

**JOINT FLEET MAINTENANCE MANUAL****VOLUME II****INTEGRATED FLEET MAINTENANCE****LIST OF EFFECTIVE PAGES**

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II-I-3BA-1 thru II-I-3BA-2	REV B	II-I-3CF-1 thru II-I-3CF-2	Change 4
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II-I-3CQ-2	REV B	II-I-4U-1 thru II-I-4U-2	Change 4
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II-I-4E-1 thru II-I-4E-6	Change 4	II-II-2-6 thru II-II-2-12	Change 4
II-I-4F-1 thru II-I-4F-2	Change 4	II-II-2A-1 thru II-II-2A-4	REV B
II-I-4G-1 thru II-I-4G-2	Change 4	II-II-2B-1 thru II-II-2B-2	Change 2
II-I-4H-1 thru II-I-4H-8	Change 4	II-II-2B-3	REV B
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II-I-4J-1 thru II-I-4J-2	Change 4	II-II-2B-6	REV B
II-I-4K-1 thru II-I-4K-2	Change 4	II-II-2C-1	Change 1
II-I-4L-1 thru II-I-4L-2	Change 4	II-II-2C-2	REV B

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II-III-5C-1 thru II-III-5C-2	Change 1		
II-III-5D-1 thru II-III-5D-2	Change 1		
II-III-5E-1 thru II-III-5E-4	Change 1		

JOINT FLEET MAINTENANCE MANUAL CHANGE REQUEST FORM	
FROM: ACTIVITY/SHIP _____	E-MAIL ADDRESS _____
CODE/DEPT/SHOP _____	DATE _____
ORIGINATOR _____	TEL EXT ( ) _____
VOL-PART-PARA NO. _____	FIGURE _____ TABLE _____
PROCESSING NORMAL _____ URGENT* _____	
* (Justify in rationale below if urgent is marked <b>and transmit via e-mail as "High Importance"</b> )	
PROBLEM DESCRIPTION:	
RECOMMENDED CHANGE: <b>(Include any proposed text addition/deletion)</b>	
RATIONALE:	

E-mail to [PTNH.SUBMEPP.JFMMMGR@Navy.Mil](mailto:PTNH.SUBMEPP.JFMMMGR@Navy.Mil)

(If mailing, fold on dotted line on reverse side and mail to Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity **or** send facsimile to (207) 438-6210.)

FOLD

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Commanding Officer

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P.O. Box 2500  
Portsmouth Naval Shipyard  
Portsmouth, NH 03804-2500

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## APPENDIX A

## LIST OF ACRONYMS

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3-M	Maintenance and Material Management
A&I	Alteration and Improvement
ACRN	Accounting Classification Reference Number
AERP	Advanced Equipment Repair Program
AIT	Alteration Installation Team
AMCA	Automated Machinery Condition Analysis
ARRS	Analysis, Record and Report Section
ASF	Assist Ship's Force
AWP	Availability Work Package
AWR	Automated Work Request
AWS	Attack Weapons Systems
<b>BAWP</b>	<b>Baseline Availability Work Package</b>
BCP	Ballast Control Panel
BQC	Emergency Underwater Telephone
CARPER	Aircraft Carrier Planned Equipment Replacement
CASREP	Casualty Report
CBM	Condition Based Maintenance
CJ	Critical Job
CM	Continuous Maintenance
CMAV	Continuous Maintenance Availability
CMP	Class Maintenance Plan
CNO	Chief of Naval Operations
CO	Commanding Officer
COMNAVSEASYSKOM	Commander Naval Sea Systems Command
COMSUBDEVRON	Commander Submarine Development Squadron
COMSUBLANT	Commander Submarine Force, United States Atlantic Fleet
COMSUBPAC	Commander Submarine Force, United States Pacific Fleet
COSAL	Coordinated Shipboard Allowance List
CPA	Central Planning Activity
CPJ	Critical Path Job
CS/CCS	Command and Control Systems
CSMP	Current Ship's Maintenance Project
CVN	Nuclear Powered Aircraft Carrier
DSS	Deep Submergence System
DSU	Deep Submergence Unit
EA	Executing Activity
EAB	Emergency Air Breathing
ECM	Electronic Counter Measure
EDL/ESL	Equipment Deficiency/Status Log
EM	Emergent Availability
EMBT	Emergency Main Ballast Tank
EOC	Engineered Operating Cycle
EOG	Electrolytic Oxygen Generator
ESM	Electronic Warfare Support Measures
FAC	Funding Activity Code

FBW SCS	Fly-By-Wire Ship Control Systems
FFP	Firm Fixed Price
FMA	Fleet Maintenance Activity
FMP	Fleet Modernization Program
FMPMIS	Fleet Modernization Program Management Information System
FWP	Formal Work Procedure
FY	Fiscal Year
HM&E	Hull, Mechanical and Electrical
IDD	Interim Drydocking
IDIQ	Indefinite Delivery, Indefinite Quantity
IEM	Inactive Equipment Maintenance
IFF	Identification Friend or Foe
ILO	Integrated Logistics Overhaul
IMA	Intermediate Maintenance Activity
INSURV	Board of Inspection and Survey
ISE	Individual Ships Exercises
ISEA	In-Service Engineering Activity
ISIC	Immediate Superior In Command (Group or Squadron)
IWS	Integrated Work Schedule
JCN	Job Control Number
JFMM	Joint Fleet Maintenance Manual
LLTM	Long Lead Time Material
LMA	Lead Maintenance Activity
LOA	Light-Off Assessment
MA	Maintenance Activity
MACHALT	Machinery Alteration
MARMC	Mid Atlantic Regional Maintenance Center
MBT	Main Ballast Tank
MCA (Submarines)	Material Condition Assessment
MCA (Surface Ships)	Machinery Condition Analysis
MCAI	Material Condition Assessment Inspection
MCAP	Material Condition Assessment Process
MDCO	Maintenance Document Control Office
MDS	Maintenance Data System
MIP	Maintenance Index Page
MJC	Master Job Catalog
MM	Maintenance Manager
MMBP	Maintenance and Modernization Business Plan
MOA	Memorandum/Memoranda of Agreement
MRC	Maintenance Requirement Card
MSC	Master Specification Catalog
MSCMO	Master Specification Catalog Maintenance Office
MS/MO	Multi-Ship/Multi-Option
MSR	Master Ship Repair Contractor
MST	Maintenance Support Team
MT	Maintenance Team
MTT	Mobile Training Team
MWO	Maintenance Work Order
NAVAIR	Naval Air Systems Command
NAVIMFAC	Naval Intermediate Maintenance Facility

NAVSEA	Naval Sea Systems Command
NAVSEA 08	Naval Sea Systems Command Nuclear Propulsion Directorate
NEC	Navy Enlisted Classification
NEMAIS	Navy Enterprise Maintenance Automated Information System
NMD	Navy Maintenance Database
NNSY	Norfolk Naval Shipyard
NPEB	Nuclear Propulsion Examining Board
NRL	Naval Research Laboratory
NRMD	Nuclear Regional Maintenance Department
NRRO	Naval Reactor Representative Office
NSA	Naval Supervisory Authority
NSWC	Naval Surface Warfare Center
NSWCCD	Naval Surface Warfare Center, Carderock Division
NSY	Naval Shipyard
NWRMC	Northwest Regional Maintenance Center
OIC	Officer In Charge
OMMS-NG	Organizational Maintenance Management System - Next Generation
OPNAV	Naval Operations
OPORD	Operational Order
OPTAR	Operating Target
ORDALT	Ordinance Alteration
PAC	Pre-Arrival Conference
PARM	Participating Managers
PB4M	Planning Board for Maintenance
PCD	Production Completion Date
PCO	Primary Contracting Officer
PEO	Program Executive Officer
PHNS	Pearl Harbor Naval Shipyard
PIRA	Pre-Inactivation Restricted Availability
PLAD	Plain Language Address Directory
PMA	Phased Maintenance Availability
PMR	Periodic Maintenance Requirement
PMS	Planned Maintenance System
PMT	Performance Monitoring Team
POET	Point of Entry Testing
PORSE	Post Overhaul Reactor Safeguards Examination
PPEA	Propulsion Plant Engineering Activity
PRC	Project Review Conference
PTD	Provisioning Technical Documentation
QA	Quality Assurance
RCC	Request for Contract Change
RCD	Required Completion Date
REC	Re-Entry Control
RMAIS	Regional Maintenance Automated Information System
RMC	Regional Maintenance Center
RMO	Reactor Maintenance Officer
RMT	Regional Maintenance Team
ROV	Repair of Other Vessels
RPCCR	Reactor Plant Configuration Change Report
RPM	Revolutions Per Minute
RRC	Regional Repair Center
RSE	Reactor Safeguards Examination

RSG	Regional Support Group
SBAT	SUPSHIP Bath
SC	Ship Change
SCA	System Certification Authority
SDI	Ship's Drawing Index
SDM	Ship Design Manager
SEIE	Submarine Escape Immersion Ensemble
SERMC	Southeast Regional Maintenance Center
SHIPALT	Ship Alteration
SID	Ship Installation Drawing
SITREP	Situation Report
SJM	Selected Job Management
SNAP	Ship's Non-Tactical Automated Data Processing System
SNPMTT	Surface Nuclear Propulsion Mobile Training Team
SOE	Submerged Operating Envelope
SOSMIL	Safety of Ship Maintenance Item List
SPALT	Strategic Systems Programs Alteration
SPM	Secondary Propulsion Motor
SPM	Ship Program Manager
SRA	Selected Restricted Availability
SRDRS	Submarine Rescue Diving Recompression System
SSBN	Nuclear-Powered Ballistic Missile Submarine
SSCA	SUBSAFE Certification Audit
SSES	Ship System Engineering Station
SSGC	SUPSHIP Gulf Coast
SSGN	Nuclear-Powered Guided Missile Submarine
SSP	Ship Specification Package
SSP	Strategic Systems Programs
SSPINST	Strategic Systems Programs Instruction
SSR	Ship Selected Records
SSRAC	NAVSEA Standard Specification for Ship Repair and Alteration Committee
SUBLANT	Submarine Atlantic
SUBMEPP	Submarine Maintenance Engineering, Planning and Procurement Activity
SUBPAC	Submarine Pacific
SUBSAFE	Submarine Safety
SUPSHIP	Supervisor of Shipbuilding
SUPSHIP NN	Supervisor of Shipbuilding Newport News
SURFMEPP	Surface Maintenance Engineering, Planning and Procurement Activity
SWLIN	Ships Work List Item Number
SWRMC	Southwest Regional Maintenance Center
SWS	Strategic Weapon System
SYSCOM	Systems Command
T/A	Type Availability
TAMS	TYCOM Alteration Management System
TEMPALT	Temporary Alteration
TEMPEST	National Policy on the Control of Compromising Emanations
TEMPMOD	Temporary Modification
TRIPER	TRIDENT Planned Equipment Replacement
TWD	Technical Work Document
TYCOM	Type Commander
UIC	Unit Identification Code
UNF	Unfunded
UQC	Underwater Telephone

## VOLUME II

## PART I

## CHAPTER 2

## MAINTENANCE AND MODERNIZATION PROGRAM

## REFERENCES.

- (a) NAVSEA Technical Specification 9090-310 - Alterations to Ships Accomplished by Alteration Installation Teams
- (b) NAVSEAINST 5400.95 - Waterfront Engineering and Technical Authority Policy
- (c) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (d) NAVSEA S9002-AK-CCM-010/6010 - Industrial Ship Safety Manual for Submarines
- (e) SSPINST 4720.1 - Policies and Procedures for Alteration of Strategic Weapon System Equipment
- (f) NAVSEA 4350.2 - Contract Work Onboard Nuclear-Powered Ships
- (g) NAVSEA T0300-AA-MMI-010 - Commercial Industrial Services (CIS) Manual
- (h) NAVSEAINST 4710.6 - Submarine Advanced Equipment Repair Program (AERP); Assignment of Responsibilities for and Administration of
- (i) SSN21-081-PMS350L-035 - Rotatable Pool Management Plan for the SEAWOLF Class SSN
- (j) OPNAVINST 4720.2 - Fleet Modernization Program (FMP); Policy for
- (k) NAVSEAINST C9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships
- (l) NAVSEAINST 4720.23 - Deep Submergence Systems Temporary Modifications
- (m) NAVSEA SL720-AA-MAN-010 - Fleet Modernization Program (FMP) Management and Operations Manual
- (n) NAVSEAINST 4130.9 - Configuration Control Procedures for Preparation of Ordnance Alterations (ORDALTS) to Expendable and Non-Expendable Items
- (o) NAVSEAINST 4720.15 - Machinery Alterations on HM&E Equipment and Systems
- (p) MIL-STD-2039 - Field Changes and Field Change Kit Preparation
- (q) COMLANTFLTINST 4700.10 - Policies and Procedures for Fleet Technical Support (FTS) (Cancelled)
- (r) COMPACFLTINST 4341.1 - Fleet Technical Assistance (FTA) Program (Cancelled)
- (s) NAVSEA 0989-LP-043-0000 - Commissioned Surface Ship General Reactor Plant Overhaul and Repair Specification
- (t) NAVSEAINST 4730.2 - Shipyard Inspection and Required Conditions of Propulsion Plant Systems (Non-Nuclear) for Nuclear-Powered Surface Ships
- (u) NAVSEA STD DWG 605-5529700 - CVN 68 Class Commissioned Ships Reactor Plant Paint Schedule
- (v) NAVSEA S9086-VD-STM-010-NSTM Chapter 631 - Preservation of Ships in Service - General
- (w) TMIN SL700-AB-GYD-010 - Pictorial Guide for Painting Ships Interiors
- (x) NAVSEA STD DWG 213-4362626 - Lagging and Insulation Schedule for Reactor Plant Systems
- (y) CNAP/CNALINST 9210.4 - Nuclear Propulsion Note 9200-2
- (z) NAVSEAINST 9304.1 - Shipboard Electric Cable and Cableway Inspection and Reporting Procedures
- (aa) DOD-STD-2003 - Military, Standard, Electric Plant Installation Standard Methods for Surface Ships and Submarines
- (ab) NAVSEA 0989-LP-062-4000 - Naval Nuclear Quality Control Manual for Shipyards
- (ac) NAVSEA 0989-031-4000 - Reactor Plant Instrumentation and Control Equipment Maintenance
- (ad) NAVSEA 0989-LP-026-1000 - A4W/A1G Reactor Plant Manual
- (ae) OPNAVINST 3120.32 - Standard Organization and Regulations of the U.S. Navy
- (af) COMLANTFLTINST 5400.2 - U.S. Atlantic Fleet Regulations
- (ag) COMPACFLTINST 5400.3 - U.S. Pacific Fleet Regulations
- (ah) OPNAVNOTE 4700 - Representative Intervals, Durations, Maintenance Cycles, and Repair Mandays for Depot Level Maintenance Availabilities of U.S. Navy Ships
- (ai) OPNAVINST 4780.6 - Policy for Administering Service Craft and Boats in the U.S. Navy
- (aj) MIL-P-24534 - Planned Maintenance System: Development of Maintenance Requirement Cards, Maintenance Index Pages, and Associated Documentation

- (ak) MIL-STD-1388 - Logistic Support Analysis
- (al) OPNAVINST 3120.33 - Submarine Extended Operating Cycle (SEOC) Program
- (am) NAVSEAINST 4790.19 - Submarine Engineered Operating Cycle (SEOC) Program
- (an) NAVSEA TL710-AB-MAN-010 - Depot Modernization Period (DMP) Procedures Manual
- (ao) OPNAVNOTE 4710 - Fleet Depot Maintenance Schedule
- (ap) NAVSEAINST 4790.16 - SSBN Extended Operating Cycle (EOC) Program; Policy, Procedures and Responsibilities for
- (aq) SSPINST 5600.11 - Preventive Maintenance Management Program for Strategic Weapon Systems Equipment and Associated Material
- (ar) NAVSEA SL720-AA-MAN-010 - Fleet Modernization Program (FMP) Management and Operations Manual

LISTING OF APPENDICES.

- A Material Condition Assessment Process Timeline
- B CVN Propulsion Plant Material Condition Assessments
- C Scope of Visual Inspections of Reactor Plant Fluid Systems

2.1 PURPOSE. The purpose of this chapter is to provide Fleet Commanders' guidance for the maintenance of ships throughout their operating cycle in accordance with references (a) through (ar). This includes maintenance levels, strategies, programs and modernization which define and support all maintenance accomplished in accordance with technical specifications and standards during a ship's operating cycle.

2.1.1 Naval Supervisory Authority.

- a. Naval Supervisory Authority Definition. The Naval Supervisory Authority (NSA) is the single Naval activity, as indicated in Table 2-1 of this chapter, responsible for the integration, oversight and verification of all work accomplished by all activities (i.e., Naval Shipyards (NSY), Regional Maintenance Centers (RMC), Supervisors of Shipyards (SUPSHIP) contractors, Type Commander (TYCOM) sponsored contractors, Intermediate Maintenance Activities (IMA), Alteration Installation Teams (AIT) and Ship's Force) working within the assigned availability, and acts as the single point of contact for this work. The NSA will provide the oversight required to ensure that all work in the assigned availability (e.g., Chief of Naval Operations (CNO) availabilities, Continuous Maintenance Availability, Emergent Availability) is authorized and completed in compliance with applicable technical requirements and maintenance/modernization policy, and that all work meets schedule, quality and environmental/safety requirements. The NSA must possess a Naval Sea Systems Command (NAVSEA) technical warrant.
- b. NSA Assignment. In most cases, the NSA is assigned by the Fleet Maintenance Officer and TYCOM in accordance with Table 2.1. An NSA must be assigned to all CNO availabilities and to all work that is contracted out to a private executing activity where the majority of the work is performed onboard the ship.
  - (1) Alterations installed by Alteration Installation Teams (AIT) per reference (a) can only be executed in availabilities that have a designated NSA. If the AIT install is being performed outside a CNO availability, the AIT Sponsor may propose NSA responsibility be assigned to any organization that is qualified as an NSA for the type of work being performed.
  - (2) An NSA is not required if the work is being performed by a U.S. Navy Lead Maintenance Activity (LMA) outside a CNO availability.
  - (3) The NSA will normally be the activity assigned based on the geographic area covered by the assigned RMC, NSY or SUPSHIP, as indicated in Volume VI, Chapter 2, Table 2-1 of this manual. If this is not practical, the NSA assignment will be made based on the area of responsibility of the cognizant Chief Engineer as delineated in reference (b).

- (1) Training.
  - (2) Providing on-site technical support.
  - (3) Acting as corporate memory.
- b. Fleet Maintenance Support Branch support should be coordinated through the respective Surface Nuclear Maintenance Training Group and, for submarines, coordinated through the parent ISIC.

## 2.9 PROPULSION PLANT MATERIAL CONDITION (AIRCRAFT CARRIERS ONLY).

2.9.1 Purpose. This section presents a comprehensive approach to assessing and maintaining propulsion plant material condition on Nuclear Powered Aircraft Carriers (CVN). The cornerstone of this program is the Material Condition Assessment Process (MCAP) which employs incremental maintenance concepts to apply inspections, maintenance, training and both depot and afloat assets toward the consistent identification, evaluation, tracking and correction of propulsion plant material condition deficiencies. The program assigns specific duties to both Ship's Force and the TYCOM staff to ensure the ship has the assets, processes and support in place to effectively manage propulsion plant material condition over the life of the ship. The effectiveness of this process is measured by the material condition of the propulsion plants.

2.9.2 Applicability. The guidance provided in this section focuses on CVNs.

### 2.9.3 Ship's Force Requirements.

2.9.3.1 Reactor Maintenance Officer. The Reactor Maintenance Officer (RMO) is responsible for the long range planning and management of propulsion plant maintenance throughout the ship's cycle. Specific responsibilities include:

- a. Coordinate with other Reactor Department Principal Assistants to ensure divisions are continuously identifying, evaluating and correcting material deficiencies in the propulsion plants. The RMO will periodically review the MCAP Database (Equipment Deficiency Log (EDL)) and the Equipment Status Logs (ESL) to ensure deficiencies are being identified and documented.
- b. Coordinate with other Reactor Department Principal Assistants to ensure divisions are submitting work requests for inclusion into future availabilities and up-keeps, as necessary to correct significant or overly burdensome material deficiencies.
- c. Function as the ship's liaison for all outside maintenance activities. The RMO shall be the primary point of contact for all matters pertaining to maintenance of the propulsion plants to include coordinating with the TYCOM in the planning, prioritizing and execution of scheduled repairs.
- d. Request assistance as necessary, via the TYCOM, to accomplish nuclear and non-nuclear planned maintenance inspections.
- e. Coordinate (with Reactor Training Assistant/Training Officer) all required shipyard and TYCOM training for the Reactor Department prior to the start of availabilities.
- f. Request training, via the TYCOM, on the execution of material inspections. The training, conducted by a small (a notional five person team consisting of shipyard nuclear and non-nuclear engineers and a MCAP Zone Manager/Coordinator) group of shipyard MCAP experts, is normally conducted in conjunction with the pre-deployment Material Condition Assessment Inspection (Pre-Deployment MCAI). The primary goal of the training is to provide focused information and training to Ship's Force personnel on MCAP inspection attributes and techniques. The RMO shall be the single point of contact for scheduling TYCOM provided and/or funded maintenance and inspection training.

- g. Coordinate, via the TYCOM, the use of groom teams, as needed. Groom teams may be shipyard or contractor personnel who can be scheduled to find and fix discrepancies associated with specific systems or components. Groom teams employ standard tests to evaluate system performance and may assist in the correction of deficiencies as well as their identification and documentation.
- h. Coordinate, with other Reactor Department Principal Assistants, to ensure that deficiency lists generated by groom and inspection teams are incorporated into the MCAP Database (EDL).
- i. During CNO availabilities, perform actions necessary for certification of Reactor Plant Support Systems required to support principal propulsion plant evolutions in accordance with reference (t). Prior to performing work on these components/systems, the RMO shall consult with the shipyard project team to ensure that a clear path to re-certification (or interim certification) is identified.
- j. Assist the Reactor Officer and the other Principal Assistants in the planning and management of SHIPALTS and modifications to reactor plant systems and support systems.
- k. Ensure that non-propulsion plant deficiencies identified as part of the MCAP are passed to the Ship's Maintenance Manager for action. The Ship's Maintenance Manager is responsible for coordinating and reporting the correction of these deficiencies in a timely manner. Increased emphasis on deficiency correction and reporting may be required by the Ship's Maintenance Manager during key event readiness periods.

2.9.3.2 Material Condition Assessment Process. Appendix A presents a notional, 27 to 36-month, MCAP Timeline. This timeline provides visibility of the many areas requiring consideration and action by both the ship and associated Project Team, both inside and outside of CNO availabilities. The timeline provides a template capturing the minimum efforts that should be undertaken throughout the ship's operational cycle to support improvement of propulsion plant material condition. It was developed by a detailed review of associated source documents and experience in MCAP implementation across the fleet and should be tailored by the RMO to suit the ship's individual schedule and circumstances. The following are events from the MCAP Timeline that are of particular significance to Ship's Force that are not specifically addressed in other source documents:

- a. Pre-Deployment Material Condition Assessment Inspection. The Pre-Deployment MCAI is a non-intrusive walk through inspection of propulsion plant spaces conducted by Ship's Force (with shipyard support) prior to deployment. This inspection is conducted as a joint effort in conjunction with pre-inspection training provided by shipyard engineers and inspectors. The scope of the pre-deployment MCAI exceeds that of the ship's periodic zone inspections and is intended to be a mid-cycle assessment of propulsion plant material condition.
  - (1) The objectives of the inspection are:
    - (a) To validate the standards used in the material condition assessment process. This is accomplished through the pre-inspection training provided by shipyard engineers and inspectors. This training is intended to be the most significant opportunity to train and educate Ship's Force personnel with regard to inspection attributes and material standards.
    - (b) To identify deficiencies prior to deployment in time to order and receive material before departure. This ensures that Ship's Force has the material on hand to correct deficiencies while on deployment.
    - (c) To provide a mid-cycle review and validation of the health of the MCAP.

- (d) To set the tone for continuing inspections during the ship's deployment. Aggressive identification and correction of deficiencies during deployment will result in an overall improved propulsion plant material condition and reduce work package churn in the subsequent CNO availability.
- (2) Scheduling of the Pre-Deployment MCAI must balance the benefits of early identification of material issues against operational requirements. However, whenever possible, the inspection should be completed no later than three months prior to deployment. The TYCOM Maintenance Program Manager will fund a shipyard MCAP training team (notionally five to ten people in size), when requested by the RMO, to assist in the performance of the MCAI. The training team provides (1) targeted training and deckplate feedback to Ship's Force in support of the inspection, and (2) acts as an independent check for both the ship and the TYCOM that the ship's MCAP program is being administered in a manner that supports the intent of the program. The ship's Commanding Officer retains responsibility for determining the impact and required actions for deficiencies identified during this inspection.
- b. Production Completion Date. Production Completion Date (PCD) is a CNO availability key event that is scheduled two weeks prior to the respective plant hot-operations key event and marks the Project Team's transition from production work to preparations for test events and plant operations. It is intended that all propulsion plant work, deficiency correction and associated testing required for hot-operations (Light Off Assessment) be completed by PCD. However, PCD requires a subjective evaluation by the ship's Commanding Officer, Reactor Officer and Project Superintendent that production work, testing and deficiency correction has been reduced to a level and/or area of the plant such that required key event preparations can proceed satisfactorily, to completion, in the ensuing two-week period. Upon reaching PCD, the Reactor Officer and the rest of the Project Team must be able to shift their focus away from production work and testing to preparations for plant operations. These preparations include but are not limited to:
- Pre-event certifications and resulting discrepancy correction
  - Danger Tag removal and system restoration
  - Ship's Force Startup Maintenance
  - System Valve lineups
  - Continued deep cleaning and small valve maintenance
  - Use of Groom Teams in areas requiring special emphasis
  - Temporary Service Removal
  - Training on Hot Operations/Non-Critical Steaming
  - Transition to an operational environment and focus
- (1) Previous availabilities have shown that if excessive production work and testing is still ongoing at the time PCD is evaluated as complete, key event preparations will be adversely affected and the hot operations key event date will usually be negatively impacted.
- (2) If it is necessary to delay PCD, strong consideration should be given to moving the hot operations key event accordingly, in order to protect the integrity of the two-week preparation period. Otherwise, it must be recognized that the transition from a maintenance intensive environment to an operationally focused environment may be negatively impacted.

- (3) In the event that some production work and testing will be ongoing, the Project Team will generate an exceptions list detailing all work and associated testing that is intended to continue after PCD. The Project Team must **formally** agree that the intensity and/or volume of the items on the exceptions list will not adversely impact the Project's ability to complete preparations for the upcoming event, in an orderly and timely manner.
- (4) Some specific questions that should be considered when determining whether a project has reached PCD include:
  - (a) Are major system piping and valves intact?
  - (b) Are propulsion plant damage control and fire-fighting systems and the associated repair lockers stocked and operational?
  - (c) Are ladders installed? Are space accesses and at least one of the two escape trunks in each space clear for passage?
  - (d) Are doors, hatches and scuttles installed and operational?
  - (e) Are temporary services removed with the exception of essential support systems and systems installed to support remaining work?
  - (f) Are all deck plates and associated supports installed?
  - (g) Has loose industrial material and debris been removed?
  - (h) Have major lagging repairs been completed? Is the extent of any remaining lagging work minimal (not including temporary lagging installed to support later testing)?
  - (i) Are pre-test inspections and correction of associated deficiencies complete?
  - (j) Has major preservation and painting been completed? Is the extent of remaining touch-up painting acceptable?
  - (k) Have deficiencies identified by the MCAI, weekly walk-throughs, associated cold plant testing, and any rework/retest associated with the testing, been completed or resolved? If not, are the remaining deficiencies at a low enough level that they can be corrected without impacting event preparations?
  - (l) If applicable, has System Turnover been completed? Have all discrepancies identified during the turnover process been corrected?
- c. Deficiency Identification and Correction. The basic organization of a CVN Reactor Department has long established programs in place to support the day-to-day identification and tracking of material deficiencies (3M system, Zone Inspection Programs, MCAP Database, EDL, CSMP, etc.). However, experience has shown that successful programs are those that support **continuous** identification and correction of propulsion plant deficiencies, that have incorporated the timelines of Appendix A and have placed increased emphasis on known problem areas. Some of the propulsion plant maintenance areas that have historically required special attention are listed below. Each CVN may identify additional areas as they progress through the maintenance cycle.
  - (1) Valve Maintenance and Inspection. All valves in the propulsion plant are required to be inspected and maintained in accordance with the applicable chapters of the component technical manual. Special emphasis should be placed on the early identification and correction

of stem packing leakage in conjunction with the MCAP inspection program. All valves having less than two valve isolation from high-energy systems should be inspected annually at a minimum. Prior to availabilities that will include a plant cool down, particular attention should be given to steam generator isolation valves, safety valves, blowdown and sampling system valves and all 500 series main feed and main steam system valves. Any valve that shows signs of packing leakage or has minimal packing gland adjustment remaining should be entered into the MCAP Database (EDL) for further evaluation.

- (2) Structural Preservation. Areas of the propulsion plant are to be inspected for structural corrosion on a rotating basis in conjunction with the ship's MCAP inspection plan. Particular emphasis should be placed on areas exposed to salt spray (ventilation spaces, weather deck fittings), equipment foundations, low traffic areas, and all out of plant spaces owned by Reactor Department or that contain reactor support equipment. References (u), (v) and (w) provide additional guidance on applying and resurfacing plant structural components and coating color schemes.

**NOTE: REFERENCE (w) WAS DISTRIBUTED TO ALL CVNs BY NAVSEA LTR 92T124/0418 DATED 5 NOV 01 AND PROVIDES AN EXCELLENT STANDARDIZED GUIDE OF THE VISUAL CONDITION OF PAINTED COMPONENTS AND SURFACES IN THE INTERIOR OF SHIPS DURING MAINTENANCE AVAILABILITIES OR CONTRACTED PRESERVATION TEAM WORK. ADDITIONAL COPIES ARE AVAILABLE IN SPIRAL BOUND BOOK FORM AND ON CD-ROM FROM THE NAVAL LOGISTICS LIBRARY (<http://nll.navsup.navy.mil/>). ACCESS THE P2003 SHOPPING CART AND INPUT EITHER TECH MANUAL NUMBER SL700-AB-GYD-010 OR NSN 0910-LP-100-4420.**

- (3) Lagging and Insulation. Damaged or worn lagging/insulation should be inspected and upgraded using the guidance of references (c), (g), and the CVN 68 Class Incremental Maintenance Plan, Sequencing Plan in conjunction with the ship's MCAP inspection program. Ships should consider maintaining a separate list of lagging removed by Ship's Force as a result of maintenance, wetting or becoming oil soaked. Guidance for installing and maintaining insulation can be found in reference (x). Painting of insulation is covered by the aforementioned Reactor Plant Paint Schedule.
- (4) Paint and Preservation. In conjunction with the structural preservation and bilge preservation inspections discussed in this section, the ship must ensure that the paint and preservation status of general propulsion plant spaces is maintained over time with emphasis placed on the work that will be done during availabilities. The CVN 68 Class Incremental Maintenance Plan, Sequencing Plan provides guidance on rotation plans for propulsion plant spaces. Ships should consider maintaining a list of spaces annotating the dates when spaces were last painted/preserved to assist in long term planning. References (u), (v) and (w) (see NOTE in paragraph 2.9.3.2.c.(2) of this chapter) provide additional guidance on applying and resurfacing plant structural components and coating color schemes.
- (5) Bilge Preservation. Invasive, below the deck level, inspections are the key to maintaining the integrity of bilges and bilge structural members. Ships should ensure that regular bilge inspections are scheduled in conjunction with the ship's MCAP inspection program with increased emphasis during the Pre-Availability and Pre-Deployment MCAI inspections. Progressive maintenance techniques are required for coatings in the propulsion plant bilges to wear as projected and must be resurfaced at the appropriate intervals. Guidance on inspection criteria and establishment of inspection zones can be found in CVN 68 Class Depot Maintenance Requirement Card MRC 631-01. References (u), (v), (w) and (y) (see NOTE in paragraph 2.9.3.2.c.(2) of this chapter) provide additional guidance on applying and resurfacing plant structural components and coating color schemes.

- (6) Oil Leak Identification and Correction. Ships should aggressively identify and correct oil leaks, with particular attention to areas underneath the main engines, turbine generators, lube oil purifiers and in the vicinity of lube oil pumps. Inspection plans should divide the propulsion plant spaces into zones to ensure all areas are inspected annually at a minimum. The list of identified oil leaks can then be prioritized in the MCAP Database (EDL) for correction.
  - (7) Electrical Cableway Inspection. Shipboard electrical cableways for the most part are taken for granted. Improperly installed cables in the propulsion plant can not only damage existing cables but may also impact watertight/airtight integrity. Cableways must be properly installed and maintained in accordance with the requirements of references (z) and (aa). Additional guidance for conducting cableway assessments in conjunction with the ship's MCAP inspection program is available in Volume VI, Chapter 28 of this manual.
  - (8) Typical Recurring Deficiencies. The ship should actively pursue the identification, documentation and correction of typical recurring deficiencies through the periodic MCAP inspections. Listed below are examples of the types of items that should be continuously identified and corrected. TYCOM will provide funding during availabilities, Planned Incremental Availabilities and Docking Planned Incremental Availabilities for the shipyard or other activity to provide assistance in resolution, as required.
    - (a) defective/missing spray shields
    - (b) missing deck plate screws
    - (c) lockwire/locking cable deficiencies
    - (d) mixed/missing/corroded fasteners
    - (e) small valve maintenance deficiencies
    - (f) loose/damaged stuffing tubes
    - (g) missing/damaged pipe hangers
    - (h) missing/misaligned/leaking funnels
    - (i) missing gage fasteners and gage line supports
    - (j) electrical cable and lighting deficiencies
    - (k) missing/damaged label plates
- d. Acceptable-As-Is items. The MCAP database has the ability to provide the ship with information concerning material conditions that have been previously classified as "Acceptable As Is". Each entry should identify the equipment and its location, provide a description of the acceptable condition and a reference to the technical documentation that accepted the condition. Shipyards can use this data during depot availabilities to preclude repetitive research for acceptable, existing conditions that would otherwise be considered deficiencies. The shipyard will provide the ship with electronic copies of all waiver letters, Liaison Action Request responses, Departures from Specifications and any other acceptance documentation generated during an availability. The RMO with the assistance of the Reactor Plant Planning Yard should ensure the data is kept up to date between depot availability periods.

2.9.3.3 Methods for Assessment of Material Condition. There are several methods used to periodically assess and improve the material condition of the propulsion plants for CVN outside of depot availabilities. The existing programs provided by the fleet commanders to improve material condition are addressed in Volume VI, Chapter 42, of this manual. Other methods include:

- a. Material inspections conducted by the Surface Nuclear Propulsion Mobile Training Teams (MTT).
- b. Material inspections conducted by the Board of Inspection and Survey.
- c. Material inspections conducted by the Nuclear Propulsion Examining Board (NPEB).
- d. Periodic inspections conducted by shipyard engineering and inspection groups, usually in conjunction with availability planning. These inspections include Carrier Availability Planning System, Point of Entry Testing (POET), MCAIs and zone inspections of the propulsion plant spaces.
- e. Carrier Engineering Material Assessment Team coordinators groom systems to include Leslie valves, high pressure air compressors, low pressure air systems, governor control systems, distilling plants, etc.
- f. Periodic Ship's Force Zone Inspections.
- g. Pre-Deployment Material Condition Assessment Inspection.

The table shown in Appendix B is a compilation of propulsion plant inspections and references.

2.9.3.3.1 Attributes and Acceptance Standards for Material Condition Inspections. The inspection criteria used for material inspections throughout the ship's operational cycle shall be uniform and consistent to provide an accurate assessment of the material condition of the propulsion plant.

- a. Reference (t) shall be used to inspect non-nuclear propulsion systems and components.
- b. References (ab), (ac) and (s) shall be used to inspect nuclear propulsion systems and components. Inspection criteria for nuclear mechanical systems is listed in Appendix C. Inspection criteria for nuclear electrical systems is listed in reference (ac).

2.9.3.4 Propulsion Plant Planned Maintenance. Reference (ad) lists the planned maintenance pertinent to reactor systems and includes numerous inspections and checks to review material condition. It can be advantageous for the ship to request shipyard quality control inspector or production shop assistance when conducting the annual inspections of the Reactor Compartment and Pressurizer Shed. In addition, the ship should consider requesting assistance when performing periodic inspections of piping hangars, piping and supports in bilges, load centers and reactor vessel shielding.

2.9.3.5 Training for Ship's Force. The TYCOM, in conjunction with other activities (e.g., NSY, Fleet Maintenance Support Branch, Shore Intermediate Maintenance Activity (SIMA), Trident Training Facility), has developed specific training courses to enhance technical maintenance capabilities and inspection techniques. In addition, shipyard personnel can provide training on subjects such as lagging replacement, lockwire/locking cable installation and inspection techniques. Ship's Force requests for specific training topics (e.g., shipyard inspection training prior to conducting the pre-deployment MCAI) shall be processed through the TYCOM. Ship's Force should schedule this training early and ensure sufficient personnel are trained.

2.9.4 Type Commander Responsibilities.

- a. Budget and plan for correction of both typical recurring deficiencies and other material deficiencies during all upkeep, availabilities, Planned Incremental Availabilities and Docking Planned Incremental Availabilities.

- b. Assign groom teams as necessary, to assist Ship's Force in maintaining the material condition of the propulsion plant.
- c. Provide the maintenance and inspection training requested by Ship's Force. This provisioning of training will include funding a shipyard MCAP team requested by the RMO in support of the pre-deployment MCAI. This small team (five to ten person notional size) provides (1) targeted training and deckplate feedback to Ship's Force in support of the inspection, and (2) acts as an independent check for both the ship and the TYCOM that the ship's MCAP program is being administered in a manner that supports the intent of the program.
- d. Provide training for RMOs through the TYCOM N9 and N43 organizations to ensure they understand common maintenance problems among carriers, the requirements of this chapter and how to better plan for availabilities.
- e. For CNO Availabilities, maintain, with Ship's Force and shipyard input, an Availability Parts Support List containing special parts and routinely required support equipment necessary to support Ship's Force work (e.g., breaker locking clips, valve locking devices, tygon tubing, flexes, thread protectors, foreign material exclusion plugs, valve stems). These material items can then be ordered and procured early so that production work will not be disrupted.
- f. Meet periodically with the Reactor Officer and/or RMO to review the ship's material condition. The need for TYCOM support in identifying and correcting material deficiencies should be addressed at this time.
- g. Provide timely review and scheduling of deficiency correction for items identified during the inspections and grooms of paragraph 2.9.3.3 of this chapter.

