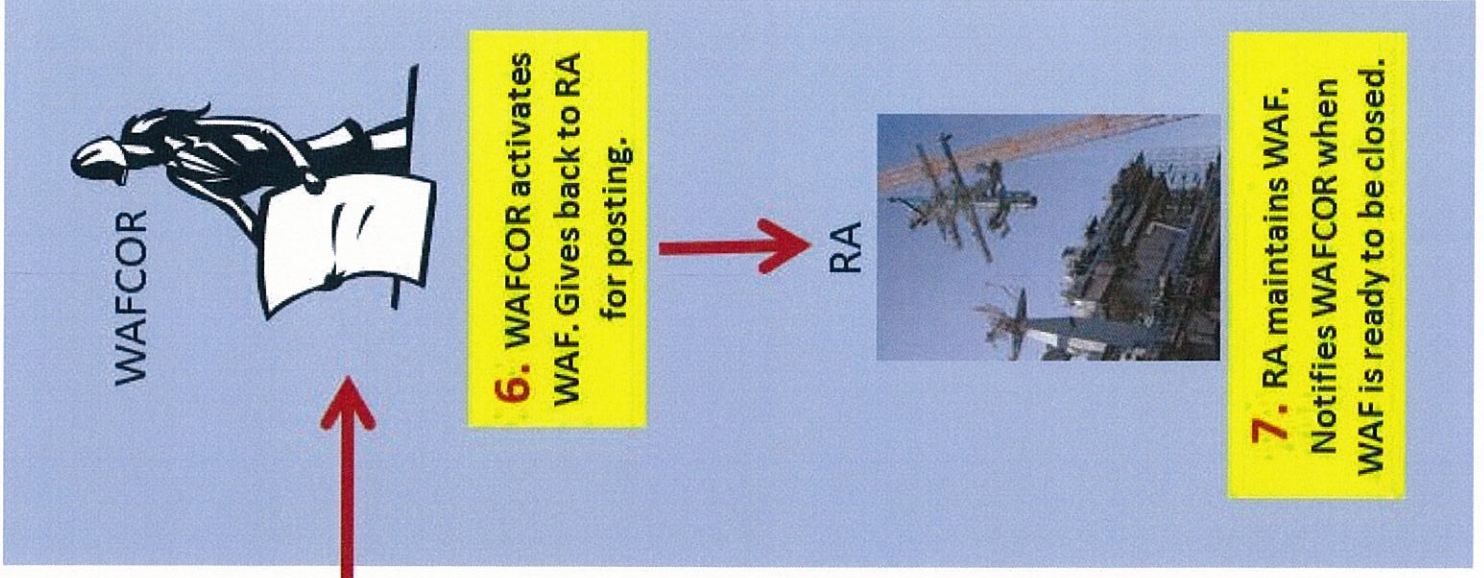
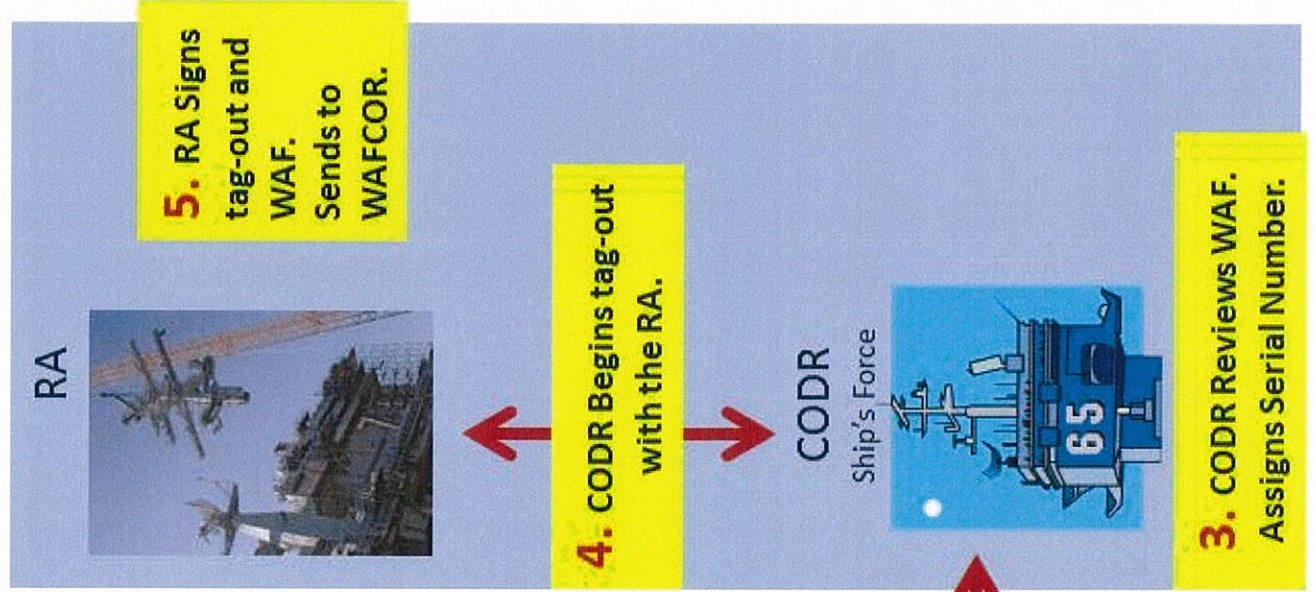
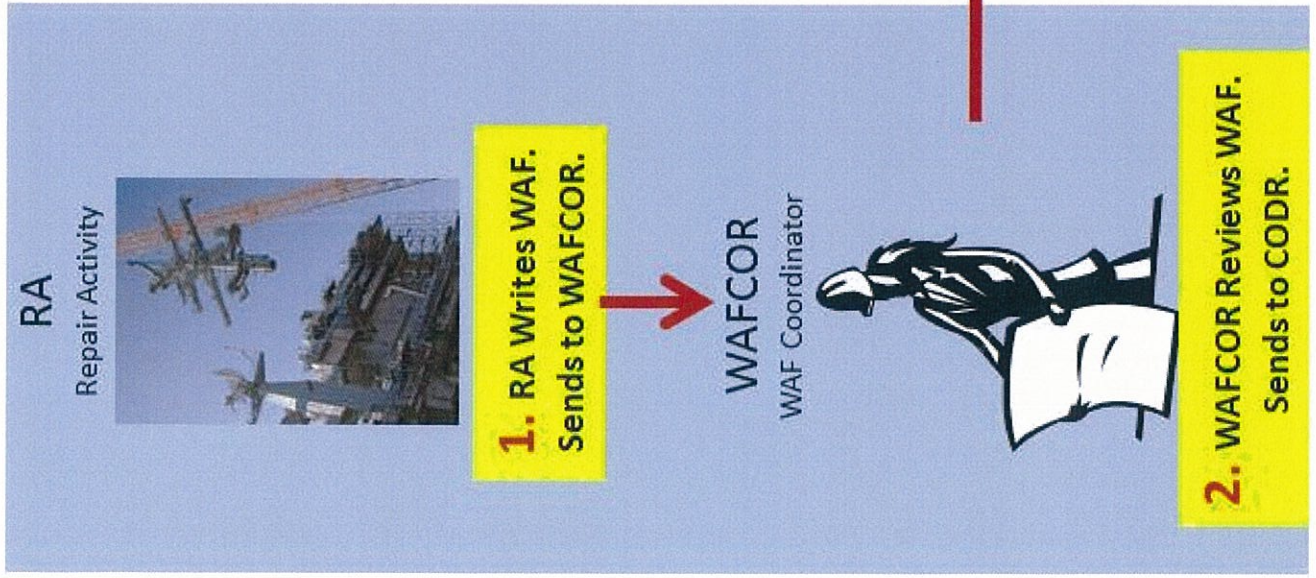
TAG-OUT RECORD SHEET FRONT AND BACK