2.9.4.1 Type Commander Mobile Training Team Visits. The MTT should periodically evaluate the ship's material condition including a review of the ship's MCAP Database (EDL) to ensure the ship has an effective program for identifying and correcting material condition deficiencies. It is important that the MTT does not critique lists that are too large, since this chapter specifically encourages ship's to document deficiencies that are beyond the capability of the ship or are too numerous to fix considering the ship's operational commitments. Attributes that should be checked include:

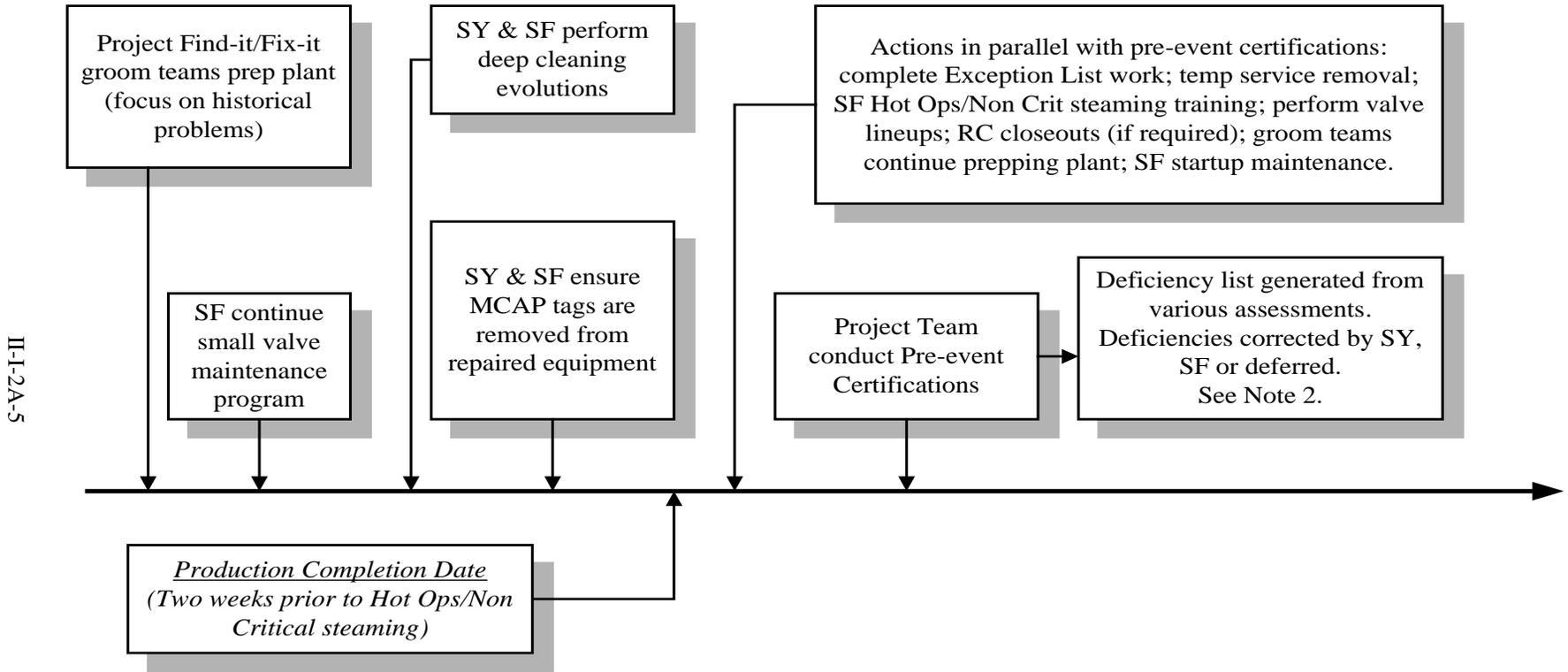
- a. Ensure that the MCAP Database (EDL) is current and accurate based on MTT material condition inspections (i.e., is the ship's MCAP Database (EDL) an accurate representation of propulsion plant material condition based on the number, type and severity of items identified by the MTT? Are the plans for corrections realistic?)
- b. Ensure that deficiencies have not remained in the MCAP Database (EDL) for an excessive amount of time (i.e., the turnover rate of the deficiencies). Large backlogs indicate the need for increased Ship's Force attention and/or TYCOM assistance to correct deficiencies.

2.9.5 Assessing Deficiency Impact and Scheduling Corrective Action. During scheduled CNO availabilities shipyard personnel must review applicable plans and specifications in order to determine whether correction of a deficiency is required to support propulsion plant testing key events. Factors that must be considered in making this determination are type and severity of the defect, service of the component involved, accessibility of the defect for repair during shipyard availability versus upkeep period, effect on personnel or equipment safety, impact on system operation and cleanliness or preservation (i.e., required to restore cosmetic appearance versus resistance to corrosion). Every attempt should be made to correct all deficiencies during scheduled CNO availabilities, however, propulsion plant testing key events shall not be delayed in order to correct deficiencies that are not required to support that event. Such deficiencies can be deferred and may be scheduled for correction outside of the

availability. Deficiencies that are primarily cosmetic are ideal candidates for deferral consideration. When material condition deficiencies are identified outside of CNO scheduled availabilities, the Reactor Officer determines whether corrective action is necessary and when it should be accomplished. Appendix A provides guidance regarding deficiency disposition in either case.

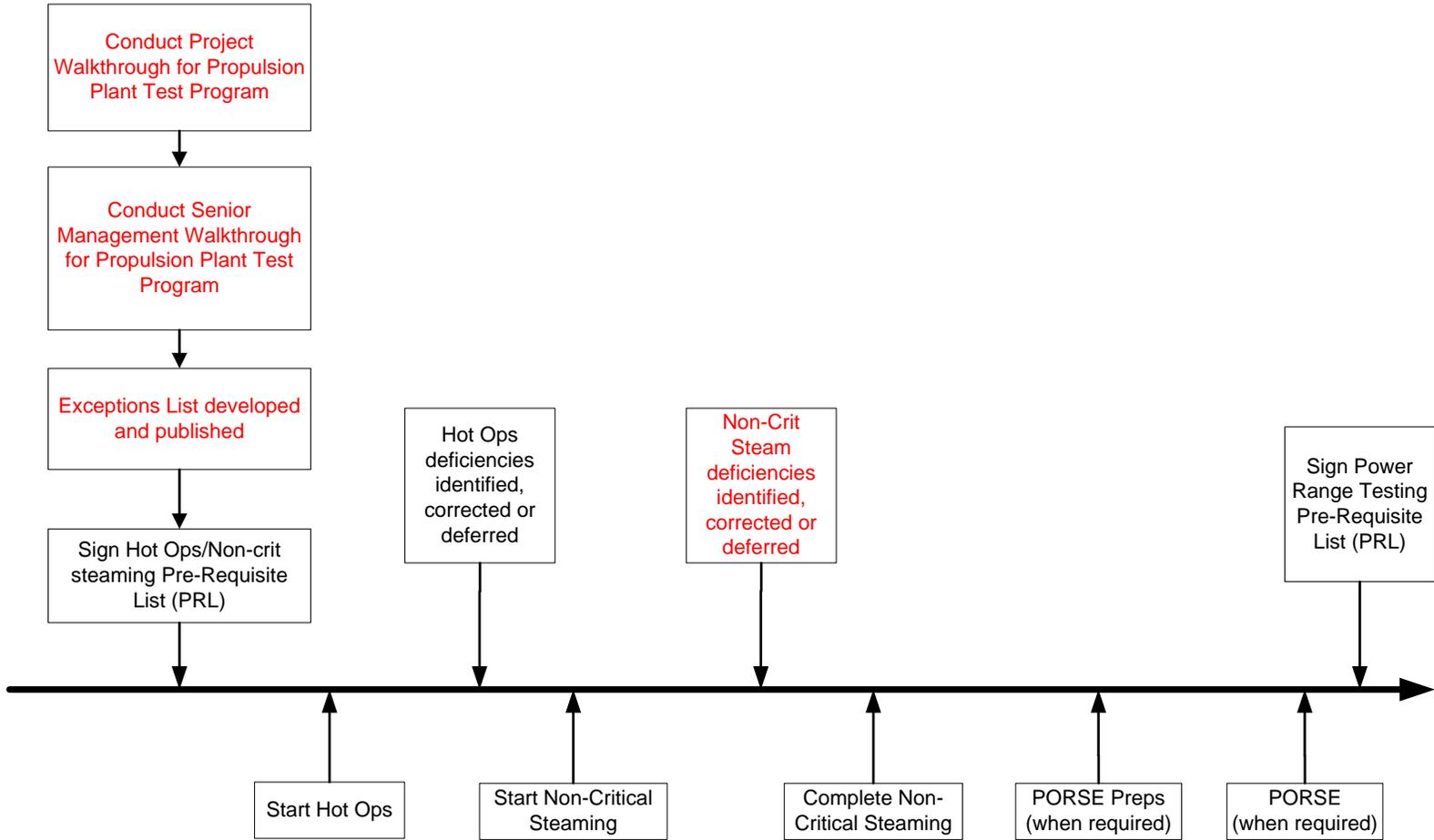
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MCAP



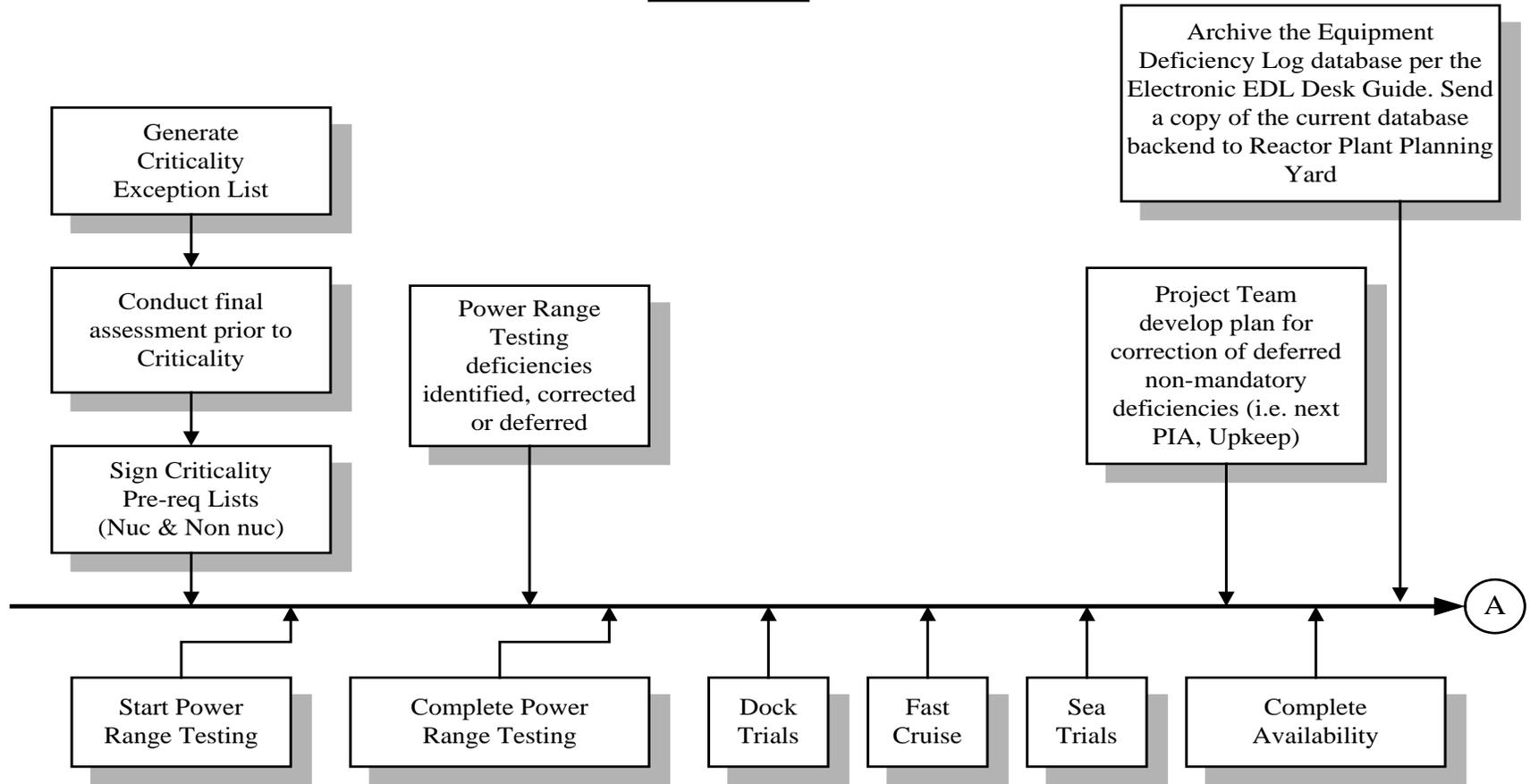
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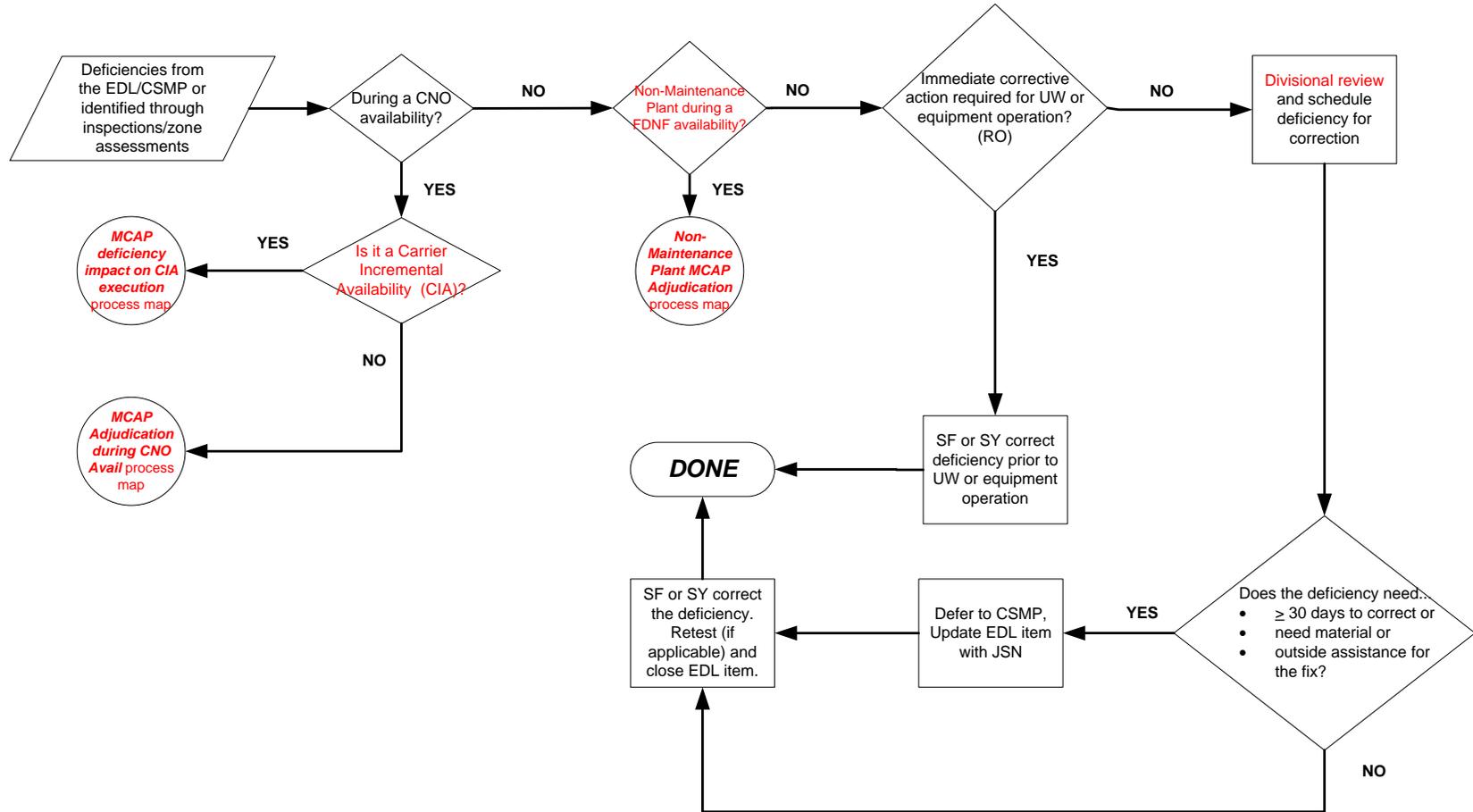
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## MCAP Deficiency Evaluation Flowchart



II-I-2A-8

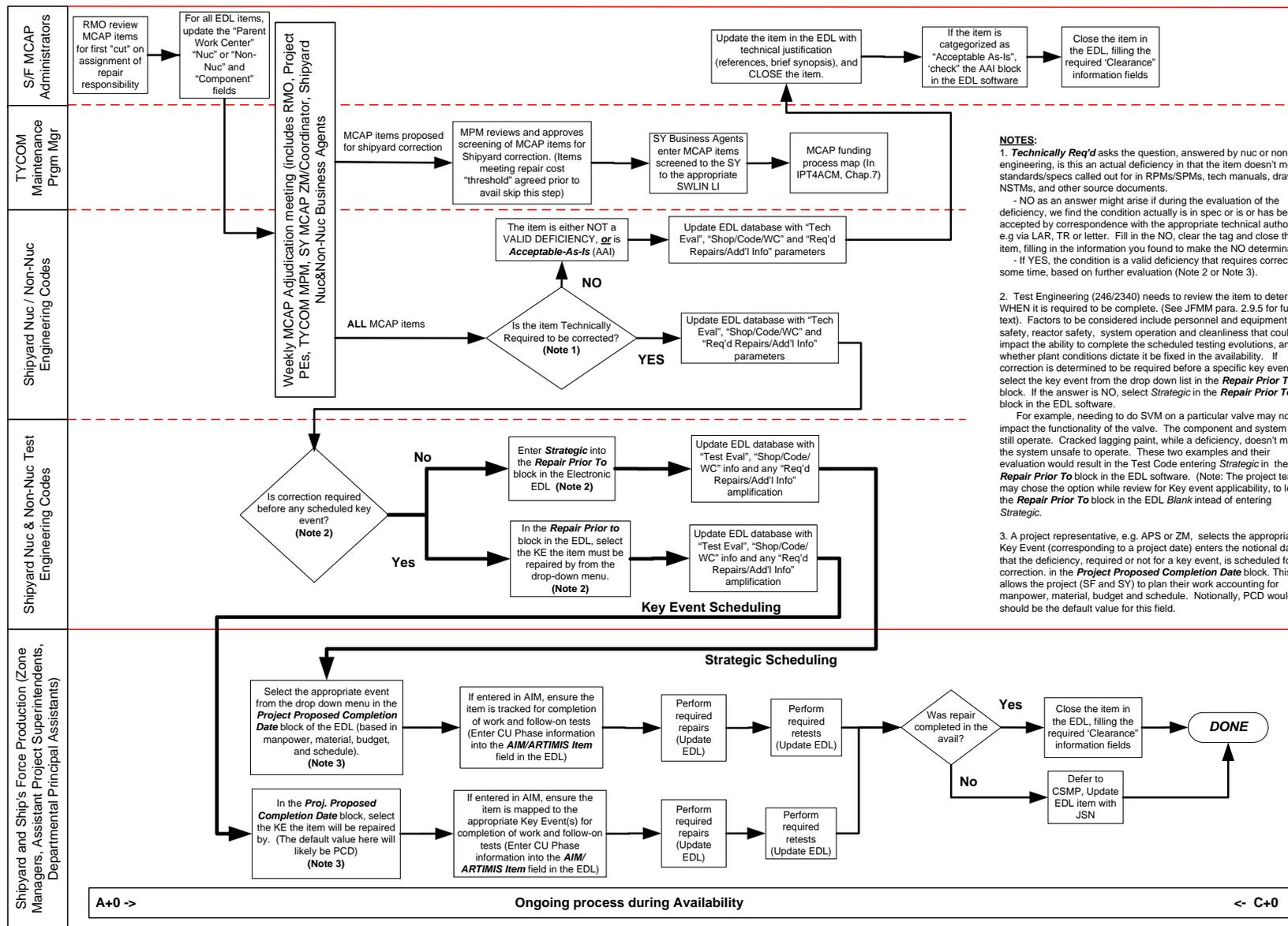
**General Notes:**

An effort should be made to fix any and all deficiencies as soon as possible. Generally, deficiency correction will fall within one of three general, generic "paths"...

1. The item doesn't meet technical requirements in one or more parameters, and must be fixed prior to the next startup, or a Key Event in a maintenance period.
2. The item doesn't meet technical requirements, and it's preferable to fix the item during the maintenance period in question. You could, however, operate the plant safely with the item as it stands.
3. While not meeting technical requirements, it's an item requiring a small (usually < 8 hours to fix) expenditure of time/labor to correct. Examples include minor paint touchup, small lagging tears, a lagging "button" missing from a sheet of bulkhead lagging.

# MCAP Adjudication Process Map (during a CNO availability)

II-I-2A-9



**NOTES:**

1. **Technically Req'd** asks the question, answered by nuc or non-nuc engineering, is this an actual deficiency in that the item doesn't meet standards/specs called out for in RPMs/SPMs, tech manuals, drawings, NSTMs, and other source documents.

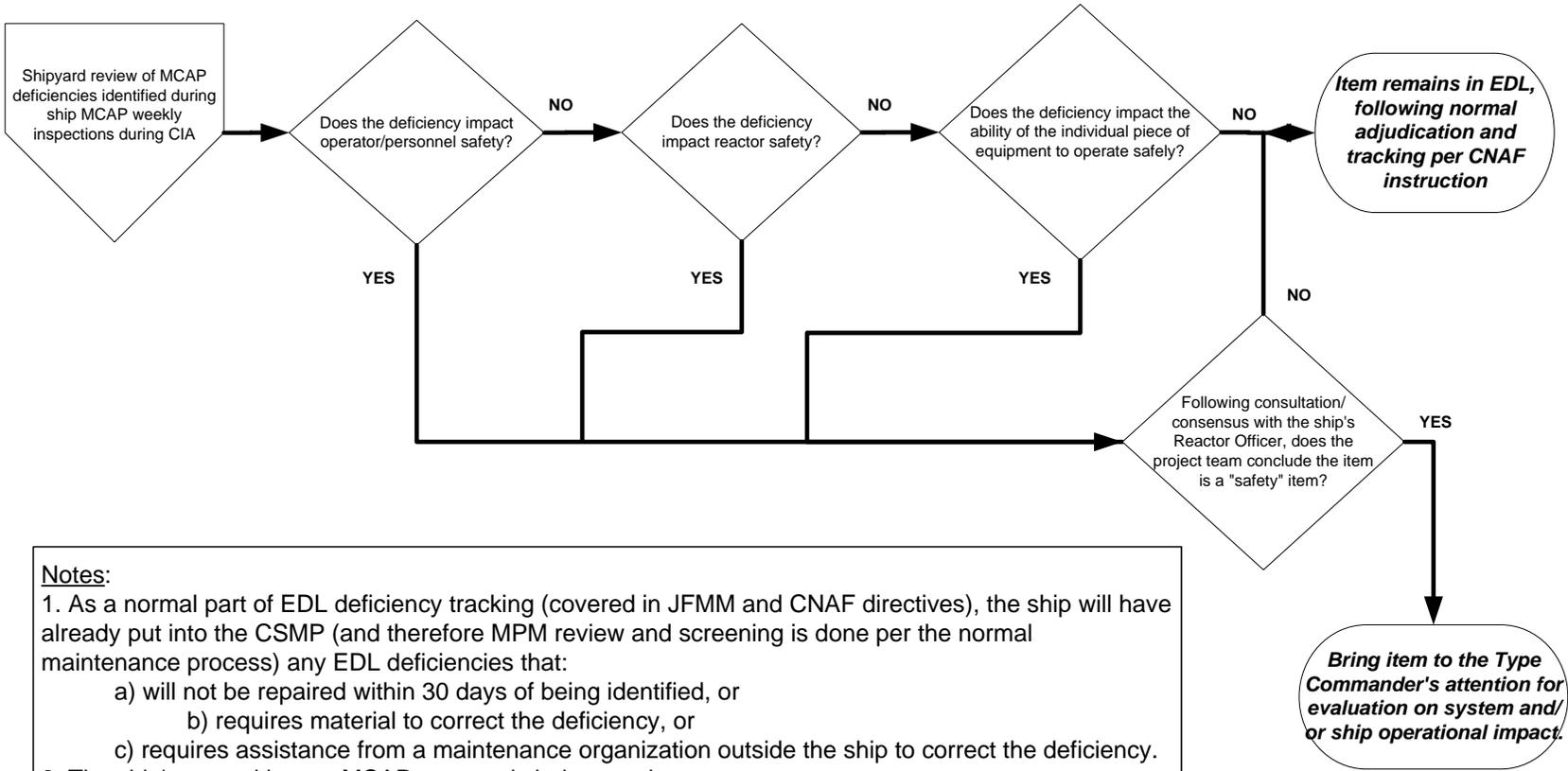
- NO as an answer might arise if during the evaluation of the deficiency, we find the condition actually is in spec or is or has been accepted by correspondence with the appropriate technical authority, e.g via LAR, TR or letter. Fill in the NO, clear the tag and close the item, filling in the information you found to make the NO determination.  
 - If YES, the condition is a valid deficiency that requires correction at some time, based on further evaluation (Note 2 or Note 3).

2. Test Engineering (246/2340) needs to review the item to determine WHEN it is required to be complete. (See JFMM para. 2.9.5 for full text). Factors to be considered include personnel and equipment safety, reactor safety, system operation and cleanliness that could impact the ability to complete the scheduled testing evolutions, and whether plant conditions dictate it be fixed in the availability. If correction is determined to be required before a specific key event, select the key event from the drop down list in the **Repair Prior To** block. If the answer is NO, select **Strategic** in the **Repair Prior To** block in the EDL software.

For example, needing to do SVM on a particular valve may not impact the functionality of the valve. The component and system can still operate. Cracked lagging paint, while a deficiency, doesn't make the system unsafe to operate. These two examples and their evaluation would result in the Test Code entering **Strategic** in the **Repair Prior To** block in the EDL software. (Note: The project team may chose the option while review for Key event applicability, to leave the **Repair Prior To** block in the EDL **Blank** instead of entering **Strategic**.

3. A project representative, e.g. APS or ZM, selects the appropriate Key Event (corresponding to a project date) enters the notional date that the deficiency, required or not for a key event, is scheduled for correction, in the **Project Proposed Completion Date** block. This date allows the project (SF and SY) to plan their work accounting for manpower, material, budget and schedule. Notionally, PCD would/ should be the default value for this field.

**MCAP deficiency impact on CIA execution**

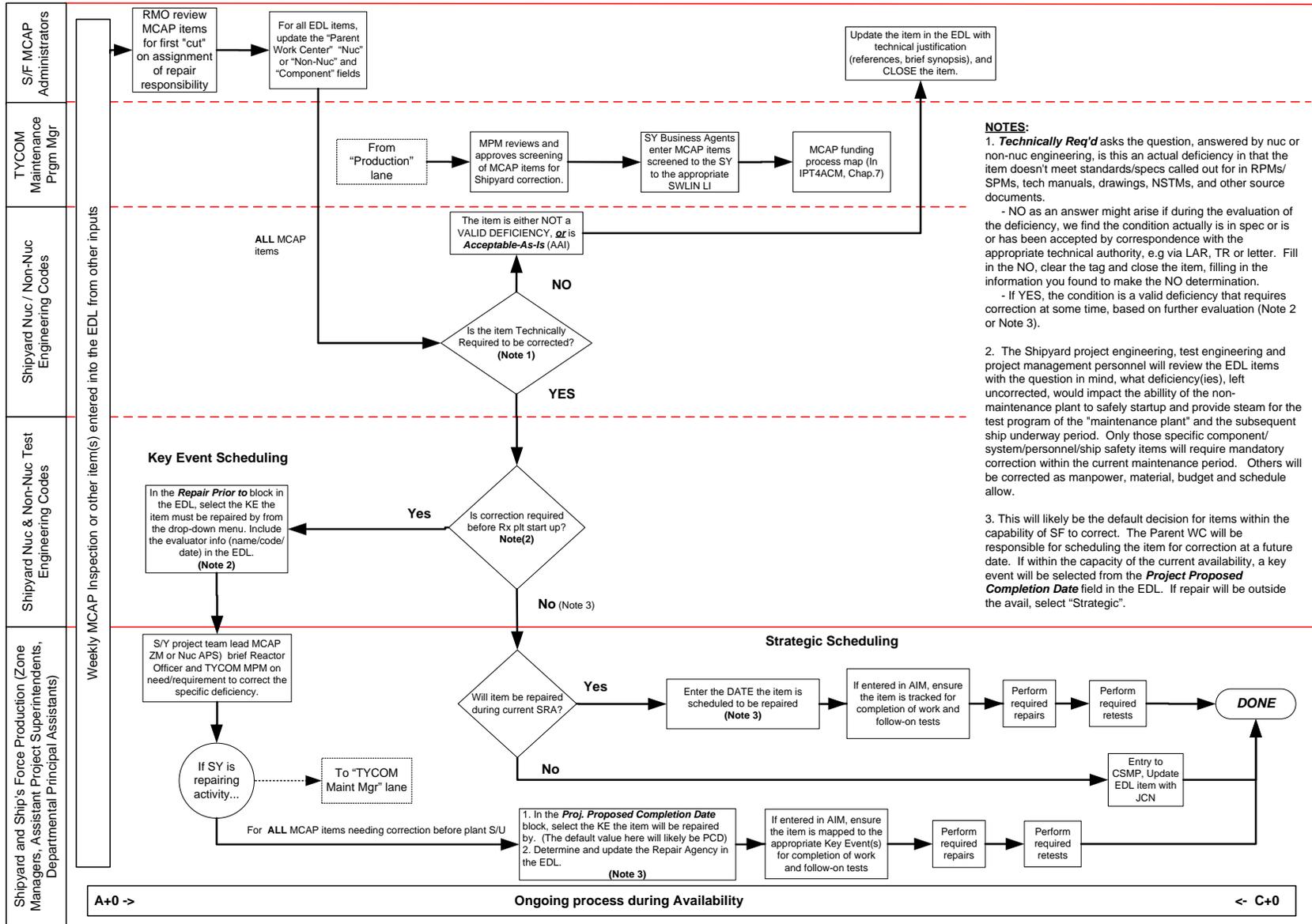


**Notes:**

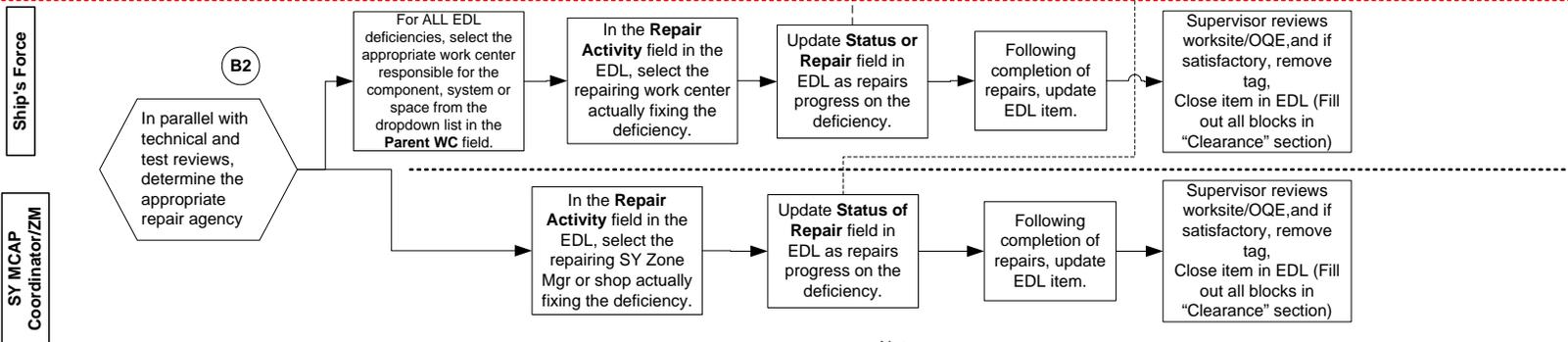
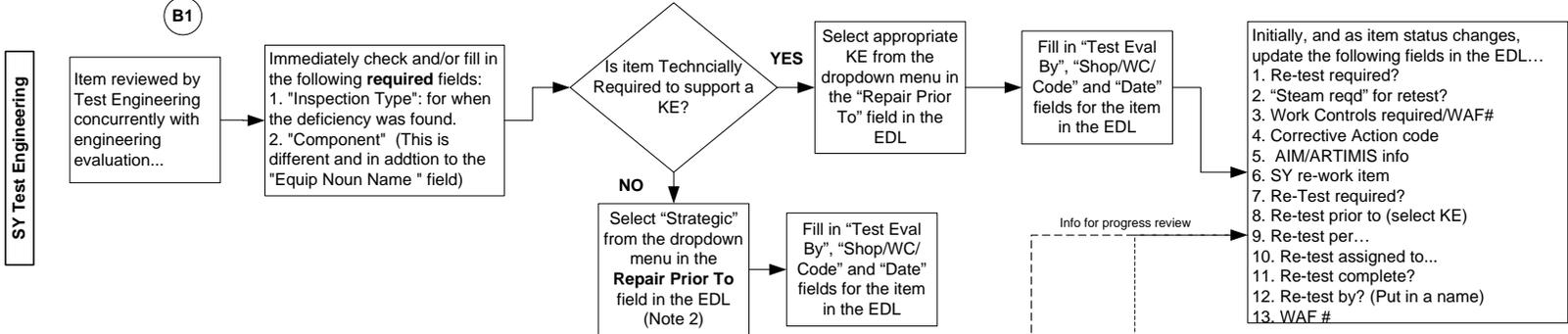
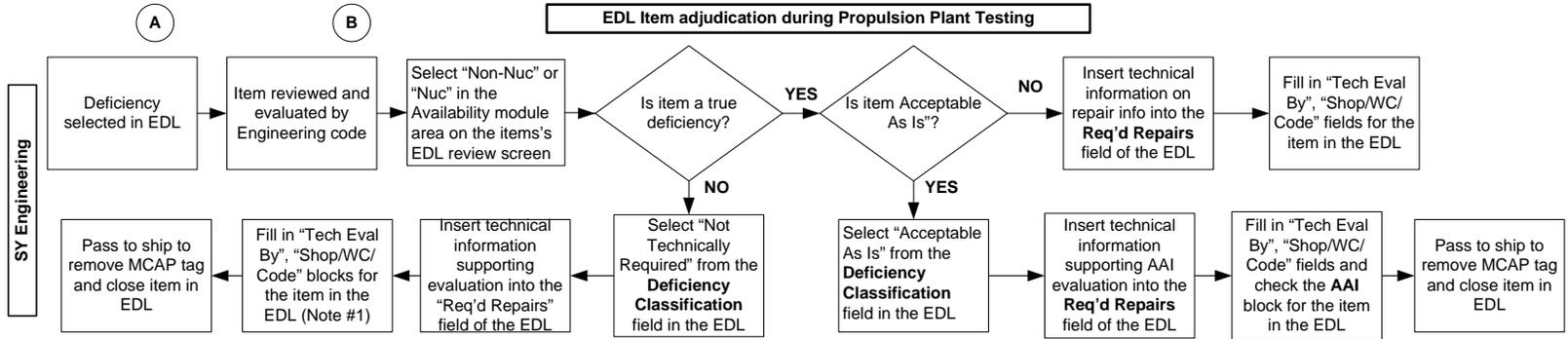
1. As a normal part of EDL deficiency tracking (covered in JFMM and CNAF directives), the ship will have already put into the CSMP (and therefore MPM review and screening is done per the normal maintenance process) any EDL deficiencies that:
  - a) will not be repaired within 30 days of being identified, or
  - b) requires material to correct the deficiency, or
  - c) requires assistance from a maintenance organization outside the ship to correct the deficiency.
2. The ship's normal in-port MCAP process is being used.
3. The shipyard is assigned NSA roles and responsibilities for the maintenance period (CIA).
4. The shipyard's engineering and test engineering codes (246/2340) will review MCAP items identified from the weekly ship walkthroughs to determine if any items discovered require repair prior to the end of the inport maintenance period (CIA). Following consultation and consensus with the Reactor Officer/Commanding Officer, the item is brought to the attention of the Type Commander to schedule the repair and evaluate it's impact on ship's schedule.

## Non-Maintenance Plant MCAP Adjudication Process Map (during a CNO availability)

II-1-27-11



**EDL Item adjudication during Propulsion Plant Testing**



Notes:  
 1. If authorized to sign as Project Engineer, check the "SY PE" review block and enter the date in the "Review" area of the EDL screen for the item being reviewed.  
 2. Items coded as "Strategic" can continue to be repaired if manpower, material, budget and schedule permit.

**APPENDIX B**

**CVN PROPULSION PLANT MATERIAL CONDITION ASSESSMENTS**

			REQUIREMENT			WHO			
ASSESSMENT/ INSPECTION/ TEST	REFERENCE & PARAGRAPH # OF REQUIREMENT(S)	TYPE OF ASSESSMENT	"WHY"	WHEN	WHEN TYPICALLY CONDUCTED	PERFORMS	EVALUATES	INSPECTION/ ACCEPTANCE CRITERIA	COMMENTS
CAPS	A	OPERATIONAL TESTING	DEVELOP AWP	PRE-PRC	A-12 TO A-8	SY, SF, OTHERS AS ASSIGNED BY TYCOM	SY ENGR	A,B,C,D,E,F,G,J,K,O,W	CAPS TASKING ACCOMPLISHED VIA TYCOM LETTER
PRE-DEPLOYMENT NUCLEAR TECH ASSESSMENT	C (9020-0-g) O (3.1.1)	VISUAL ZONE INSPECTION & RECORDS REVIEW	VALIDATE AWP	POM	TYPICALLY BY A-9	SY NUC ENGR	SY NUC ENGR	A,B,C,D,E,F,G,H,O,W	
PRE-DEPLOYMENT MATERIAL CONDITION ASSESSMENT INSPECTION (MCAI)	V	VISUAL ZONE INSPECTION	MID-CYCLE ASSESSMENT OF PROP PLT MATERIAL CONDITION	PRIOR TO DEPLOYMENT	TYPICALLY 2-4 MONTHS PRIOR TO DEPLOYMENT	SF	SF	A,B,D,E,F,G,H,K,O,W	SHIPYARD TRAINING REGARDING INSPECTION ATTRIBUTES AND STANDARDS PROVIDED TO SF IN ADVANCE
PROPULSION PLANT **GROOM TEAM	P	DEFINED BY TYCOM	MAINTAIN HIGH LEVEL OF MATERIAL CONDITION	TYCOM TASKING	PERIODICALLY	RMC, CEMAT	TYCOM	B,D,E,F,G,W	GROOM TEAMS SHOULD BE REQUESTED AND ARRANGED THROUGH THE TYCOM
MACHINERY CONDITION ANALYSIS (MCA) TESTING	L, S (#), U	COMPONENT VIBRATION ANALYSIS	SUPPORT CONDITION BASED MAINTENANCE DECISIONS	PMS AS SCHEDULED. FORMAL DLI MCA VISITS PRE	PERIODICALLY THROUGHOUT CYCLE	SSNN Code 1800, SF	SSNN Code 1800, SF	B,W	
SURFACE NUCLEAR PROPULSION MOBILE TRAINING TEAM (SNPMTT)	NONE	OPERATIONAL & VISUAL	ORSE/PORSE PREPS	ROUTINE	PERIODICALLY THROUGHOUT CYCLE	TYCOM N9	TYCOM N9	A,B,D,E,F,G,W	
ORSE	M	OPERATIONAL & VISUAL	OPNAV, NRC SAFEGUARD INSPECTION	EVERY 12 PLUS OR MINUS 3 MOS	TYPICALLY DURING WORKUPS AND RETURN FROM DEPLOYMENT	NPEB	NPEB	A,B,D,E,F,G,W	
INSURV	N, Q	OPERATIONAL & VISUAL (MI)	LIFECYCLE ASSESSMENT	36 - 54 MOS	AS SCHEDULED	BOARD OF INSPECTION AND SURVEY	BOARD OF INSPECTION AND SURVEY	B,D,E,F,G,N,W	
NON-NUCLEAR POINT-OF- ENTRY TESTING (POET)	R	COMPONENT VISUAL INSPECTION & OPERATIONAL TESTING	VALIDATES AWP & COMPONENT RELIABILITY TO SUPPORT CRITICALITY	PRE- AVAILABILITY	RETURN TRANSIT FROM DEPLOYMENT (A-2 TO A-4)	SY ENGINEERING AND PROJECT TEAM MEMBERS WITH ASSISTANCE FROM SF	SY ENGR	A,B,D,F,J,K,W	SOME GROOMING PERFORMED DURING POET
POST-DEPLOYMENT NUCLEAR TECH ASSESSMENT	C (9020-0-g) O (3.1.1)	VISUAL ZONE INSPECTION & RECORDS REVIEW	VALIDATE AWP	PRE- AVAILABILITY	AFTER RETURN FROM DEPLOYMENT	SY NUC ENGR	SY NUC ENGR	A,B,C,D,E,F,G,H,O,W	
NON-NUCLEAR TECH ASSESSMENT	K (4.a.(1)(a))	VISUAL ZONE INSPECTION & RECORDS REVIEW	VALIDATE AWP	PRE- AVAILABILITY	AFTER RETURN FROM DEPLOYMENT	SY ENGR	SY ENGR	A,B,D,F,J,K,W	
PRE-AVAIL MATERIAL CONDITION ASSESSMENT INSPECTION (MCAI)	C (9020-0-g) O (3.6) K (4.a.(1)(b))	VISUAL ZONE INSPECTION	IDENTIFY DEFICIENCIES FOR EARLY INCLUSION IN THE AWP	LESS THAN 90 DAYS PRIOR TO AVAILABILITY START	TYPICALLY AFTER RETURN FROM DEPLOYMENT	TEAM OF SF AND SY PROJ TM MEMBERS, ENGINEERS, NUCLEAR INSPECTORS	SY ENGR	A,B,C,D,E,F,G,H,K,O,W	
PMS	A, S	VARIOUS	MAINTAIN MATERIAL CONDITION	CONTINUOUS	CONTINUOUS	SF	SF	A,S,W	
NUCLEAR PRETEST INSPECTION	C (9020-0-g) O (3.1.1.(2))	VISUAL OF WORK PERFORMED	CERTIFY READINESS FOR TESTING	PRE-TEST	DURING AVAIL	SY NUC INSPECTORS	SY NUC ENGR	A,B,C,D,E,F,G,H,W	

II-1-2B-1

COMUSFLTFORCOMINST 4790.3 REV B CH 4

			REQUIREMENT		WHO				
ASSESSMENT/ INSPECTION/ TEST	REFERENCE & PARAGRAPH # OF REQUIREMENT(S)	TYPE OF ASSESSMENT	"WHY"	WHEN	WHEN TYPICALLY CONDUCTED	PERFORMS	EVALUATES	INSPECTION/ ACCEPTANCE CRITERIA	COMMENTS
NON-NUCLEAR PRETEST INSPECTION	K (4.a.(1)(c))	VISUAL OF WORK PERFORMED	CERTIFY READINESS FOR TESTING	PRE-TEST	DURING AVAIL	SY ENGR	SY ENGR	A,B,D,E,F,G,H,K,W	
PORSE	T (6.a)	VISUAL ZONE INSPECTION & RECORD REVIEW	OPNAV, NRC SAFEGUARD	PRE-CRIT DURING AVAILS SKED GREATER THAN 6 MONTHS	PRIOR TO REACTOR START-UP DURING AVAILS SKED GREATER THAN 6 MONTHS	NPEB	NPEB	A,B,D,E,F,G,W	
NUCLEAR/NON-NUCLEAR PRE-EVENT INSPECTIONS	C (9020-0-g) O (3.7.3) K (4.a.(1)(d))	VISUAL ZONE INSPECTION	VALIDATES PROPULSION PLANT MATERIAL CONDITION FOR AVAIL KEY EVENTS	PRIOR TO HOT OPS/NON-CRIT STEAMING	TYPICALLY AFTER PRODUCTION COMPLETION DATE (PCD)	TEAM OF SF AND SY PROJ TM MEMBERS, ENGINEERS, NUCLEAR INSPECTORS	SY ENGR	A,B,C,D,E,F,G,H,K,O,W	
NUCLEAR/NON-NUCLEAR PRE-CRITICALITY CERTIFICATION	C (9020-0-g) O (3.7) K (4.a.(1)(d))	VISUAL ZONE INSPECTION	VALIDATES PROPULSION PLANT READY FOR CRITICAL OPERATIONS	PRE-CRIT, POST NON CRIT STEAMING	PRIOR TO CRIT	TEAM OF SF AND SY PROJ TM MEMBERS, ENGINEERS, NUCLEAR INSPECTORS	SY ENGR	A,B,C,D,E,F,G,H,K,O,W	
NRRO PRE-EVENT/PRE- CRITICALITY WALKTHROUGHS	NONE	VISUAL ZONE INSPECTION	VALIDATE PROPULSION PLANT READY TO SUPPORT ASSOCIATED KEY EVENT	UPON PROJECT TEAM DETERMINATION THAT PROP PLANT IS READY FOR ASSOCIATED KEY EVENT	TYPICALLY 2 DAYS PRIOR TO KEY EVENT	NRRO REPS	NRRO/SY ENGR	A,B,C,D,E,F,G,H,K,O,W	A SY SENIOR MGMT WALKTHROUGH MAY BE SCHEDULED BETWEEN THE PRE-EVENT CERTIFICATION AND THE NRRO WALKTHROUGHS
AVAILABILITY PERIODIC ZONE ASSESSMENTS	O (3.7.4) K	VISUAL ZONE INSPECTION	ENSURE CONTINUOUS IDENTIFICATION AND CORRECTION OF PROP PLT DEFICIENCIES TO SUPPORT DOWNSTREAM KEY EVENTS	AT PERIODICITY TO BE DETERMINED BY THE PROJECT TEAM	COMMENCE AT AVAILABILITY START AND SCHEDULED PERIODICALLY UNTIL 2-3 WEEKS PRIOR TO PRODUCTION COMPLETION DATE (PCD)	TEAM OF SF AND SY PROJ TM MEMBERS, ENGINEERS, NUCLEAR INSPECTORS AS APPROPRIATE	SY ENGR	A,B,C,D,E,F,G,H,K,O,W	

## References:

A) NAVSEA 0989-026-1000	L) SSNN Code 1800 Tasking Letter, 4710
B) Component Technical Manuals	M) OPNAVINST 3540.3
C) NAVSEA 0989-043-0000	N) INSURVINST 4730.1
D) Various System Diagrams & Piping Plans	O) NAVSEA 0989-062-4000
E) NAVSEA Instructions (9210.18, 9210.36, Etc.)	P) COMFLTFORCOMINST 4790.3, Volume VI, Chapter 42
F) Military Standards (MIL-STD-767, MIL-STD-2041, Etc.)	Q) COMFLTFORCOMINST 4790.3, Volume IV, Chapter 26
G) NAVSEA Manuals 389-0317, 250-1500-1, 389-0288, 0989-150-0000	R) S9220-AC-MAN-010
H) Off-Yard Correspondence	S) NAVSEAINST 4790.8/OPNAVINST 4790.4
I) OPNAVINST C9210.2	T) OPNAVINST 9080.3
J) NAVSEA 0989-036-0000	U) COMFLTFORCOMINST 4790.3, Volume II, Part I, Chapter 2, Paragraph 2.4.4
K) NAVSEAINST 4730.2	V) COMFLTFORCOMINST 4790.3, Volume II, Part I, Chapter 2, Paragraph 2.9.3.2.a
	W) COMFLTFORCOMINST 4790.3, Volume II, Part I, Chapter 2, Paragraph 2.9.5

\*\* INCREMENTAL MAINTENANCE PLAN (IMP) MANUAL SHOWS RECOMMENDED GROOM TIMELINE

# MCA COVERED BY PMS, e.g.: MIP 2550/003-76 FOR MAIN FEED PUMPS, SYSCOM MRC 84 C1ZQ N APPLIES

## VOLUME II

## PART I

## CHAPTER 3

## CHIEF OF NAVAL OPERATIONS SCHEDULED MAINTENANCE AVAILABILITIES

REFERENCES.

- (a) Integrated Project Teams for Aircraft Carrier Maintenance Handbook
- (b) OPNAVINST C3000.5 - Operation of Naval Nuclear Powered Ships
- (c) OPNAVNOTE 4700 - Representative Intervals, Durations, Maintenance Cycles, and Repair Mandays for Depot Level Maintenance Availabilities of U.S. Navy Ships
- (d) OPNAVINST 4700.38 - Berthing and Messing During CNO Scheduled Maintenance Availabilities
- (e) OPNAVINST 3120.32 - Standard Organization and Regulations of the U.S. Navy
- (f) COMSUBLANT/COMSUBPACNOTE C3120 - Submarine Operating Restrictions and Depth Authorizations
- (g) OPNAVINST 3120.33 - Submarine Extended Operating Cycle (SEOC) Program
- (h) NAVSEA S9086-7G-STM-010 - NSTM Chapter 997 (Docking Instructions and Routine Work in Dry Dock)
- (i) NAVSEAINST 4441.2 - Changes to Coordinated Shipboard Allowance List (COSAL); Procedures for
- (j) COMNAVAIRLANTINST 9090.2 - Conduct of Shipyard Trials and Inspections Incident to Service Life Extension Program (SLEP), Overhauls or Availabilities of Conventionally Powered Aircraft Carriers
- (k) COMNAVSURFLANT/COMNAVSURFPACINST 3502.2 - Surface Force Training Manual
- (l) COMNAVAIRLANT/COMNAVAIRPACINST 3500.20 - Aircraft Carrier Training and Readiness Manual
- (m) COMNAVAIRLANTINST 9080.2 - Conduct of Trials and Inspections Incident to Construction, Overhauls or Availabilities of Nuclear Powered Aircraft Carriers (CVN)
- (n) OPNAVINST 9080.3 - Procedures for Tests and Trials of Navy Nuclear Powered Ships Under Construction, Modernization, Conversion, Refueling and Overhaul
- (o) OPNAVINST 3540.3 - Naval Nuclear Propulsion Examining Boards
- (p) OPNAVINST C9210.2 - Engineering Department Manual for Naval Nuclear Propulsion Plants
- (q) COMNAVSUBFOR OPORD 2000
- (r) NAVSEA S9086-DA-STM-000 - NSTM Chapter 100 (Hull Structures)
- (s) NAVSEA S9086-C4-STM-000 - NSTM Chapter 094 (Trials)
- (t) NAVSEA 0924-LP-062-0010 - Submarine Safety (SUBSAFE) Requirements Manual
- (u) COMNAVSUBFORINST 5400.25 - Standard Submarine Supply Department Organization and Regulations Manual
- (v) COMNAVSUBFORINST 5400.29 - Standard Submarine Navigation/Operations Department Organization and Regulations Manual
- (w) COMNAVSUBFORINST 5400.40 - Standard Submarine Combat Systems Department Organization and Regulations Manual (SSN)
- (x) COMNAVSUBFORINST 5400.41 - Standard Submarine SSBN 726 Class Weapons Department Organization and Regulations Manual
- (y) COMNAVSUBFORINST 5400.47 - Standard Submarine Combat Systems Department Organization and Regulations Manual (SSGN)
- (z) COMNAVSUBFORINST C3500.2 - Continuous Training Manual
- (aa) OPNAVINST 9110.1 - Submarine Test and Operating Depths; Policy Concerning
- (ab) COMSUBLANTINST 5400.4 - Submarine Force, U.S. Atlantic Fleet Regulations
- (ac) COMSUBPACINST 5400.7 - Submarine Force, U.S. Pacific Fleet Regulations
- (ad) COMLANTFLT OPORD 2000/COMPACFLT OPORD 201
- (ae) NAVSEAINST C9094.2 - Submarine Valve Operation Requirements for Builders and Post Overhaul Sea Trial Test Dives

- (af) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
- (ag) NAVSEAINST C9210.30 - Procedures for Administration of Nuclear Reactor Plant Preventive Maintenance and Tender Nuclear Support Facilities Preventive Maintenance on Ships
- (ah) SSPINST 5600.11 - Preventive Maintenance Management Program for Strategic Weapon Systems Equipments and Associated Material
- (ai) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (aj) COMLANTFLTINST 5400.2 - U.S. Atlantic Fleet Regulations
- (ak) COMPACFLTINST 5400.3 - U.S. Pacific Fleet Regulations
- (al) NAVSEA 0989-LP-043-0000 - Commissioned Surface Ship General Reactor Plant Overhaul and Repair Specifications
- (am) OPNAVINST 3540.4 - Propulsion Examining Boards for Conventionally Powered Ships
- (an) NAVSEA 0989-LP-037-2000 - Commissioned Submarine General Reactor Plant Overhaul and Repair Specifications
- (ao) NAVSEA 0989-064-3000 - Cleanliness Requirements for Naval Nuclear Plant Maintenance by Forces Afloat
- (ap) NAVSEA S9AA0-AB-GOS-010 - General Specifications for Overhaul of Surface Ships (GSO) 2004 Edition
- (aq) NAVSEA S9086-TX-STM-010 - NSTM Chapter 583 (Boats and Small Craft)
- (ar) NAVSEA S9086-G9-STM-000 - NSTM Chapter 231 (Propulsion and SSTG Steam Turbines)
- (as) NAVSEA S9086-GY-STM-010 - NSTM Chapter 221 (Boilers)
- (at) NAVSEA S9086-HN-STM 010 - NSTM Chapter 244 (Propulsion Bearings and Seals)
- (au) NAVSEA S9086-HK-STM-010 - NSTM Chapter 241 (Propulsion Reduction Gears, Couplings, Clutches and Associated Components)
- (av) NAVSEA S9086-TV-STM-010 - NSTM Chapter 581 (Anchoring)
- (aw) NAVSEA S9086-RK-STM-010 - NSTM Chapter 505 (Piping Systems)
- (ax) NAVSEA S9086-TA-STM-010 - NSTM Chapter 562 (Surface Ship Steering)
- (ay) NAVSEA S9086-TD-STM-010 - NSTM Chapter 565 (Surface Ship Stabilizing Systems)
- (az) CNAFINST 3500.71 - Flight Deck Certification

LISTING OF APPENDICES.

- A Typical CNO Availability Planning Milestones (Submarines Only)
  - B Typical CNO Availability Planning Milestones (Surface Force Only)
  - C Typical CNO Availability Planning Milestones (Aircraft Carriers Only)
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  - G Sample New Work Forwarding Letter and Index
  - H Suggested Message Format for a New Work Candidate
  - I Minimum Dock Trials Requirements (Surface Ships Only)
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  - N Minimum Sea Trials Requirements for Chief of Naval Operations Availabilities Less Than Six Months Duration (Submarines Only)
  - O Minimum Sea Trials Requirements for Chief of Naval Operations Availabilities Greater Than Six Months Duration (Submarines Only)
  - P Summary of Significant Post Repair Sea Trial Requirements (Submarines Only)
- SAMPLE MESSAGES FOR CNO SCHEDULED AVAILABILITIES (SURFACE SHIPS ONLY)
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  - AB Sample Ship's Report of Fast Cruise Completion (Surface Ships Only)
  - AC Sample Supervising Authority Readiness for Sea Trial Message (Surface Ships Only)

SAMPLE MESSAGES FOR CNO SCHEDULED AVAILABILITIES OF LESS THAN SIX MONTHS IN DURATION (SUBMARINES ONLY)

- BA Sample TYCOM Message Concerning Escort Services
- BB Sample ISIC Message to TYCOM Concerning Crew Certification and Material Condition for Fast Cruise and Sea Trials
- BC Major Trial and Inspection Milestones
- BD Sample TYCOM Message to Ship Concerning Sea Trials Depth Authorization
- BE Sample Ship Message to TYCOM Concerning Readiness for Follow-On Sea Trials
- BF Sample ISIC Message to TYCOM Concerning Material Certification for Follow-On Sea Trials
- BG Sample TYCOM Message to Ship Concerning Follow-On Sea Trials Depth Authorization
- BH Sample Ship Message to ISIC Concerning Readiness for Fast Cruise
- BI Sample ISIC Message to Ship Authorizing Commencement of Fast Cruise
- BJ Sample Ship Message to ISIC and TYCOM Concerning Readiness for Sea Trials
- BK Sample ISIC Message to TYCOM Concerning Final Material Certification Prior to Sea Trials
- BL Sample Ship Message to ISIC and TYCOM Concerning Material Certification Upon Completion of Sea Trials
- BM Submarine Sea Trial Situation Report (SITREP)
- BN Sample Message Concerning Mod Alert Notification
- BO Sample TYCOM Message to Ship Concerning URO for Industrial Activity Availabilities Less Than Six Months in Duration
- BP Message Scenario for CNO Availabilities of Less than Six Months in Duration
- BQ Sample ISIC Message to TYCOM Concerning Fly-By-Wire Crew Certification and Fly-By-Wire Material Condition for At-Sea Testing or Fast Cruise and Sea Trials
- BR Sample TYCOM Message to Ship Concerning Authorization to Use Fly-By-Wire Ship Control Systems
- BS Sample ISIC Message to TYCOM Concerning Fly-By-Wire Material Certification upon Completion of At-Sea Testing or Sea Trials
- BT Sample TYCOM Message to Ship Concerning URO for Fly-By-Wire Ship Control Systems

SAMPLE MESSAGES FOR CNO SCHEDULED AVAILABILITIES OF GREATER THAN SIX MONTHS IN DURATION (SUBMARINES ONLY)

- CA Sample SRDRS Support Services Message
- CB Sample ISIC Message to TYCOM Concerning Crew Certification
- CC Major Trial and Inspection Milestones
- CD Sample TYCOM Message to Ship Concerning Completion Prerequisites
- CE Sample TYCOM Message to NAVSEA Concerning Fast Cruise and Critical Reactor Operations
- CF Sample TYCOM Message to Ship Concerning Sea Trials Depth Authorization
- CG Sample TYCOM Message to Ship Concerning URO
- CH Sample ISIC Message to TYCOM Concerning Material Certification Prior to Sea Trials
- CI Sample ISIC Message to TYCOM Concerning Material Certification upon Completion of Sea Trials
- CJ Sample Ship Message to TYCOM Concerning Readiness for Fast Cruise
- CK Sample Ship Message to TYCOM Concerning Readiness for Sea Trials
- CL Sample TYCOM Message Concerning Resumption of Sea Trials Completion Prerequisites
- CM Sample ISIC Message to TYCOM Concerning Material Certification for Follow-On Sea Trials
- CN Sample Ship Message to TYCOM Concerning Readiness for Follow-On Sea Trials
- CO Sample TYCOM Message to Ship Concerning Follow-On Sea Trials Depth Authorization
- CP Submarine Sea Trial Situation Report (SITREP)
- CQ Sample Message Concerning Mod Alert Notification
- CR Message Scenario for CNO Availabilities of Greater than Six Months in Duration
- CS Sample ISIC Message to TYCOM Concerning Fly-By-Wire Crew Certification and Fly-By-Wire Material Condition for At-Sea Testing or Fast Cruise and Sea Trials
- CT Sample TYCOM Message to Ship Concerning Authorization to Use Fly-By-Wire Ship Control Systems
- CU Sample ISIC Message to TYCOM Concerning Fly-By-Wire Material Certification Upon Completion of At-Sea Testing or Sea Trials
- CV Sample TYCOM Message to Ship Concerning URO for Fly-By-Wire Ship Control Systems

3.1 PURPOSE. This chapter provides guidance for the implementation of policies set forth in references (a) through (ao). Reference (a) was implemented by Naval Sea Systems Command (NAVSEA) letter Ser 04X2/008 dated 14 March 2000. Submarine Sea Trials will follow NAVSEA approved agendas. Requirements listed here apply unless otherwise approved by NAVSEA. Where differences may exist, NAVSEA requirements take precedence.

3.2 CHIEF OF NAVAL OPERATIONS SCHEDULED MAINTENANCE AVAILABILITIES.

- a. Chief of Naval Operations (CNO) scheduled maintenance availabilities greater than six months in duration are:
  - (1) Overhaul. An availability scheduled for accomplishment of industrial maintenance and modernization. Types of availabilities include:
    - (a) Regular Overhaul.
    - (b) Complex Overhaul.
    - (c) Engineered Overhaul.
    - (d) Refueling Overhaul.
    - (e) Refueling Complex Overhaul.
    - (f) Engineered Refueling Overhaul.
  - (2) Other availabilities. An availability scheduled primarily for industrial maintenance and installation of major, high priority alterations. Types of these availabilities include:
    - (a) Depot Modernization Period.
    - (b) Planned Incremental Availability.
    - (c) Docking Planned Incremental Availability.
    - (d) Extended Drydocking Phase Maintenance Availability.
- b. CNO scheduled maintenance availabilities less than six months in duration. Short, labor intensive availabilities scheduled for accomplishment of industrial maintenance and modernization. Types of these availabilities include:
  - (1) Selected Restricted Availability (SRA).
  - (2) Docking SRA.
  - (3) Phased Maintenance Availability (PMA).
  - (4) Docking Phased Maintenance Availability.
  - (5) Service Craft Overhaul.
  - (6) Extended SRA.
  - (7) Extended Docking SRA.

- h. Loose industrial material and debris removed.
- i. All main propulsion piping, valves, and systems intact, hydrostatic tightness tests completed satisfactorily and remote valve operator and associated/indicator tests completed satisfactorily.

In the event that the decision is made to delay the scheduled PCD, careful consideration should be given to ensure that the above listed times allotted for Ship's Force between PCD and the LOA/propulsion plant light off are preserved, even if the availability end date would be adversely affected. The ship's CO, Chief Engineer, and the availability senior Project Manager should carefully evaluate any and all work remaining within the main machinery spaces/propulsion plant that could impact Ship's Force ability to be successful in preparing for the LOA/propulsion plant light off. An exceptions list should be generated and agreed to by the ship's CO, Chief Engineer and the maintenance provider's senior Project Manager listing all outstanding propulsion plant work which will continue after PCD while the ship is preparing for the LOA/propulsion plant light off.

3.3.5 Memorandum of Agreement. The Memorandum of Agreement (MOA) shall be executed and jointly signed by the ship's CO, the NSA, the Immediate Superior In Command (ISIC) representative (if applicable) and the FMA representative (if applicable) prior to arrival. It is an agreement between the industrial activity and Ship's Force concerning the responsibilities of each party during the availability. It deals with a number of areas in which Ship's Force generally provides support to the industrial activity and vice versa. References (al) and (an) contain training requirements and additional guidance for MOAs involving nuclear powered surface ships. As a minimum the MOA shall include:

- a. Purpose.
- b. Applicability.
- c. Responsibilities for control of plant conditions and work area isolation.
- d. Responsibilities for accomplishment of work.
- e. Responsibilities for Quality Assurance (QA).
- f. Responsibilities for support services/equipment.
- g. Responsibilities for testing requirements.
- h. Responsibilities for waivers, deviations, or Departure from Specifications.
- i. **Precise delineation of the Submarine Safety (SUBSAFE) responsibility of each activity for all phases of SUBSAFE work prior to issuing Re-Entry Controls (REC) for SUBSAFE work.**
- j. Responsibilities for training.
- k. Miscellaneous responsibilities (as required) (i.e., Radiological Control, Hazardous Material, etc.).
- l. Signatures of all activities (signifying agreement with the terms and responsibilities of the MOA).

3.3.6 Responsibilities. Responsibilities for the Maintenance Policies and Procedures for CNO scheduled availabilities are as follows:

3.3.6.1 Fleet Commander.

- a. Maintain the Availability Intervals and Cycles issued in reference (c) to the maximum extent practical within operational requirements.

- b. Inform the Chief of Naval Personnel of any significant changes which would affect ship manning requirements during an extended CNO Maintenance Availability.
- c. Coordinate with the Program Executive Office, Direct Reporting Program Manager or Ship Program Manager, as applicable, in the accomplishment of CNO Maintenance Availability planning.
- d. Implement Docking Officer Qualification and Certification requirements as issued in NAVSEA instructions.
- e. Plan for and monitor availability execution to achieve a balance of cost and schedule for the scope of work authorized. Ensure that any growth in the scope of work authorized is necessary to reasonably assure safe, reliable operation of the ship during the subsequent operating cycle.
- f. Plan for and provide berthing, messing, offices, classrooms, equipment stowage space, and Ship's Force repair shop in accordance with reference (d) when shipboard facilities are expected to become unusable or uninhabitable.

3.3.6.2 Type Commander.

- a. Coordinate the scheduling of availabilities at industrial activities with Fleet Commander, NAVSEA and CNO.
- b. Initiate the required budgetary actions for funding availabilities.
- c. Coordinate the work assignments between the FMA and the industrial activity.
- d. Seek resolution of all class and major technical problems and coordinate industrial requirements for modernization and repair.
- e. Authorize Availability Work Packages (AWP) prepared by Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity (Submarines only)/PMS 312C (Aircraft Carriers only)/applicable TYCOM (all other Surface Ships) with recommendations from the ship's CO, Maintenance Manager (MM) and ISIC (if applicable). Exercise all work candidate screening and follow up actions relating to the availability directly with the ship concerned.
- f. (Submarines Only) Coordinate the interface of the Maintenance and Material Management (3-M) system with the Periodic Maintenance Requirement (PMR) scheduling and feedback reporting system.
- g. Designate a TYCOM representative for the WDC/PRC and Pre-Arrival Conference (PAC) when such conferences are scheduled.
- h. Recommend to CNO any high priority fleet modernization desired to be accomplished.
- i. (Submarines Only) Send a Sea Trials Support Services message, if required, to specify Submarine Rescue Diving Recompression System (SRDRS) "modified-alert" requirements (see Appendices BA or CA of this chapter).
- j. (Submarines Only) For minor CNO Maintenance Availabilities send a Waiver of Escort Requirements Message to NAVSEA when requested by the ISIC in accordance with paragraph 3.6.8.3.9.b.(4) of this chapter.
- k. Conduct a QA audit of Ship's Force and FMA Controlled Work Packages in accordance with Volume V, Part I, Chapter 9 of this manual.

- l. (Submarines Only) For major CNO Maintenance Availabilities issue the required messages for Fast Cruise, Sea Trials and Unrestricted Operations (URO) Certification in accordance with paragraph 3.6.8.4 of this chapter.
- m. (Submarines Only) For CNO scheduled availabilities of less than six months in duration issue the required message for Sea Trials in accordance with paragraph 3.6.8.3 of this chapter.

3.3.6.3 Type Commander/Immediate Superior In Command (Group or Squadron).

- a. All Ships.
  - (1) Assist the TYCOM, SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers) and Surface Maintenance Engineering, Planning and Procurement Activity (SURFMEPP) (Surface Ships) in the preparation of the AWP.
  - (2) Monitor corrective maintenance action taken by industrial activities and Regional Support Groups (RSG)/Regional Maintenance Centers (RMC).
  - (3) Schedule and conduct inspections of Forces Afloat.
  - (4) Monitor progress of CNO Maintenance Availabilities.
  - (5) Ensure that a MOA is executed prior to availability start in accordance with paragraph 3.3.5 of this chapter.
- b. Submarines Only.
  - (1) Ensure timely accomplishment and reporting of PMR maintenance actions on assigned ships. This should include the use of the PMR scheduling system and the SUBMEPP scheduling tape for automatic interface between the Master Job Catalog, the Current Ship's Maintenance Project (CSMP), and the Automated Material Requisitioning system.
  - (2) Ensure industrial activities and ships maintain current copies of Maintenance Standards, PMR schedules and PMR inventories.
  - (3) Review Ship's Force submitted deferrals for industrial activity assistance to determine if restoration in accordance with Maintenance Standard criteria is warranted in lieu of, or in addition to, requested industrial activity corrective maintenance.
  - (4) Ensure industrial activities provide the 3-M and Maintenance Standards feedback necessary for analysis by SUBMEPP.
  - (5) Request assistance from SUBMEPP as necessary in resolving problems with PMR scheduling and software.
  - (6) Report to SUBMEPP the inability to perform PMRs due to software technical inadequacy, non-availability of overhauling spares, insufficient manpower or inadequate industrial activity facilities.
  - (7) Designate an Availability Coordinator to coordinate industrial activity, FMA drydock and Ship's Force work to meet the availability completion date.
  - (8) Provide updated Sea Trials status by telephone to Commander, Submarine Development Squadron (COMSUBDEVRON) FIVE if SRDRS "modified-alert" support services are in use.

- (9) For minor CNO Maintenance Availabilities issue the required messages for Sea Trials escort requirements/waiver of escort requirements as applicable, Fast Cruise, Sea Trials and URO Certification in accordance with paragraph 3.6.8.3 of this chapter.

3.3.6.4 Submarine Maintenance Engineering, Planning and Procurement Activity/Planning Engineering Repairs and Alterations.

- a. Develop plans for accomplishing periodic maintenance or equipment replacement.
- b. Maintain Baseline AWP's configured to each ship class and type availability and include the standard 3-M data elements controlled by the TYCOM.
- c. Prepare and issue all phases of AWP's and AWP Supplements (if applicable).
- d. Maintain custody of shore based spares under the direction of NAVSEA and the TYCOM.
- e. (Submarines Only) Prepare, issue and maintain PMR computerized inventories and scheduling reports and associated Master Job Catalog/PMR computer tapes.
- f. (Submarines Only) Prepare, issue and maintain Maintenance Standards under the guidance of NAVSEA and the TYCOM.

3.3.6.5 Ship's Commanding Officer. The CO is the TYCOM representative for monitoring the progress and quality of industrial work. As such he should review availability progress during weekly conferences with Department Heads and others as necessary. The Supervising Authority meets weekly with the CO and other industrial activity officials as described in paragraph 3.6.3.1 of this chapter. The CO should be prepared to discuss and assist in the resolution of scheduling, design, material, and production problems. The CO's responsibilities are defined in reference (e). Additionally, COs shall:

- a. All Ships.
  - (1) Review AWP's and provide comments to the TYCOM, ISIC and SUBMEPP/PMS 312C during the WDC/PRC.
  - (2) Assign a Ship Selected Records (SSR) Coordinator to perform the functions of paragraph 3.6.6.b. of this chapter.
  - (3) Publish policy concerning the number of duty sections, liberty, ship cleanliness, tagout procedures, tank closeout and blanking of otherwise exposed fluid systems, waveguides and air systems before availability start.
  - (4) Ensure non-conformances (Waivers/Deviations or Departures from Specification) submitted during the availability by any activity are approved prior to trials at sea (if held) and not later than the completion of the availability.
- b. Submarines Only.
  - (1) Review the status of PMR maintenance schedules and CSMP reports with parent ISIC prior to CNO Maintenance Availabilities in order to assist in planning for accomplishment of the required planned maintenance and corrective maintenance. Additional information and requirements concerning PMR are discussed in detail in Volume VI, Chapter 24 of this manual.
  - (2) Maintain a current SUBMEPP PMR inventory of maintenance requirements and Maintenance Standards applicable to the ship class.

### 3.4 AVAILABILITY WORK PACKAGE PLANNING.

3.4.1 Forces Afloat Planning Sources. The majority of the Forces Afloat Work Package can be identified in advance from the following sources:

- a. Ship's CSMP Integrated with the Life Cycle Maintenance Plan. This document contains work items deferred during the previous maintenance availabilities, outstanding Departures from Specifications, dry dock requirements, etc. To ensure the CSMP accurately reflects the required ships maintenance, the ISIC Material Officer/TYCOM will review each ship's CSMP in detail with the ship prior to the WDC/PRC for CNO Maintenance Availabilities. The ISIC/TYCOM 3-M Coordinator and Maintenance Document Control Office (MDCO) should provide the necessary technical assistance and training to facilitate CSMP updates.
  - (1) (Submarines Only) PMR/URO. The ISIC will load scheduled PMRs into each ship's CSMP for a specific availability.
  - (2) Alterations. The ISIC MDCO/TYCOM will enter alterations on the ship's CSMP which the TYCOM has authorized for accomplishment. The ISIC/TYCOM calls out alterations for a specific availability based on material availability as identified by the industrial activity. Within funding constraints and TYCOM guidance, all alterations authorized on the TYCOM Alteration Management System/Fleet Modernization Program are candidates for accomplishment during each availability.
  - (3) Condition Based Maintenance. (Machinery Condition Analysis/Technical Assessment, Repair, Groom and Evaluation Team/Performance Monitoring Team (PMT), Combat System Readiness Review, etc.). The ISIC/TYCOM Material Officer and Ship's Force shall ensure that all material deficiencies identified by Condition Based Maintenance programs as identified in Part I, Chapter 2, section 2.4 of this volume are loaded into the CSMP for a specific availability.
- b. Work Routines. A set of Master Job Catalog standard work routines should be developed for every availability. The MDCO/TYCOM tailors each work routine package to the needs of the ship by calling out additional work routines to document periodic, interim drydocking, URO maintenance and calibration recall requirements, as applicable.
- c. Pre-Availability Tests and Inspections. Ship's Force, PMTs and industrial activity inspectors perform and submit the results of these pre-availability tests and inspections to the industrial activity/SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers)/applicable TYCOM (all other Surface Ships) for evaluation and inclusion in the AWP, as applicable. NAVSEA 07T provides results and recommendations for pre-availability tests performed by PMTs and Ship's Force.
- d. Additional requirements for nuclear powered ships are contained in reference (b).

3.4.2 Forces Afloat Planning Actions. Ship's Force shall take the following maintenance availability planning actions, as applicable:

#### 3.4.2.1 Forces Afloat Work Package Preparations.

- a. Develop a Ship's Force concurrent Work Package that includes all major maintenance actions such as Planned Maintenance System (PMS), Reactor Plant PMS, repairs, PMRs, alterations, and testing to be conducted by Ship's Force during the availability, as applicable.
- b. Identify CPJs in accordance with paragraph 3.3.1 of this chapter, and submit to the planning/industrial activity for integration into the availability schedule.
- c. Establish a strategy for calibration of gages, instruments, and tools based on the Calibration Recall List.

- d. Identify all industrial activity provided production and testing support equipment needed to accomplish Ship's Force work, or to recertify systems following Ship's Force work. Identify this equipment to the industrial activity prior to the start of the availability. This support equipment includes the following, as applicable:
  - (1) Reactor Plant PMS support equipment.
  - (2) System hydrostatic test equipment.
  - (3) Calibration equipment.
  - (4) Special tools.
- e. Ship's Force should use Appendices A, B or C of this chapter as guidance to prepare for availabilities, as applicable. These appendices provide Typical CNO Maintenance Availability Planning Milestones for submarines, surface ships and aircraft carriers respectively.

### 3.4.3 Availability Work Packages.

3.4.3.1 Availability Work Package Content. The AWP includes all nuclear and non-nuclear authorized industrial work and associated Forces Afloat work for modernization, maintenance and repair during the availability. The work described is developed from NAVSEA and TYCOM instructions.

### 3.4.3.2 Availability Work Package Sources.

- a. Class Maintenance Plan (CMP).
- b. NAVSEA authorized alterations.
- c. TYCOM authorized alterations, repairs, PMRs, Engineering for Reduced Maintenance Costs items and baseline AWP.
- d. Results of pre-availability tests and inspections.
- e. CSMP.

3.4.3.3 Availability Work Package Development. The five stages of AWP development include Baseline, Preliminary, Proposed, Approved, and Completed.

- a. SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers)/**SURFMEPP Activity** (all other Surface Ships) develop and maintain Baseline AWP for each ship class and type of availability.
- b. SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers)/applicable TYCOM (all other Surface Ships) consolidate the Baseline AWP, NAVSEA authorized alterations and TYCOM authorized alterations, repairs, PMRs and Engineering for Reduced Maintenance Costs items to produce the Preliminary AWP. This Preliminary AWP is issued approximately 12 to 14 months prior to the start of the availability.
- c. Systems Command (SYSCOM), TYCOM, and the ship's CO should review the Preliminary AWP to ensure that it includes known work candidates and authorized alterations that will not be accomplished prior to availability start and for proposed work candidates, which in their opinion, are unnecessary. Appendix D of this chapter provides suggested guidelines for review of the AWP. Following the initial review of the Preliminary AWP, Ship's Force shall host a meeting with the TYCOM and SUBMEPP/PMS 312C, as applicable to consolidate comments and recommendations for the WDC/PRC. This meeting is normally held early in the same week as the WDC/PRC.