TECHNICAL WORK DOCUMENT RECORD SHEET

SAMPLE 042 FORM

STOP WAF FORM

WAF PROCESS FLOW CHART



**APPENDIX A
WORK AUTHORIZATION FORM**

1. USS	2. SYSTEM	3. WAF NO.
4. JSN	5. DIVISION/LWC/RA	
7. JOB DESCRIPTION	6. TECHNICAL WORK DOCUMENT	

PREPARATION FOR WORK

8. POST WORK TESTING AS SPECIFIED: <input type="checkbox"/> BELOW <input type="checkbox"/> IN THE TWD <input type="checkbox"/> NO TEST REQD <input type="checkbox"/> FORMAL TEST PROGRAM
9. RESTRICTIONS/PRECAUTIONS/REMARKS
10. DIVISION/REPAIR ACTIVITY READY TO COMMENCE WORK LPO/DIV OFF /RA _____ DATE _____

AUTHORIZATION TO WORK

11. SAFETY OF SHIP (Submarine Only): <input type="checkbox"/> YES <input type="checkbox"/> NO RA SSO (if SPOD used) or QUALIFIED WATCH/DUTY OFFICER (if SOSMIL used) _____ DATE _____
12. CONCURRENCES: _____ DATE _____ DATE _____ DATE _____
13. TAGOUT REQUIRED: <input type="checkbox"/> YES <input type="checkbox"/> NO SYSTEM/COMPONENT IS LINED UP FOR WORK. A TAGOUT IS HUNG, VERIFIED AND SIGNED BY THE REPAIR ACTIVITY (IF REQUIRED) AND SHIP. <div style="text-align: right;">TAGOUT NO. _____</div> WATCH/DUTY OFFICER _____ DATE _____
14. PLANT/SHIP CONDITIONS (E.G. DRAINED, DE-PRESSURIZED, DE-ENERGIZED) SET. DIVISION/RA IS AUTHORIZED TO START WORK. WATCH/DUTY OFFICER _____ DATE _____ REPAIR ACTIVITY _____ DATE _____

NOTIFICATION OF WORK COMPLETION

15. RESTRICTIONS/PRECAUTIONS/REMARKS	
16. WORK IS COMPLETE LPO/DIV OFF or RA _____ DATE _____	17. TESTING IS COMPLETE WATCH/DUTY OFF or RA _____ DATE _____
18. WAF CLOSED OUT RA _____ DATE _____ WATCH/DUTY OFF _____ DATE _____	

CHECK IF CONTINUED ON ANOTHER SHEET

Sheet _____

DANGER/CAUTION TAG-OUT RECORD SHEET

1. SYSTEM OR COMPONENT				2. LOG SERIAL NO.		
3. AMPLIFYING INSTRUCTIONS (MANDATORY FOR CAUTION TAGS)						
OPERATIONS/WORK ITEMS INCLUDED IN TAG-OUT						
4. REASON FOR TAG-OUT AND APPLICABLE DOCUMENTATION (E.G. TWD, JSN, WAF, ETC.)	5. TAG NUMBERS USED	6. DATE/TIME ISSUED OR ADDED	7. PETTY OFFICER IN CHARGE (SIGNATURE)	9. AUTHORIZING OFFICER (SIGNATURE)	WORK COMPLETE	
			8. INDEPENDENT REVIEWER (SIGNATURE)	10. REPAIR ACTIVITY REP. (SIGNATURE) (WHEN REQD)	11. WORK CENTER REPRESENTATIVE	13. DATE

14. TAG NO.	15. SYSTEM COMPONENT ID	16. TAGGED POSITION/ CONDITION	17. POSTED BY (INITIAL)	18a. POSTING CHECKED BY (INITIAL)	18b. RA WITNESS (INITIAL)		19. CLEARANCE POSITION/ CONDITION	20. CLEARANCE AUTHORIZED (SIGNATURE)		21. DATE/ TIME CLEARED	22. CLEARED BY (INITIAL)
								a. AUTHORIZING OFFICER	b. REPAIR ACTIVITY		
23. SIGNATURE OF WATCH OFFICER/DUTY OFFICER						24. DATE/TIME			<input type="checkbox"/> CONTINUED ON ADDITIONAL SHEET (CHECK IF APPLICABLE)		

TECHNICAL WORK DOCUMENT RECORD SHEET

SYSTEM/COMPONENT:			WAF SERIAL NO.				
TWD RECORD SHEET	TWD LINE ITEM NO.	TWD (TGI, DL, DR, CWP, FWP)	BRIEF DESCRIPTION	TWD AUTHORIZATION		STATUS C-COMPLETED, T-TRANSFERRED X-CANCELED	REMARKS
				1 ST CHECK (INI)	2 ND CHECK & AUTH (INI)		

SAMPLE

can change

20023.0603.0001

SHIP:	<u>USS GEORGE H W BUSH (CVN-77)</u>	ITEM NO:	<u>042-02-003</u>
COAR:	<u>26-002</u>	PCN:	<u>CNAF-Q476</u>
		CMP:	<u>NONE</u>
		PLANNER:	<u>WINSLOW</u>

1. SCOPE:

1.1 Title: Work Authorization Control (WAF) Requirements; accomplish

1.2 Location of Work:

1.2.1 Throughout the Ship

1.3 Identification:

1.3.1 Not Applicable

2. REFERENCES:

2.1 None

2.2 S0400-AD-URM-010/TUM, Tag-out Users Manual

Example

3. REQUIREMENTS:

3.1 In addition to the requirements invoked by 009-106 of 2.1 provide a representative, from one day after contract award to the end of shipboard work, whose only function will be as a WAF Coordinator (WAFCOR) responsible for the work authorization control process for all contractor work and other RAs work being performed during the contract performance period. The WAFCOR shall receive, process, compare and coordinate the WAFs/Technical Work Documents (TWDs) from the various RAs, meet with the various RAs, the Commanding Officer's Designated Representative (CODR), and the SUPERVISOR daily, eliminate any tag-out conflicts, and advise the SUPERVISOR of any WAF problems that would impact either the contractors, the other RAs, or the ships work operations and testing.

3.1.1 "RA work" shall include, but not be limited to, any authorized work pursuant to the awarded job order/contract, and any work being performed by other RAs during the same time period (other RAs such as, Alteration Installation Team(s), Fleet Maintenance Activity, Norfolk Naval Shipyard, other government provided contractors/activities), including any subcontractors used by an RA.

3.1.2 The WAFCOR shall ensure that each RA submits, at least 14 days prior to the actual scheduled start date of shipboard work, a filled out WAF, including TWDs (block 6 of the WAF) with the WAF when necessary to show or

STOP WAF

1. STOP WAF SERIAL NUMBER	2. SHIP TYPE / NUMBER	3. SYSTEM ID	4. ASSOCIATED WAF SER.NO.
5. TASK GROUP INSTRUCTION NUMBER(S) (TGIs)			
6. DESCRIPTION OF WORK TO BE STOPPED			

AUTHORIZATION STOP WORK SECTION

7. ALL WORK DESCRIBED IN BLOCKS 5 AND/OR HAS BEEN STOPPED.

RA _____ DATE _____ TIME _____

PROJECT MGR. _____ DATE _____ TIME _____

WAFCOR _____ DATE _____ TIME _____

SHIP'S FORCE _____ DATE _____ TIME _____

AUTHORIZATION RELEASE STOP WORK SECTION

8. ALL WORK AS DESCRIBED IN BLOCKS 5 AND/OR HAS BEEN RELEASED FOR CONTINUATION OF WORK.

RA _____ DATE _____ TIME _____

PROJECT MGR. _____ DATE _____ TIME _____

WAFCOR _____ DATE _____ TIME _____

SHIP'S FORCE _____ DATE _____ TIME _____

STOP WAF

NAVSEA
STANDARD ITEM

FY-13

ITEM NO: 009-106
DATE: 30 JUL 2010
CATEGORY: I

1. SCOPE:

1.1 Title: Work Authorization Form Coordinator (WAFCOR); provide

2. REFERENCES:

2.1 Joint Fleet Maintenance Manual (JFMM)

3. REQUIREMENTS:

3.1 Provide a representative whose function is to coordinate the Work Authorization and Control Process, known as the Work Authorization Form (WAF) Coordinator (WAFCOR), from 30 days prior to the actual scheduled start date of shipboard work to the completion of shipboard work.

3.2 The WAFCOR shall be responsible for the work authorization control process for all Repair Activity (RA) work being performed during the contract performance period. The WAFCOR shall receive, process, compare, and coordinate all WAFs and Technical Work Documents (TWDs) submitted by RAs in accordance with the requirements of Volume IV, Chapter 10, of 2.1. The WAFCOR shall meet daily with the designated representatives from each RA, the Commanding Officer's designated representative, and the SUPERVISOR to eliminate any tag-out conflicts, and to advise the SUPERVISOR of any work authorization problems that could impact the RA's or the ship's work operations and testing.

3.2.1 The WAFCOR shall ensure that each RA submits a properly filled out WAF. The WAF/TWD shall show or explain the job description for each work authorization. The WAFCOR shall assign a tracking number and submit the WAF to the Commanding Officer's designated representative. The Commanding Officer's designated representative will determine if adequate isolation and plant/system conditions exist to safely and properly conduct the work, authorize and hang tag-outs, and sign the WAF. Each individual RA must submit work authorizations even if multiple RAs are working on the same components.

3.2.2 The WAFCOR shall legibly sign and release the WAF for start of work upon receipt of legible signature from the cognizant RA's designated representative.

3.2.2.1 Post a copy of the released WAF at the worksite prior to and during productive work. Maintain the WAF in the work authorization log until notified by the cognizant RA's designated representative that the work is complete and ready for tags to be cleared. The RA's designated representative will sign the WAF completion block, then obtain ship's concurrence to clear the tag and sign the Tagout Record sheet(s) completion block. Additional sign-offs required by the WAF for testing and closure shall be made as the work progresses.

3.2.3 The WAFCOR shall ensure that the cognizant RAs submit a copy of revisions or changes to the WAF or TWD at the time of revision or change. The WAFCOR will submit all changes to the Commanding Officer's designated representative for processing. Accomplish all applicable verifications required by the original WAF including any tag-out actions. Signatures by all applicable parties shall be reentered on the original WAF or attached sheet. The system tag-outs shall be verified by the Commanding Officer's designated representative and the cognizant RA prior to the accomplishment of the work.

4. NOTES:

4.1 Repair Activity (RA) is any activity (public or private) other than Ship's Force involved in the construction, testing, repair, overhaul, refueling, or maintenance of the ship. Repair Activities include the prime contractor, all subcontractors, government provided contractors or agencies, Alteration Installation Teams, Fleet Maintenance Activities, Naval Shipyards, and others.

4.2 Training requirements are listed in NAVSEA Standard Item 009-24.

NAVSEA
STANDARD ITEM

FY-13

ITEM NO: 009-24
DATE: 29 JUL 2011
CATEGORY: I

1. SCOPE:

1.1 Title: Authorization, Control, Isolation, Blanking, and Tagging Requirements; accomplish

2. REFERENCES:

- 2.1 Standard Items
- 2.2 Joint Fleet Maintenance Manual (JFMM)
- 2.3 *9002-AK-CCM-010/6010, Industrial Ship Safety Manual (ISSM) for Submarines*
- 2.4 S0400-AD-URM-010/TUM, Tag-Out Users Manual
- 2.5 845-4612172, Hydrostatic Test Blanks
- 2.6 MIL-STD-777, Schedule of Piping, Valves, Fittings, and Associated Piping Components for Naval Surface Ships
- 2.7 802-5959353, MIL-STD-777D Modified for DDG-51 Class, Schedule of Piping, Valves, Fittings, and Associated Piping Components
- 2.8 *29 CFR Part 1915, Occupational Safety and Health Standards for Shipyard Employment*

3. REQUIREMENTS:

3.1 Accomplish the requirements of Volume IV, Chapter 10 of 2.2, for administration, work authorization procedure, transfer of non-nuclear systems and nuclear instrumentation and control systems, work authorization form revisions, and barrier criteria. For submarines only, accomplish the requirements of Volume IV, Chapter 10 of 2.2 for safety of ship maintenance item identification, listing, and control, or the requirements of 2.3 for Ship's Plan of the Day (SPOD).

3.2 Accomplish the requirements of 2.4 for equipment, systems, circuits, components, piping, and valves that require isolation.

3.2.1 Ensure the isolation, deenergization, drainage of the isolated area, and depressurization of mechanical, electrical, electronics, and pressure system has been accomplished.

3.2.2 Train and qualify contractor's designated representative in the Work Authorization Form (WAF) and Tag-Out process in accordance with 2.2 and 2.4.

3.2.2.1 Maintain a current copy of the plan utilized to train and qualify contractor's designated representatives in accordance with 2.2 and 2.4 for reference by the SUPERVISOR.

3.2.2.2 Notify the SUPERVISOR of revisions to the plan as they occur.

3.3 Post warning signs and barriers and install temporary positive means to prevent closure or movement of components that create a safety hazard at hull and deck openings.