- d. SUBMEPP (Submarines only)/PMS 312C (Aircraft Carriers only)/TYCOM (other Surface Ships only) will host a WDC/PRC attended by NAVSEA, the Supervising Authority, FMA (if applicable), TYCOM, ISIC, PMT (Submarines Only), Strategic Systems Project Officer (SSBN/SSGN 726 Class submarines only) and Ship's Force when practical. During this meeting the Preliminary AWP is carefully reviewed and the SYSCOM and the TYCOM authorize the work. When actions are required before a decision is made, those actions are identified and subsequently monitored. The goal is to issue the Proposed AWP (one which represents all SYSCOM/TYCOM authorized work integrated and specifically tailored to the ship involved) within two months following this meeting. At this meeting, the SYSCOM/TYCOM authorizes the industrial activity to continue with planning on the basis of the work identified in the AWP. During this meeting any activity may submit new work candidates for consideration by the SYSCOM/TYCOM. The SYSCOM/TYCOM will authorize or reject each new work candidate submitted.
- e. SYSCOM/TYCOM and the ship's CO should review the Proposed AWP to ensure that it contains all agreements made at the WDC/PRC. Appendix D of this chapter also provides suggested guidelines for review of this AWP.
- f. The Supervising Authority will host a PAC attended by NAVSEA, FMA (if applicable), TYCOM, ISIC, SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers), and Ship's Force when practical. During this meeting the Proposed AWP, with results of the pre-availability tests and inspections incorporated where possible, will be carefully reviewed and the SYSCOM/TYCOM will approve the work. The goal is to issue the Approved AWP at the conclusion of this meeting. During this meeting any activity may submit new work candidates for consideration by the SYSCOM/TYCOM. The SYSCOM/TYCOM will authorize or reject each new work candidate submitted.
- g. Within six months after the completion of the availability, SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers)/applicable TYCOM (all other Surface Ships) will issue the Completed AWP.

### 3.5 AVAILABILITY PLANNING.

#### 3.5.1 Ship's Force Pre-Planning.

- a. To effectively complete the Ship's Force and Maintenance Support Team (MST) (if assigned) responsibilities during the months preceding the start of the availability, it is necessary to assign an Officer/Chief Petty Officer as the Availability Coordinator, responsible for coordinating the completion of the milestones. The quality of the availability will be reflected in the preparations done by Ship's Force and MST (if assigned).
- b. Prior to commencement of the availability, the industrial activity will request the ship to provide personnel Temporary Assigned Duty to the activity (approximately one month prior to the start date). The industrial activity will identify the personnel requirements of this pre-arrival team based on the type of availability and ship class.

**NOTE: THE SUCCESS OF THE AVAILABILITY IS DIRECTLY RELATED TO THE QUALITY AND EXPERIENCE LEVEL OF THE TEAM MEMBERS ASSIGNED.**

3.5.1.1 Industrial Activity Visit. The ship's CO, Executive Officer, MST Officer In Charge (OIC) (if applicable) and department heads will visit the industrial activity as soon as practical prior to the start of the availability. The CO shall meet key industrial activity managers involved in the availability, other COs of ships in availabilities at the same industrial activity and if applicable, the local Naval Reactors Representative. The Executive Officer, MST OIC (if applicable) and department heads shall meet their counterparts within the industrial activity Project Team and counterparts assigned to other ships in an availability at the same industrial activity. The Executive Officer shall also check available crew quarters and barge accommodations, if applicable. Ship's Force shall:

- a. Coordinate with the industrial activity to conduct pre-availability training and indoctrination. The following are suggested topics for training:

- (1) Industrial activity organization and Ship's Force/MST (if assigned) interface.
- (2) Industrial activity procedures and practices, including:
  - (a) Operational Control Transfer.
  - (b) Tagout/Rip-Out/Work Authorization Form.
  - (c) SUBSAFE REC Procedures.
  - (d) Deficiency Reporting and Correcting.
  - (e) Radiological Controls Agreement.
  - (f) General Testing Requirements.
  - (g) Defueling/Fueling Requirements (Nuclear Reactor and Fossil Fuel).
  - (h) Industrial Activity Procedures for Accomplishing PMS of Equipment Under Their Cognizance.
  - (i) Nuclear Reactor/Radiological Accident Plan.
  - (j) Maintenance of Ship's Cleanliness.
  - (k) QA Interface with the Industrial Activity.
- (3) General schedule of Key Events and phases of work and testing.
- (4) Safety requirements including Ship's Force/MST (if assigned) industrial activity responsibilities for:
  - (a) Dry Dock Safety.
  - (b) Fire Watches.
  - (c) Watertight Integrity.
  - (d) Reactor Plant Safety.
  - (e) Personal Protective Equipment.
- (5) Relationship with industrial activity management including responsibility regarding weekly management meetings.
- (6) Functions and responsibilities of the joint test groups (Nuclear/Hull, Mechanical and Electrical/Combat Systems) and the Ship's Safety Council including the designation of Ship's Force group and council members.
- (7) Control mechanism for work and tests affecting ship's conditions.
- (8) Special evolutions and procedures to be conducted early in the availability such as dry docking and establishing plant conditions.
- (9) QA.

- (10) IEM.
  - (11) Hazardous Material Requirements.
  - (12) Special Environmental Requirements.
  - (13) Support of Trials and Inspections.
  - (14) System Experts.
  - (15) Space Turnover.
- b. Develop training plan and watchstation requalification program in accordance with TYCOM directives.
  - c. Develop Plan of Action and Milestones for Ship's Force/MST (if assigned) responsibilities during the availability.
  - d. Review and prepare SSRs for turnover to the planning yard/industrial activity at the start of the availability (see paragraph 3.6.6 of this chapter).
  - e. Support the industrial activity's pre-availability shipchecks, tests and inspections.

3.5.1.2 Availability Coordinator (Submarines only). A submarine served, nuclear trained Limited Duty Officer will be assigned to augment the normal ship's complement during Depot Modernization Periods, Engineered Refueling Overhauls, or Engineered Overhauls and will act as the Availability Coordinator for the ship. Availability Coordinator responsibilities are specified in Volume V, Part I, Chapter 1, paragraph 1.5.6 of this manual.

3.5.2 Docking Conference. For availabilities involving a ship's dry docking, the industrial activity will conduct a Docking Conference prior to the ship entering the activity if scheduled to go directly into dry dock.

3.5.3 Ship's Force Administrative Preparations. Ship's Force administrative preparations for availabilities will include:

- a. Necessary revisions to ship and department organization manuals to ensure compliance with established requirements.
- b. Preparation of necessary ship and department directives to ensure that administration is formally supported in accordance with current requirements.
- c. Formulation of procedures for qualification of underway/steaming watchstanders and maintenance of proficiency of inport watchstanders, including:
  - (1) Implementation of formal provisional qualification procedures.
  - (2) Establishment of qualification goals for Key Events, such as undocking, operational testing of ship and propulsion plant systems, steam testing, initial criticality, space turnover, etc.
  - (3) Incorporation of qualification requirements necessitated by alterations to ship or propulsion plant systems.
- d. Procedures for maintenance and security of Ship's Force/MST (if assigned) barge or office spaces.
- e. General overhaul plan for Ship's Force/MST (if assigned) responsible actions including provisions for:
  - (1) Ship off-load.

- (2) Establishment of barge, berthing and messing facilities.
  - (3) Establishment of routine ship and barge watch bills.
  - (4) Scheduling of required shore based schools and leave for personnel.
  - (5) Provision for accomplishment of known Ship's Force/MST (if assigned) corrective maintenance.
  - (6) Establishment of Ship's Force PMS routines.
  - (7) Establishment of Integrated Logistics Overhaul (ILO) procedures.
  - (8) Provisions for shift work during known periods of intensive testing (e.g., Engine Room Steaming Operations, Hot Operations, Power Range Testing).
  - (9) Ship load-out.
  - (10) Target dates for completion of key ship and department directives and procedures.
- f. Assignment of ship system experts, or QA Inspectors, capable of monitoring industrial activity work on assigned systems.

### 3.6 AVAILABILITY EXECUTION.

3.6.1 Responsibilities. Responsibilities for CNO scheduled Maintenance Availabilities are as follows:

#### 3.6.1.1 Fleet Commander.

- a. Monitor availability execution to achieve a balance of cost and schedule for the scope of work authorized. Ensure that any growth in the scope of work authorized is necessary to ensure safe, reliable operation of the ship during the subsequent operating cycle.
- b. Ensure that testing of all systems and equipment installed or repaired during the availability, which require at sea testing, is conducted prior to availability completion.
- c. Provide berthing, messing, offices, classrooms, equipment stowage space, and Ship's Force repair shops in accordance with reference (d), when shipboard facilities are unusable or uninhabitable.

#### 3.6.1.2 Type Commander/Immediate Superior In Command (Group or Squadron).

- a. Authorize new items and growth industrial work items.
- b. Monitor and approve all changes in established milestones, not internal to industrial activity, including LOA and completion dates.
- c. Issue direction when the quality or completeness of industrial activity work is in question.
- d. Monitor off-ship crew messing and berthing arrangements when required.
- e. Notify the TYCOM when essential Ship's Force work cannot be completed on the scheduled contract or Key Event completion date. Make recommendations for assistance where appropriate.
- f. (Surface Ships Only). Periodically assess and monitor shipboard conditions using Appendix E of this chapter for guidance.

- (13) Prior to getting underway for Sea Trials, Shipyard, Ship's Force and Type Commander shall jointly agree that the required seven day supply of Oxygen (O<sub>2</sub>) and seven day supply of Carbon Dioxide (CO<sub>2</sub>) removal capacity will be available in each compartment, based upon the number of expected occupants of that compartment, independent of the supply and removal capacity in the other compartment(s).
  - (14) For industrial activity availabilities, a one to five day deficiency correction period will normally be scheduled subsequent to the Sea Trials and prior to the completion date. The requirement to return to the availability site to correct deficiencies may be waived on a case basis with TYCOM authorization and agreement of the ship's CO and the Supervising Authority if the material condition of the ship so warrants.
  - (15) After the conclusion of Sea Trials, the submarine shall not be operated at depths greater than 1/2 Test Depth plus 50 feet, unless specifically authorized by the TYCOM, and shall not be released for unrestricted operations until all RECs are closed and the TYCOM issues the unrestricted operations authorization message.
  - (16) After the conclusion of Sea Trials, and based upon a review of Sea Trial deficiencies and TYCOM authorization, the submarine may transit to a port other than the industrial activity.
- c. If equipment malfunctions (except for casualties affecting recoverability, salvage, watertight integrity, or operation of ship's control surfaces), or seawater leakage in excess of the specification is found during the conduct of the initial tightness dive or the controlled dive to test depth, the ship should continue to the required depth and execute the sea trial agenda unless the Commanding Officer determines it appropriate to abort the dive. The Commanding Officer and Trials Director should be particularly circumspect in the case of leakage locations not isolable by flood control/other closures (e.g., electrical hull penetrators, periscope hoist rods, etc.).
  - d. Following completion of the initial tightness dive and the controlled dive to test depth, SUBSAFE deficiencies which result in seawater leakage exceeding the specification for acceptance shall be reported to the TYCOM, NAVSEA and info to all concerned.
  - e. If leakage is from an unisolable joint, ship's depth will be limited to 1/2 test depth plus 50 feet until approval from the TYCOM is received to continue trials at depths greater than 1/2 test depth plus 50 feet.

3.6.8.3.1 Operating Depth Policy. The TYCOM's policy with respect to maximum allowable operating depths during trials, evolutions to be performed at the various depths, and the prescribed maximum water depth applicable in each case is stated in Volume VI, Chapter 26 of this manual. In every instance where the maximum authorized operating depth is exceeded, a report shall be made in accordance with reference (r), paragraphs 3.10 and 3.26 through 3.28.

3.6.8.3.2 Propulsion Plant Tests (If Required). For full power trials provisions of reference (s), Section 6 apply. Submarine depth during the submerged full power trial should be consistent with the applicable Submerged Operating Envelope (SOE), based on the Emergency Main Ballast Tank (EMBT) blow from maximum authorized operating depth being previously accomplished. The full power submerged ahead test for commissioned nuclear powered submarines shall be terminated by a back emergency bell. The duration of the back emergency shall be limited to 45 seconds, to be followed immediately by an appropriate ahead bell. Caution must be exercised to avoid developing stern way.

3.6.8.3.3 Ocean Engineering Project Availability. Certain submarines have been assigned to provide dedicated support to NAVSEA Ocean Engineering Projects. Ships dedicated to these projects have been assigned to a parent industrial activity which provides Logistic support, performs the maintenance actions required by the Submarine Extended Operating Cycle program and other functions normally provided by an industrial activity. Routine and Submarine Extended Operating Cycle maintenance is factored into the Availability Work Package prepared by the cognizant technical activity in support of the Ocean Engineering Project. Certification of the work during these

availabilities is governed by reference (t), Volume V of this manual and the applicable requirements of paragraph 3.6.8.3 of this chapter for availabilities less than six months duration or paragraph 3.6.8.4 of this chapter for availabilities greater than six months duration. Specific actions and reporting requirements which are mandatory prior to completion of an availability are summarized in Appendix BC or Appendix CC of this chapter, as applicable. The TYCOM will reiterate these requirements during the availability by a "Countdown Message" for availabilities greater than six months in duration. A sample format of this "Countdown Message" is shown in Appendix CD of this chapter.

3.6.8.3.4 Salvage Inspection (As Required). Conduct a Salvage Inspection in accordance with Volume IV, Chapter 18 of this manual. The Salvage Inspection should be conducted early enough in the availability to allow time to complete any mandatory corrective maintenance prior to Fast Cruise.

3.6.8.3.5 Phase II Crew/Material Condition Inspection. A Phase II Crew Certification Inspection is normally not required, but should be determined on a case basis by the parent ISIC. If there will be less than 15% personnel turnover, crew certification may be waived. Should the CO determine that alterations accomplished or the transfer of experienced personnel warrant a crew certification, a formal request shall be submitted to the ISIC. When required, crew certification will be performed in accordance with references (u) through (z). The material certification consisting of an ISIC audit of all Ship's Force SUBSAFE work in accordance with Volume V, Part I, Chapter 9 of this manual will need to be conducted for all industrial activity availabilities since the extent of the availability is such that an independent evaluation by an organization other than Ship's Force is required.

3.6.8.3.6 Pre-Critical Inspections. For availabilities where the reactor will be shutdown for 16 weeks or more, it is considered prudent to use an inspection plan similar to that employed by NAVSEA. Normally, the crew's readiness can be assessed within two days using such a plan, which should encompass the following:

- a. An administrative review.
- b. Observation of basic drills and evolutions not requiring reactor operation.
- c. Personnel interviews.
- d. Material inspection.

3.6.8.3.6.1 Scheduling of Pre-Critical Inspections. The ISIC Pre-Critical Inspection should be scheduled by the responsible ISIC about four weeks prior to criticality. The TYCOM should be advised as soon as possible in advance of the tentative date for the ISIC Pre-Critical Inspection and confirmed dates should be established about one month in advance of the inspection.

3.6.8.3.6.2 Composition of the Inspection Team. The Pre-Critical Inspection Team should consist of:

- a. A nuclear trained member of the cognizant ISIC Staff, usually the Squadron Training Officer.
- b. A qualified nuclear trained officer with experience as an Engineer Officer.

3.6.8.3.6.3 Reports of Inspection.

- a. The Senior Inspector should provide the inspected unit with an informal report of findings by the inspection team, copy to the cognizant ISIC and TYCOM.
- b. The ship's CO shall review the findings of the inspection team and make necessary adjustments to his training program to ensure his crew's readiness for criticality. He shall keep the cognizant ISIC advised of his training plan and his assessment of his crew's progress.
- c. The cognizant ISIC shall review the inspection findings, the CO's training plan and progress evaluations and direct follow-up reviews and/or inspections necessary to verify the ship's readiness for criticality.

3.6.8.3.7 Dock Trials. Dock Trials must, as a minimum, test those systems/equipments repaired or altered during the availability. The CO should use Appendix L of this chapter as a guide in preparing the Dock Trial Agenda.

3.6.8.3.8 Fast Cruise. Fast Cruise may commence immediately upon completion of Dock Trials and shall consist of the minimum requirements as set forth in Appendix M. The requirement for a Fast Cruise may be less than or greater than 24 hours in length depending upon the length of the availability and the time since the crew last operated the ship at sea. The CO, with ISIC concurrence, will determine length of the Fast Cruise. Prior to the ship commencing Fast Cruise, the Supervising Authority shall report to the ship, by message, that all mandatory work approved for accomplishment during the availability is completed. When the ship is ready for sea with the exception of conducting Fast Cruise and after receipt of the SUBSAFE material certification report from the performing activity as required by references (s), (u) through (z) and Volume V of this manual, the ship will request permission from the ISIC by priority message to commence Fast Cruise. The ISIC will then, if satisfied with the state of crew training and material readiness, authorize the ship to commence Fast Cruise by message, information copy to CNO, Fleet Commander, NAVSEA, and the TYCOM.

- a. A 24 hour rest and repair period will normally be scheduled following Fast Cruise and prior to the start of Sea Trials. This rest and repair period may be extended or reduced at the discretion of the ISIC.
- b. COs should consider the work and alterations accomplished during the availability when determining the extent of the Fast Cruise. The minimum requirements are listed and identified with an asterisk in Appendix M of this chapter.

3.6.8.3.9 Sea Trials. Upon receipt of the report of successful completion of Fast Cruise from the ship, the ISIC authorizes the ship to get underway for Sea Trials. For submarines, following completion of Fast Cruise the ISIC will notify the TYCOM of satisfactory completion of Fast Cruise and readiness for Sea Trials using the message format of Appendix BB. The submarine TYCOM will authorize the ISIC to allow the ship to get underway for Sea Trials using the message format of Appendices BD and BR if the ship had Upgrades/Alterations or Major Repair Work of the FBW SCS. The submarine CO will keep the TYCOM aware of the progress of the Sea Trial through periodic SITREPs using the message format of Appendix BM of this chapter. SITREPs will be **submitted following completion of the initial tightness dive, following completion of the deep dive to test depth and daily at a minimum and as identified by the TYCOM or the Sea Trial Agenda**. Sea Trials following availability are normally conducted with a significant number of "riders". These riders represent NAVSEA, TYCOM and Shipbuilder personnel onboard to observe various tests and trial evolutions. The ship's normal loadout of Lithium Hydroxide canisters, Lithium Hydroxide curtains, Emergency Air Breathing (EAB) masks, Submarine Escape Immersion Ensemble (SEIE) suits and oxygen candles is not sufficient to support this increase in personnel. Therefore, an additional four Lithium Hydroxide canisters, four Lithium Hydroxide curtains, one EAB mask, one SEIE suit and two Oxygen candles shall be carried for each rider exceeding normal crew manning. Lithium Hydroxide canisters, EABs, SEIE suits and Lithium Hydroxide curtains are to be obtained from the industrial activity. Sea Trials are required only as necessary to test work completed during the availability but must include those mandatory requirements identified in Appendix N of this chapter. The industrial activity shall include at least four days in the availability for conduct of Sea Trials. The industrial activity shall prepare a Sea Trial Agenda for Sea Trials conducted after an availability. The submarine involved shall submit the Sea Trial Agenda to the ISIC for approval, with an information copy to the TYCOM. Extensions or reductions of the Sea Trial period may be granted where warranted by the scope of the work accomplished. Where extension of the Sea Trial period and a change in the availability schedule is required, requests for such extensions must be submitted by the industrial activity to the TYCOM as early as practical. All deficiencies resulting from Sea Trials will be satisfactorily resolved prior to the completion of the availability. If no Sea Trial deficiencies are found, the availability may be completed with TYCOM concurrence at the completion of Sea Trials.

- a. **EMBT Blow**: An EMBT blow is required for each Sea Trial following an industrial activity availability, availability docking, or availability of less than six months duration. EMBT blow shall be conducted in accordance with the applicable URO MRC and does **not** require an escort for EMBT blow at depths of 400 feet or less.
- b. **Assignment of Escort Ship**.

- (1) In accordance with reference (aa), a surface escort shall be provided during deep dive submergence trials for ships completing an availability for repair of collision/grounding damage where deformation is observed to be in the hull integrity envelope and/or supporting structure.
- (2) In accordance with reference (aa), the requirement for providing an escort during deep dive submergence trials upon completion of all other availabilities will be evaluated by Commander, NAVSEA on a case basis. Commander, NAVSEA will advise the applicable Submarine Force Commander in writing whether or **not** an escort will be required based on the scope of work in the availability. In general, an industrial activity availability of less than six months duration should **not** require an escort, since the work typically performed in these availabilities is limited in scope, is carefully controlled and, therefore, does not result in substantial risk of unidentified or incomplete work adversely affecting the SUBSAFE boundary.
- (3) Escort requirements should be determined early so that an escort satisfying the requirements of paragraph 3.6.8.4.7.b.(6) of this chapter can be scheduled if required. The TYCOM will in turn request services from the Fleet Commander as applicable. As a general rule, pressure hull work which could not affect hull circularity will not require an escort.
- (4) Waiver of escort requirements may be requested by message when necessary. The ISIC will request the waiver as soon as possible. The TYCOM will pass the request to Commander, NAVSEA for approval. An escort waiver request message is to include all of the following specific statements, as applicable:
  - (a) A ( ) inch by ( ) inch hull cut between frames ( ) and ( ) including a ( ) inch section of frame ( ) was the only major hull integrity work accomplished during the availability. If no hull frame cut was made, a positive statement to that effect is required.
  - (b) The hull cut weld satisfactorily passed RT and 7 day MT non-destructive tests.
  - (c) Post repair frame circularity check readings are within specifications.

c. Assignment of SRDRS During Submarine Sea Trials.

- (1) A SRDRS will be placed in a modified alert status at the beginning of Sea Trials requiring an escort following in industrial availability or major maintenance availability for:
  - (a) Ships initial tightness and deep dive events.
  - (b) Subsequent Sea Trials until the completion of the initial dive to design test depth.
  - (c) If, in the TYCOM's judgment, a Sea Trial requires an escort due to major hull cuts.
- (2) A modified alert message will be sent by the industrial activity with the required SRDRS support dates 6 weeks prior to the requested date. Any changes in this request date will require immediate notification to the Fleet commander, Commander Naval Sea Systems Command (COMNAVSEASYSCOM) and Commander, Submarine Development Squadron (COMSUBDEVRON) FIVE. Sample messages in Appendices BN and CQ of this chapter.
- (3) The ship conducting Sea Trials will notify COMSUBDEVRON FIVE in Silverdale, WA and COMNAVSEASYSCOM when SRDRS services are no longer required due to completion of the events in paragraph 3.6.8.3.9.c.(1) of this chapter or due to delay in completing Sea Trials.

- (4) The SRDRS is not required to be placed in a modified alert status for those Sea Trials requiring an escort solely for the accomplishment of an EMBT blow from depths greater than 400 feet.

3.6.8.3.10 Interrupted Sea Trials. In the event a Sea Trial is interrupted, or an additional Sea Trial becomes necessary, the following requirements are to be met. These requirements shall be invoked if the ship returns to port for industrial activity repairs which affect SUBSAFE certification or which will require at-sea testing.

- a. The industrial activity will draft a revised Sea Trials agenda to support resumption of the trials. This agenda shall be provided to the ISIC for concurrence and TYCOM for information.
- b. The Ship will report by message (format of Appendix BE of this chapter) that Ship's Force is ready for follow-on sea trials.
- c. The ISIC shall report by message (format of Appendix BF of this chapter) to the TYCOM that the material condition of those SUBSAFE Certification boundaries that were installed, repaired and/or tested by Ship's Force is satisfactory for resuming Sea Trials.
- d. Upon completion of all of the requirements in paragraphs 3.6.8.3.10 a. and b. above, the TYCOM will provide a message (Appendix BG of this chapter) to the ISIC granting permission to proceed with the conduct of Sea Trials and authorize the ship to dive to the Sea Trial operating depth.
- e. The industrial activity will identify by message to COMNAVSEASYSCOM and COMSUBDEVRON FIVE any additional SRDRS requirements to support the interrupted trials. Sample message in Appendices BN and CQ of this chapter.

3.6.8.3.11 Availability Completion Prerequisites. Upon completion of Sea Trials and correction/resolution of deficiencies, the following requirements must be met prior to completion of an industrial availability less than six months duration:

- a. The Supervising Authority shall report by message (format similar to reference (t), Appendix B.3.8) to the TYCOM, satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory and Sea Trial deficiencies. Report that the SUBSAFE material condition of the ship installed, repaired, and/or tested by the industrial activity is satisfactory for URO to test depth. Identify any deferred SUBSAFE work and/or conditionally approved deviations and waivers.
- b. Following verification from the ship Commanding Officer and the Supervising Authority of satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, certification that the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory, and upon confirmation of maintenance of SUBSAFE certification of portions of ship not affected by the industrial activity, the TYCOM shall report by message (Appendix BO of this chapter) to the ship, with copies to CNO and NAVSEA, reporting status of SUBSAFE certification and authorizing URO to test depth.
- c. ISIC. Following verification from the In-Service Engineering Activity (ISEA)/activity performing the work of satisfactory completion of all at-sea testing or trials, completion of controlled dives, correction of all mandatory sea trial deficiencies and resolution of all ISIC FBW SCS Certification Audit Deficiencies recommendations, certify to the TYCOM using Appendix BS, with information copies to CNO, the appropriate Fleet Commander and NAVSEA, the FBW SCS material condition of those parts of the ship installed, repaired and/or tested by the ISEA/activity performing the work is satisfactory, and recommend authorization for FBW SCS unrestricted use in support of submarine unrestricted operations, subject to ISIC verification that FBW SCS certification of areas outside ISEA/activity performing the work tasking has been sustained, or specifically identify any operating restrictions of the ship and/or system.

- d. TYCOM. Following verification from the ISIC of satisfactory completion of all at-sea testing, correction of all mandatory deficiencies, receipt of certification that the FBW SCS material condition of those parts of the ship installed, repaired and/or tested by the ISEA/activity performing the work is satisfactory, and upon confirmation that FBW SCS certification was not affected for those portions of ship FBW SCS not affected by the ISEA/activity performing the work, issue a message to the ship using Appendix BT, with copies to CNO, ISIC and NAVSEA, certifying the FBW SCS and authorizing FBW SCS unrestricted use in support of submarine unrestricted operations or specifically identify any operating restrictions of the ship and/or system.

3.6.8.4 Trials, Inspections and Certification Major Availabilities (Greater Than Six Months) (Submarines Only).

The following paragraphs summarize policies and responsibilities with respect to trials, tests and inspections incident to completion of major submarine availabilities. The TYCOM will maintain operational control of the submarine throughout the overhaul, conversion, refueling or post-conversion availability through the designated ISIC. For Atlantic/Pacific submarine units undergoing availabilities in West/East coast industrial activities, respectively, the TYCOM responsible for conducting all trials and inspections specified in this manual is the TYCOM with Operational Control of the unit.

- a. Policy. Major availabilities require a succession of inspections and tests which culminate in a series of underway trials. References (n), (s), (ab) and (ac) set forth the philosophy and sequencing of the various categories of these tests and trials, the results of which determine the readiness of the ship at the completion of overhaul or repair. References (ad) and (q) delineate the Force Commander's responsibility for operational control of submarines assigned during trials and for assuring that the crew and ship have attained a satisfactory state of training, administrative, operational and material readiness for at-sea operations during the trials. ISICs and COs shall comply with the provisions of this volume in the conduct of trials incident to the conversion, overhaul and refueling of submarines assigned.

b. General Information for Industrial Activity Availability Trials and Inspections.

- (1) The normal sequence of events leading up to Sea Trials is described in paragraph 3.6.8.4.b.(2) of this chapter. Fast Cruise may not commence until Dock Trials have been satisfactorily completed and a satisfactory state of crew training and material readiness, has been certified. The required inspections and tests and their associated time periods may be modified by the TYCOM upon request from the cognizant ISIC.

- (2) The following inspections and tests are required:

- (a) Periodic Monitoring Inspections.

- 1 Arrival Assist (on or about A+30) using the attributes of Volume I, Chapter 3, paragraph 3.3.1 of this manual.

- 2 Engineering Readiness Review(s).

- 3 Departmental Readiness Review(s).

- (b) Pre-Critical Inspection (two days).

- (c) Phase I Inspection (one day).

- (d) Salvage Inspection (one day).

- (e) Dock Trials (one day).

- (f) Phase II Crew/Material Certification (two days).

- (g) Audit of Ship's Force REC and Departure from Specification records.

- (h) Minimum of 48 hours for industrial activity work (following Phase II crew certification) (two days).
  - (i) Fast Cruise normally consists of two days of uninterrupted operation, one day to allow the industrial activity and Ship's Force personnel to correct deficiencies, followed by two more days of uninterrupted operation (five days).
  - (j) Rest and repair period (about one day).
  - (k) Underway for initial Sea Trials.
  - (l) Appendix CC of this chapter provides a detailed summary of major trial and inspection milestones required for industrial activity availabilities of six months or greater in duration.
- (3) When circumstances are such that Sea Trials must be rescheduled or planned for a weekend to avoid costly delays, Fleet Commander approval will be obtained by the Supervising Authority on a case basis.
  - (4) Critical operation of reactors while nuclear powered ships are in a naval or commercial industrial activity will be governed by reference (b). Until satisfactory completion of post repair propulsion plant trials (in the case of ships in industrial availabilities), permission to conduct critical reactor plant operations must be obtained from NAVSEA. Subsequent to completion of propulsion plant post repair trials, the CO may authorize critical operation of the reactor in support of tasks assigned the ship. However, so long as the ship remains in an industrial activity, the CO will notify the industrial activity, as appropriate, well in advance of any critical operations of the ship's reactor. This notification shall include the nature and duration of such operations. Crew certification inspections will not involve or require critical operation of the reactor.
  - (5) In conducting the inspections required herein, inspectors should be guided by the concept that at the start of Fast Cruise the ship should be, in all respects, ready for Sea Trials with the exception of the additional training the crew will receive during Fast Cruise.
  - (6) NAVSEA SUBSAFE Certification Audit (SSCA). During major CNO Maintenance Availabilities NAVSEA will conduct a SSCA as required by reference (t). A copy of the SSCA will be provided to the Supervising Authority, the ship's CO, the TYCOM and Fleet Commander. Prior to conducting Fast Cruise the Supervising Authority must report to NAVSEA and the TYCOM that those parts of the ship installed, repaired and/or tested by the industrial activity are certified satisfactory for post repair Sea Trials, including the resolution of NAVSEA SSCA Category I recommendations, status of all incomplete SSCA Category IA recommendations, and report that the ship is ready for commencement of Fast Cruise.
  - (7) The requirement for TYCOM certification of SUBSAFE boundaries not entered by the industrial activity and material readiness upon completion of an industrial activity imposes additional responsibilities on the ISIC inspectors. A formal audit of Ship's Force REC and Departure from Specification records shall be conducted by the ISIC QA Officer prior to Fast Cruise. Included in the audit and material inspection will be a review of ship procedures to ensure no unauthorized work was conducted within certified boundaries, and all outstanding Forces Afloat Departures from Specification, as defined in Volume V, Part I, Chapter 8 of this manual, granted prior to the availability which required corrective action. There may or may not have been restrictions involved with these departures. A review of the Ship's Force REC Records and Procedures is necessary for SUBSAFE work accomplished by Forces Afloat in accordance with Volume V, Part I, Chapter 5 of this manual, along with a review of the applicable URO MRC status. The ISIC certification message will also provide a statement certifying that ship and industrial activity procedures ensured that no unauthorized work was

conducted within the certified boundaries and, when required, will also provide a status report of any outstanding Re-Entries, Forces Afloat Departures from Specification and delinquent URO MRCs. The scope and nature of this inspection will vary dependent upon the extent and length of the availability. In this regard:

- (a) Material certification may be made subject to the correction of specific deficiencies. (Deficiencies are such that they can be readily identified and listed.)
  - (b) Material certification should be postponed to a later date when deficiencies are so significant or so numerous as to preclude correction in the time remaining before scheduled commencement of Fast Cruise.
  - (c) Deficiencies that could affect the safe operation of the ship during Sea Trials must be corrected, reinspected and reported to the TYCOM as having been corrected prior to the start of Fast Cruise.
- (8) Inspectors must determine that all work/testing necessary to support Sea Trials has in fact been completed or identified for completion prior to the commencement of Fast Cruise including the following.
- (a) All ship systems which effect safe operation of the ship during Sea Trials must be operable.
  - (b) All work necessary for safe operation during Sea Trials which was undertaken by the industrial activity, Ship's Force, FMA, or other outside activities must have been satisfactorily completed and tested. Included must be a check for any "special configuration or installations" ensuring that they have been authorized by proper authority, that their impact has been fully assessed and that the Sea Trial Agenda considers these impacts or limitations.
- (9) Following completion of the required training and material readiness certification, COs must keep the cognizant ISIC fully informed of any changes in personnel, training and/or material status which could affect the validity of certification. Prompt notification is required to permit revision of Operation Orders and services required.
- (10) Underway trials following major availabilities, particularly initial submerged and test depth trials, must be undertaken with the knowledge that the crew lacks recent experience operating as a unit and that the ship's structure and fittings have not been tested in an at-sea environment. All tests and procedures must be conducted carefully and methodically. Systems or components designed to operate at test depth should not be exercised at test depth for the sole purpose of proving the design. They should be operated at the deepest depth at which they might be used. Trials and tests which are inherently hazardous should not be conducted. For example, the automated hovering system should not be demonstrated at test depth. Reference (ae) provides pertinent information regarding the testing of seawater systems during underway trials.
- (11) An approved agenda is required for each underway period. The prerequisites for the first underway period are set forth in paragraphs 3.6.8.4.4 through 3.6.8.4.7 of this chapter.
- (12) The first underway tests will be of limited scope. The initial tightness dive will be a deliberate, planned, step-by-step evolution using conservative angles and moderate speed. The submarine shall be accompanied by an escort ship properly equipped with sonar communication equipment as described in paragraph 3.6.8.4.7 of this chapter. The maximum water depth for this dive shall be 400 feet, as prescribed by reference (q).

- (13) The initial trial schedule shall include a minimum of six hours of submerged ISE for Ship's Force training. This ISE should be sequenced as soon as practical after the initial tightness dive and should include the necessary evolutions to allow each watch section ship control party to familiarize themselves with their assigned stations and duties. The ship should be operated at moderate speed to develop proficiency prior to the deep dive and full power run. Testing may be scheduled during the ISE period on a not-to-interfere basis with training. The time spent in the initial tightness dive, if at moderate speed, may be included as one section's training. The requirement to provide each watch section ship control party with about two hour's experience submerged at moderate speeds prior to the deep dive and full power run is mandatory for ship safety.
- (14) All trial periods must be organized such that each member of the command has an opportunity to get six uninterrupted hours of rest during each 24 hour period encompassed by the trials. Sea Trial events which can be accomplished by normal watch sections may be conducted concurrently with crew rest periods.
- (15) Prior to getting underway for Sea Trials, Shipyard, Ship's Force and Type Commander shall jointly agree that the required seven day supply of Oxygen (O<sub>2</sub>) and seven day supply of Carbon Dioxide (CO<sub>2</sub>) removal capacity will be available in each compartment, based upon the number of expected occupants of that compartment, independent of the supply and removal capacity in the other compartment(s).
- (16) A deficiency correction period will be scheduled subsequent to the last Sea Trial and prior to the completion date. The scheduled length and location of this deficiency correction period will be determined by the type and magnitude of the deficiencies to be corrected.
- (17) After the conclusion of Sea Trials, the submarine shall not be operated at depths greater than 1/2 Test Depth plus 50 feet, unless specifically authorized by the TYCOM, and shall not be released for unrestricted operations until all RECs are closed and the TYCOM issues the unrestricted operations authorization message.
- (18) After the conclusion of Sea Trials, and based upon a review of Sea Trial deficiencies and TYCOM authorization, the submarine may transit to a port other than the industrial activity.
- c. If equipment malfunctions (except for casualties affecting recoverability, salvage, watertight integrity, or operation of ship's control surfaces), or seawater leakage in excess of the specification is found during the conduct of the initial tightness dive or the controlled dive to test depth, the ship should continue to the required depth and execute the sea trial agenda unless the Commanding Officer determines it appropriate to abort the dive. The Commanding Officer and Trials Director should be particularly circumspect in the case of leakage locations not isolable by flood control/other closures (e.g., electrical hull penetrators, periscope hoist rods, etc.).
- d. Following completion of the initial tightness dive and the controlled dive to test depth, SUBSAFE deficiencies which result in seawater leakage exceeding the specification for acceptance shall be reported to the TYCOM, NAVSEA and info to all concerned.
- e. If leakage is from an unisolable joint, ship's depth will be limited to 1/2 test depth plus 50 feet until approval from the TYCOM is received to continue trials at depths greater than 1/2 test depth plus 50 feet.

3.6.8.4.1 Responsibilities. The responsibilities for trials and inspections are as follows:

- a. NAVSEA.

- (1) Provide approved procedures for tests of the reactor plant required for nuclear refueling and for reactor plant repairs and alterations accomplished in the availability.
- (2) Authorize critical operation of the reactor as outlined in paragraph 3.6.8.4.b.(4) of this chapter.
- (3) Approve the scheduling and the sequencing of nuclear propulsion plant tests and concur in the schedule and sequence for nuclear propulsion plant trials.
- (4) Arrange for technical assistance from the U.S. Department of Energy as required.
- (5) Conduct SSCAs and provide to the Supervising Authority, the ship's CO and the TYCOM and Fleet Commander a copy of the SSCA report.
- (6) Review and concur with the Sea Trial Agenda submitted by the Supervising Authority.
- (7) Certify (reference (t), Appendix B.3.2) to the TYCOM, information copies to CNO and Fleet Commander, that the material SUBSAFE condition of those parts of the ship installed, repaired and/or tested by the industrial activity are certified as satisfactory for Sea Trials and controlled dives to a specified depth (usually test depth).
- (8) Following verification from the Supervising Authority of satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, and resolution of all NAVSEA SSCA Category IA recommendations, certify to the TYCOM, with information copies to CNO and the appropriate Fleet Commander, the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory, and recommend authorization for URO to design test depth subject to TYCOM verification that SUBSAFE certification of areas outside the industrial activity AWP has been sustained.

b. Supervising Authority.