3.4 Install and maintain blanks and plugs, painted blaze orange (*existing system fasteners used for blanking and that will be either discarded or re-used for installations are excluded*), on piping, valves, equipment, ventilation systems, on components being stored, installed, or removed, on openings aboard ship resulting from the removals, immediately upon each removal, and on openings requiring isolation to accomplish work in the Work Items including tanks. The use of cloth, polyvinyl sheet, paper, tape, and rubber sheeting as blanks is prohibited. DC plugs, wood, or wood products are prohibited as blanks on pressurized systems, but may be used on non-pressurized systems.

3.4.1 Blanks installed on equipment, valves, and piping openings in systems which are subject to pressure shall be in accordance with 2.5 to withstand maximum system pressure and secured in place with gaskets and fasteners in accordance with 2.6 and 2.7.

3.4.1.1 Pressure blanks shall have a positive means of attachment for affixing tags. Tags must endure the repair process, and must stay attached and be readable until the blanks are removed.

3.4.2 Blanks/plugs installed on openings in equipment, valves, and piping systems not subject to pressure shall preclude entry of foreign material and protect flanges and threaded areas.

3.4.3 Remove blanks/plugs installed in 3.4 immediately prior to installing piping, valves, or equipment and when work requiring isolation is complete.

3.4.4 Provide and maintain a written record of temporary blanks/plugs used, including those used for Foreign Material Exclusion (FME), documented on a signed and dated check-off sheet verifying installation and removal. Include type, size, quantity, and associated system/equipment name

or tank number and location (frame, port, starboard, below or above water line).

3.4.4.1 Maintain the list for the duration of the availability.

3.4.4.2 For tanks, the check-off sheet for the removal of blanks shall be at the tank closing and the removal shall be verified by Ship's Force representative and the SUPERVISOR prior to tank closing. After the tank closing is satisfactory, the check-off sheet shall be submitted.

3.4.4.3 Submit one legible copy, in hard copy or **approved transferrable** media, of the temporary blank/plug record and check-off sheet to the SUPERVISOR.

3.4.5 Piping, ventilation, and equipment components designated as scrap prior to removal do not need to be blanked to maintain cleanliness. However, precautions shall be taken to preclude spillage of system contents.

3.5 Install identification tags on each removed piping section, valve, ventilation system, and equipment to indicate company name, ship's name, hull number, system, location, and Work Item number prior to removal from system. Tags must endure the repair process, and must stay attached and be readable until the removed piping section, valve, ventilation system, or equipment is reinstalled.

3.6 Tape and insulate cable ends disconnected from equipment to prevent shorting out or grounding in the event a system is accidentally energized.

3.6.1 Tag each cable indicating circuit number and location of panel and fuse box-energizing cable.

3.6.2 Install dust covers on equipment connectors following disconnection of cable plugs.

3.7 *Use the company's lockout/tag-out plus program for unmanned craft and barges in accordance with 2.8.*

3.7.1 Position equipment to achieve required isolation, deenergization, drainage of the isolated area, and depressurization, **and use lockout/tag-out plus program when lock-out** of equipment, systems, circuits, components, piping, or valves is required **in accordance with 2.8.**

3.7.2 *Provide a copy of the contractor's lockout/tag-out plus program when requested by the SUPERVISOR*

4. NOTES:

4.1 JFMM (2.2), *6010* (2.3), and TUM (2.4) are available on-line at:

<http://www.submepp.navy.mil/jfmm/index.htm>

JFMM VOLUME IV

CHAPTER 10

WORK AUTHORIZATION AND CONTROL

REFERENCES.

- (a) NAVSEA S9002-AK-CCM-010/6010 - Industrial Ship Safety Manual for Submarines
- (b) S0400-AD-URM-010/TUM - Tag-Out User's Manual
- (c) NAVSEA MS 6310-081-015 - Submarine Preservation
- (d) NAVSEA S9505-AF-MMA-010 - Submarine Non-Nuclear Piping Systems Test Manual
- (e) OPNAVINST 5100.19 - Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat
- (f) OPNAVINST 5100.23 - Navy Occupational Safety and Health (NAVOSH) Program Manual
- (g) NAVSEA S9165-AC-HBK-010 - Submarine Sonar Dome Handbook
- (h) NAVSEA SE300-AZ-MMA-010 - Description, Operation and Maintenance SSN21 Class Sonar Bow Dome
- (i) NAVSEA SE300-MA-MMA-011 - Glass Reinforced Plastic (GRP) Bow Sonar Dome
- (j) COMSUBPACNOTE 9086 - COMSUBPAC Engineering Notes and Technical Notes

LISTING OF APPENDICES.

A Work Authorization Form

B Technical Work Document Record Sheet

C Work Authorization Form Continuation and Revision Sheets

D Barrier Criteria for Submarine Hull Penetrations

E Safety of Ship Maintenance Item List Example

F Safety of Ship Maintenance Item List

G Procedures and Safety Precautions for Entering Submarine Spaces, Tanks and Voids

H Close-out Inspection Check-off List

10.1 PURPOSE. To provide the procedures for authorization and control of shipboard work.

10.2 WORK AUTHORIZATION.

Work on ship's systems and components, as defined in Volume I, Chapter 1, Appendix D of this manual, must be properly authorized and controlled in order to ensure rigorous personnel and ship safety standards are met at all times. All outside activity work on ship's systems and components, regardless of who performs the work, requires formal authorization through a Work Authorization Form (WAF) for the specific work to be accomplished. This applies to all U.S. Naval ships in all types of maintenance availabilities, public and private. The Work Authorization System and preparation of the WAF are discussed below.

10.3 WORK AUTHORIZATION CONTROL.

Work on the Fleet's ships is conducted under positive Work Authorization Control in order to ensure rigorous personnel and ship safety standards are met at all times. The following considerations apply in meeting these standards:

- a. Work requiring formal authorization may include Planned Maintenance System (PMS), troubleshooting, corrective maintenance (repair) or alterations. It may also include removal of system components for repairs.
- b. As many ship systems, such as hydraulics and high-pressure air, are operationally interrelated, caution must be exercised in planning work so that other systems are not unintentionally disabled when setting work boundaries for the system to be worked.

10.4 WORK AUTHORIZATION SYSTEM.

Work Authorization shall be controlled as follows:

- a. Designation of Work Requiring Formal Control. The WAF is the vehicle by which work requiring formal control is authorized for accomplishment and tracked to completion or otherwise no longer requiring isolation or authorization.

COMUSFLTFORCOMINST 4790.3 REV C IV-10-2 b. A WAF, shown in Appendix A, is required to authorize the start of work on all ship systems and equipment by activities other than Ship's Force. Work includes all maintenance, repairs or modifications and installation or removal of temporary support systems and equipment. Repair activity non-intrusive work (e.g., painting,

lagging, sheet metal work, deck plate, structural foundation) that does not affect ship or personnel safety does not normally require a WAF.

c. For Ship's Force maintenance conducted in nuclear propulsion plants, the Engineering Department Manual contains the requirements regarding when a WAF is needed. For Ship's Force work conducted outside the nuclear propulsion plant, the cognizant department head shall determine the necessity for a WAF.

d. For availabilities where a repair activity is assigned responsibilities for work authorization control by Memorandum of Agreement (MOA), the requirement regarding when Ship's Force must submit a WAF shall be specified in the MOA.

10.4.1 Administration. The following administrative process is to be used in executing Work Authorization Control:

10.4.1.1 Work Authorization Form.

The WAF, shown in Appendix A, shall be filled out by the organization conducting the work, or Ship's Force, as determined by the MOA signed for the availability per Volume II, Part I, Chapters 3 and 4 of this manual.

10.4.1.2 Work Authorization Log.

The Work Authorization Log(s) shall be maintained at the same location and administered by the same individuals as the ship's tagout logs or, when the repair activity is assigned responsibilities for work authorization control by MOA, the repair activity shall retain original WAFs with a copy of all WAFs (or as specified by local MOA) and the WAF index shall be provided to Ship's Force either by hard copy or electronically via a database that can be easily accessed by the Ship's Duty Officers.

NOTE: FOR SHIP'S FORCE GENERATED WAFS, THE SERIAL NUMBER SHALL USE THE SAME PREFIXES USED FOR THE TAGOUTS THAT SET THE SYSTEM ISOLATION FOR THE WORK. WHEN A REPAIR ACTIVITY IS ASSIGNED RESPONSIBILITIES FOR WORK AUTHORIZATION CONTROL, THAT ACTIVITY WILL SPECIFY THE SERIALIZATION PROCESS USED BY ALL ACTIVITIES INCLUDING SHIP'S FORCE FOR THE AVAILABILITY.

10.4.1.3 Technical Work Document Record Sheet.

When the job description on the WAF covers multiple components and their associated Technical Work Documents (TWD), a TWD Record Sheet (Appendix B) in addition to the WAF may be used to document this work.

10.4.1.4 Work Authorization Form Continuation and Revision Sheets.

If necessary, a WAF Continuation Sheet similar to the one shown in Appendix C may be used when information on the initial original WAF will not fit in the blocks provided in the WAF form in Appendix A. The WAF Continuation Sheet shown in Appendix C depicts the minimum blocks that must be filled out. Additional blocks may be utilized as deemed appropriate. Any changes necessary to the information on the WAF form after Block 14 is signed will be on the WAF Revision Sheet or changes to the existing WAF as described in paragraph 10.4.4 of this chapter. Existing WAF Continuation Sheets may be used until exhausted if desired. The WAF Revision Sheet, similar to the one shown in Appendix C, may be used to accomplish WAF revisions as permitted by paragraph 10.4.4 of this chapter. The WAF Revision Sheet shown in Appendix C depicts the minimum blocks that must be filled out. Additional blocks may be utilized as deemed appropriate.

10.4.1.5 Numbering Work Authorization Form Continuation and Revision Sheets.

Revisions and continuation sheets generated by computer software may be numbered as determined by the software programming. Paper WAF continuation and revision sheets are to be numbered as follows:

- a. The WAF (Appendix A) will be identified as "Sheet 1".
- b. Continuation sheets will be identified as "Sheet 1A, Sheet 1B", etc.
- c. Revision sheets will be identified as "Sheet 2, Sheet 3", etc.

10.4.2 Work Authorization Procedure. The following procedure is to be followed for properly authorizing work:

- a. The WAF is presented to the Watch/Duty Officer by the division/repair activity tasked with the work.
- b. (Submarines Only) For Safety of Ship items, as defined in paragraph 10.4.8 of this chapter and reference (a), the Watch/Duty Officer shall obtain the Commanding

Officer's permission prior to authorizing work. When assigned, the repair activity's Ship Safety Officer signature is required.

c. The Watch/Duty Officer will then determine if adequate isolation and plant/system conditions exist to safely and properly conduct the work including that the system is drained, deenergized and depressurized. The tagout is then established in accordance with reference (b). The work is not to be authorized if doubt exists on either of these points. For high energy systems (i.e., >200°F, >1000 psi) that could have the potential for trapped energies, the repair activity after consulting with Ship's Force, may provide a written plan (i.e., valve lineup, procedure, marked up drawings) to Ship's Force to ensure all parties are satisfied the system is properly drained and depressurized.

d. When system isolation and plant conditions are satisfactory to conduct the work (e.g., tagout complete, system depressurized, drained and deenergized), the Watch/Duty Officer authorizes the work and signs the WAF. For repair activity generated WAFs, the Repair Activity Representative (RAR) also signs the WAF. The Watch/Duty Officer and RAR signature indicates that, based on personal observation, certified records or direct report from watchstanders or divisional personnel, that system isolation and plant/ship conditions are set and the division/repair activity is authorized to start work.

NOTE: ELECTRICAL SAFETY CHECKS (E.G., VOLTAGE CHECKS TO ENSURE CIRCUITS ARE DE-ENERGIZED) ARE PART OF THE WORK PROCESS, NOT PART OF THE TAGOUT PROCESS, AND THEREFORE SHOULD BE PERFORMED AFTER BLOCK 14 OF THE WAF IS SIGNED. VOLTAGE CHECKS PERFORMED PRIOR TO SIGNING BLOCK 14 OF THE WAF MUST BE APPROVED BY THE COMMANDING OFFICER AND PERFORMED IN ACCORDANCE WITH NAVSEA S9086-KC-STM-010/CH-300.

e. Some component contractor personnel who perform work on ships are not knowledgeable of ship systems and are not qualified to determine if plant/ship conditions are satisfactory to conduct work. For such cases, the contractor's signature will be based on a direct report or briefing they receive from Ship's Force or the Lead Maintenance Activity (if assigned), unless another method of providing the information to the contractor is specified in a MOA. The

contractor's signature represents confirmation that the contractor understands the hazards presented by the ship's systems on which he will be working, and that he/she has received assurances the work area has been appropriately isolated, depressurized, de-energized or drained. As an alternative, the contractor may specifically agree via their contract or MOA that all repair activity responsibilities as defined in this chapter will be assigned to a Lead Maintenance Activity per paragraph 10.4.5 of this chapter. In all cases, appropriate information should be provided to the contractor prior to initiating work to ensure the contractor understands the hazards involved.

f. The original WAF is placed in the Work Authorization Log and a copy shall be maintained with the TWD until the work is completed.

g. Once the work is completed, the WAF is signed by the repair activity as work complete and forwarded to Ship's Force for clearing of Tagout Record Sheet line items in accordance with reference (b).

h. Following completion of testing (if there is no formal test program) and setting of appropriate system status (e.g., clear tags and perform valve line-ups as appropriate for the situation), the WAF is signed as closed and forwarded to the cognizant department head for review.