- (1) Accept custody of and responsibility for special nuclear material upon delivery from the U.S. Department of Energy.
- (2) Accept custody of and responsibility for spent nuclear fuel and other special nuclear material removed from the submarine incident to refueling until transferred to the U.S. Department of Energy.
- (3) Transfer custody of and responsibility for nuclear fuel and other special nuclear material to the CO of the submarine undergoing refueling when it has been installed in the submarine.
- (4) Provide sufficient time for crew training during the major availability period to permit the Ship's Force to attain a state of training adequate to ensure proper operation and safety of the ship and its personnel during Fast Cruise and Sea Trials.

**NOTE: THE SCHEDULING AND SEQUENCING OF TRIALS INVOLVING TESTS OF A REACTOR PLANT PROPULSION PLANT MUST BE APPROVED BY THE FLEET COMMANDER AND CONCURRED TO BY NAVSEA.**

- (5) Prior to Fast Cruise, submit the Sea Trial Agenda to NAVSEA for concurrence and to the TYCOM for approval. Resolve any differences between NAVSEA and the TYCOM. Submit the Deep Dive Test Form and EMBT Blow Test Procedures to NAVSEA for approval. The Sea Trial Agenda shall provide the detailed sequence of events for conducting the Sea Trials required to be performed.

- (6) Schedule the ship salvage inspection to ensure sufficient time for the TYCOM to conduct the inspection and for correction of deficiencies.
- (7) Report the status of the material condition of those parts of the ship installed, repaired and/or tested by the industrial activity prior to each Sea Trial.
  - (a) Report by message (reference (t), Appendix B.3.1) to NAVSEA and TYCOM, in advance of the scheduled start of Fast Cruise, that those parts of the ship installed, repaired and/or tested by the industrial activity are certified satisfactory for post repair Sea Trials, including resolution of NAVSEA SSCA Category I recommendations and status of all incomplete NAVSEA SSCA Category IA recommendations, and report that the ship is ready for commencement of Fast Cruise. The message shall also state that there are no conditional SUBSAFE Deviations or Waivers which have not been satisfied or cite those that exist, and that, subject to satisfactory completion of Fast Cruise and resolution of mandatory deficiencies, the material condition of the ship is satisfactory for commencement of Sea Trials.

**NOTE: SUBSEQUENT TO THE MESSAGE IN PARAGRAPH 3.6.8.4.1.b. (7)(a) OF THIS CHAPTER, ANY DEFICIENCY DISCOVERED AND THE CORRECTIVE ACTION TAKEN WHICH AFFECTS THE WATERTIGHT INTEGRITY, THE RECOVERABILITY OF THE SHIP, THE OPERATION OF THE SHIP'S CONTROL SURFACES, OR THE SHIP'S SALVAGE CAPABILITY SHALL BE REPORTED TO NAVSEA AND THE APPROPRIATE FLEET COMMANDER AND TYCOM BY MESSAGE CITED IN PARAGRAPH 3.6.8.4.1.b. (7)(a) OF THIS CHAPTER. PREVIOUS CERTIFICATION OF MATERIAL CONDITION SHALL BE SUSPENDED UNTIL NAVSEA AND TYCOM REVIEW THE REPORT AND NAVSEA CERTIFIES TO THE TYCOM BY MESSAGE THAT THE MATERIAL CONDITION OF THE PARTS OF THE SHIP COVERED BY THE INDUSTRIAL ACTIVITY AWP IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH, AND THE TYCOM IN TURN CERTIFIES TO THE SHIP THAT THE SHIP'S SUBSAFE CERTIFICATION BOUNDARY IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH.**

- (b) Report by message (reference (t), Appendix B.3.3) to NAVSEA and TYCOM, with the concurrence of the CO, the successful completion of Fast Cruise and SUBSAFE material condition readiness as a prerequisite to start of Sea Trials.
- (c) Where a previous Sea Trial was aborted, or corrective actions for Sea Trial deficiencies require an additional deep dive, report by message (reference (t), Appendix B.3.5) to NAVSEA that the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory for Follow-On Sea Trials to test depth.
- (8) Report by message (reference (t), Appendix B.3.8) to NAVSEA, satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, and resolution of all NAVSEA SSCA Category IA recommendations. Report that the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory for URO to test depth. Identify any deferred SUBSAFE work and/or conditionally approved deviations and waivers.
- (9) Coordinate the schedule for Fast Cruise and post repair trials with the TYCOM/ISIC representative.
- (10) Recommend to the President, Board of Inspection and Survey and the TYCOM, information to NAVSEA, Fleet Commander and TYCOM/ISIC representative, when post availability Material Inspection and Underway Trials by the Board of Inspection and Survey are required.

c. TYCOM.

- (1) Schedule the Fleet Commander PORSE as recommended by the industrial activity in the Key Events Schedule and confirmed by the parent TYCOM/ISIC representative upon completion of the ISIC Pre-Critical Inspection.
- (2) Provide Fast Cruise, Sea Trial and completion prerequisites message (Appendix CD of this chapter) to the ship approximately 90 days prior to the start of Sea Trials.
- (3) Assign material representatives to be embarked during trials as required by paragraph 3.6.8.4.2 of this chapter.
- (4) Inform the CNO and Fleet Commander of the scope and schedule of the trials. This is normally done by copy of the TYCOM/ISIC representative Operation Order to the CNO and Fleet Commander.
- (5) Provide escorts as required. Send a Sea Trials Support Services message (Appendix CA of this chapter) to specify SRDRS "modified alert" requirements.
- (6) Approve Sea Trial Agenda.
- (7) Report, by message (Appendix CE of this chapter), to NAVSEA crew readiness for Sea Trials and request NAVSEA Nuclear Propulsion Directorate (08) authorization for critical operations.
- (8) Prior to each Sea Trial, following certification from the Supervising Authority and NAVSEA that the material condition of those parts of the ship installed, repaired and/or tested by the industrial activity is satisfactory for Sea Trials and TYCOM verification that the SUBSAFE certification of those parts of the ship not affected by the industrial activity AWP has been sustained, report by message (Appendix CF of this chapter) to the ship, with copies to CNO and NAVSEA, reporting that the status of the SUBSAFE Certification Boundary is satisfactory and authorizing the conduct of Sea Trials and dives to specified depth. If the ship had Upgrades/Alterations or Major Repair Work of the FBW SCS, and following a recommendation from the ISIC, authorize underway operation of the FBW SCS using Appendix CT.
- (9) Following verification from NAVSEA of satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, certification that the SUBSAFE material condition of those parts of the ship installed, repaired and/or tested by the industrial activity is satisfactory, and upon confirmation of maintenance of SUBSAFE certification of portions of ship not affected by the industrial activity, report by message (Appendix CG of this chapter) to the ship, with copies to CNO and NAVSEA, reporting status of SUBSAFE certification and authorizing URO to test depth. If the ship had Upgrades/Alterations or Major Repair Work of the FBW SCS, following verification from the ISIC of satisfactory completion of all at-sea testing, correction of all mandatory deficiencies, receipt of certification that the FBW SCS material condition of those parts of the ship installed, repaired and/or tested by the ISEA/activity performing the work is satisfactory, and upon confirmation that FBW SCS certification was not affected for those portions of ship FBW SCS not affected by the ISEA/activity performing the work, issue a message to the ship using Appendix CV, with copies to CNO, ISIC and NAVSEA, certifying the FBW SCS and authorizing FBW SCS unrestricted use in support of submarine unrestricted operations or specifically identify any operating restrictions of the ship and/or system.

**NOTE: SUBSEQUENT TO THE MESSAGES, APPENDICES CB AND CE OF THIS CHAPTER, AND REFERENCE (t), APPENDICES B.3.1 AND B.3.2, ANY DEFICIENCY DISCOVERED AND THE CORRECTIVE ACTION TAKEN WHICH AFFECTS THE WATERTIGHT INTEGRITY, THE RECOVERABILITY OF THE SHIP, THE OPERATION OF THE SHIP'S CONTROL SURFACES OR THE SHIP'S SALVAGE CAPABILITY SHALL BE REPORTED**

**TO NAVSEA, TYCOM AND FLEET COMMANDER BY THE SUPERVISING AUTHORITY (INDUSTRIAL ACTIVITY DEFICIENCY) OR SHIP CO (FORCES AFLOAT DEFICIENCY) IN MESSAGE FORMAT. PREVIOUS CERTIFICATION SHALL BE CONSIDERED RESCINDED. WHEN A REVIEW OF THE DEFICIENCY IS COMPLETED BY NAVSEA FOR INDUSTRIAL ACTIVITY ITEMS AND TYCOM FOR SHIP'S FORCE ITEMS, NAVSEA WILL CERTIFY TO THE TYCOM THAT THE MATERIAL CONDITION OF THE PARTS OF THE SHIP COVERED BY THE INDUSTRIAL ACTIVITY AWP IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH. THE TYCOM IN TURN CERTIFIES THAT THE SHIP'S SUBSAFE CERTIFICATION BOUNDARY IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH.**

- d. ISIC/TYCOM Representative.
- (1) Conduct periodic monitoring of ships using paragraph 3.6.8.4.4 of this chapter as a guide to include:
    - (a) Technical, administrative and training assistance visits directed toward improvements in management and conduct of maintenance during the availability and training tasks (Tech Assists).
    - (b) Evaluation visits to determine the state of administration and training (Work-Ups).
    - (c) Spot checks to monitor progress and effectiveness in specific material, training and administrative areas (Monitor Visits).
    - (d) Monitor Maintenance Reports that require post availability actions (Liaison Action Requests, Deficiency Management Tracking System items, Departure From Specifications, Deficiency Reports, etc.) for inclusion in the ship's CSMP, as required.
  - (2) Conduct a Pre-Critical Inspection of the Engineering Department in accordance with paragraph 3.6.8.4.4 of this chapter to determine the ship's readiness for either the RSE or the Fleet Commander PORSE (as applicable).
  - (3) Schedule a salvage inspection by the operating forces in time to have discrepancies corrected prior to the start of Fast Cruise.
  - (4) Conduct a formal Phase I certification inspection of the ship's company in accordance with references (u) through (z). The purpose of this inspection shall be to audit the readiness and training of the Ship's Force, particularly in the areas of watchstander qualifications, damage control readiness, status of operational and emergency bills, present on board of essential technical manuals, and general operational knowledge. This inspection shall be scheduled about one month prior to Fast Cruise and should include written examinations and personal interviews with officers and key enlisted men to determine their readiness and status of training as outlined for Phase I. A comparison of personnel allowance (including Navy Enlisted Classification requirements) versus onboard count shall be made to ensure that the ship is adequately manned.
  - (5) Prior to Fast Cruise, the ISIC QA Officer shall conduct a formal audit of Ship's Force REC and Departure from Specification Records and CSMP. Using the SUBMEPP PMR and URO MRC scheduling reports and current industrial activity/Ship's Force updates to the latest report, ensure all "D"-Level PMR and URO MRC accomplishment is current. The ISIC shall forward the audit results to the TYCOM via the cognizant Commander, Submarine Group. The ISIC will then report to the TYCOM by message (Appendix CB of this chapter) the status of the crew/material certification. An update of this certification is needed prior to Sea Trials and following the rescinding of certification noted in the NOTE following paragraph 3.6.8.4.1.c.(9) of this chapter. If Upgrades/Alterations or Major Repair Work of the FBW SCS was

performed, a 100% audit of the work, as defined in Volume V, Part I, Chapter 9 of this manual, will be performed by the ISIC. The ISIC shall report certification of work and recommend at-sea operations using the message format of Appendix CS.

- (6) Witness and certify to the TYCOM that the state of crew training is satisfactory for at-sea operations in accordance with references (u) through (z). This will be done during a two day period subsequent to Dock Trials and prior to Fast Cruise as outlined in paragraph 3.6.8.4.4.e. of this chapter. This two day period shall be scheduled so that there is normally a 48 hour period between the end of this event and the beginning of Fast Cruise. This two day Phase II crew certification period is divided into a 40 hour crew work-up and rest period and an eight hour modified dockside Operational Readiness Inspection. The entire period should be scheduled to minimize interference with industrial activity work. However, since the certification must be conducted most carefully to be meaningful, the officer scheduling the certification should coordinate industrial activity interference during the eight hour modified Operational Readiness Inspection. This certification should be thorough and meticulous. Pressure from the industrial activity or any other source to compromise the submarine's safety must not be permitted to influence the judgment of the certifying officers. The desired overall sequence of these events is shown in Appendix CC of this chapter.
- (7) Conduct a material inspection of the ship concurrent with the inspection of paragraph 3.6.8.4.1.d.(5) of this chapter. This inspection should be conducted using the guidelines contained in paragraphs 3.6.8.4.b.(5) and 3.6.8.4.b.(7) of this chapter.
- (8) Satisfactory completion of the inspections of paragraphs 3.6.8.4.1.d.(5) through 3.6.8.4.1.d.(7) of this chapter should be reported to the TYCOM in one "PRIORITY" crew certification message in accordance with sample message format of Appendix CB of this chapter paralleled by a telephone call to the TYCOM Watch Officer reporting the date-time group of the message. If significant deficiencies exist or it appears that extension of time is required to correct training/material deficiencies, the TYCOM shall be immediately advised by telephone and by message. The Supervising Authority will be included as an information addressee.
- (9) Receive from the CO/Supervising Authority the scope, schedule and agenda of tests for Sea Trials for review. The concurrence of NAVSEA is required for the sequencing and scheduling of propulsion plant Sea Trials for industrial activity availabilities.
- (10) Prior to Sea Trials, report by message (Appendix CH of this chapter) to the TYCOM the material certification of the ship.
- (11) Advise the TYCOM by message of escort requirements and ensure that an escort is provided during the initial tightness dive, during the deep dive and during emergency blow tests as required by paragraph 3.6.8.4.7.a. of this chapter.
- (12) Arrange for a SRDRS to be on "modified alert" during the Sea Trials via message (Appendix CA of this chapter) to COMSUBDEVRON FIVE.
- (13) Provide updated sea trials status by telephone to COMSUBDEVRON FIVE if SRDRS "mod-alert" support services are in use in accordance with paragraph 3.6.8.4.7.b.(6) of this chapter.
- (14) Provide an operation order to be used incorporating the provisions of reference (q). Provide a copy to the TYCOM and, where appropriate, the local ISIC, information to CNO and Fleet Commander. Include within operation orders pertaining to post-availability trials, instructions to send specific messages announcing the start and completion of initial deep dive with the TYCOM as an information addressee.
- (15) Arrange for the embarkation of technical personnel who may be assigned by NAVSEA to observe tests or trials.

- (16) Arrange for the assignment of operating areas and communications frequencies.
- (17) Assign a submarine qualified officer to act as TYCOM representative embarked during Sea Trials as required by paragraph 3.6.8.4.2 of this chapter. When necessary, provide a gold dolphin wearer to ride the escort vessel.
- (18) When authorized by the TYCOM, grant permission for the ship's CO to commence Sea Trials in accordance with the approved Sea Trials Agenda.
- (19) Upon completion of Sea Trials, report by message (Appendix CI of this chapter) to the TYCOM the status of any work performed by Forces Afloat within the SUBSAFE boundary, status of Departures from Specification and status of URO MRCs. If Upgrades/Alterations or Major Repair Work of the FBW SCS was performed, following verification from the ISEA/activity performing the work of satisfactory completion of all at-sea testing or trials, completion of controlled dives, correction of all mandatory sea trial deficiencies, and resolution of all ISIC FBW SCS Certification Audit Deficiencies recommendations, certify to the TYCOM using Appendix CU, with information copies to CNO, the appropriate Fleet Commander and NAVSEA, the FBW SCS material condition of those parts of the ship installed, repaired, and/or tested by the ISEA/activity performing the work is satisfactory, and recommend authorization for FBW SCS unrestricted use in support of submarine unrestricted operations, subject to ISIC verification that FBW SCS certification of areas outside ISEA/activity performing the work tasking has been sustained, or specifically identify any operating restrictions of the ship and/or system.

e. Ship CO.

- (1) Carry out his command responsibilities in accordance with reference (e).

**NOTE: SUBMARINES UNDERGOING INDUSTRIAL ACTIVITY AVAILABILITIES NORMALLY REMAIN IN COMMISSION WITH A CREW ASSIGNED. THE CO REMAINS FULLY RESPONSIBLE FOR THE NUCLEAR PROPULSION PLANT DURING ALL PHASES OF THE AVAILABILITY, INCLUDING ALL POST REPAIR TESTS AND TRIALS.**

- (2) Develop and execute training plans and documents in order to maintain the state of training of the crew adequate to support post repair tests, inspections and trials. The nature and scope of the training required will depend to a great extent on the length of the availability. Care shall be taken to ensure that these plans and documents are in conformance with instructions and procedures approved by NAVSEA.
- (3) Supervise operation of the nuclear propulsion plant. Critical operations will be conducted as set forth in paragraph 3.6.8.4.b.(4) of this chapter.
- (4) Prepare the ship's engineering personnel and propulsion plant and spaces for examination by the Director, Division of Naval Reactors, U.S. Department of Energy or the Fleet Commander Nuclear Propulsion Examining Board. For PORSE conducted by the Nuclear Propulsion Examining Board, direct liaison is authorized with the industrial activity to ensure estimated dates are included in the Key Events schedule.
- (5) Maintain PMS in accordance with reference (af), SUBSAFE REC in accordance with Volume V, Part I, Chapter 5 of this manual to ensure no unauthorized Ship's Force work is conducted within the certified SUBSAFE boundaries, Reactor Plant PMS in accordance with reference (ag) and Planned Maintenance Management Program in accordance with reference (ah), for work performed by Forces Afloat. Ensure records are ready for ISIC audit conducted prior to Fast Cruise.
- (6) Participate in at-sea periods prior to the first Sea Trials as follows:

- (a) If possible accompany the preceding ship in overhaul on the first Sea Trial to learn how the propulsion trial is run.
  - (b) For ships in availabilities 18 months or longer, the CO shall participate in an underway period of sufficient duration about six months before Phase II Crew Certification. The purpose of this ride is to refresh him on what is important to ensure the safe conduct of his own Sea Trials and to insure his crews training program is emphasizing those matters. This underway should be on a ship, preferably of the same class, which is concentrating on basic submarine operations, such as Selected Refresher Training or ISE, in order for the CO to see evolutions such as coming to periscope depth, snorkeling, ventilating, casualty training, etc. If the availability schedule has 10-12 weeks between Power Range Testing and Phase II Crew Certification, the CO should go to sea about two months before Power Range Testing. The intent is for the CO to go to sea after having been in the industrial activity for a fair amount of time (normally one year or more), but with sufficient time remaining to improve his own training program if necessary. During these underways, the CO should have time on the bridge and also observe piloting and navigation.
- (7) Determine, in conjunction with the Supervising Authority, the nature and extent of the post-repair Sea Trials. Review the Sea Trial Agenda, including the sequence and duration of each test. The CO will concur with the trial agenda, then the Supervising Authority will submit it to NAVSEA for concurrence and the TYCOM for approval. Provide copies of the approved detailed schedule and agenda for underway trials to the local ISIC, if appropriate, the escort ship and embarked TYCOM representative, if assigned. This schedule and agenda shall include:
- (a) The minimum requirements in paragraph 3.6.8.4.7 of this chapter.
  - (b) A firm time scheduled for the conduct of all tests and trials showing their sequence and duration.
  - (c) General prerequisites for the conduct of each test. Detailed prerequisites should be itemized as part of individual test requirements.
  - (d) Responsibility for the conduct of each test (industrial activity or ship).
  - (e) Support required from the operating forces for the conduct of each test.
  - (f) Provision for adequate crew rest time during Sea Trials. Opportunity for six uninterrupted hours of rest in each twenty-four hour period is a minimum for each member of the command.
  - (g) Provision for a minimum of six hours of uninterrupted independent ship exercises for crew training following the initial tightness dive and prior to the deep dive.
  - (h) Underway tests may be run during ISE and rest periods on a not-to-interfere basis. Specifically, tests which can be conducted underway under normal operating conditions without manning of special watch stations that require extra military personnel, may be scheduled during rest periods. Tests which will not interfere with Ship's Force drills and training exercises may be conducted during ISE periods.
- (8) Undergo a salvage inspection in accordance with Volume IV, Chapter 18 of this manual.
- (9) Conduct one day Ship's Force Dock Trials in accordance with paragraph 3.6.8.4.5 of this chapter.

- (10) Demonstrate the state of training of the crew in accordance with references (u) through (z).
- (11) Ensure that all pertinent alongside tests, inspections, and trials are conducted.
- (12) Certify to the designated ISIC/TYCOM representative that all salvage inspection discrepancies affecting safe conduct of Sea Trials have been corrected. Deliver a copy of the salvage plan to the escort ship, if required, and confer with the escort ship to coordinate communications and operational procedures, ensuring that the escort is fully informed as to the submarine's condition and intentions.
- (13) Concur with Supervising Authority message (reference (t), Appendix B.3.1) concerning Fast Cruise/Sea Trial readiness.
- (14) Report by message (Appendix CJ of this chapter) to the TYCOM that crew and ship are ready for Sea Trials. List exceptions such as completion of Fast Cruise, removal of shore power connections, etc.
- (15) When authorized by the TYCOM and, when permission has been granted by NAVSEA 08 for critical reactor operations, conduct a Fast Cruise in accordance with paragraph 3.6.8.4.6 of this chapter.
- (16) Concur with Supervising Authority message (reference (t), Appendix B.3.3) that Fast Cruise was successfully completed, all mandatory deficiencies for Sea Trials have been corrected and recommend commencement of Sea Trials.
- (17) Report completion of Fast Cruise to the TYCOM by message (Appendix CK of this chapter) and request permission to commence Sea Trials.
- (18) When all the requirements of this instruction are completed and permission has been received from the TYCOM, proceed to sea in accordance with operation order. At sea, carry out the approved Sea Trial Agenda and Schedule.

**NOTE: SUBSEQUENT TO THE MESSAGES, APPENDICES CF AND CH OF THIS CHAPTER, ANY DEFICIENCY DISCOVERED AND THE CORRECTIVE ACTION TAKEN WHICH AFFECTS THE WATERTIGHT INTEGRITY, THE RECOVERABILITY OF THE SHIP, THE OPERATIONS OF THE SHIP'S CONTROL SURFACES OR THE SHIP'S SALVAGE CAPABILITY SHALL BE REPORTED TO NAVSEA, TYCOM AND FLEET COMMANDER BY THE SUPERVISING AUTHORITY/ISIC/TYCOM REPRESENTATIVE BY MESSAGE. PREVIOUS CERTIFICATION MESSAGES SHALL BE SUSPENDED. WHEN A REVIEW OF THE DEFICIENCY IS COMPLETED BY NAVSEA FOR INDUSTRIAL ACTIVITY ITEMS AND TYCOM FOR SHIP'S FORCE ITEMS, NAVSEA WILL CERTIFY TO THE TYCOM THAT THE MATERIAL CONDITION OF THE PARTS OF THE SHIP COVERED BY THE INDUSTRIAL ACTIVITY AWP IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH. THE TYCOM IN TURN CERTIFIES THAT THE SHIP'S SUBSAFE CERTIFICATION BOUNDARY IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH.**

3.6.8.4.2 Type Commander Embarked Representative. For the first Sea Trial after a major industrial activity availability of a nuclear powered submarine, an unrestricted line officer (a former CO senior to the CO) normally provided by the ISIC/TYCOM will be the TYCOM embarked representative. This officer has the authority to act for the TYCOM in making on the spot changes to the approved Sea Trial Agenda. A TYCOM material representative may also be assigned. When assigned, he will serve as a technical advisor to the TYCOM embarked representative on matters pertaining to Sea Trial Agenda changes, compliance with this manual and disposition of emergent material deficiencies.

- a. During Sea Trials, assume the duties of Officer In Tactical Command unless otherwise designated by the ISIC. As Officer In Tactical Command, this officer must comply with direction found in Annex C of reference (q).
- b. When no officer senior to the CO is embarked for sea trials, the following officers shall act for the TYCOM in approving on-the-spot changes to the Sea Trial Agenda in the order of precedence listed:
  - (1) TYCOM material representative if embarked.
  - (2) Designated ISIC representative if embarked.
  - (3) Ship's CO.

**NOTE: SEA TRIAL AGENDAS ARE DEVELOPED AS A RESULT OF LESSONS LEARNED OVER A LONG PERIOD OF TIME. EVENTS AND SEQUENCES OF EVENTS ARE IMPORTANT AND SHOULD BE CHANGED ONLY AFTER THOROUGH DELIBERATION.**

3.6.8.4.3 Availability Completion Prerequisites. The following requirements will be included in the TYCOM "Countdown Message" outlined in paragraph 3.6.8.4.8 of this chapter:

- a. The Supervising Authority will report by message (reference (t), Appendix B.3.8) to NAVSEA, satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, and resolution of all NAVSEA SSCA Category IA recommendations. Report that the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory for URO to test depth. Identify any deferred SUBSAFE work and/or conditionally approved deviations and waivers.
- b. Following verification from the Supervising Authority of satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, and resolution of all NAVSEA SSCA Category IA recommendations, NAVSEA shall certify by message (reference (t), Appendix B.3.9) to the TYCOM, with information copies to CNO and the appropriate Fleet Commander, the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory, and recommend authorization for URO to design test depth subject to TYCOM verification that SUBSAFE certification of areas outside industrial activity AWP has been sustained.
- c. Following verification from NAVSEA of satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, certification that the SUBSAFE material condition of those parts of the ship installed, repaired and/or tested by the industrial activity is satisfactory, and upon confirmation of maintenance of SUBSAFE certification of portions of the ship not affected by the industrial activity, the TYCOM shall report by message (Appendix CG of this chapter) to ship, with copies to CNO and NAVSEA, reporting status of SUBSAFE certification and authorizing URO to test depth.

3.6.8.4.4 Inspection Procedures.

- a. Periodic Monitoring, Inspections, and Visits.
  - (1) Purpose.
    - (a) To provide to ships in availability such administrative and training assistance as is necessary to improve the Ship's Force conduct of the availability, maintenance and training tasks. Visits of this nature are termed Tech Assists.
    - (b) To evaluate the effectiveness of administration and training. Inspections of this nature are termed Work-Ups.

- (c) To conduct spot checks to monitor progress in specific material, administrative and training areas. Visits of this nature are termed Monitor Visits.
- (2) Discussion. The extent, type and frequency of periodic monitoring, inspections, and visits should be determined on a case basis by the responsible ISIC or TYCOM representative. The initial inspection should be broad in scope in order to appraise the responsible ISIC of the adequacy of the ship's performance and progress. Normally, the initial visit will indicate the necessary frequency and scope of subsequent Tech Assists and Monitor Visits. In general, any required Work-Ups should be scheduled in advance of Key Events during the availability.
- (3) Areas of Inspection Coverage. Initial inspections normally examine the effectiveness of Ship's Force preparations for an availability. Subsequent inspections and visits should review the following areas as appropriate for the purpose of the specific inspection.
- (a) Review procedures and administrative steps for provisional watch station qualifications.
  - (b) Review department organization manuals.
  - (c) Review department instructions and administrative procedures.
  - (d) Review ship's instructions and administrative procedures.
  - (e) Review department logs, operating instructions and casualty procedures.
  - (f) Review ship's standard operating procedures and the ship's organization and regulations manual.
  - (g) Review training conducted and planned to support the goal of requalifying or reestablishing proficiency of watchstanders.
  - (h) Monitor performance of watchstanding.
  - (i) Conduct spot check of ship's records and logs in use.
  - (j) Review Ship's Force controlled work (SUBSAFE, Level I and Nuclear) and procedures to ensure proper controls and documentation in accordance with this manual and no unauthorized work is conducted within the SUBSAFE boundaries.
  - (k) Review status of Ship's Force responsible PMS/IEM.
  - (l) Inspect installed equipment for cleanliness and adequate protection from damage.
  - (m) Review Tag-Out and Work Authorization Logs. Spot check for compliance in accordance with current directives.
  - (n) Inspect ship for hazards.
  - (o) Inspect provisions for casualty control including watertight integrity.
  - (p) Verify that all COSAL material including operating space items, have been off-loaded to processing areas which provide appropriate security.
  - (q) Inspect the processing area to verify provisions and procedures for careful ILO inventory.

- (r) Review response of supply system to requisitions in support of Ship's Force work.
  - (s) Verify that items are withdrawn from the ship's COSAL stock undergoing inventory/ILO only on an emergency basis and that such issues are well documented with appropriate adjustments to the inventory records.
  - (t) Evaluate general safety practices.
- (4) Scheduling of Periodic Monitoring, Inspection and Visits. Periodic Monitoring, Inspections, and Visits should be scheduled by the responsible ISIC as appropriate for the purposes of the inspection concerned. Some monitoring visits should be conducted on an unannounced basis. These inspections should be given so as to minimize interference with industrial activity and Ship's Force work.
- (5) Reports of Inspection. Formal reports of the results of periodic monitoring, inspection and visits are not required by the TYCOM. However, the responsible ISIC should advise the TYCOM in situations when the attainment of required progress toward completion of Key Events is in jeopardy.
- b. Pre-Critical Inspection.
- (1) Purpose. To evaluate the readiness of the engineering department to undergo a PORSE by the Fleet Commander Nuclear Propulsion Examining Board or a RSE by representatives from NAVSEA 08.
  - (2) Discussion. The conduct of the Pre-Critical Examination by the ISIC is not intended to duplicate the inspections for which readiness is being evaluated. It is considered prudent, however, to use an inspection plan similar to that employed by NAVSEA. Normally, the crew's readiness can be assessed within two days using such a plan, which should encompass the following:
    - (a) An administrative review.
    - (b) Observation of basic drills and evolutions not requiring reactor operation.
    - (c) Personnel interviews.
    - (d) Material inspection.

**NOTE: FOR SSBN/SSGN PRE-CRITICAL INSPECTIONS, THE CREW TO BE INSPECTED IS THE COMPOSITE CREW SELECTED FOR INITIAL CRITICALITY AND POWER RANGE TESTING.**

- (3) Scheduling of Pre-Critical Inspections. The ISIC Pre-Critical Inspection should normally be scheduled by the responsible ISIC about four weeks prior to criticality (non-refueling availability) and six weeks prior to initial criticality for an overhaul involving refueling. The TYCOM should be advised as soon as possible in advance of the tentative date for the ISIC Pre-Critical Inspection and confirmed dates should be established about one month in advance of the inspection.
- (4) Composition of the Inspection Team. The Pre-Critical Inspection Team should consist of:
  - (a) A nuclear trained member of the cognizant ISIC Staff, usually the Squadron Training Officer.
  - (b) A nuclear trained officer with experience as an Engineer Officer.

- (c) When available, a nuclear trained officer from the TYCOM's Staff will participate in ISIC Pre-Critical Inspections involving refueling. Arrangements for participation of the TYCOM Staff member should be initiated by the responsible ISIC at least one month in advance of the anticipated ISIC Pre-Critical Inspection.
- (5) Reports of Inspection.
- (a) The Senior Inspector should provide the inspected unit with an informal report of findings by the inspection team, copy to the cognizant ISIC and TYCOM.
  - (b) The ship's CO shall review the findings of the inspection team and make necessary adjustments to the training program to ensure the crew's readiness for the examination. The ship's CO shall keep the cognizant ISIC advised of the training plan and the assessment of the crew's progress.
  - (c) The cognizant ISIC shall review the inspection findings, the CO's training plan and progress evaluations, and direct follow-up reviews and/or inspections necessary to verify the ship's readiness for the examination.
- c. Phase I Certification Inspection.
- (1) Purpose. To determine the state of readiness and training of the Ship's Force, particularly in the areas of watchstander qualification, damage control readiness, status of operational and emergency bills, present onboard supply of essential technical manuals and general operational knowledge.
  - (2) Discussion. The guidelines for the Phase I inspection are provided in references (u) through (z). The intent of the inspection is to provide a preliminary estimate of readiness and to identify areas requiring action prior to final certification (Phase II).
  - (3) Scheduling of Phase I Certification Inspection. Phase I Inspections should be scheduled by the responsible ISIC about 35 days before scheduled initial Sea Trials.
    - (a) Chief Inspector - ISIC representative of appropriate seniority.
    - (b) Assistant Chief Inspector - a submarine CO.
    - (c) Assistant inspectors for the following departments/areas - overall training, executive, operations, navigation, communications, weapons, first lieutenant, engineering and material.
    - (d) The inspector for the engineering areas of nuclear powered submarines will be a nuclear trained officer qualified as an Engineer Officer.
  - (4) Reports of Inspection.
    - (a) The Chief Inspector shall provide the inspected ship with an informal report of findings by the inspection team.
    - (b) In the event that inspection results indicate the readiness for final (Phase II) certification in the required time cannot be assured, the responsible ISIC should advise the TYCOM of the circumstances.

- d. **Material Inspection.** Prior to certifying commissioned ships' readiness for at-sea operations, conduct a material inspection to determine that the ship is materially ready for at-sea operations in accordance with Volume V of this manual. In addition, on all ships conduct a Salvage Inspection in accordance with Volume IV, Chapter 18 of this manual. Results of material inspections should be reported with Phase II crew certification reports.
- e. **Phase II Certification Inspection.**
  - (1) **Purpose.** To certify that the state of training of the crew is satisfactory for at-sea operations.
  - (2) **Discussion.** The requirements for Phase II certification inspection are provided in references (u) through (z).
  - (3) **Scheduling of Phase II Certification Inspections.** Phase II inspections should be scheduled by the responsible ISIC about nine days prior to Sea Trials.
  - (4) **Composition of the Inspection Team.** The requirements for Phase II Certification Team composition are the same as those for Phase I.
  - (5) **Reports of Certification.** The Phase II Certification and Material Certification Reports are combined and submitted in accordance with Appendix CB of this chapter.

3.6.8.4.5 Dock Trials. Ship's Force Dock Trials provide the opportunity to test and check out systems, components and portable equipment prior to the Fast Cruise training period simulating underway conditions. Although normally a period of one day is assigned for integrated Ship's Force Dock Trials, tests and evolutions performed in the one to two weeks prior to the Dock Trial date may be accepted by the CO as fulfilling the requirements of this paragraph. The purpose of Dock Trials is to afford the ship an opportunity to demonstrate that major systems and equipments are in fact ready to support Sea Trials. It is expected that individual equipments will have been satisfactorily tested prior to commencement of the integrated operational tests afforded by Ship's Force Dock Trials. Appendix L of this chapter lists the minimum requirements for Dock Trials and will be used by the ship's CO in preparing for and conducting Dock Trials.

3.6.8.4.6 Fast Cruise. The overall objective of the Fast Cruise is to train the crew and determine the crew's ability to take the ship to sea safely. In addition to the normal underway routine, the CO shall have all equipments operated to check for proper operation and to determine the state of training of the crew. Fast Cruise shall, as far as is practicable, simulate at sea operating conditions. It is to be conducted by the Ship's Force and is to be unhampered by repair work or by movement of industrial activity personnel through the ship. The Supervising Authority shall **not** schedule any trials, tests or other work to be performed on the ship during this period. The Fast Cruise should be four days in duration for nuclear ships and two days for non-nuclear submarines. It should be completed within a five-day period. It should end not more than three days prior to underway trials. Normally, the ship will go to sea for underway trial within a day after completion of Fast Cruise. Should the 72 hour period be exceeded, the TYCOM may direct an additional Fast Cruise. The parent ISIC will make formal recommendations to the TYCOM as to the desired period of Fast Cruise. Appendix M of this chapter lists the minimum requirements for Fast Cruise and will be used by the ship's CO in preparing for and conducting Fast Cruise. Additional drills and operations are at the discretion of the ship's CO. The ship shall be operated as if underway, simulating the various evolutions required for safe operation of the ship. Each underway section shall be exercised in the evolutions which are normally performed on a section basis. During each evolution, check out all communication systems. Ensure that each is in proper working order and that, where duplicate systems exist, a priority system is designated.

3.6.8.4.7 Sea Trials. Appendix O of this chapter delineates the minimum requirements incident to Sea Trials following industrial activity availabilities. For submarines, following completion of Fast Cruise the ISIC will notify the TYCOM of satisfactory completion of Fast Cruise and readiness for Sea Trials using the message format of Appendix CH. The submarine TYCOM will authorize the ISIC to allow the ship to get underway for Sea Trials using the message format of Appendix CF. The submarine CO will keep the TYCOM aware of the progress of the Sea Trial through periodic SITREPs using the message format of Appendix CP of this chapter. SITREPs will be

submitted following completion of the initial tightness dive, following completion of the deep dive to test depth and daily at a minimum and as identified by the TYCOM or the Sea Trial Agenda. Sea Trials following availability are normally conducted with a significant number of "riders". These riders represent NAVSEA, TYCOM and Shipbuilder personnel onboard to observe various tests and trial evolutions. The ship's normal loadout of Lithium Hydroxide canisters, Lithium Hydroxide curtains, EAB masks, SEIE suits and oxygen candles is not sufficient to support this increase in personnel. Therefore, an additional four Lithium Hydroxide canisters, four Lithium Hydroxide curtains, one EAB mask, one SEIE suit and two oxygen candles shall be carried for each rider exceeding normal crew manning. Lithium Hydroxide canisters, EABs, SEIE suits and Lithium Hydroxide curtains are to be obtained from the industrial activity. The Supervising Authority and ship's CO will use Appendix O of this chapter in preparing for and conducting Sea Trials.

- a. Assignment of Escort Ship. An escort is required for:
  - (1) Initial tightness and deep dives after a major industrial activity availability, including EMBT blow at the completion of each of these dives.
  - (2) Any EMBT blow from greater than 400 feet. Rationale is to give submarine added protection to prevent interference from any surface contact.