10.4.3 Transfer of Non-Nuclear Systems and Nuclear Instrumentation and Control Systems (Depot availabilities only). During depot availabilities, large amounts of work will be performed on ship's systems. Formal work control practices in place by a shipyard enable Ship's Force to transfer non-nuclear systems and Nuclear Instrumentation and Control systems to the shipyard. Transfer of systems is the process by which Ship's Force transfers the authority to approve all actions within a system or portion of a system to a shipyard and subsequent return of systems back to Ship's Force prior to major events. Systems, or portions of systems, are transferred with or without transferring the ability to operate ship's equipment. By transferring a system or portion of a system to the shipyard, the shipyard is responsible for authorizing all work, testing and equipment operation within the boundary transferred. Transfer of systems does not diminish a Commanding Officer's overall responsibility for the safety of personnel, equipment

and the ship. Although other activities may perform work within the boundaries and Ship's Force normally retains responsibility for operating ship's equipment, all actions (i.e., work, testing, equipment operations, etc.) within the boundary must be approved by the shipyard.

a. The MOA between the shipyard and ship for the availability shall include the following minimum attributes regarding transfers:

(1) Clearly state that all actions performed within the boundary being transferred must be approved by the shipyard.

(2) Normally, Ship's Force retains responsibility for operating ship's equipment. If any transfers with operations are planned, the MOA shall define the extent to which the shipyard will operate ship's equipment within the boundaries.

(3) Normally, Ship's Force retains responsibility for PMS, unless otherwise specified in the MOA.

(4) Delineate who is responsible to maintain system status within the boundary.

(5) Identify the process (e.g., Joint Fleet Maintenance Manual Volume IV, Chapter 10, paragraphs 10.2 through 10.4.5) by which work control shall be administered, including interface between the shipyard, Ship's Force and other applicable activities.

b. A WAF shall be used to transfer a system or portion of a system to the shipyard. Block 7 of the WAF shall clearly state this intent (i.e., specify "transfer" or "transfer including operations"). Ship's Force formally transfers a system or portion of a system to the shipyard by signing Block 14 of the WAF. Unless Block 7 of the WAF states the transfer is "including operations", the shipyard is not authorized to operate ship's equipment within the transferred boundary.

c. The shipyard returns a system or portion of a system back to Ship's Force by completing all authorized work and testing specified on the WAF and signing Blocks 16, 17 and 18 of the WAF. Ship's Force indicates acceptance of the work and testing and, if applicable, operation by signing Block 18 of the WAF. For nuclear powered ships, the Engineering Department Manual contains requirements for accepting operational control from the shipyard.

d. When the shipyard is responsible for operating ship's equipment as specified in the transfer MOA, operation of ship's equipment shall be in accordance with shipyard or Naval Sea Systems

Command (NAVSEA) procedures (e.g., test procedures, ship's operating instructions, Steam and Electric Plant Manual, etc.).

e. When waterborne, Ship's Force shall retain operation of hull and back-up valves.

f. When portions of a system are required to be operational to support propulsion plant key events in accordance with NAVSEA Instruction 4730.1 and 4730.2 series, those portions of the system shall be transferred back to Ship's Force.

g. Ship's Force shall have the capability to isolate the transferred area from components and systems under Ship's Force control. The valves, switches, breakers, fuses, blanks, etc., that provide this capability shall remain under Ship's Force control.

h. Any ship system which could directly affect the reactor plant or conduct of reactor plant testing shall not be transferred to a shipyard until required nuclear temporary support systems are installed and the system is isolated from the reactor plant.

i. Within the boundaries transferred to the shipyard, Ship's Force shall be notified prior to commencing testing and when testing is interrupted and completed.

j. All transfers on submarines shall be consistent with ship's safety requirements and reference (a).

k. In order to minimize subsequent changes to the WAF and ensure that Ship's Force is aware of the work scope, the WAF which transfers systems or portions of systems should include all known customer authorized work within the specified job description.

l. This authority applies to all work performed by or sub-contracted by the shipyard.

m. Within the boundaries approved by the WAF, the shipyard can add additional work to the WAF without Ship's Force approval by adding additional TWDs to a TWD Record Sheet (Appendix B) provided the additional work is within the original description of work and tagout boundaries (i.e., no additional tags are required). This method is applicable only when two independent reviews of the additional work by the shipyard confirms that the existing WAF and its associated tagout(s) provide adequate isolation and conditions for the work (see paragraph 10.4.5 of this chapter). TWDs (Task Group Instructions (TGI), Deficiency Logs, Deficiency Reports, etc.) that meet this criteria and require work control per paragraph 10.3 of this chapter will be added to the TWD Record Sheet. To ensure Ship's Force remains informed of all

work being performed on ship's systems, the shipyard shall verbally notify Ship's Force at the time work is added to the TWD Record Sheet and subsequently provide a hard copy of the changed TWD Record Sheet if it cannot be printed by the Ship's Duty Officer from an electronic database. Work added to the TWD Record Sheet does not need to be added to the associated Tagout Record Sheet.

n. When other activities perform work and testing within boundaries transferred to a shipyard and the shipyard is acting as their RAR, the shipyard may add the other repair activity's work to the TWD Record Sheet. Otherwise, a separate WAF shall be generated and a new line item shall be added to the existing Tagout Record Sheet.

o. Ship's Force performing work, testing or equipment operations within boundaries transferred to a shipyard shall prepare a separate WAF processed as described in paragraph 10.4.2 of this chapter, add a new line item to the existing Tagout Record Sheet and obtain shipyard concurrence in Block 12 of the WAF. RAR signature is not required on the Tagout Record Sheet.

p. For small depot availabilities (e.g., conventional surface ship availabilities less than six months in duration, submarine Selected Restricted Availabilities and Extended Refit Periods, Aircraft Carrier upkeeps), the above provisions may be applied on a case basis where the amount of work on a system is extensive and warrants transferring a portion of a system. These exceptions require Type Commander approval.

10.4.4 Work Authorization Form Revisions.

Changes to the scope of the existing job description or system transfer boundary shall be authorized by a formal revision to the existing WAF. Except as noted below for minor administrative changes, changes to conditions (i.e., Blocks 7, 8, 11, 13 and/or 14) established by an authorized WAF, including the associated tagout(s), also require a formal revision to the existing WAF. A formal revision to a WAF can be accomplished by either preparing a new WAF with the same number or revising the existing WAF.

a. Prepare a new WAF. A new WAF with the same number will be used primarily for major changes to Block 7, Job Description or other major changes which warrant reverification of all aspects of the work authorization.

(1) A new WAF with the same number will be generated with changes included.

(2) In Block 9, enter revision (REV A, REV B, REV C, etc.) and reason for and description of the change.

(3) Authorize the new WAF in accordance with the requirements of this chapter.

(4) Mark superseded WAF(s) "SUPERSEDED" and retain with the new WAF.

b. Revise Existing WAF. The revised existing WAF will be used primarily for tag shifts or other minor changes.

(1) Enter all required changes. Include initials, date and revision with each entry.

(2) Line-out all changed or invalidated information. Include initials, date and revision with each line-out.

(3) Remake all affected signatures.

(4) In Block 9, enter reason for and description of the change. Sign and date the entry.

(5) Obtain authorization including verification of "Plant/Ship Conditions Set" by resigning Blocks 13 and 14 of the WAF.

c. Revise existing WAF using the WAF Revision Sheet.

(1) Fill in the information required by the WAF Revision Sheet, including the revision (REV A, REV B, REV C, etc.). Add additional blocks as deemed appropriate.

(2) Enter the reason for and description of the change. Sign and date the entry.

(3) Obtain all required signatures.