**NOTE: IN ALL CASES, HULL STRENGTH/TIGHTNESS AND VALVE OPERATIONS WILL HAVE BEEN TESTED TO A DEPTH EQUAL TO OR GREATER THAN EMBT BLOW DEPTH BEFORE TESTING EMBT.**

- (3) For second and subsequent underway periods if major hull or sea connected system work has been accomplished since last Sea Trials.
- b. Escort Ship Capability Requirements. The surface escort ship must have the following capabilities with the necessary equipment in an operating condition:
  - (1) Radio Communication:
    - (a) Ability to transmit and receive on two UHF and on HF circuits simultaneously including 243.0 MHz or equivalent system capabilities (Very High Frequency (VHF) and INMARSAT-C).
    - (b) Equipped to tape record all non-secure radio transmissions between the submarine and the escort.
    - (c) Capability to communicate on the submarine HF/UHF or equivalent system capabilities (VHF/INMARSAT-C) circuits.
  - (2) Sonar and Sonar Communications:
    - (a) Equipped with underwater telephone capable of communicating to the submarine's test depth or equivalent system capabilities.
    - (b) Sufficient operators to man underwater telephone on a continuous basis, including CW capable operator on call if the requirement for CW communications develops.
    - (c) Equipped to tape record (installed or portable) all transmissions between the submarine and the escort by underwater telephone.
    - (d) Explosive charge signals or active sonar called for by AXP-1.

- (3) Navigation:
  - (a) Equipped with an operable LORAN C, Global Positioning System (GPS) or the latest accurate off-the-shelf navigational equipment.
  - (b) Equipped with an operable Dead Reckoning Tracers or equivalent system capability.
  - (c) Possess navigational capability to fix his position to two mile average accuracy.
  - (d) Fathometer.
  - (e) Gyrocompass.
  - (f) Underwater log or equivalent system capability.
  
- (4) Sea Keeping and Speed:
  - (a) Ability to remain at sea for one week in State 6 seas.
  - (b) Be capable of making 10 knots. Escorts will keep the submarine informed of any speed/sea state limitations. In addition, if the escort has an unfaired WQC hydrophone, it shall notify the submarine of the maximum sea state and speed which will not restrict WQC communications. If the submarine requires a speed above this limit, the submarine should run a track about the escort within WQC range.
  
- (5) When an escort ship is other than another submarine, the ISIC will designate a minimum of one officer qualified in submarines (Gold Dolphins) and ensure a sufficient number of officers qualified in submarines (Gold Dolphins) will be embarked during the escort duty. An escort is not required on Board of Inspection and Survey (INSURV) trials since the EMBT blow is done in accordance with applicable URO MRC vice from maximum authorized operating depth.
  
- (6) Assignment of SRDRS During Submarine Sea Trials.
  - (a) A SRDRS will be placed in a modified-alert status at the beginning of Sea Trials requiring an escort following an industrial activity availability or major maintenance period for:
    - 1 The ship's initial tightness and deep dive event.
    - 2 Subsequent Sea Trials until the completion of the initial dive to design test depth.
    - 3 If, in the TYCOM's judgment, a Sea Trial requires an escort due to major hull cuts, etc. The TYCOM shall obtain NAVSEA concurrence when determining the need for escort/SRDRS services.
  - (b) The ship conducting Sea Trials will notify COMSUBDEVRON FIVE in Silverdale, WA and COMNAVSEASYSYCOM when SRDRS services are no longer required due to completion of the events in paragraph 3.6.8.4.7(6)(a) of this chapter or due to delay in completing Sea Trials.
  - (c) The SRDRS is not required to be placed in a modified alert status for those Sea Trials requiring an escort solely for the accomplishment of an EMBT blow from depths greater than 400 feet.

- (7) A modified alert message will be sent by the industrial activity with the required SRDRS support dates 6 weeks prior to the requested date. Any changes in this request date will require immediate notification to the Fleet Commander, COMNAVSEASYSKOM and COMSUBDEVRON FIVE. Sample messages in Appendix BN and CQ of this chapter.

3.6.8.4.8 Interrupted/Additional Sea Trials. In the event a Sea Trial is interrupted, or an additional Sea Trial becomes necessary, the following requirements are to be met. These requirements shall be invoked if the ship returns to port for industrial activity repairs which affect SUBSAFE certification or which will require at-sea testing. These requirements will be reiterated by the TYCOM via a special "Countdown Message" Appendix CL of this chapter when the need arises:

- a. The industrial activity will draft a revised Sea Trials Agenda to support resumption of the trials. This Agenda shall be provided to NAVSEA for concurrence and TYCOM for approval.
- b. The ISIC shall report by message (format of Appendix CM of this chapter) to the TYCOM that the material condition of those SUBSAFE Certification boundaries that were installed, repaired and/or tested by Ship's Force is satisfactory for resuming Sea Trials.
- c. The Supervising Authority shall provide a report, by message (reference (t), Appendix B.3.5), to NAVSEA (information copy to the TYCOM) that the material condition of the systems installed, repaired and/or tested by the industrial activity is satisfactory for resumption of Sea Trials. As a minimum, the report should state the status of all incomplete Category IA Audit Items resulting from the NAVSEA SSCA and that all SUBSAFE work has been performed in accordance with the requirements of reference (t).
- d. The CO of the ship shall provide a report by message (format of Appendix CN of this chapter) to the TYCOM stating that the crew and ship are ready for Sea Trials. Any exceptions are to be listed in this message.
- e. NAVSEA (PMS 392), upon receipt of the Supervising Authority report, shall recertify the material condition of the ship for operation to a specific operating depth for Sea Trials and report recertification by message (reference (t), Appendix B.3.6) to the TYCOM.
- f. Upon completion of all of the requirements in paragraphs 3.6.8.4.8.a. through e above, the TYCOM will provide a message (Appendix CO of this chapter) to the ship granting permission to proceed with the conduct of Sea Trials and authorize the ship to dive to the Sea Trial operating depth recommended by NAVSEA.

3.6.8.4.9 Availability Completion Prerequisites. Upon completion of Sea Trials and correction/resolution of deficiencies, the following requirements must be met prior to completion of an industrial availability greater than six months duration. These requirements will be reiterated in the TYCOM "Countdown Message" Appendix CD or CL of this chapter:

- a. The Supervising Authority shall report by message (reference (t), Appendix B.3.8) to NAVSEA, satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory sea trial deficiencies, and resolution of all NAVSEA SSCA Category IA recommendations. Report that the SUBSAFE material condition of the ship installed, repaired, and/or tested by the industrial activity is satisfactory for URO to test depth. Identify any deferred SUBSAFE work and/or conditionally approved deviations and waivers.
- b. Following verification from the Supervising Authority of satisfactory completion of all Sea Trials, completion of controlled dives, correction of all mandatory Sea Trial deficiencies, and resolution of all NAVSEA SSCA Category IA recommendations, NAVSEA shall certify by message (reference (t) Appendix B.3.9) to the TYCOM, with information copies to CNO and the appropriate Fleet Commander, the SUBSAFE material condition of those parts of the ship installed, repaired, and/or

tested by the industrial activity is satisfactory, and recommend authorization for URO to design test depth subject to TYCOM verification that SUBSAFE certification of areas outside the industrial activity AWP has been sustained.

- c. Following verification from NAVSEA of satisfactory completion of all sea trials, completion of controlled dives, correction of all mandatory sea trial deficiencies, certification that the SUBSAFE material condition of those parts of the ship installed, repaired, and/or tested by the industrial activity is satisfactory, and upon confirmation of maintenance of SUBSAFE certification of portions of ship not affected by the industrial activity, the TYCOM shall report by message (Appendix CG of this chapter) to the ship, with copies to CNO and NAVSEA, reporting status of SUBSAFE certification and authorizing URO to test depth.

### 3.7 COMPLETION OF AVAILABILITY.

- a. (Surface Ships and Aircraft Carriers) In order to standardize reporting practices, the official end of a CNO Availability will be upon completion of the TYCOM approved Sea Trials Agenda. Ships shall report Sea Trial Completion in the form of Appendix F1 or Appendix F2 of this chapter.
- b. (Submarines only) CNO availabilities are complete when the TYCOM transmits one of the two following messages:
  - (1) Appendix BO of this chapter. (SAMPLE TYCOM MESSAGE TO SHIP CONCERNING URO FOR INDUSTRIAL ACTIVITY AVAILABILITIES LESS THAN SIX MONTHS IN DURATION (SUBMARINES ONLY)).
  - (2) Appendix CG of this chapter. (SAMPLE TYCOM MESSAGE TO SHIP CONCERNING URO FOR INDUSTRIAL ACTIVITY AVAILABILITIES GREATER THAN SIX MONTHS IN DURATION (SUBMARINES ONLY)).

### 3.8 AVAILABILITY COMPLETION DEPARTURE CONFERENCE.

3.8.1 Departure Conference and Availability Completion Message. At the end of the availability, the Supervising Authority, FMA (if applicable), and Ship's Force will conduct a Departure Conference to finalize the status of all work performed during the availability. The conduct of this conference is similar to that of the Progress Reviews conducted in accordance with paragraph 3.6.3.1.b. of this chapter, and should be used to gather all necessary information to draft and send the Availability Completion Message. As a minimum, the Availability Completion Message should address all areas addressed in the Weekly Progress Message, Appendices F1 or F2 of this chapter as applicable, as well as the following:

- a. Unresolved maintenance issues and guarantee work items.
- b. Report of configuration changes resulting from alterations installed during the availability.
- c. Summarize the NAVSEA waivers issued during the availability.
- d. Identify those work candidates that will be deferred until the next industrial availability.

### 3.9 POST AVAILABILITY.

3.9.1 Completed Availability Work Package. Within six months after the completion of the availability, SUBMEPP (Submarines)/PMS 312C (Aircraft Carriers)/applicable TYCOM (all other Surface Ships) will issue the Completed Work Package.

## APPENDIX C

## TYPICAL CNO AVAILABILITY PLANNING MILESTONES

(AIRCRAFT CARRIERS ONLY)

MILESTONE	RESPONSIBILITY		
		PIA/DPIA	FDNF
1. RECEIVE/DETERMINE BUDGET CONTROL FOR CNO AVAILABILITIES		C+0	
2. PROVIDE COMP RPT TO PMS 312C/RPPY	TYCOM MPM	C+1	
3. ISSUE BAWP FDR	PMS 312C	C+1	
4. ISSUE AVAILABILITY DEPARTURE REPORT	NAVSHIPYARD	C+1	
5. CONDUCT CAMPR	PMS 312C	C+2	A-19
6. ISSUE ADVANCED PLANNING LETTER GUIDANCE/LETTER OF AUTHORIZATION	PMS 312C	C+3	A-18
7. DELIVER DRAFT BAWP	PMS 312C	C+4	
8. CONDUCT PRE-RELEASE BAWP REVIEW	PMS 312C TYCOM MPM NAVSHIPYD	C+4.5	
9. 312C DELIVERS BAWP	PMS 312C	C+5	A-16
10. INITIAL MAINT PLANNING MEETING	TYCOM MPM	A-17	A-15
11. TASK CORE WORK; RECEIVE CORE WORK (PUBLIC SHIPYARD AND MSMO)	TYCOM MPM	A-17	A-15
12. INITIAL BAWP CHANGE REQUEST SUBMITTAL	TYCOM MPM	A-15	A-13*
13. A-12 CONFERENCE	TYCOM MPM NAVSHIPYD	A-12	(NR13)A-12
14. START CAPS PROCESS/MCA	TYCOM MPM NAVSHIPYD	A-12	(NR14)A-7
15. ESTIMATES BACK FROM SHIPYARD	TYCOM MPM NAVSHIPYD	A-12	(NR14)A-7
16. SCREEN ALL KNOWN WORK	TYCOM MPM NAVSHIPYD	A-9	A-7
17. COMPLETE CAPS PROCESS	TYCOM MPM NAVSHIPYD	A-9	A-7
18. CONDUCT PRC 1	TYCOM MPM NAVSHIPYD	A-9	A-7
19. INTERMEDIATE BAWP CHG REQUEST SUBMITTAL	TYCOM MPM	A-8	A-7*

MILESTONE	RESPONSIBILITY	PIA/DPIA	FDNF
20. AT 50%, REVIEW PICKLIST	TYCOM MPM PROJECT TEAM PMS 312	A-7	A-5
21. MRA 1	TYCOM MPM PROJECT TEAM PMS 312	A-7	A-5
22. CONVENE PRC 2	TYCOM MPM PROJECT TEAM	A-5.5	A-3
23. SCREEN ALL KNOWN WORK		A-4	A-3*
24. CLASS C ESTIMATES BACK FROM SY			
25. FINAL BAWP CHANGE REQUEST SUBMITTAL			
26. MRA 2	TYCOM MPM PROJECT TEAM PMS 312C	A-3	A-2
27. AUTHORIZE FINAL AWP	TYCOM MPM NAVSHIPYD RMC	A-2	A-2
28. POETS/MCAI COMPLETE	TYCOM MPM NAVSHIPYD RMC	A-2	A-2
29. MSMO WORK CONTRACTED	TYCOM MPM NAVSHIPYD RMC	A-2	A-2
30. INCORPORATE RESULTS OF POET/MCAI INTO AWP	TYCOM MPM NAVSHIPYD RMC	A-2	A-2
31. FINAL REVIEW ESTIMATE (FRE) ESTABLISHED	TYCOM MPM NAVSHIPYD	*A-1	A-1
32. START AVAILABILITY		A-0	A-0

\* THE FINAL REVIEW ESTIMATE (FRE) IS DELIVERED 30 DAYS PRIOR TO EXECUTION OF INDUSTRIAL WORK, BUT NO LATER THAN 30 DAYS PRIOR TO THE CNO AVAILABILITY START DATE.

**APPENDIX K****MINIMUM TESTS TO BE PERFORMED DURING SEA TRIALS****(SURFACE SHIPS ONLY)****I. RESPONSIBILITIES** (reference (ap), Chapter 094).

The Ship's Force or Ship Trial Coordinator is responsible for:

1. The scheduling of the various trials and for conducting tests during trials while underway. A schedule of equipment tests should be available so all personnel are prepared for the evolutions.
2. Equipment operation during testing and for conducting the trials in accordance with reference (s) and TYCOM directives.
3. Verifying necessary trial documentation and technical data is on board.
4. Review of Personnel Qualification Standard (PQS) programs to identify new equipment and systems requiring PQS coverage, to implement PQS standards for new personnel, and to determine required watch station qualification in preparation for propulsion plant light-off and Sea Trials.
5. Providing a Sea Trial watch organization to accomplish the trial agenda.
6. Preparing and providing fire and abandon ship bills and holding emergency underway drills (can be completed and certified as part of Dock Trials or Fast Cruise).

**II. PREPARATION FOR SEA TRIALS** (reference (ap), Chapter 094c).

Prior to Sea Trials, every reasonable effort shall be made to complete all prerequisites:

1. Docksides tests shall be satisfactorily completed and all safety requirements met. Incomplete non-safety items shall be documented, including plans for timely resolution and completion. Should it be impractical to conduct any of these prerequisite tests docksides, the Naval Supervisory Authority (NSA) may permit the test to be conducted while underway.
2. All equipment, furniture and systems necessary to the conduct of the trials shall be installed and in operating condition. All labeling, painting, sheathing, insulation and deck covering shall be completed.
3. An inclining experiment, if required, shall be performed and the results certified in writing to the NSA that the ship meets stability requirements and is safe for sea.
4. All temporary rigging and equipment, except that necessary for collection of Sea Trial test data, and all debris shall be removed from the ship.
5. Painting that will not be dry at time of trials shall be avoided.
6. Messing, sanitary and berthing facilities shall be operational and available for use during Sea Trials.

7. The ship shall be prepared for possible emergencies at sea. The NSA shall certify in writing that equipment or systems listed that have been installed, overhauled or disturbed during the overhaul have been restored to their normal operating status. The minimum readiness includes:
  - a. Power boats to be utilized in an emergency shall be fully operational, fitted-out and provisioned as prescribed by reference (aq).
  - b. All davits shall be operational.
  - c. Air inflatable lifeboats shall be onboard and properly installed and within PMS certification requirements.
  - d. Emergency radios shall be onboard and operable.
  - e. Life rings and float lights shall be rigged in stowage brackets.
  - f. Life jackets for all personnel embarked plus 5 percent spares shall be onboard and distributed in readily accessible areas.
  - g. Adequate first aid kits and emergency medical equipment shall be onboard.
  - h. Fire fighting and damage control equipment shall be returned to the ship (if removed), verified to be fully operational/ready for use and properly stowed.
  - i. All navigation devices and equipment shall be tested to ensure proper operation.
  - j. Work on all compartments whose water tight integrity is essential to the safety of the ship shall be completed and, where authorized, satisfactorily tested.

### III. PRIOR TO GETTING UNDERWAY.

1. Prior to Sea Trials following extended in-port or lay-up time, the following preliminary inspections should be conducted (reference (s), section 1.3.2):
  - a. Inspect the underwater sea chests.
  - b. Clean the sea chests of marine growth and debris if required.
  - c. Inspect underwater hull for foreign material or objects.
  - d. Inspect and clean as necessary condenser sea water sides.

**NOTE: CVNS IN JAPAN HAVE THEIR HULLS INSPECTED PER QUARTERLY REQUIREMENTS SET BY NAVSEA.**

  - e. Ensure correct hoses for blowing sea chests are available on board and can be made up to hose connections provided for this purpose.
  - f. Establish operability of each item of machinery to be used during the trial.
    - (1) Test equipment to validate minimal equipments available to conduct operations in accordance with technical specifications.

- (2) Specific emphasis should be placed on fire pumps, anchor equipment and steering systems.
2. Ensure instrumentation to be used for obtaining trial data is properly installed, calibrated and certified.
- a. The NSA shall determine, in conjunction with the Commanding Officer, any special instrumentation required such as flow meters, torsion meters and calorimeters. Government Loaned Equipment may be made available with NAVSEA approval. The NSA will ensure the installation of any other temporary test instrumentation and equipment necessary for the trials except as otherwise stated herein or as indicated on the list of Government Furnished Equipment.
  - b. Unless otherwise specified, the NSA shall ensure the installation of all temporary instrumentation and equipment regardless of who furnished it. All temporary instrumentation and equipment shall be removed from the ship by the NSA upon conclusion of the trial. It shall be the NSA's responsibility to maintain Government Loaned Equipment in proper working order. The NSA shall calibrate, test and otherwise ensure both temporary and permanent instrumentation utilized to collect data for trials is reliable. Government furnished flow meters on loan from Naval Ship Systems Engineering Station Philadelphia will be calibrated by Naval Ship Systems Engineering Station.
  - c. Verify proper installation, adjustment and operability of torsion meter, if installed (reference (s), section 1.4.1.f).
  - d. Care shall be taken that proper draft and trim of the ship are maintained throughout the duration of the trial (reference (s), section 1.4.1.g).
    - (1) Firefighting systems shall be completely installed, tested and placed in operating condition before the ship is fueled.
    - (2) Fuel ship and adjust draft and trim to attain trial requirements.
  - e. Prior to departure, check all communications equipment, including radio, interior communications circuits, telephones and special signal circuits that may be used during the trial.
  - f. Zero set EM log.
  - g. Settle Navigation System and gyrocompass.
  - h. Test arresting gear systems, including barricade (as applicable).
  - i. Test Visual Landing Aid systems (as applicable).
  - j. Conduct static JP-5 System Certification. Test Control Console functions and conduct system stripping, transferring and purifying operations, as necessary, in preparation for underway systems dynamic operations.

#### IV. UNDERWAY ENGINEERING AND OTHER MAJOR TESTS.

1. The following systems shall be tested to the extent authorized in the NSA's Work Package and test procedures identified in the trial agenda and be in an operating condition at the time of Sea Trial (reference (ap), Chapter 094c). Table 1 summarizes general items. Procedural precedence is current PMS, equipment technical manuals and NAVSEA technical manuals procedures:
  - a. Newly installed, modified or overhauled ventilating, heating and air conditioning systems.
  - b. Newly installed, modified or overhauled firefighting systems and damage control equipment.
  - c. Newly installed, modified or overhauled alarms and safety devices.
    - (1) All alarm systems shall be operative.
    - (2) Gages and safety devices shall be checked and all final adjustments completed in accordance with technical specifications.
    - (3) SSTG Resistance Temperature Element settings may be made according to reference (ar), Table 231-3-2 during dockside testing at 0 to 100 percent load or during Sea Trials, whichever gives the highest temperature reading (reference (ar), section 3.10.3.4.1-.3).
  - d. Newly installed, modified or overhauled interior communication systems.
  - e. Newly installed, modified or overhauled radio and navigation systems.
2. Propulsion systems.
  - a. Particular attention shall be paid to boiler water treatment levels during Dock and Sea Trials. Additional tests of water chemistry and increased bottom blowdown frequency shall be planned (reference (as), section 2.4.12).
  - b. A full power run shall be scheduled following each regular maintenance availability to ascertain the propulsion plant is capable of full power operation. The following general rules shall be observed during all full power trials and during other machinery trials to which they may be applicable, consistent with conditions imposed (reference (s), section 1.4.1.e):
    - (1) In diesel powered ships not required to be fitted with torsion meters, brake horsepower developed by the main propulsion engines may be closely approximated by careful observations of fuel injection rack positions and compared with data taken during shop tests, where output has been previously measured directly on a dynamometer, or equivalent.
    - (2) Fuel used for the trials should be comparable to that used during shop tests.
    - (3) Average power developed by diesel-electric plants may be computed from kilowatt output from each propulsion generator set. Such observations shall be taken at intervals of not greater than 15 minutes for the duration of the run.

- (4) In ships required to be fitted with torsion meters, readings of torque and RPM should be taken at sufficiently frequent intervals to produce an essentially continuous record. The record should be averaged at 15-minute intervals, for the duration of the run.
3. Main lube oil systems: Post-availability Sea Trial operations will normally jar and vibrate the lube oil system enough to break loose foreign material hidden in the system, even after flushing. To contain this foreign material, muslin or nylon bags shall be kept in the lube oil strainers from initial operation through final Sea Trials (reference (ar), section 3.10.3.4.3). Filter bags and disposable filters shall remain in propulsion machinery lubricating oil systems until Sea Trials are completed, except where 25 or 40 micron filter elements are required for the propulsion lubricating oil system, remove the disposable filter elements and install the applicable cleanable filter elements upon completion of Sea Trials (reference (at), section 3.7.3.5.2).
  4. Reduction gear systems for new and overhauled gears: At the first Sea Trial, determine proper tooth contact of main pinions and gears and conduct operational tests. After trials, in addition to inspections that may be directed by the proper authority, remove the inspection plates and examine the tooth contact and the condition of the teeth to note changes that occurred during the trial (reference (au), section 5.3.9).
  5. Turbine casing joints: Experience has shown when new bolting is installed, particularly steam chest bolting exposed to temperatures above 900°F, the bolting shall be rechecked and retightened after initial dockside steaming and again after Sea Trials following the overhaul (reference (ar), section 8.7.6).
  6. Turbine bearing Resistance Temperature Element Settings: Make the initial settings before initially operating the bearing. Make the final settings before the Inspection Survey (INSURV) Trial or final Post Overhaul Trial if an INSURV Trial is not run. Base these settings on the highest values observed from the ship Sea Trials or shipbuilder test form data taken during all previous trials (reference (ar), section 3.10.3.4.2).
  7. Propulsion demonstrations (reference (ap), Chapter 200f).
    - a. Runs ahead at various power levels, using all main propulsion unit combinations, including cruising speed and maximum full-power ahead.
    - b. Runs astern, using all main propulsion unit combinations, including maximum full-power astern.
    - c. For Builder's Sea Trials only: Emergency reversals and crash stops, including maximum design full-power ahead to maximum design full power astern and vice versa.
    - d. Maximum speed steering gear tests ahead, limited speed steering tests astern and such other ship maneuvering tests as the specifications may require.
    - e. Twenty percent boiler overload test on one boiler (as applicable).
    - f. Boiler flexibility tests (as applicable).
    - g. Locked-shaft tests (as applicable).
  8. Anchor gear demonstration (including towing winch demonstration, if installed) (reference (av), section 3.8.1).
    - a. Complete all inspections, repairs and adjustments prior to conducting drop tests.

- b. Conduct drop tests by or under the direction of experienced personnel from the repair activity.
- c. Conduct drop test in accordance with the test agenda based on type of repairs conducted. Do not allow more than 15 fathoms (90 ft) of chain to run free without stopping. Observe the 65 fathom (390 ft) maximum depth for the drop test.

**NOTE: 65 FATHOM DROP TEST IS ONLY REQUIRED FOR NEW INSTALLATIONS AND TYPICALLY CONDUCTED AT ORIGINAL SHIP DELIVERY BUILDERS'S SEA TRIALS.**

- d. Conduct anchor retrieval rate test to determine adequacy of power units.
9. Distilling plant test: Conduct twenty-four-hour production capacity check. A shorter test period is permissible with concurrence of the NSA and so indicated in the trials agenda (reference (aw), section 7.7.6.3.5).
  10. Steering gears: Ensure limits are determined (or have been determined) during current or previous Sea Trials and are posted on the ship control console and in the steering gear room (reference (aw), section 2.2.3).
    - a. Reference (ax), Table 562-2-1 lists the astern limits for several (but not all) ship classes and may be used as a reference. Any limits posted on the ship control console or in the steering gear room shall be strictly followed.
    - b. Conduct an analysis of the hydraulic fluid contamination by a naval test facility as required in accordance with PMS or whenever one of the following conditions exists:
      - (1) Immediately before the first Sea Trials following a maintenance availability.
      - (2) Immediately after Sea Trials following a maintenance availability.
  11. Auxiliary propulsion units/Thruster engines: Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications (reference (s), section 1.4).
  12. Electrical ship service generating and distribution system: Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications (reference (s), section 1.4).
  13. Surface ship stabilizing devices: Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications (reference (ay), section 7.9.4.4).
    - a. Conduct an analysis of the hydraulic fluid contamination by a naval test facility as required in accordance with PMS or whenever one of the following conditions exists:
      - (1) Immediately before the first Sea Trials following a maintenance availability.
      - (2) Immediately after Sea Trials following a maintenance availability.
  14. Washdown countermeasures and miscellaneous topside demonstrations: Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications (reference (s), section 1.4).

15. Ballast or deballast ship (when applicable): Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications (reference (s), section 1.4).
16. Sonar, radar and navigation system demonstrations. Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications.
17. Underway replenishment demonstrations: Conduct testing (including special winch tests, as applicable) in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications.
18. Other demonstrations and tests: Conduct testing in accordance with the trial agenda based on scope of repairs conducted in accordance with the NSA's contract specifications. Consideration should also be given to those equipments repaired or overhauled by Ship's Force and subsequent testing is required to validate operability. These items may be tested or demonstrated during Sea Trials providing:
  - a. Such tests do not significantly extend the duration of Sea Trials.
  - b. Such tests are within the capability of Ship's Force.
  - c. Such tests have a prescribed PMS MRC procedure or an equivalent procedure provided by Ship's Force or in service engineering agent which has technical authority concurrence.

V. AIRCRAFT OPERATIONS (IF APPLICABLE).

1. Certify Aircraft Launch and Recovery Equipment (as required).
2. Conduct flight deck certification (as applicable) in accordance with applicable TYCOM instructions (reference (az)).

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- (19) Perform both a low pressure blow and an EMBT blow for as long as necessary to verify system operability. A static blow shall not be used to test the EMBT blow system. For SSN 23 only: Additionally, perform an MBT 6 normal blow from the BCP for a minimum duration of 2 seconds to verify that air flows into MBT 6 as indicated by a reduction in air bank pressure. For SSBN/SSGN 726 Class submarines only: Additionally, perform a high pressure blow for as long as necessary to verify system operability.
  - (20) Check that initial EMBT Blow system actuating air pressure and air bank pressure is within +0 PSIG, -200 PSIG of nominal operating air pressure.
  - (21) Ensure all MBT blow systems are in a normal line up configuration.
  - (22) Additional requirements may be imposed at the discretion of the CO.
- b. The following tests and evolutions shall be carried out immediately prior to or during the initial tightness dive:
- (1) Obtain navigational fix and take sounding. Maximum depth of water is 400 feet as specified in reference (q).
  - (2) Rig ship for deep submergence. Line up propulsion plant for maximum reliability. All systems shall be in the maximum secure condition with unnecessary sea systems isolated (See Note 3).
  - (3) Station additional personnel throughout the ship to inspect for leaks.
  - (4) Transmit commencing initial tightness dive message. Submerge the ship per the Ship Systems Manual Operating Procedures. If desired to conduct periscope depth tests, the ship may be submerged to periscope depth.
  - (5) Check operation of ship control systems, including depth indication (See Note 4).
  - (6) When escort is required, communicate with escort on RAC/WQC at each depth increment or at 10 minute intervals, whichever is sooner. If communications are lost, return to depth at which communications can be established before continuing (See Note 2).
  - (7) All hands inspect for leaks and report them.
  - (8) Inspect the discharge of all automatic drains in each EMBT Blow quadrant for sea water leakage prior to the first dive when the ballast tanks are flooded (e.g., at periscope depth).
  - (9) At periscope depth, operate all masts checking optics and leakage. Observe speed and depth restrictions for masts without violation of the SOE (See Note 5). Event may be performed following initial dive, if sea state prevents operation at periscope depth.
  - (10) Test operation of trim and drain system discharging to sea.
  - (11) If not at 150 feet for SSN 688 Class submarines (155 feet for SSN 774 Class submarines), (160 feet for SSBN/SSGN 726 and SSN 21 Class submarines), proceed to 150 feet for SSN 688 Class submarines (155 feet for SSN 774 Class submarines), (160 feet for SSBN/SSGN 726 and SSN 21 Class submarines) and obtain SAT 1/3 trim in accordance with the Ship's Operating Manual. Take readings as required to make a check of ballasting.
  - (12) At 200 feet:
    - (a) Adjust trim (See Note 6).

- (b) Inspect for leaks.
  - (c) Communicate with escort at each depth increment or at 10-minute intervals, whichever is sooner. If communications are lost, return to depth at which communications can be re-established before continuing (See Note 2).
- (13) At 200 feet, in accordance with reference (ae):
- (a) Check accuracy of gauges and repeaters (See Note 4).
  - (b) Evaluate signal ejectors or launchers. Conduct operational test of each by hand and impulse methods, as applicable (See Note 7).
  - (c) Check shafting bearings and stern tubes for excessive heating, leakage and noise. Main shaft seals must be tested at each depth specified in reference (ae) testing one seal for 20 minutes, and shifting to the other seal. Test the second seal for 20 minutes or until the boat is ready to go to the next depth, whichever comes first.
  - (d) Cycle rudder and planes through full throw at slow speed to check for binding.
  - (e) Operate all Main and Auxiliary Sea Water hull and back-up valves and those other seawater system valves worked during the availability (using remote closures, as applicable, from flooding control stations) that are required to maintain propulsion and other functions vital to the ship's operation.

**NOTE: REQUIRED SYSTEMS ARE LISTED IN PARAGRAPH 4b OF REFERENCE (ae). OBSERVE RESTRICTIONS ON OPERATION OF SYSTEMS LISTED IN PARAGRAPH 4d OF REFERENCE (ae).**

- (f) Test operation of trim and drain system discharging to sea.
  - (g) Cycle main ballast tank vents hydraulically to check for binding.
- (14) Test the SPM (See Note 13 in Appendix O of this chapter).
- (15) Additional requirements may be imposed at the discretion of the CO.
- c. The following tests and evolutions shall be carried out following the initial tightness dive and prior to the deep dive:
- (1) Transmit initial tightness dive complete message.
  - (2) A minimum of six hours of Individual Ship Exercises submerged for crew training.
  - (3) Charge air banks and battery as necessary. The ship may be submerged while charging air banks provided the depth of the ship does not exceed other guidelines in this instruction, or those of the flooding bill or ship's operating procedure.
  - (4) If escort is required, detach escort after initial tightness dive. Escort will then proceed to station for deep dive. Ensure that deep dive rendezvous time and location are clearly established before escort is released. The escort may be retained for additional testing during the transit as described in Appendix P. Transit depths shall not exceed depth as described in Appendix P.
  - (5) Additional requirements may be imposed at the discretion of the CO.

- d. The following tests and evolutions shall be carried out immediately prior to or during the deep dive:
- (1) Check that initial EMBT Blow system actuating air pressure and air bank pressure is within +0 PSIG, -200 PSIG of nominal operating air pressure.
  - (2) Verify MBT systems lined up for normal operation.
  - (3) Take sounding. Accurately fix ship's position within the specified dive area in accordance with reference (q). Transmit the commencing deep dive message.
  - (4) Proceed to normal submergence depth and obtain 1/3 speed trim. Use conservative angles and speed on initial dive.
  - (5) Trim ship to maintain neutral buoyancy (See Note 6).
  - (6) Rig ship for deep submergence. Line up propulsion plant for maximum reliability. All systems shall be in the maximum secure condition with unnecessary sea systems isolated (See Note 3).
  - (7) Station additional personnel throughout the ship to inspect for leaks.
  - (8) At 400 feet and then in increments of 100 feet descending to one-half the maximum operating depth and every 100 feet or other lesser specified increments thereafter down to the maximum authorized operating depth:
    - (a) Adjust trim (See Note 6).
    - (b) Inspect for leaks.
    - (c) Communicate with escort (if escort required) at each 100 foot depth increment or at 10 minute intervals, whichever is sooner. If communications are lost, return to a depth at which communications can be re-established before continuing (See Note 2).

**NOTE: REQUIRED SYSTEMS ARE LISTED IN PARAGRAPH 4b OF REFERENCE (ae). OBSERVE RESTRICTIONS ON OPERATION OF SYSTEMS LISTED IN PARAGRAPH 4d OF REFERENCE (ae).**

- (9) At depths listed for hull valve cycling in reference (ae) including the maximum authorized operation depth:
  - (a) Check accuracy of gauges and repeaters (See Note 4).
  - (b) Evaluate signal ejectors or launchers. Conduct operational test of each by hand and impulse methods, as applicable (See Note 7).
  - (c) Check shafting bearings and stern tubes for excessive heating, leakage and noise. Main shaft seals must be tested at each depth specified in reference (ae) testing one seal for 20 minutes, and shifting to the other seal. Test the second seal for 20 minutes or until the boat is ready to go to the next depth, whichever comes first.
  - (d) Cycle rudder and planes through full throw to check for binding. Cycling of rudder and planes through full throw should be limited to 90% of test depth.

- (e) Operate all Main and Auxiliary Sea Water hull and back-up valves and those other seawater system valves worked during the availability (using remote closures, as applicable, from flooding control stations) that are required to maintain propulsion and other functions vital to the ship's operation at increments of depth specified in reference (ae).

**NOTE: TRASH DISPOSAL UNITS (TDU) WITH BALL VALVES WILL NOT BE OPERATED BELOW 200 FEET. TDUs WITH FLAPPER VALVES WILL NOT BE OPERATED BELOW 150 FEET.**

- (f) Operate trim and drain pumps, discharging to sea.
  - (g) Cycle main ballast tank vents to check for binding. Main ballast tank vents will be cycled hydraulically except at test depth where they will be cycled manually.
- (10) Surface fully with EMBT blow in accordance with applicable URO MRC. Check air bank pressures before and after blow. For SSN 23 only: Perform an MBT 6 normal blow from the BCP until MBTs 6A and 6B are blown to residual water levels.
  - (11) Transmit completion of deep dive message.
  - (12) Additional requirements may be imposed at the discretion of the Commanding Officer.
- e. The following tests and evolutions shall be carried out submerged following the deep dive:
- (1) Full power run (See Notes 8, 9 and 10).
  - (2) Emergency stop (See Notes 9 and 10).
  - (3) Steering and diving operation at full speed (See Note 11).
  - (4) Steep angles - operate ship through several depth changes using large up and down angles. Check operation of ship machinery (See Note 9).
  - (5) Time raising each periscope and mast at maximum depth and speed for which they are designed. Check training feature where applicable.
  - (6) Run and observe air conditioning plants throughout trials noting deficiencies. Operate the Lithium Bromide air conditioning plant (if installed) to demonstrate ability to carry entire maximum existing ship's air conditioning load or 100 percent capacity.
  - (7) Additional requirements may be imposed at the discretion of the Commanding Officer.

4. Sea Trial Conclusion. At the conclusion of Sea Trials, and based on a review of Sea Trial deficiencies and TYCOM concurrence, the submarine may transit to a port other than the overhauling activity. During this transit the submarine shall not operate at depths greater than one-half test depth plus fifty feet, unless specifically authorized by NAVSEA, and shall not be released for unrestricted operations until final certification is received via message from the TYCOM (Appendix BO).

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#### NOTES

- 1. **For SSBN/SSGN 726 Class submarines only - This surface evolution, full power run astern, shall be conducted only if maintenance was accomplished on the reduction gears, the astern throttle(s) or the main shaft thrust bearing.**

2. In the execution of any Sea Trial, whether escorted or not, submarine COs are reminded of their responsibility to communicate with escorts and/or shore authorities within the prescribed previously agreed upon time limits to avoid initiation of lost submarine procedures.
3. Reference (ae) (C9094.2 (Series)) prescribes procedures for system operation during the deep dive.
4. Compare all depth and pressure gauges. Depth and pressure gauges should be checked as soon as each next specified depth is reached.
5. Any evolutions (e.g., mast testing, propeller cavitation data collection, etc.) required by the Sea Trials Agenda which violate the ship's SOE must be approved by the TYCOM prior to Sea Trials in accordance with paragraph 2 of this Appendix.
6. Deep dive should be conducted using moderate speed and constantly adjusting trim, at depths indicated in paragraphs 3.b.(12)(a) and 3.d.(8)(a) of this Appendix, to maintain neutral buoyancy. Moderate speed shall be defined as that range of speed that allows the ship to recover from a loss of stern plane control or flooding casualty.
7. Integrity of launchers or signal ejectors shall be established by admitting sea pressure through equalizing lines or flooding connection and the muzzle valve/door operated before conducting operational tests. Shoot water slugs from specified launchers or signal ejectors, at depths specified by reference (ae). Shoot pyrotechnics on initial dive and at test depth on deep dive only if work was accomplished on the launchers or signal ejectors or if an escort vessel is required for the trial.
8. Run full power submerged for at least two hours. Operate at minimum non-cavitating depth but not to exceed 400 feet, in accordance with reference (q); water depth is not limited for this event.
9. Note that the required sequence of events is initial dive, deep dive, full power run submerged, back emergency, then high speed maneuverability and steep angle tests. Initial high speed ship control tests, steep angle tests and exercises at major casualties shall be conducted in water that does not exceed one and one-half times design test depth.
10. The submerged full power run with an ahead flank bell is to be terminated with a back emergency bell, consistent with current Main Propulsion Operating Limits (shaft torque is not a limiting factor in this test). The duration of the back emergency bell will be limited to 45 seconds, to be followed immediately by an appropriate ahead bell. The 45 second limit will:
  - a. Standardize the crashback requirements throughout the submarine force.
  - b. Provide a backing transient similar to that experienced in response to a stern plane jam.
  - c. Be short enough that no ship will gather sternway.
11. At maximum safe speed, operate the rudder and planes through full throw in both directions, in all remote modes of operation.