(4) Once the WAF Revision Sheet has been completed, it must be maintained with the original WAF in the WAF log.

d. Minor Administrative Changes to Existing WAFs. The Watch/Duty Officer or the RAR may make pen and ink changes that are editorial and/or administrative in nature to the original WAF without processing a new or revised WAF. These changes must not affect the scope or sequence of shipboard work, and include items such as obvious typographical errors, erroneous job order numbers or spelling errors. Either the Watch/Duty Officer or Repair Activity may

make these changes on the original WAF without resigning Blocks 13 and 14. The changes shall be initialed and dated by the person entering the changes.

e. Iterative Tagouts. When using the reference (b) Iterative Tagout procedure, a revision to the WAF is not required provided the specific tests or maintenance evolutions are controlled by a formal process. This process is to be defined and concurred with by a MOA established between Ship's Force and the Lead Maintenance Activity. The process shall ensure that isolation is re-established and system conditions verified prior to recommencing work.

10.4.5 Centralized Work Control Procedures.

It is the responsibility of the Lead Maintenance Activity to determine the need for centralized work control and to assign the responsibility for work authorization control. During depot availabilities, a centralized work control team will be established. For other availabilities, this decision is based on the number of repair activities performing work during the availability and the complexity of the work. When centralized work control procedures are invoked, the following process shall be used:

- a. Work by all repair activities is processed by the centralized work control team including work covered by paragraph 10.4.3 of this chapter. Ship's Force involvement will be defined by MOA.
- b. The Lead Maintenance Activity will specify participation and supervision of the centralized work control team by MOA. Ship's Force is an integral part of the centralized work control team and should man the team with experienced officers or senior petty officers.
- c. The repair activity performing the work shall prepare the WAF, sign as RAR on the Tagout Record Sheet and sign the WAF, Blocks 10, 14, 16 and 17 if applicable, unless specified otherwise by MOA (e.g., repair activity does not maintain qualified personnel). The Lead Maintenance Activity assigned responsibility for centralized work control is responsible for processing the WAF and signing all other repair activity blocks on the WAF.
- d. For work covered by paragraph 10.4.3 of this chapter, the Ship's Force member(s) of the centralized work control team would notify the responsible Division or Work Center Supervisor and Duty Officer of added work to a TWD Record Sheet to ensure that Ship's Force remains informed of all work being performed on ship's systems.

10.4.6 Equipment Tagout Procedures.

Tagouts shall be accomplished in accordance with the requirements of reference (b).

10.4.7 Barrier Criteria.

a. Barrier criteria for maintenance is located in reference (b) and applicable Reactor Plant and Steam and Electric Plant manuals.

NOTE: BARRIER CRITERIA REQUIRED BY REACTOR PLANT AND STEAM AND ELECTRIC PLANT MANUALS HAVE PRECEDENCE OVER REFERENCE (b) CRITERIA.

b. (Submarines only) Specific guidance for submarine hull penetrations is located in Appendix D.

10.4.8 Safety of Ship Maintenance Item Identification, Listing and Control (Submarines only).

a. Safety of Ship Maintenance Item List (SOSMIL). Safety of Ship maintenance items are those evolutions having significant potential to impact the ship's watertight integrity, damage control capability or which require special attention to ensure ship safety.

NOTE: DESIGNATION OF SAFETY OF SHIP MAINTENANCE ITEMS FOR BOTH SHIP'S FORCE AND ANY OUTSIDE ORGANIZATION IS REQUIRED WHEN FLEET MAINTENANCE ACTIVITY (FMA), INDUSTRIAL ACTIVITIES AND CONTRACTOR PRODUCTION WORK IS IN PROGRESS. REQUIREMENTS OF PARAGRAPH 10.4.8 OF THIS CHAPTER OR A SHIP'S PLAN OF THE DAY WILL BE IMPLEMENTED ANY TIME WORK AFFECTING SAFETY OF SHIP ITEMS IS PERFORMED REGARDLESS OF AVAILABILITY STATUS.

b. Safety of Ship Maintenance Items. The ship's Commanding Officer's permission is required prior to authorizing the maintenance evolution. The following, as a minimum, shall be scheduled on the SOSMIL:

- (1) All maintenance involving single closure isolation from sea.
- (2) All maintenance which removes a means of blowing main ballast tanks.
- (3) All maintenance requiring the use of flat patches, hull blanks or cofferdams, with specific entries identifying the actual installation and removal of these items.
- (4) All maintenance which removes the capability to dewater the ship using either the trim or the main drain systems.
- (5) All maintenance which removes the ship's installed firefighting capability (e.g., maintenance which prevents pressurization of the trim system).
- (6) Bleeding or charging oxygen banks.

(7) Handling or loading of explosives or weapons.

(8) All maintenance which removes portions of, or the entire Emergency Air Breathing system.

(9) Fueling or defueling.

(10) Diver operations.

(11) Pumping or flooding the sonar dome.

(12) Battery charges.

(13) Nitrogen load.

(14) Refrigerant on/off load.

(15) Ballasting evolutions with an expected change of >3 inches.

(16) Securing the Emergency Diesel Generator.

(17) Other maintenance or evolutions which require special coordination between Ship's Force and maintenance providers to ensure safe accomplishment of authorized work (i.e., Sail Safety, Loading Vertical Launch System Platform).

(18) All maintenance that violates the integrity of the pressure hull, watertight bulkhead or watertight doors, excluding the routine operations of access hatches.

(19) All maintenance that disables any bilge alarm or any portion of an emergency announcing circuit when temporary alarms or indications are not installed.

(20) All maintenance that secures normal or emergency lighting circuits in a compartment or space such that damage control response would be significantly impacted.

NOTE: USE OF TEMPORARY SYSTEMS TO REPLACE FUNCTIONS OF SHIP'S INSTALLED SYSTEMS SHOULD BE CONSIDERED WHEN DEEMED NECESSARY. CLASS SUBMARINE ORGANIZATION AND REGULATIONS MANUALS AND SHIP SYSTEM MANUALS MAY PROVIDE FURTHER GUIDANCE.

c. SOSMIL Preparation. The SOSMIL will be prepared by a person designated by the ship's Commanding Officer using written input provided by Ship's Force divisions and the FMA representative. A new SOSMIL will be prepared prior to the FMA Daily Production Meeting of Volume II, Part I, Chapter 4, paragraph 4.4.11 of this manual. Appendix E of this chapter is

provided as an example and depicts the minimum attributes that must be documented on the SOSMIL. Appendix F of this chapter may be reproduced locally for use. Prepare the SOSMIL as follows:

- (1) Indicate ship's name, hull number, upkeep number, calculated maximum expected draft, actual morning draft and date prepared.
- (2) For each job, list the Job Control Number/WAF number (as applicable) (operating instruction, PMS item, operating procedure), job description, scheduled end date and any remarks.
- (3) The SOSMIL should indicate planned work for the next seven days. A thick black line shall be used on the left side of the current day to indicate the current days work.
- (4) In the job description block, indicate in parentheses a number that corresponds to the list at the bottom of the sheet as to why the job requires a SOSMIL entry.
- (5) Items shall remain listed on the SOSMIL until work has been verified complete and associated WAF has been completed or Block 11 of the WAF revised as no longer affects Safety of Ship.