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- (8) All hands inspect for leaks and report them.
- (9) Inspect the discharge of all automatic drains in each EMBT Blow quadrant for sea water leakage prior to the first dive when the ballast tanks are flooded (e.g., at periscope depth).
- (10) Operate all periscopes checking optics and leakage. Operate all masts.
- (11) Test full throw of rudder and planes at slow speeds.
- (12) Test operation of trim and drain system discharging to sea.
- (13) If not at 150 feet for SSN 688 Class submarines (155 feet for SSN 774 Class submarines), (160 feet for SSBN/SSGN 726 Class and SSN 21 Class submarines), proceed to 150 feet for SSN 688 Class submarines (155 feet for SSN 774 Class submarines), (160 feet for SSBN/SSGN 726 Class and SSN 21 Class submarines) and obtain SAT 1/3 trim in accordance with the Ship's Operating Manual. Take readings as required to make a check of ballasting.
- (14) Test all sonar equipment on each hydrophone. In addition, for SSBN/SSGN 726 Class submarines, test the Emergency Underwater Telephone (BQC) on each hydrophone.
- (15) At 200 feet:
  - (a) Adjust trim (See Note 10).
  - (b) Inspect for leaks.
  - (c) Communicate with escort at each depth increment or at 10 minute intervals, whichever is sooner. If communications are lost, return to depth at which communications can be re-established before continuing (See Note 4).
- (16) At 200 feet as specified in reference (ae):
  - (a) Check accuracy of depth gauges and repeater (See Note 7).
  - (b) Equalize signal ejectors or launchers and conduct operational tests (See Note 8).
  - (c) Check shaft bearings and stern tubes for excessive heating, leakage and noise. Test one seal for 20 minutes and shift to the other seal. Test the second seal for 20 minutes or until the boat is ready to go to the next depth, whichever comes first.
  - (d) Cycle rudder and planes through full throw, at slow speeds, to check for binding (See Note 11).
  - (e) Operate all hull and back-up valves (using remote closures, as applicable, from flooding control stations) of seawater systems required to maintain propulsion and other functions vital to the ship's operation.

**NOTE: REQUIRED SYSTEMS ARE LISTED IN PARAGRAPH 4.b. OF REFERENCE (ae). OBSERVE RESTRICTION ON OPERATION OF SYSTEMS LISTED IN PARAGRAPH 4.d. OF REFERENCE (ae).**

- (f) Check operation of bulkhead ventilation valves and watertight doors for binding (excluding lower escape hatches).

- (g) Operate trim and drain pumps, discharging to sea.
  - (h) Cycle components of each torpedo tube. Check for leakage. Establish integrity of torpedo tubes by admitting sea pressure through equalizing lines or flooding connection before cycling components (See Note 2).
  - (i) Cycle main ballast tank vents hydraulically to check for binding.
  - (j) Equalize TDU with sea pressure through trim line, then cycle the muzzle valve.
- (17) Conduct an EMBT blow from 200 feet keel depth. Check bank pressure before and after surfacing. Surfacing with EMBT blow may be delayed to accommodate additional testing or transit as explained in Appendix P.
- (18) Additional requirements may be imposed at the discretion of the CO.
- d. The following tests and evolutions, summarized in Appendix P, shall be carried out following the initial tightness dive and prior to the deep dive:
- (1) Transmit initial tightness dive completion message.
  - (2) A minimum of six hours of Individual Ship Exercises submerged for crew training.
  - (3) Charge air banks and battery as necessary. The ship may be submerged while charging air banks provided the depth of the ship does not exceed other guidelines in this instruction or those of the flooding bill or ship's operating procedures.
  - (4) Detach escort after initial tightness dive. Escort will then proceed to station for deep dive. Ensure that deep dive rendezvous time and location are clearly established before escort is released. The escort may be retained for additional testing during the transit as described in Appendix P. Transit depth shall not exceed depth as described in Appendix P.
  - (5) Additional requirements may be imposed at the discretion of the CO.
- e. The following tests and evolutions, may be carried out following the initial tightness dive but are not required to be completed prior to the deep dive:
- (1) Snorkel on each engine designed for snorkeling. (See Notes 9 and 12).
  - (2) Test the SPM (See Note 13).
  - (3) Check hovering system (See Note 9).
  - (4) Additional requirements may be imposed at the discretion of the CO.
- f. The following tests and evolutions, summarized in Appendix P, shall be carried out immediately prior to or during the deep dive:
- (1) Check that initial EMBT Blow system actuating air pressure and air bank pressure is within +0 PSIG, -200 PSIG of nominal operating air pressure.
  - (2) Verify MBT system lined up for normal operation.

- (3) Take soundings. Maximum water depth is given in reference (q). Accurately fix the ship's position within the specified dive area, in accordance with reference (q). Transmit commencing deep dive message.
- (4) Proceed to normal submergence depth and obtain slow speed trim. Use conservative angles and speed.
- (5) Trim ship to maintain neutral buoyancy (See Note 10).
- (6) Rig ship for deep submergence. Line up propulsion plant for maximum reliability. All systems should be in the maximum secure condition with unnecessary sea systems isolated (See Note 6).
- (7) Station additional personnel throughout the ship to inspect for leaks.
- (8) At 400 feet and then in increments of 100 feet descending to one-half the maximum operating depth and every 100 feet or other lesser specified increments thereafter down to the maximum authorized operating depth:
  - (a) Adjust trim (See Note 10).
  - (b) Inspect for leaks.
  - (c) Communicate with escort at each depth increment or at 10 minute intervals, whichever is sooner. If communications are lost, return to depth at which communications can be re-established before continuing (See Note 4).
- (9) At depths listed for hull valve cycling in reference (ae) (as applicable), except maximum authorized operating depth:
  - (a) Check accuracy of depth gauges and repeater (See Note 7).
  - (b) Equalize signal ejectors or launchers and conduct operational tests (See Note 8).
  - (c) Check shaft bearings and stern tubes for excessive heating, leakage and noise. Main shaft seals must be tested at each depth specified in reference (ae), testing one seal for 20 minutes and shifting to the other seal. Test the second seal for 20 minutes or until the boat is ready to go to the next depth, whichever comes first.
  - (d) Cycle rudder and planes through full throw, at slow speeds, to check for binding (See Note 11).
  - (e) Operate all hull and back-up valves (using remote closures, as applicable, from flooding control stations) of seawater systems required to maintain propulsion and other functions vital to the ship's operation at increments of depth specified in reference (ae).

**NOTE: REQUIRED SYSTEMS ARE LISTED IN PARAGRAPH 4.b. OF REFERENCE (ae). OBSERVE RESTRICTION ON OPERATION OF SYSTEMS LISTED IN PARAGRAPH 4.d. OF REFERENCE (ae).**

- (f) Check operation of bulkhead ventilation valves and watertight doors for binding (excluding lower escape hatches).

- (g) Operate trim and drain pumps, discharging to sea.
- (h) Cycle components of each torpedo tube. Check for leakage. Establish integrity of torpedo tubes by admitting sea pressure through equalizing lines or flooding connection before cycling components (See Notes 2 and 9).
- (i) Cycle main ballast tank vents to check for binding. Main ballast tank vents will be cycled hydraulically except at test depth where they will be cycled manually.
- (j) Equalize TDU with sea pressure through trim line.

**NOTE: DURING SEA TRIALS DO NOT OPERATE TDUs WITH BALL VALVES BELOW 200 FEET OR TDUs WITH FLAPPER VALVES BELOW 150 FEET.**

- (10) At maximum authorized operating depth:
  - (a) Repeat item (9) (a) - Depth gauges and repeaters. (See Note 7)
  - (b) Equalize signal ejectors or launchers. Shoot pyrotechnics from each by hand and impulse methods, as applicable (See Note 8).
  - (c) Repeat item (9) (c) - Shafting and bearings.
  - (d) Repeat item (9) (e) - Cycle hull and back-up valves as specified in reference (ae).
  - (e) Repeat item (9) (f) - Bulkhead ventilation valves and watertight doors.
  - (f) Repeat item (9) (g) - Trim and drain pumps.
  - (g) Repeat item (9) (h) - Torpedo tubes. (See Notes 2 and 9)
  - (h) Repeat item (9) (i) - Cycle main ballast tank vents, manually only, and check for binding.
  - (i) Repeat item (9) (j) - Equalize TDU with sea pressure through trim line.
- (11) Prior to blow, visually inspect discharge of automatic drains in each EMBT quadrant for seawater leakage. Surface fully with EMBT blow from maximum authorized operating depth (not to exceed maximum depth permitted by the SOE at the initial speed required for the test). Check air bank pressures before and after blow. For SSN 23 only: Perform an MBT 6 normal blow from the BCP until MBTs 6A and 6B are blown to residual water levels.
- (12) Additional requirements may be imposed at the discretion of the CO.

g. The following tests and evolutions shall be carried out on the surface following the deep dive:

- (1) Transmit completion of deep dive message.
- (2) Note condition of periscope optics.
- (3) Measure resistance to ground of all external electrical cables.
- (4) Take radio antenna megger/capacitance readings (as appropriate) immediately after surfacing, again in one-half hour, and compare with readings obtained in item 3.b.(20) of this appendix.

- (5) Measure resistance across and to ground from each side of all sonar hydrophones, projectors, and transducers or run applicable sonar hydrophone and transducer fault localization test (See Note 14).
  - (6) Measure rodmeter coil and button resistance and coil insulation resistance to ground.
  - (7) Open all lower hatches, except **DO NOT** open weapons shipping hatch while at sea. Check the upper hatch seals, Logistics Escape Trunks/Logistics Plug Trunks inter-seals and penetrations for leakage. Open the sonar sphere access door, where applicable, and check sonar sphere for leakage. Weapons shipping trunk shall be opened and checked dockside, immediately upon return from sea trials, for evidence of leakage.
- h. The following tests and evolutions shall be carried out submerged following the deep dive:
- (1) Full power run (See Notes 15, 16 and 17).
  - (2) Emergency stop (See Notes 15 and 16).
  - (3) Steering and diving operation at full speed (See Notes 16 and 18).
  - (4) Steep angles - operate ship through several depth changes using large up and down angles to check operation of ship machinery (See Note 16).
  - (5) Time raising each periscope and mast at maximum depth and speed for which they are designed. Check training feature where applicable.
  - (6) Comply with CS/CCS test program with regard to firing of water slugs and testing of torpedo tubes (See Note 2).
  - (7) Run ahead at maximum speed allowed by SOE. Operate torpedo tube shutters and ejection pump shutters. If shutters do not open, gradually reduce speed until shutters open. This establishes "stall speed" for each shutter.
  - (8) Additional requirements may be imposed at the discretion of the CO.

4. Sea Trial Conclusion. At the conclusion of Sea Trials, and based on a review of Sea Trial deficiencies and TYCOM concurrence, the submarine may transit to a port other than the overhauling activity. During this transit the submarine shall not operate at depths greater than one-half test depth plus fifty feet, unless specifically authorized by NAVSEA, and shall not be released for unrestricted operations until all RECs are closed and final URO certification is received, per the Submarine Safety (SUBSAFE) Requirements Manual.

#### NOTES

1. **Temporary condensate strainers that cannot be monitored for differential pressure shall be inspected and cleaned during sea trials following at least one hour of operation at between 45 and 55 percent reactor power, and prior to operation at higher power levels, in accordance with reference (a).**
2. **Fire water slugs from torpedo tubes at the depths and speeds required by the CS/CCS test program (or Combat Systems Assessment or Non-Propulsion Electronic System Operability, Verification and Evaluation, as applicable).**
3. **For SSBN/SSGN 726 Class only - This surface evolution, full power run astern, shall be conducted only if maintenance was accomplished on the reduction gears, the astern throttle(s) or the main shaft thrust bearing.**

4. **In the execution of any Sea Trial, whether escorted or not, submarine COs are reminded of their responsibility to communicate with escorts and/or shore authorities within prescribed, previously agreed upon, time limits to avoid initiation of inadvertent lost contact or submarine disaster procedures.**
5. **Pumps should be tested in the industrial activity, prior to Sea Trials, to determine that they can pump against a test depth head.**
6. **Reference (ae) prescribes procedures for system operation during deep dive.**
7. **Compare all depth and pressure gauges. Depth and pressure gauges should be checked as soon as the next specified depth is reached.**
8. **Integrity of launchers or signal ejectors shall be established by admitting sea pressure through equalizing lines or flooding connection and the muzzle valve/door operated before conducting operational tests. Shoot water slugs from specified launchers or signal ejectors, at depths specified by reference (ae). Shoot pyrotechnics on initial dive and at test depth on deep dive. Shooting of pyrotechnics during the initial dive shall be accomplished in conjunction with the 200 foot EMBT Blow. Shooting of pyrotechnics at test depth during the deep dive shall be accomplished in conjunction with the test depth EMBT Blow.**
9. **If major structural modifications were accomplished, those seawater systems which are not required for normal safe operation of the ship at test depth, but which have been designed for and may be subjected to test depth pressure, should not be subjected to submergence pressure during the initial dive to any specified depth (e.g., blown sanitary tanks). If major structural modifications were not accomplished, those sea water systems which are not required for normal safe operation of the ship at test depth, but which have been designed for and may be subjected to test depth pressure, may be equalized and operated on the initial dive to test depth (See reference (ae)).**
10. **Deep dive should be conducted using moderate speed and constantly adjusting trim, at depths indicated in paragraph 3.c.(15)(a) and 3.f.(8)(a) of this Appendix, to maintain neutral buoyancy. Moderate speed shall be defined as that range of speed that allows the ship to recover from a loss of stern plane control or flooding casualty or as otherwise directed by NAVSEA.**
11. **Cycling of rudder and planes through full throw should be limited to 90% of test depth.**
12. **Check operation of electrodes, head valve and each snorkel safety circuit.**
13. **The following table summarizes SPM limitations:**

## APPENDIX BM

SUBMARINE SEA TRIAL SITUATION REPORT  
(SITREP LESS THAN SIX MONTHS)

FM USS <SHIP NAME>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 INFO CNO WASHINGTON DC//N77//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>N43//  
 COMNAVSEASYS COM WASHINGTON DC//PMS 392/080//  
 DIRSSP WASHINGTON DC//205// {For SSBN/SSGN Only}  
 <SUBOPAUTH>// {IF OTHER THAN PARENT TYCOM}  
 COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>//N5//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 (OTHER UNITS IN AREA IF APPLICABLE)//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/USS <SHIP NAME>//  
 SUBJ/(TYPE AVAILABILITY) SITREP (SEQUENTIAL NUMBER)//  
 REF/A/DOC/COMFLTFORCOM/<DATE>//  
 REF/B/DOC/AS APPLICABLE/<DATE>//  
 NARR/ REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II.  
 RMKS/1. CO'S SUMMARY, EVENTS 1-9 COMPLETED WITH THE FOLLOWING DEFICIENCIES NOTED:  
 A. SUBSAFE/URO DEFICIENCIES.  
 1) **NON-ISOLABLE SEAWATER LEAKS**  
 (A) #1 SCOPE HULL GLAND LEAK 1 DPM AT 20% TD  
 (B) **SSW-30 (BODY-BONNET LEAK)**  
 (C) **DE-7 (STEM SEAL LEAK)**  
 (D) **RUDDER RAM**  
 (E) **EHP P46-3P**  
 (F) **TD-89 (FWD ESCAPE TRUNK DRAIN)**  
 (G) **#2 SCOPE INBOARD HOIST CYLINDER FITTING**  
 (H) **#1 SCOPE INBOARD HOIST CYLINDER FITTING**  
 (I) **STERN PLANES RAM PACKING**  
 (J) **STBD RETRACTABLE BOW PLANE EXTEND RETRACT CYLINDER**  
 (K) **AHP-525 (PARKER CHECK VALVE SEAT LEAK)**  
 (L) **SSW-20 UPSTREAM FLANGE**  
 (M) **EHP P025-01S (WHIP ANTENNA)**  
 (N) **INNER STERN PLANES RAM PACKING**  
 2) **ISOLABLE SEAWATER LEAK**  
 (A) **TDU VENT, TD-104 LEAKS 3 DPM AT 65% TD**  
 (B) **ASW-5 BODY-BONNET LEAK**  
**OTHER DEFICENCIES**  
 (A) **STERN PLANES AUX ANGLE INDICATOR ON BCP DOES NOT ILLUMINATE, URO-16**  
 (B) **MSW-2 CYCLE TIME SHUT IS 10.1 SEC**  
 (C) **MBT 3A WILL NOT OPEN**  
 B. NON-SUBSAFE/URO DEFICIENCIES.  
 1) **SCULLERY DRAIN LEAKING AT FITTING F-18, 27 DPM**  
 2) **3 FLOOR TILES IN CREWS MESS LIFTED AFFECTING SANITATION**  
 3) **CO HOT WATER SHOWER RECIRC PUMP FAILED**  
 2. PREVIOUS DEFICIENCIES REPORTED AND STATUS.

(LIST ALL PREVIOUS DEFICIENCIES AND CURRENT STATUS-THE GOAL IS TO CAPTURE THE COMPLETE MATERIAL CONDITION IN EACH MESSAGE) STATUS = REPAIRED (R), CORRECTIVE ACTION REQUIRED (CAR), NOT APPLICABLE (NA)

EXAMPLE –

- 1) SCULLERY DRAIN LEAKING AT FITTING F-18, 27 DPM -R
  - 2) 3 FLOOR TILES IN CREWS MESS LIFTED AFFECTING SANITATION - CAR
  - 3) CO HOT WATER SHOWER RECIRC PUMP FAILED - CAR
  - 4) #1 SCOPE HULL GLAND LEAK 1 DPM AT 20% TD - CAR
  - 5) TDU VENT, TD-104 LEAKS 3 DPM AT 65% TD - CAR
  - 6) STERN PLANES AUX ANGLE INDICATOR ON BCP DOES NOT ILLUMINATE, URO-16 - R
3. ADDITIONAL INFO.
- 1) DESCRIBE ANY ADDITIONAL INFO DESIRED OR LIST "NONE".
  4. **TYCOM, NAVSHIPYD, AND NAVSEA REPS CONCUR-DO NOT CONCUR (AS APPROPRIATE).//**
- BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

## APPENDIX CF

SAMPLE TYCOM MESSAGE TO SHIP CONCERNING SEA TRIALS DEPTH AUTHORIZATION  
FOR INDUSTRIAL ACTIVITY AVAILABILITIES GREATER THAN SIX MONTHS IN DURATION

(SUBMARINES ONLY)

FM COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//  
 COMNAVSEASYS COM WASHINGTON DC//  
 <LANT/PAC>FLT<NORFOLK VA/PEARL HARBOR HI>//  
 <DIRSSP WASHINGTON DC FOR SSBN>//  
 COMSUBGRU <NO.>//  
 COMSUBBRON <NO.>//  
 <SUPERVISING AUTHORITY>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/COMSUB<LANT/PAC>//  
 SUBJ/(SUBS) **UNRESTRICTED OPERATION OF USS <SHIP NAME/HULL NO.> //**  
 REF/A/MSG/COMNAVSEASYS COM/<DTG>// {B.3.9}  
 REF/B/DOC/NAVSEA 0924-LP-062-0010//  
 REF/C/DOC/COMSUB<LANT/PAC>NOTE C3120//  
 NARR/REF A IS NAVSEA **URO MSG FOR USS <SHIP NAME/HULL NO.>. REF B IS THE SUBSAFE REQUIREMENTS MANUAL. REF C CONTAINS TYCOM AUTHORIZED SUBMARINE OPERATING AND TEST DEPTHS.**//  
 RMKS/1. REF A CERTIFIED THE SUBSAFE MATERIAL CONDITION OF THOSE PARTS OF USS <SHIP NAME/HULL NO.> INSTALLED, REPAIRED, AND/OR TESTED BY THE SHIPYARD IS SATISFACTORY **AND RECOMMENDED THAT USS <SHIP NAME/HULL NO.> BE AUTHORIZED TO CONDUCT UNRESTRICTED OPERATIONS TO TEST DEPTH.**  
 2. **<TYCOM> CONFIRMS THAT CERTIFICATION OF THE REMAINDER OF ITEMS NOT COVERED BY REF A WITHIN THE SUBSAFE CERTIFICATION BOUNDARY HAS BEEN SUSTAINED. ACCORDINGLY, USS <SHIP NAME/HULL NO.> IS AUTHORIZED TO CONDUCT OPERATIONS TO <SPECIFIED> DEPTH, SUBJECT TO THE FOLLOWING RESTRICTIONS: <list restrictions if they exist or state "NONE">.**  
 3. **CONTINUED CERTIFICATION FOR OPERATIONS TO TEST DEPTH IS SUBJECT TO COMPLIANCE WITH REF B. URO MRC PERIODICITIES COMMENCE ON <DATE>.**  
 4. **THIS MESSAGE REMAINS IN EFFECT UNTIL INCLUDED IN A FUTURE REVISION OF REF C.**//  
 BT  
**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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## APPENDIX CG

SAMPLE TYCOM MESSAGE TO SHIP CONCERNING URO FOR INDUSTRIAL ACTIVITY  
AVAILABILITIES GREATER THAN SIX MONTHS IN DURATION

(SUBMARINES ONLY)

FM COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//  
 COMNAVSEASYS COM WASHINGTON DC//  
 <LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>//  
 <DIRSSP WASHINGTON DC FOR SSBN>//  
 COMSUBGRU <NO.>//  
 COMSUBRON <NO.>//  
 <SUPERVISING AUTHORITY>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/COMSUB<LANT/PAC>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> SEA TRIALS DEPTH AUTHORIZATION//  
 REF/A/MSG/COMNAVSEASYS COM/<DTG>/{B.3.2}  
 REF/B/MSG/SUPERVISING AUTHORITY/<DTG>/{B.3.3}  
 REF/C/LTR/NAVSEA <SER NO./DATE>//  
 REF/D/LTR/COMSUB<LANT/PAC>/<SER NO./DATE>//  
 NARR/REF A IS NAVSEA SUBSAFE MATERIAL CONDITION READINESS REPORT AND SEA TRIALS  
 DEPTH RECOMMENDATION FOR USS <SHIP NAME/HULL NO.>. REF B IS <SUPERVISING AUTHORITY>  
 REPORT OF USS <SHIP NAME/HULL NO.> FAST CRUISE COMPLETION AND READINESS FOR SEA  
 TRIALS. REF C CONCURRED IN THE SEA TRIAL AGENDA FOR USS <SHIP NAME/HULL NO.>. REF D  
 APPROVED THE SEA TRIAL AGENDA FOR USS <SHIP NAME/HULL NO.>./.  
 RMKS/1. REF A CERTIFIED THE SUBSAFE MATERIAL CONDITION OF THOSE PARTS OF USS <SHIP  
 NAME/HULL NO.> INSTALLED, REPAIRED AND/OR TESTED BY THE SHIPYARD IS SATISFACTORY FOR  
 SEA TRIALS TO TEST DEPTH.  
 2. THIS MESSAGE CONFIRMS THAT THE CERTIFICATION OF THE REMAINDER OF ITEMS WITHIN  
 THE SUBSAFE CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL NO.> HAS BEEN SUSTAINED.  
 ACCORDINGLY, THE STATUS OF THE SUBSAFE CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL  
 NO.> IS SATISFACTORY FOR SEA TRIALS TO TEST DEPTH <SUBJECT TO ANY RESTRICTIONS IN PARA 2  
 OF REF A if any are identified>.  
 3. REF B REPORTED COMPLETION OF FAST CRUISE AND READINESS TO PROCEED ON SEA TRIALS.  
 4. USS <SHIP NAME/HULL NO.> IS AUTHORIZED TO DIVE UNDER DELIBERATE AND CONTROLLED  
 CONDITIONS TO <SPECIFIED> DEPTH IAW THE SEA TRIAL AGENDA CONCURRED IN BY REF C AND  
 APPROVED BY REF D./.  
 5. EXCEPT AS LISTED IN 6. BELOW, THIS DEPTH AUTHORIZATION IS AUTOMATICALLY  
 SUSPENDED UPON RE-ENTRY TO THE SUBSAFE CERTIFICATION BOUNDARY OR CASUALTY  
 AFFECTING RECOVERABILITY, SALVAGE, WATERTIGHT INTEGRITY OR OPERATION OF SHIP'S  
 CONTROL SURFACES. THE SHIP SHALL NOT OPERATE AT A DEPTH GREATER THAN 200 FEET  
 UNTIL RE-ENTRY IS CERTIFIED TO TYCOM AND TYCOM GRANTS APPROVAL TO OPERATE TO  
 PREVIOUSLY AUTHORIZED DEPTH.  
 6. RE-ENTRY CONTROL TO ADJUST FLOOD CONTROL HYDRAULIC VALVE TIMING WILL BE  
 CERTIFIED BY THE COMMANDING OFFICER, TYCOM CERTIFICATION IS NOT REQUIRED, AND A  
 SITREP WILL BE TRANSMITTED PRIOR TO RESUMPTION OF OPERATION BELOW 200 FEET.  
 7. AT THE CONCLUSION OF SEA TRIALS, THE SHIP SHALL NOT OPERATE AT DEPTHS GREATER  
 THAN ONE-HALF TEST DEPTH PLUS FIFTY FEET UNTIL RECEIPT OF THE URO AUTHORIZATION  
 MESSAGE FROM THE TYCOM.

| 8. ALL SEA TRIALS SITREPS ARE TO BE SENT USING IMMEDIATE PRECEDENCE.//  
BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

## APPENDIX CO

**SAMPLE TYCOM MESSAGE TO SHIP CONCERNING FOLLOW-ON  
SEA TRIALS DEPTH AUTHORIZATION FOR INDUSTRIAL ACTIVITY AVAILABILITIES GREATER  
THAN SIX MONTHS IN DURATION**

(SUBMARINES ONLY)

FM COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//  
 COMNAVSEASYS COM WASHINGTON DC//  
 <LANT/PAC>FLT<NORFOLK VA/PEARL HARBOR HI>//  
 <DIRSSP WASHINGTON DC FOR SSBN>//  
 COMSUBGRU <NO.>//  
 COMSUBRON <NO.>//  
 <SUPERVISING AUTHORITY>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/COMSUB<LANT/PAC>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> <FOLLOW-ON<sup>(1)</sup>> SEA TRIALS DEPTH AUTHORIZATION//  
 REF/A/MSG/COMNAVSEASYS COM/<DTG>//{B.3.6}  
 REF/B/LTR/NAVSEA/<SER NO./DATE>//  
 REF/C/LTR/COMSUB<LANT/PAC><SER NO./DATE>//  
 NARR/REF A IS NAVSEA SUBSAFE MATERIAL CONDITION READINESS REPORT AND <FOLLOW-ON<sup>(1)</sup>>  
 SEA TRIALS DEPTH RECOMMENDATION FOR USS <SHIP NAME/HULL NO.>. REF B CONCURRED IN THE  
 <FOLLOW-ON<sup>(1)</sup>> SEA TRIALS AGENDA FOR USS <SHIP NAME/HULL NO.>. REF C APPROVED THE <FOLLOW-  
 ON<sup>(1)</sup>> SEA TRIALS AGENDA FOR USS <SHIP NAME/HULL NO.>. //  
 RMKS/1. REF A CERTIFIED THE SUBSAFE MATERIAL CONDITION OF THOSE PARTS OF USS <SHIP  
 NAME/HULL NO.> INSTALLED, REPAIRED AND/OR TESTED BY THE SHIPYARD IS SATISFACTORY FOR  
 <FOLLOW-ON<sup>(1)</sup>> SEA TRIALS TO TEST DEPTH.  
 2. **THIS MSG** CONFIRMS THAT THE CERTIFICATION OF THE REMAINDER OF ITEMS WITHIN  
 SUBSAFE CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL NO.> HAS BEEN SUSTAINED.  
 ACCORDINGLY, THE STATUS OF THE SUBSAFE CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL  
 NO.> IS SATISFACTORY FOR <FOLLOW-ON<sup>(1)</sup>> SEA TRIALS TO TEST DEPTH <SUBJECT TO  
 RESTRICTIONS IN PARA 2 OF REF A *if any are identified*>.  
 3. USS <SHIP NAME/HULL NO.> IS AUTHORIZED TO DIVE UNDER DELIBERATE AND CONTROLLED  
 CONDITIONS TO <SPECIFIED> DEPTH IAW THE <FOLLOW-ON<sup>(1)</sup>> SEA TRIALS AGENDA CONCURRED IN  
 BY REF B AND APPROVED BY REF C.  
 4. EXCEPT AS LISTED IN 5. BELOW, THIS DEPTH AUTHORIZATION IS AUTOMATICALLY  
 SUSPENDED UPON RE-ENTRY TO THE SUBSAFE CERTIFICATION BOUNDARY OR CASUALTY  
 AFFECTING RECOVERABILITY, SALVAGE, WATERTIGHT INTEGRITY, OR OPERATION OF SHIP'S  
 CONTROL SURFACES, THE SHIP SHALL NOT OPERATE AT A DEPTH GREATER THAN 200 FEET  
 UNTIL RE-ENTRY IS CERTIFIED **TO TYCOM AND TYCOM GRANTS APPROVAL TO OPERATE TO  
 PREVIOUSLY AUTHORIZED DEPTH.**  
 5. RE-ENTRY CONTROL TO ADJUST FLOOD CONTROL HYDRAULIC VALVE TIMING WILL BE  
 CERTIFIED BY THE COMMANDING OFFICER, TYCOM CERTIFICATION IS NOT REQUIRED, AND A  
 SITREP WILL BE TRANSMITTED PRIOR TO RESUMPTION OF OPERATION BELOW 200 FEET.//  
 BT

<sup>(1)</sup>:       **UPCOMING TRIALS WHICH ARE SUBJECT OF THIS CERTIFICATION (E.G., SECOND  
 SEA TRIALS, ETC.).**

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD  
 IS UTILIZED.**

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## APPENDIX CP

SUBMARINE SEA TRIAL SITUATION REPORT  
(SITREP GREATER THAN SIX MONTHS)

FM USS <SHIP NAME>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 INFO CNO WASHINGTON DC//N77//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>N43//  
 COMNAVSEASYS COM WASHINGTON DC//PMS 392/08O//  
 DIRSSP WASHINGTON DC//205// {For SSBN/SSGN Only}  
 <SUBOPAUTH>// {IF OTHER THAN PARENT TYCOM}  
 COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>//N5//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 (OTHER UNITS IN AREA IF APPLICABLE)//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/USS <SHIP NAME>//  
 SUBJ/(TYPE AVAILABILITY) SITREP (SEQUENTIAL NUMBER)//  
 REF/A/DOC/COMFLTFORCOM/<DATE>//  
 REF/B/DOC/AS APPLICABLE/<DATE>//  
 NARR/ REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II.  
 RMKS/1. CO'S SUMMARY, EVENTS 1-9 COMPLETED WITH THE FOLLOWING DEFICIENCIES NOTED:  
 A. SUBSAFE/URO DEFICIENCIES.  
 1) **NON-ISOLABLE SEAWATER LEAKS**  
 (A) #1 SCOPE HULL GLAND LEAK 1 DPM AT 20% TD  
 (B) **SSW-30 (BODY-BONNET LEAK)**  
 (C) **DE-7 (STEM SEAL LEAK)**  
 (D) **RUDDER RAM**  
 (E) **EHP P46-3P**  
 (F) **TD-89 (FWD ESCAPE TRUNK DRAIN)**  
 (G) **#2 SCOPE INBOARD HOIST CYLINDER FITTING**  
 (H) **#1 SCOPE INBOARD HOIST CYLINDER FITTING**  
 (I) **STERN PLANES RAM PACKING**  
 (J) **STBD RETRACTABLE BOW PLANE EXTEND RETRACT CYLINDER**  
 (K) **AHP-525 (PARKER CHECK VALVE SEAT LEAK)**  
 (L) **SSW-20 UPSTREAM FLANGE**  
 (M) **EHP P025-01S (WHIP ANTENNA)**  
 (N) **INNER STERN PLANES RAM PACKING**  
 2) **ISOLABLE SEAWATER LEAK**  
 (A) **TDU VENT, TD-104 LEAKS 3 DPM AT 65% TD.**  
 (B) **ASW-5 BODY-BONNET LEAK**  
**OTHER DEFICIENCIES**  
 (A) **STERN PLANES AUX ANGLE INDICATOR ON BCP DOES NOT ILLUMINATE, URO-16**  
 (B) **MSW-2 CYCLE TIME SHUT IS 10.1 SEC**  
 (C) **MBT 3A WILL NOT OPEN**  
 B. NON-SUBSAFE/URO DEFICIENCIES.  
 1) **SCULLERY DRAIN LEAKING AT FITTING F-18, 27 DPM**  
 2) **3 FLOOR TILES IN CREWS MESS LIFTED AFFECTING SANITATION**  
 3) **CO HOT WATER SHOWER RECIRC PUMP FAILED**  
 2. PREVIOUS DEFICIENCIES REPORTED AND STATUS.

(LIST ALL PREVIOUS DEFICIENCIES AND CURRENT STATUS-THE GOAL IS TO CAPTURE THE COMPLETE MATERIAL CONDITION IN EACH MESSAGE) STATUS = REPAIRED (R), CORRECTIVE ACTION REQUIRED (CAR), NOT APPLICABLE (NA)

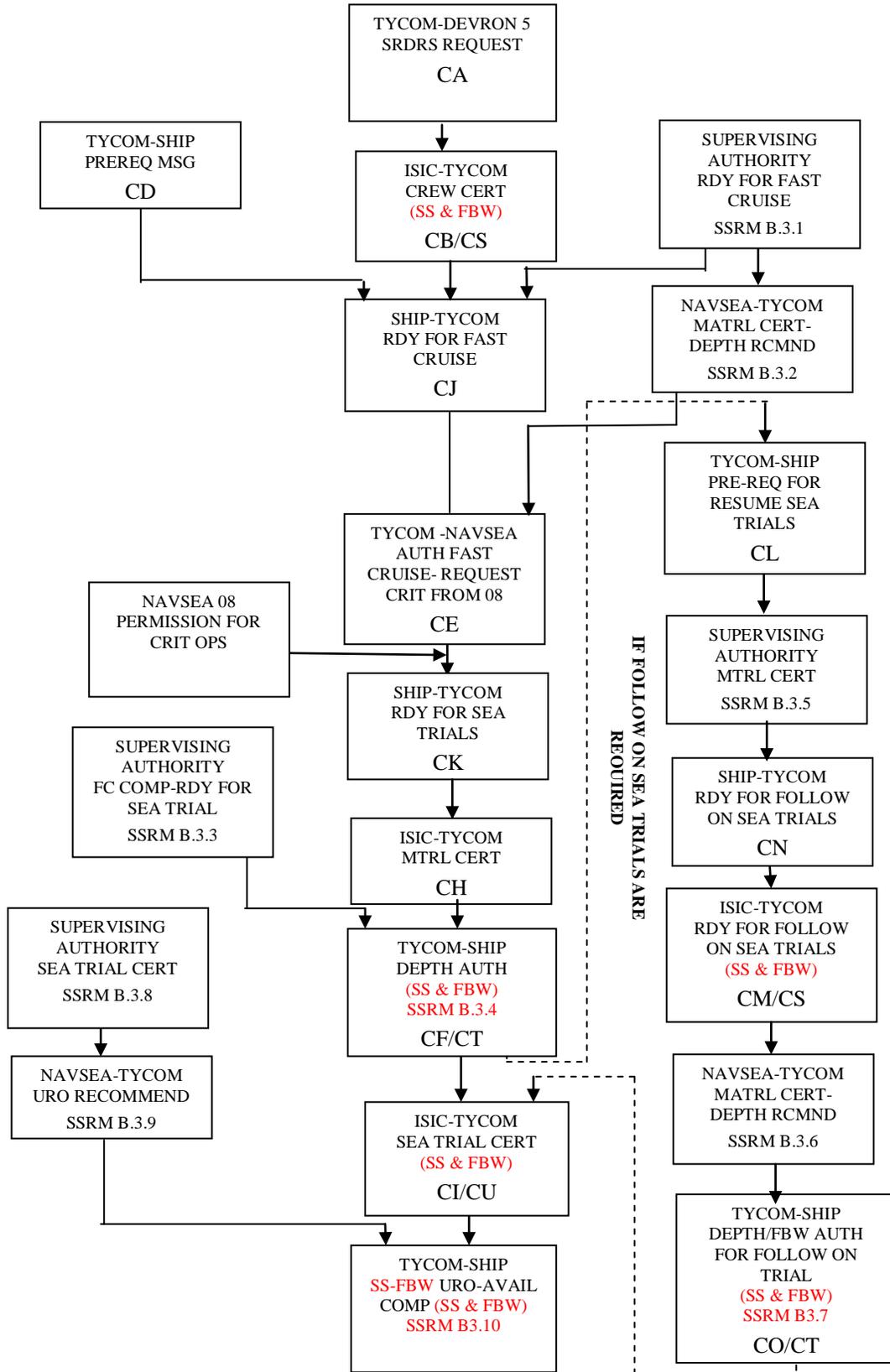
EXAMPLE –

- 1) SCULLERY DRAIN LEAKING AT FITTING F-18, 27 DPM -R
  - 2) 3 FLOOR TILES IN CREWS MESS LIFTED AFFECTING SANITATION - CAR
  - 3) CO HOT WATER SHOWER RECIRC PUMP FAILED - CAR
  - 4) #1 SCOPE HULL GLAND LEAK 1 DPM AT 20% TD - CAR
  - 5) TDU VENT, TD-104 LEAKS 3 DPM AT 65% TD - CAR
  - 6) STERN PLANES AUX ANGLE INDICATOR ON BCP DOES NOT ILLUMINATE, URO-16 - R
3. ADDITIONAL INFO.
- 1) DESCRIBE ANY ADDITIONAL INFO DESIRED OR LIST "NONE".
  4. TYCOM, NAVSHIPYD, AND NAVSEA REPS CONCUR-DO NOT CONCUR (AS APPROPRIATE).//
- BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

APPENDIX CR

Message Scenario for CNO Availabilities of Greater than Six Months in Duration



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## VOLUME II

## PART I

## CHAPTER 4

## FLEET MAINTENANCE AVAILABILITIES

REFERENCES.