d. Maximum Expected Draft. For those items which will have an affect on ship's draft, expected draft changes greater than three (3) inches will be calculated fore and aft for that evolution and indicated in the remarks section. Draft calculations will be made by a Diving Officer of the Watch qualified individual. Additionally, for all ballasting evolutions, a second independent calculation will be performed and provided by a second Diving Officer of the Watch qualified individual. The worst-case draft change for each item will be totaled to arrive at a "maximum draft" and a maximum one foot buffer added to arrive at the "maximum expected draft". (The ship's Commanding Officer can decide to reduce the buffer as he desires. If Safety Draft Marks are in use, the bottom edge of the mark shall match the "maximum expected draft".) The "maximum expected draft" is listed at the top of the SOSMIL. Calculation sheets will be retained until the job is no longer carried on the SOSMIL. If the ship exceeds the "maximum expected draft", the Duty Officer will stop the evolution, place the ship in a safe condition and notify all parties who signed the SOSMIL and the ship's Commanding Officer.

NOTE: THIS SHALL IN NO WAY BE CONSTRUED AS LIMITING ACTIONS BY THE DUTY OFFICER OR NOTIFICATION OF THE SHIP'S COMMANDING OFFICER OF SMALLER DRAFT CHANGES. ANY UNEXPECTED DRAFT CHANGE SHOULD BE THOROUGHLY INVESTIGATED AND UNDERSTOOD.

e. Morning Actual Draft. The actual ship's draft recorded each morning prior to the Daily Production Meeting. This draft will serve as a baseline value for draft changes that occur throughout the day.

f. The Ship's Force Availability Coordinator will present the SOSMIL at the FMA daily production meeting for review and signatures. The SOSMIL will be signed by:

(1) Ship's Force (signed by a department head). Signature indicates that all evolutions that affect ballast have been identified, the form has been completed in accordance with this instruction and the correct drafts have been calculated and at least four feet of freeboard is available to all hull openings.

(2) Immediate Superior In Command (ISIC) (signed by an ISIC representative). Signature indicates that all maintenance has been identified, the form has been completed in accordance with this instruction and the draft measurements are noted.

(3) Maintenance Organization (signed by appropriate senior level person of the repair activity, normally the Production Officer, as he leads the FMA Daily Production Meeting). Signature indicates all authorized Safety of Ship work items are listed. If any additional items are to be worked, a formal change to the SOSMIL will be required.

g. Following review and signature, the Ship's Force Availability Coordinator will provide the original copy to the ship's Duty Officer. Reproduced copies for distribution shall be made from the "original document" only. Copies will be provided to:

(1) Each Production Meeting attendee listed below:

(a) FMA Division Officers

(b) FMA Repair Duty Officer/Repair Duty Chief Petty Officer

(c) FMA Regional Maintenance Team Leader. He/she shall receive enough copies to make further distribution to the FMA Duty Officers and each FMA Division Officer having work listed on the SOSMIL.

(d) Supply Repair Other Vessel Officer

- (e) Ship's Force Availability Coordinator
- (f) ISIC Material/Squadron Representative
- (g) FMA Availability Coordinator

- (2) The ship's Engineering Duty Officer.
- (3) The ship's Below Decks Watch.
- (4) The ship's Petty Officer of the Deck.
- (5) Naval Submarine Support Center Representative.

h. SOSMIL Use and Pre-Job Briefs. None of the evolutions or maintenance specified in paragraph 10.4.8.b of this chapter shall commence unless it is scheduled on the current SOSMIL. The activity performing any maintenance or evolutions listed on the SOSMIL is responsible for a pre-job brief prior to commencing work. A pre-job brief is required for all items listed on the SOSMIL and will be attended by all parties involved as desired by the Ship's Duty Officer.

10.5 FINAL CERTIFICATION, CLOSE-OUT AND RE-ENTRY OF SUBMARINE SPACES, TANKS AND VOIDS.

10.5.1 Purpose. To establish procedures for the final certification, close-out and re-entry of submarine spaces, tanks and voids.

10.5.2 Discussion. Historically during space, tank or void close-out, a large number of diverse and inconspicuous items have been overlooked. These items have, at times, seriously degraded both material readiness and acoustic signature of submarines. This section establishes a procedure to ensure a thorough certification of all spaces prior to final close-out and provides a check-off list when re-entry is required. The check-off list/sheet is not all inclusive. Common sense and effective use of personnel experience and knowledge must be used to ensure complete and thorough inspections. Non-steel damping and acoustic restraining covers are not required to be painted. Accidental overspray is acceptable. Full paintout of damping restraining covers and acoustic tile covers is not the intent. If damping and acoustic tiles are painted they must be checked to ensure that the paint will not bridge the gap between the rubber and the restraining cover more than 75% over an area. Degradation of the performance of tiles is possible. A suggested way to repair the area is to score the gap between the restraining cover

and the damping tile and between the acoustic tile covers and the rubber. Previously painted serviceable tiles may remain in service. Reference (c) allows paint on piping.

NOTE APPENDIX G MAY BE USED AS AN AID FOR ENTERING SUBMARINE SPACES, TANKS AND VOIDS.

IV-10-10 10.5.3 Action.

a. The Damage Control Assistant (DCA) is designated the coordinator for the close-out of all spaces. As such he is responsible for the following:

(1) Assigning responsible personnel to close-out or assist in closing out specific spaces, tanks and voids.

(2) Providing personnel designated to conduct tank, void, or space close-outs with a copy of Appendices G or H as applicable.

(3) Ensuring personnel performing close-outs are aware of their responsibilities and are adequately trained. He shall provide, by periodic notice, a list of personnel qualified to perform close-out inspections.

(4) Maintaining a folder for completed copies of Appendix H. This folder will serve as a space, tank and void close-out certification record. Only the most recent copies of these Appendices are required to be retained. This folder should also include an index of all spaces, tanks and voids applicable to close-out certification and their status.

(5) Keeping the Commanding Officer and the Engineer Officer informed as to the status of close-outs and significant deficiencies noted.

b. Personnel performing tank, void and space close-out or entry are responsible for:

(1) Obtaining a copy of Appendix G and Appendix H.

(2) Forwarding to the DCA completed copies of Appendix H.

c. Responsibility for Re-Entry Controls (REC) and final certification is as follows:

(1) In cases where entry is required to be made for production work by both Ship's Force and FMA personnel, the FMA will be responsible for REC and Ship's Force will be responsible for final certification close-out.

(2) For cases where only FMA work is anticipated, the FMA will be responsible for REC and Ship's Force will be responsible for final certification close-out. For the cases in

which only the maintenance activity has access (e.g., waterborne entry into mud tanks or ballast tanks by divers) the maintenance activity will be responsible for final certification close-out.

(3) For cases where only Ship's Force work is anticipated, Ship's Force will be responsible for REC and final certification close-out.

10.5.4 Applicability. All SSN and SSBN/SSGN Class submarines and FMAs.