- (a) NAVSEAINST 4790.8/OPNAVINST 4790.4 - Ships' Maintenance and Material Management (3-M) Manual
- (b) COMNAVSUBFOR OPORD 2000
- (c) NAVSEAINST C9210.30 - Procedure for Administration of Nuclear Reactor Plant Preventive Maintenance and Tender Nuclear Support Facilities Preventive Maintenance on Ships
- (d) NAVSEA 0989-LP-043-0000 - Commissioned Surface Ship General Reactor Plant Overhaul and Repair Specification
- (e) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships
- (f) COMLANTFLTINST 5400.2 - U.S. Atlantic Fleet Regulations
- (g) COMPACFLTINST 5400.3 - U.S. Pacific Fleet Regulations
- (h) NAVSEAINST C9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships
- (i) COMLANTFLTINST 4700.10 - Policies and Procedures For Fleet Technical Support (Cancelled)
- (j) COMPACFLTINST 4341.1 - Fleet Technical Assistance (FTA) Program (Cancelled)
- (k) NAVSEA S9213-33-MMA-000 - Radiological Controls for Ships
- (l) OPNAVINST 3120.33 - Submarine Extended Operating Cycle (SEOC) Program
- (m) OPNAVINST C3000.5 - Operation of Naval Nuclear Powered Ships
- (n) NAVSEA S9086-DA-STM-000 - NSTM Chapter 100 (Hull Structures)
- (o) NAVSEA S9086-C4-STM-000 - NSTM Chapter 094 (Trials)
- (p) COMNAVSUBFORINST 5400.25 - Standard Submarine Supply Department Organization and Regulations Manual
- (q) COMNAVSUBFORINST 5400.29 - Standard Submarine Navigation/Operations Department Organization and Regulations Manual
- (r) COMNAVSUBFORINST 5400.40 - Standard Submarine Combat Systems Department Organization and Regulations Manual (SSN)
- (s) COMNAVSUBFORINST 5400.41 - Standard Submarine SSBN 726 Class Weapons Department Organization and Regulations Manual
- (t) COMNAVSUBFORINST 5400.47 - Standard Submarine Combat Systems Department Organization and Regulations Manual (SSGN)
- (u) NAVSEA 0924-LP-062-0010 - Submarine Safety (SUBSAFE) Requirements Manual
- (v) OPNAVINST 9110.1 - Policy Concerning Submarine Test and Operating Depths
- (w) OPNAVINST C9210.2 - Engineering Department Manual for Naval Nuclear Propulsion Plants
- (x) NAVSEAINST C9094.2 - Submarine Valve Operation Requirements for Builders and Post-Overhaul Sea Trial Test Dives

LISTING OF APPENDICES.

- A Sample Message to TYCOM from ISIC Requesting Concurrence to Defer, Delete or Shorten a Scheduled CMAV
- B Sample TYCOM Message Concerning Escort Services for IDD or PIRA Availabilities
- C Suggested Format for a Message Work Candidate
- D Business Case Analysis Tool
- E1 Availability Key Event List
- E2 **CMAV Key Event Codes**
- F Availability Planning Message (Submarines Only)
- G **Final 100 Hours for Scheduled CMAV**

H	Availability Milestone Schedule
I	Availability Planning Response Message (Submarines Only)
J	Major Trial and Inspection Milestones for IDD and PIRA Availabilities
K	Sample ISIC Message to TYCOM Concerning Crew Certification and Material Condition for Fast Cruise and Sea Trials for IDD or PIRA Availabilities
L	Sample Ship Message to ISIC and TYCOM Concerning Material Certification Upon Completion of Sea Trials for IDD or PIRA Availabilities
M	Dock Trials Guidelines for IDD or PIRA Availabilities
N	Fast Cruise Requirements for IDD or PIRA Availabilities
O	Sample ISIC Message to TYCOM Concerning Final Material Certification Prior to Sea Trials for IDD or PIRA Availabilities
P	Sample TYCOM Message to Ship Concerning Sea Trials Depth Authorization for IDD or PIRA Availabilities
Q	Minimum Sea Trials Requirements for IDD or PIRA Availabilities
R	Submarine Sea Trial Situation Report (SITREP)
S	Sample TYCOM Message To Ship Concerning URO for IDD or PIRA Availabilities
T	Sample Ship Message to TYCOM Concerning Readiness for Follow-On Sea Trials for IDD or PIRA Availabilities
U	Sample ISIC Message to TYCOM Concerning Material Certification for Follow-On Sea Trials in Cases Where a Previous Sea Trial was Aborted or Corrective Actions for Sea Trial Deficiencies Require an Additional Deep Dive for IDD or PIRA Availabilities
V	Sample TYCOM Message to Ship Concerning Follow-On Sea Trials Depth Authorization for IDD or PIRA Availabilities
W	Sample Ship Message to ISIC Concerning Readiness for Fast Cruise for IDD or PIRA Availabilities
X	Sample ISIC Message to Ship Authorizing Commencement of Fast Cruise for IDD or PIRA Availabilities
Y	Sample Ship Message to ISIC and TYCOM Concerning Readiness for Sea Trials for IDD or PIRA Availabilities

4.1 PURPOSE. Provide guidance for the implementation of policies set forth in references (a) through (x) for Fleet Maintenance Availability planning, scheduling, and execution. Policy, procedures and guidance regarding utilization of Fleet Technical Assistance (FTA) program resources are contained in Volume VI, Chapter 2 of this manual.

4.2 DEFINITIONS.

4.2.1 Fleet Maintenance Activity. All government waterfront ship maintenance and modernization, activities, e.g., Regional Maintenance Centers, Naval Ship Repair Facilities, Naval Submarine Support Facilities, Naval Intermediate Maintenance Facilities, TRIDENT Refit Facilities, Weapons Repair Facilities, Naval Shipyards, tenders and other activities of that type responsible for the processing, screening and brokering, and execution of work candidates.

4.2.2 Lead Maintenance Activity. The single activity responsible for integrating all maintenance and modernization on US Naval ships during any type availability. The Lead Maintenance Activity (LMA) is the activity responsible for planning and coordinating the work of the Executing Activities in Continuous Maintenance (CM). The LMA may also be an Executing Activity.

4.2.3 Executing Activity. The public or private enterprise that is assigned or awarded the responsibility for accomplishing the actual production work to effect repairs or modernization to ships.

4.2.4 Business Case Analysis. A critical evaluation of late identified work, new work or growth work, based on the benefit of completing the work, the cost of the work to be performed including premiums, available work capacity and material resources, the risk to other work and schedule impact.

4.2.5 Planning Board for Maintenance. The regularly scheduled meeting of the ship's Maintenance Team, as required by Chapter II-II-1 and defined in Chapter VI-41 of this manual, to discuss ship wide maintenance issues. Chaired by the Ashore Ship's Maintenance Manager, this forum provides a review of current planned off-ship and organizational maintenance, Current Ship's Maintenance Project (CSMP) quality and accuracy, future maintenance and modernization planning, and fiscal concerns. The objective is to ensure clarity of intent for both the ship's efforts and the shore infrastructure with respect to total ship maintenance, operational schedules, and other concerns affecting ship material readiness.

4.2.6 Maintenance and Modernization Business Plan. The Maintenance and Modernization Business Plan (MMBP), located in Volume VI, Chapter 33 of this manual, prepared six to eight months in advance of the fiscal year, is the ship's plan for maintenance and modernization effort for a fiscal year. The ship's maintenance team prepares the plan. The Maintenance Team applies its knowledge of the ship's material condition and Type Commander (TYCOM) scheduled modernization and Chief of Naval Operations (CNO) availabilities in the prospective operating cycle to develop the budget recommendation for funding maintenance requirements. The plan is based on an assessment of the ship's anticipated material condition, the validated CSMP including Class Maintenance Plan (CMP) applicable tasks, planned fleet alterations, outstanding Departures from Specifications (DFS), Casualty Reports (CASREP) and Board of Inspection and Survey material discrepancies. The MMBP shall address funding required for CNO availabilities advanced planning and CM opportunities.

4.2.7 Immediate Superior In Command. In the context of this chapter the following may act in support of or in the place of the Immediate Superior In Command (ISIC) for maintenance:

- a. Surface Ships - Class Squadron Commander.
- b. Carriers - Commander Naval Air Forces (LANT/PAC).
- c. Submarines - Submarine Squadron Commander or Submarine Squadron Support Unit.
- d. Submarine Tenders - Commander Submarine Force, U.S. Pacific Fleet.

4.3 FLEET MAINTENANCE AVAILABILITIES. Fleet Maintenance Availabilities consist of the following:

4.3.1 Ship's Force Upkeep. A Ship's Force Upkeep is a scheduled period in which the ship is principally engaged in self-maintenance.

4.3.2 Scheduled Continuous Maintenance Availability. A Scheduled Continuous Maintenance Availability (CMAV) is a scheduled availability normally 2 to 6 weeks in duration and normally scheduled once per non-deployed quarter during a period when the ship will be in port.

NOTE: **SUBMARINE MAINTENANCE MODERNIZATION AVAILABILITIES MAY BE 2 TO 6 MONTHS LONG. THESE AVAILABILITIES CAN BE MANAGED SEPARATE FROM THE REQUIRED MAINTENANCE AVAILABILITIES OR INCORPORATED IN THE REQUIRED MAINTENANCE PERIODS AT THE DISCRETION OF THE PLANNING BOARD FOR MAINTENANCE (PB4M) AND ISIC. MODERNIZATION AVAILABILITIES WILL INCLUDE KEY EVENTS AND CERTIFICATION MILESTONES PRIOR TO AT-SEA OPERATIONS AND MAY REQUIRE SEA TRIALS AS APPROVED BY THE PB4M AND ISIC IN ACCORDANCE WITH THIS CHAPTER.**

- a. Submarines - One 35-day regular CMAV every 3 to 4 months, of which 21 days are dedicated to production work. The Pre-Overseas Movement 1 availability should normally be scheduled for 42 days to allow for front loading of pre-deployment and deployment maintenance, alterations and installs. For SSBNs one 28 day CMAV per each patrol cycle. For SSGNs the maintenance schedule for a 15-month operating cycle has a single 100 day CMAV maintenance period and three forward deployed 21 day CMAVs. The Scheduled Continuous Availability requirement is mandatory. It cannot be deferred,

deleted or shortened without TYCOM (N43) concurrence. Appendix A of this chapter contains a sample message to TYCOM from ISIC requesting concurrence to defer, delete or shorten a scheduled CMAV.

- b. Carriers - As Scheduled.
- c. Surface Ships - At a minimum, one 3-week CMAV per non-deployed quarter of which two weeks are for production work and the last week in all CMAVs is for Ship's Force job close out and testing.

4.3.3 Unscheduled Continuous Maintenance Availability. The Unscheduled CM Availability is a single yearlong availability, for the period 01 October through 30 September, scheduled for each ship every fiscal year. The Year Long Unscheduled CM Availability is for the scheduling and completion of non-emergent work items that are not accomplished during any other schedule availability.

4.3.4 Emergent Availability. The Emergent Availability (EM) is designed for work of such an urgent nature, normally C-3 and C-4 CASREPS, that the heightened risk of disruption and paying of premiums is accepted, and planning horizons are shortened.

#### 4.4 COMMON ELEMENTS.

4.4.1 Responsibilities. Responsibilities for the Maintenance Policies and Procedures for Fleet availabilities are as follows:

##### 4.4.1.1 Immediate Superior In Command.

- a. Coordinate scheduling of availabilities at LMAs with TYCOMs.
  - (1) Monitor corrective maintenance action taken by LMA/Executing Activities.
  - (2) Schedule and conduct inspections of Forces Afloat.
  - (3) Monitor progress of availabilities.
- b. Initiate the required budgetary actions for funding availabilities.
- c. Ensure all authorized alterations are identified by priority based on material availability.
- d. Identify the routine package to be accomplished based on Master Job Catalog (MJC) review.
- e. Review results of scheduled monitoring inspections and testing that could result in significant new work or could impact scheduled work.
- f. Identify required special evolutions associated with availabilities in support of Pre-Overseas Movement preparations and pre-availability test and inspection requirements.
- g. Issue availability planning message.
- h. (Submarines only) Ensure all Periodic Maintenance Requirement (PMR) and Unrestricted Operation Maintenance Requirement Card maintenance actions intended for accomplishment during availability are identified.
- i. (Submarines only) Send a Sea Trials Support Services message to specify Deep Submergence Rescue System "modified-alert" requirements in accordance with Appendix B of this chapter.

- j. (Submarines only) Provide updated Sea Trials status by telephone to Commander, Submarine Development Squadron (COMSUBDEVRON) FIVE if Deep Submergence Rescue System "modified-alert" support services are in use.
- k. (Submarines only) Identify key events for each CMAV during the pre-arrival conference. Determine if Fast Cruise and/or Sea Trails is/are required based on the scope of the availability work, alterations and modernization. The ISIC will task the PB4M/Regional Maintenance Center (RMC) to submit the Fast Cruise and/or Sea Trails agendas for ISIC approval in accordance with paragraph 4.6.3.3 of this chapter.
- l. (Submarines only) Monitor Ship and Executing Activity preparations to transition to a CMAV period and make final report that the ship has transitioned to the CMAV period after the completion of the arrival conference to the Group and TYCOM.

4.4.1.2 Regional Maintenance Center/Lead Maintenance Activity. (As appropriate)

- a. Develop recommended Key Event schedule and present to the ISIC/Ship's Force.
- b. Conduct ship checks, plan work candidates and order required material.
- c. Recommend rejected work candidates to the RMC ISIC, as applicable.
- d. Develop strategy for calibration of gages, instruments and tools.
- e. Identify and order Long Lead Time Material (LLTM).
- f. Review the Availability Work Package, write Formal Work Procedure (FWP)/Technical Work Documents (TWD), identify critical jobs and develop an Integrated Work Schedule (IWS) to aid in tracking and coordination of all work.
- g. Conduct the Work Package Execution Review (WPER).
- h. Conduct arrival conference.
- i. Conduct daily and weekly meetings.
- j. Issue Departure and Assessment report in accordance with paragraph 4.6.3.2.e of this chapter.

4.4.1.3 Ship's Maintenance Team. (Commanding Officer (CO))

- a. Validate, broker, schedule, and track through execution all maintenance candidates.
- b. Manage Ship's MMBP.
- c. Maintain a current and valid CSMP that serves as the single authoritative source for all maintenance requirements.
- d. Develop, plan and coordinate Ship's Force Upkeeps, CMAVs, CMs, and EMs and repairs within the resources provided.
- e. Prioritize all deferred maintenance actions intended for accomplishment during an availability.
- f. Develop a strategy for calibration of gages, instruments and tools.

- g. Publish a policy concerning number of duty sections, liberty, ship cleanliness, tagout procedures, tank closeout and installation of blank flanges of otherwise exposed fluid systems, waveguide and air systems before the availability starts.
- h. Assign an Officer/Chief Petty Officer to serve as the Availability Coordinator, responsible for coordinating the completion of all pre-availability and availability milestones.

4.4.1.4 Assigning Lead Maintenance Activity/Ship's Force Maintenance Responsibility. The RMC/ISIC assigns work responsibility for each maintenance item in an availability work package. The assignment of work responsibility will be such that split responsibility between two organizations does not occur for the same unit task on a maintenance action. The following guidelines apply:

- a. The Fleet Maintenance Activity (FMA) will remove all controlled system interference as defined in Volume V, Part I, Chapter 2 of this manual and Ship's Force will remove all other interference.
- b. The following are examples of maintenance actions requiring Intermediate Level shop work that will be assigned as "ship-to-shop":
  - (1) Calibration and repair of portable equipment, removable gages, and rack-out electronic equipment/meters.
  - (2) Manufacture of components which do not require fit-up in a larger assembly, or that are fabricated with a sample provided by Ship's Force.
  - (3) Small flanged or bolted valves and operators sized 2.5 IPS and below.
  - (4) Small components such as pumps, motors, controllers, deck plates, access covers and lockers.

4.4.1.5 Fleet Maintenance Activity/Nuclear Regional Maintenance Department Radiological Controls Support. In order to fully use the FMA radiological controls resources, Ship's Force shall request FMA/Nuclear Regional Maintenance Department (NRMD) radiological support for their jobs that involve significant radiological controls. The following guidelines apply:

- a. FMA/NRMD will provide full radiological control support including material, surveys, supervision and instructions for radiological aspects of the job.
- b. FMA/NRMD will provide mock-up training, when necessary, for Ship's Force personnel performing the actual work.
- c. Ship's Force jobs which fall into this category include, but are not limited to, retention tank (or equivalent) inspection, nuclear instrument detector replacement, and primary plant venting or draining evolutions.
- d. As an example, during a retention tank inspection, an FMA/NRMD would:
  - (1) Construct and certify the containment tent.
  - (2) Conduct the necessary pre-job, in process and post-job surveys.
  - (3) Train Ship's Force personnel in the use of air fed hoods.
  - (4) Provide radiological monitoring.
  - (5) Review and comment on the Ship's Force work procedure.

- e. The FMA/NRMD should develop standard radiological work procedures to be used in developing FWP/TWDs in support of Ship's Force jobs. The service of the Fleet Maintenance Support Branch should be used by FMAs, when necessary, to formulate these work procedures.

#### 4.4.2 Submission of Work Candidates.

4.4.2.1 Documenting Requests. Requests by Ship's Force for corrective maintenance assistance or support equipment from outside activities will be appropriately documented on an Automated Work Request form 4790-2K or form 4790-2L of reference (a) or message work candidate in accordance with paragraph 4.4.2.2 of this chapter, and prioritized in accordance with reference (a). The work candidate will be promptly forwarded for processing. The description of the deficiency or support requested and the action desired shall be complete and clear. This description must be in sufficient detail to allow LMA personnel to plan, obtain parts and assemble the correct tools.

4.4.2.2 Message Work Candidates. Messages may be used to notify the FMA as early as possible when data systems up-lines are not available. This is particularly applicable to ships in transit between FMAs, and ships scheduled to return to port shortly before starting an availability. Accordingly, ships should submit message work candidate requests to the parent RMC/ISIC, with an information copy to the tending LMA and tending Squadron/RMC (if different), for items of this type. Where the change of LMA occurs coincident with a change in Operational Control, the (new) tending Squadron/RMC should be action addressee for the message, with both the parent RMC/ISIC and (new) LMA as information addresses. Appendix C of this chapter provides the format for a message work candidate.

4.4.3 Critical Jobs. Critical Jobs (CJ) are those jobs or series of jobs that require special management attention and normally present the greatest risk to on-time completion of the key event or availability. The Executing Activity should be judicious in designating jobs as CJs to prevent diverting management attention from those jobs which are, in fact, critical to on time completion of the availability. Consideration shall be given to, but not limited to, the following in determining the CJs:

- a. Little or no room for delay exists.
- b. Establishing plant conditions.
- c. LLTM.
- d. Complexity of job or special skills or resources required.
- e. Significant test requirements.
- f. Not previously accomplished by the Executing Activity (alterations, etc.).

4.4.4 Integrated Work Schedule. The IWS is an integrated timeline that includes plant conditions, major work steps, tests and recertification used to progress all jobs as determined by the Naval Supervisory Authority (NSA)/LMA. The IWS should include:

- a. Establishing plant conditions.
- b. Major production steps.
- c. Testing/Recertification.
- d. Closing out work procedures.

4.4.5 Technical Assistance and Assessment. Technical assistance and assessments are to be assigned as work candidates within any of the following Fleet maintenance availabilities:

- a. CMAV.
- b. CM.
- c. EM Availabilities.

4.4.6 Late Work and Scope Control.

- a. The complete LMA Availability work package is defined and agreed upon at the WPER. To provide for adequate time to plan the work and acquire the necessary materials in an efficient manner, the work cut-off date should not exceed Arrival minus 30 days. A minimum of 30 days will be allotted for work brokered to I-level activities. This will allow a WPER to take place at A-21. If these minimum thresholds cannot be complied with, the Maintenance Team will complete a Business Case Analysis in accordance with paragraph 4.4.6.b. of this chapter.
- b. The Maintenance Team will perform a Business Case Analysis as a method of identifying risks associated with adding work after A-30. The Business Case Analysis is described in Appendix D of this chapter. Late work should not extend the availability completion date. The RMC/ISIC will take appropriate actions to make job tradeoffs, defer jobs to a subsequent availability or seek outside assistance to conduct the work.
- c. Non-mission essential late work may be accepted on a case by case basis. The ISIC will provide approval authority for all late work after establishing that the LMA can support the additional work load and the scope of work does not impact the ship's operational schedule or schedule of other operational units.

4.4.7 Memorandum of Agreement. For all surface ship availabilities not assigned to an FMA, a Memorandum of Agreement (MOA) will be issued. The purpose of the MOA is to define areas of responsibility for all activities involved with the availability. For all submarine availabilities involving maintenance within the Submarine Safety (SUBSAFE) boundary, a MOA will be issued.

4.4.8 Radiological Controls. Nuclear powered vessels are responsible to implement and ensure adherence to radiological controls in accordance with reference (k). Industrial activities authorized to perform nuclear maintenance are responsible to engineer appropriate radiological controls into assigned work.

4.4.9 Ship to Shop Material Control. Positive identification and control of ship to shop transfer of equipment and components is maintained through the use of a Ship to Shop tag. The Ship to Shop tag may also be used in conjunction with other methods specified by the Executing Activity or the LMA. Each Executing Activity shall make sure that positive control exists for those subcomponents of equipment and components received with a Ship to Shop tag attached. The procedure for using the Ship to Shop tag is provided in Volume V, Part I, Chapter 11 of this manual.

4.4.10 Shipchecks. The LMA or Executing Activity shall conduct ship checks, if the tended ship is available, to verify the scope of work, identify interference, obtain equipment technical data, identify shipping (rigging) paths, verify system/equipment configuration, and obtain additional problem identification data from Ship's Force. Shipchecks shall be conducted as early in the planning phase as possible.

4.4.11 Lead Maintenance Activity Daily Production Meeting. This meeting is for the coordination of ongoing work for all availabilities. The LMA Repair Officer/Production Officer, or their designated representatives, will conduct a Daily Production Meeting for all ships in availabilities.

- a. Purpose. The primary purpose of the LMA Daily Production Meeting is to establish a joint Executing Activity/Ship's Force production plan and eliminate schedule conflicts that impact work for at least the next seven shifts (56 hours). It further tracks the current status of CJs. The results of this meeting are

used to assess overall progress of the work, develop recovery plans when necessary and to ensure all the activities understand the production plan and support requirements during a minimum of the next seven shifts (56 hours).

- b. Execution. The Daily Production Meeting will be held as early in the day as practicable.
- c. Attendees. Representatives of the LMA Waterfront Operations, the Executing Activities, the tended ship, and LMA Supply or Fleet and Industrial Supply Center, as appropriate, shall attend this daily production meeting and participate in its agenda. Others may attend as requested by the LMA.
- d. Agenda. The following agenda will be used for the LMA Daily Production Meeting. Additional items may be added at the discretion of the Waterfront Operations Officer, Repair Officer or Production Officer.
  - (1) Discuss specific work scheduled to be accomplished and support required over the next seven shifts.
  - (2) Discuss projected site evolutions (ship moves, weapons moves, pier maintenance, or changes of command, etc.) which could impact production work.
  - (3) Discuss respective ship evolutions such as stores load or Fast Cruise that could impact production work.
  - (4) The Executing Activity brief on the current status of CJs on each ship.
  - (5) Review Safety of Ship Maintenance Item List, necessary safety precautions and their status.

4.4.12 Lead Maintenance Activity Progress Review. This review will be conducted weekly for surface force ships and submarines in CMAVs.

- a. Purpose. The primary purpose of the LMA progress review is to ascertain that CJs and Key Events are progressing satisfactorily for on time completion of the availability. The meeting shall also identify and resolve any issues, conflicts or differences since availability start or last review. These meetings may be conducted in conjunction with a ship's PB4M.
- b. Execution. This review shall be conducted by the Waterfront Operations, Repair Officer, Production Officer, or their representatives and be scheduled so as not to conflict with daily production meetings.
- c. Attendees. As a minimum the following shall attend this review.
  - (1) Waterfront Operations Officer, Repair Officer, or Production Officer.
  - (2) Ship Superintendent and designated Executing Activity representatives.
  - (3) Tended ship CO.
  - (4) Availability Coordinator and designated Ship representatives.
  - (5) ISIC/RMC designated representatives.
  - (6) Maintenance Support Team (MST) Officer In Charge (OIC) (if applicable).

- d. Agenda. As a minimum the following agenda shall be used for LMA progress review. Additional items may be added at the discretion of the Waterfront Operations Officer, Repair Officer, Production Officer, ship CO, or ISIC. Attendees shall be prepared to discuss their respective portions of the agenda.
- (1) Specific work scheduled for accomplishment during the availability.
  - (2) Projected Executing Activity and ship evolutions which could impact production work on ship(s).
  - (3) Discuss current status of CJs and Key Events listed in Appendix E1 (Submarines Appendix E2).
  - (4) Heavily loaded Executing Activity work centers and impact on the availability.
  - (5) Status of funds, supplies and equipage funding.
  - (6) Status of outstanding DFS scheduled for correction during the availability.
  - (7) Outstanding high priority repair material status.
  - (8) Provide Automated Work Requests (AWR) or a list of completed work with applicable 3-M final action taken codes in accordance with reference (a).
  - (9) For ships with work in the Year Long CM or EM Availability no separate formal meeting is required. Rather, issues with these availabilities should be a part of the routine PB4M held by the ship's maintenance team or special meetings as needed to properly monitor and manage the ongoing maintenance.

4.4.13 100 Hour Transition Periods (Submarines only). The 100 hours at the beginning and at the end of a CMAV are critical times for availability execution. The ISIC, LMA and ship are responsible for coordinating the 100 hour plan. Any job or event that is viewed as hindering the start of the availability shall be included in the 100 hour plan. Communication is vital to ensuring a full understanding of all work and associated requirements. The 100 hour transition plans will be outlined in the Availability Planning Message in accordance with Appendix F. Details for the first and final 100 hours shall be as follows.

4.4.13.1 First 100 Hour Plan (Submarines only). The First 100 Hour Plan will notionally start the first full work day of the availability. The items listed below are the focus of the first 100 hours and will be discussed at the Arrival Conference.

- a. Establishing plant conditions/work controls.
- b. Working hours.
- c. Jobs still requiring ship checks will be listed in the availability planning message.
- d. Test forms required for Ship's Force retest of FMA work will be delivered to the ship within the first 100 hours for Ship's Force to review, plan and write procedures as necessary.
- e. Time critical jobs that will start during the first 100 hours.

4.4.13.2 Final 100 Hour Plan (Submarines only). The Final 100 Hour Plan will notionally begin four days prior to the last day of the ship's scheduled CMAV. Items listed below must be completed prior to the 100 hour point. Appendix G will provide an outline of the final 100 hours.

- a. Production work complete - it is vital all production work is completed by the 100 hour point to allow for the remaining event to occur without delay.
- b. Weapons handling.
- c. Testing associated with production work is completed.
- d. Sail closeout.

4.5 SHIP'S FORCE UPKEEP. Ship's Force Upkeep availability is a scheduled period in which the ship is conducting self-maintenance in accordance with reference (a), training, supporting inspections by outside activities, and performing routine shipboard evolutions. Ship's Force Upkeep availability can be accomplished at sea when the ability of the ship to perform its assigned missions and tasks is not affected and the work is accomplished onboard the ship. Scheduled Ship's Force Upkeep periods shall not be interrupted for other than emergency reasons.

#### 4.5.1 Upkeep Work Planning.

4.5.1.1 Planning Sources. The upkeep work package shall be developed using three sources:

- a. Planned Maintenance System (PMS) shall be scheduled in accordance with reference (a).
- b. Reactor Plant PMS shall be scheduled in accordance with reference (c).
- c. CSMP will be reviewed to ensure scheduling and accomplishment of all work which is within Ship's Force capability.

#### 4.5.1.2 Ship's Force Planning Actions.

- a. Preparation for Ship's Force Upkeep should be the normal activity of the maintenance team and be discussed at PB4M meetings.
- b. Review all Ship's Force screened CSMP work candidates and identify those items to be accomplished within the scheduled Ship's Force Upkeep period.
- c. Identify CJs.
- d. Develop an IWS in accordance with paragraph 4.4.4 of this chapter to aid in tracking and sequencing CJs.
- e. Establish strategy for Ship's Force calibration of gages, instruments, and tools based on the onboard Calibration Recall List.
- f. Develop FWPs, Controlled Work Packages, and TWDs, as required, in accordance with Volume V, Part I, Chapter 2 of this manual.
- g. (Submarines only) Identify operational Unrestricted Operation (URO) Maintenance Requirement Cards (MRC) to be accomplished during the availability. The ship shall identify the plan to accomplish PMRs called down by the ISIC and identify any conflicts affecting the PMR execution.

4.5.2 Ship's Force Upkeep Work Execution. Duty section, division meetings, and/or shift briefings will be conducted as necessary to discuss current status of work and projected work progress expected for the period covered. The status and projections will be based on CJs and the IWS and should be reviewed at the regular ship's PB4M Maintenance Team meetings.

#### 4.5.3 Ship's Force Upkeep Work Completion.

4.5.3.1 Management Closeout Procedures. Upon completion of repairs, FWPs, Controlled Work Packages, and TWDs will be closed out in accordance with Volume V, Part I, Chapter 2 of this manual. Update the CSMP. Ensure non-conformances (Waivers/Deviations or Departures from Specification) submitted during the availability by any activity are approved prior to trials at sea (if held) and not later than the completion of the availability.

4.5.3.2 Dock Trials/Fast Cruise/Sea Trials. Dock Trials, Fast Cruise and Sea Trials shall be conducted as required. Sample agendas in Part I, Chapter 3 of this volume may be modified, as necessary, to ensure the equipment which was worked during the upkeep is exercised prior to at sea operation.

4.5.4 Ship Certification Prior to Underway (Submarines only). Ship and Executing Activity provide the ISIC a written report of ship's certification continuity prior to underway in accordance with Volume V, Part I, Chapter 5 of this manual. If Upgrades/Alterations or Major Repair Work of the FBW SCS was performed, the ISIC will accomplish a 100% audit, as defined in Volume V, Part I, Chapter 9 of this manual of the work. ISIC and TYCOM will use the FBW message reporting process for certification specified in Part I, Chapter 3 of this volume for availabilities of less than six months duration.

#### 4.6 SCHEDULED CONTINUOUS MAINTENANCE AVAILABILITY.

4.6.1 Scheduled Continuous Maintenance Availability Planning. Thorough, detailed planning is an absolute prerequisite to effective CMAV execution. Effective CMAV management begins well before the ship arrives with material procurement and job planning. Appendix H of this chapter is a typical CMAV Milestone Schedule to be used by all activities involved in planning and executing the availability.

4.6.1.1 Scheduled Continuous Maintenance Availabilities Planning Sources. A significant portion of the CMAV Work Package can be identified in advance from five basic sources. **Submarines, will also execute a planning availability as described in sub-paragraph f. below.**

- a. Ship's CSMP. This document contains work items deferred during previous maintenance availabilities as the result of inadequate material support, outstanding DFS, drydock requirements, etc. To ensure the CSMP accurately reflects the required ship's maintenance, the Maintenance Team and ISIC will review each ship's CSMP in detail with Ship's Force during routine PB4Ms and prior to every maintenance availability.
- b. Ship's Force Planned Maintenance. Ship's Force shall conduct a review of PMS and Reactor Plant PMS requirements and ensure all maintenance actions are identified.
- c. PMR/URO electronic files (Submarines only). Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity provides electronic files of PMR/URO maintenance requirements for each ship, as applicable. The ISIC will load these requirements into each ship's CSMP for a specific CMAV.
- d. Alterations (Fleet Alterations, Program Alterations, Ship Alterations, Machinery Alterations, Alteration and Improvements, Strategic Systems Program Alterations, etc.). The RMC/ISIC will enter alterations on the ship's CSMP that the TYCOM has authorized for accomplishment. The Ship Maintenance Team/RMC/ISIC calls out alterations for a specific CMAV based on material availability and Executing Activity capacity as identified by the Executing Activity. Within funding constraints and TYCOM guidance, all alterations authorized on the TYCOM Alteration Management System (Submarine Force only)/Fleet Modernization Program (FMP) are candidates for accomplishment during each CMAV.
- e. Work Routines. A set of standard routines from the MJC should be planned for every CMAV. The ISIC/RMC tailors each CMAV routine package to the needs of the ship by calling out additional routines to document periodic, interim dry docking, URO maintenance (as applicable), and calibration recall requirements, as appropriate.

- f. **Planning availability. (Submarines only)** A scheduled one week planning availability will normally be scheduled approximately four weeks prior to a scheduled regular CMAV. The purpose of the planning availability is to allow the LMA and other activities scheduled to perform maintenance during the regular CMAV to conduct ship checks and job scoping early enough to write required FWPs/TWDs, order material and develop a cohesive plan for the regular availability. Only underway limiting repairs should be accomplished during a planning availability. Paragraphs of 4.6.1 and all A-30 items from Appendix H of this chapter shall be addressed and focused on during the planning availability. The results of the planning availability directly feed into the WPER.

4.6.1.2 Scheduled Continuous Maintenance Availability Planning Functions. The Maintenance Team/RMC/ISIC will take the following actions in planning a CMAV. Surface Ships see Part II, Chapter 1 of this volume for maintenance validation, screening and brokering.

- a. **Work Package Submission.** Ensure that ships submit a CMAV work packages as scheduled in accordance with Appendix H of this chapter. Message work packages may be sent if the ship is not in port. This singular action has significant impact on the ability of both the RMC/ISIC and Executing Activity to properly plan for the CMAV, and determine potential impacts on other planned work.
- b. **PMR/URO Review (Submarine only).** Review PMR/URO requirements and ensure all maintenance actions intended for accomplishment during the CMAV are identified and entered in the CSMP. Using the PMR scheduling system as described in Volume VI, Chapter 24 of this manual, the ISIC will request that all applicable PMR work be added to the ship's CSMP when the SUBMEPP CD-ROM is received. This work is applicable if it is prescribed for the ship and is due in accordance with the associated schedule. PMR and URO work is mandatory. PMR requirements are to be accomplished on or before the scheduled due date listed in the SUBMEPP provided report as contained in the TYCOM PMR scheduling system. PMR requirements which are not accomplished by their scheduled completion date will be rescheduled and identified to the TYCOM in accordance with Volume VI, Chapter 24, paragraph 24.7.3.i of this manual. UROs are to be accomplished by the scheduled due dates or appropriate waivers or DFS must be requested.
- c. **FMP Review.** Review FMP and ensure all authorized alterations intended for accomplishment during the CMAV are identified by priority based on material availability as identified by the Executing Activity. Ensure they are properly entered into the CSMP.
- d. **MJC Review.** Review the MJC and identify the routine package to be accomplished during the CMAV. Ensure it is properly entered into the CSMP.
- e. Review work candidates for applicability of Master Specification Catalog task lists.
- f. Draft Key Event Schedule.
- g. **Work Package Screening.** Screen and forward the assigned prioritized work package to the Executing Activity. Maintenance Team/RMC/ISIC responsibilities for work package screening are established in reference (a). Additional specific requirements are:
  - (1) Ensure work candidates meet the criteria for the level of work and are correctly prioritized in accordance with reference (a).
  - (2) If the assistance requested is for use of the Executing Activity facilities or technical guidance in order for Ship's Force to accomplish planned or corrective maintenance, the submitting ship and TYCOM should be advised to use MJC Routine N0000EXCNA740, (Facilities for Ship's Force Work).

- (3) If a work candidate is received in message format, the RMC/ISIC shall input the message work candidate into the Maintenance Data System (MDS). For a ship in transit, the parent RMC/ISIC must advise the RMC/ISIC to which the ship is reporting of the desired disposition of the message work candidate.
  - (4) Designate controlled work as defined in Volume V, Part I, Chapter 5 of this manual. Indicate the appropriate governing Key Event.
  - (5) (Submarines only). If the equipment is contained in the PMR program and the repair can possibly satisfy the PMR requirement, the ISIC will designate the work as Special Interest in Block 10, note the PMR MJC Job Control Number (JCN) in Block 49, and instruct to call out the MJC item. Enter remarks as necessary in Block 49 preceded by "SQ-", and sign in Block C.
- h. From the Key Event schedule, develop an IWS in accordance with paragraph 4.4.4 of this chapter to aid in tracking and sequencing CJs.
  - i. CMAV Funding. CMAV funding targets are developed as a part of each ship's MMBP. RMC/ISIC will establish CMAV funding targets in order to properly and responsibly administer funds, and gain optimum readiness return on each dollar invested.
  - j. Submarine Engineering Management, Monitoring and Fleet Support Program Office Performance Monitoring Team (PMT)/Supervisor of Shipbuilding Newport News PMS 312C Material Condition Assessment (MCA) Review. Review scheduled Submarine Engineering Management, Monitoring and Fleet Support Program Office/PMT/PMS 312C MCA inspections, monitoring and testing that may result in significant new work for the Executing Activity or Ship's Force; or that may impact scheduled Ship's Force or Executing Activity work.
  - k. Outside Activity Support. Identify outside activities (e.g., Naval Surface Warfare Center, Carderock Division (NSWCCD), Alteration Installation Team, Naval Undersea Warfare Center, Supervising Authority, RMC, Industrial Activity Tiger Team, etc.) participating in the CMAV and their associated support requirements.
  - l. Special Evolutions. Identify required special evolutions associated with pre-availability tests and inspections.
  - m. WPER. The WPER is conducted with the Executing Activity (and Ship's Force if available) as scheduled in accordance with Appendix H of this chapter. The purpose is to finalize the CMAV work package and required evolutions. This is accomplished as noted below. This meeting may be conducted in conjunction with the ship's PB4M.
    - (1) Attendees will include the Maintenance Team/ISIC Material Officer/TYCOM Ship's Coordinator, Maintenance Planning Manager, RMC, Maintenance Manager, Production Officer representative, Executing Activity, Ship's Engineer Officer, MST OIC, Availability Coordinator and the Ship Superintendent (as applicable).
    - (2) Assemble the proposed CMAV work package from the CSMP, PMR/UROs, FMP and MJC, as applicable.
    - (3) Screen the proposed work package to designate the work to be accomplished during the CMAV.
    - (4) Prioritize the proposed work package.

- (5) (Submarines only). Identify Safety of Ship Maintenance Items List evolutions in Volume IV, Chapter 10, paragraph 10.4.8 of this manual.
  - (6) Designate the CJs.
  - (7) Integrate Executing Activity recommended CMAV Key Event schedule with other ISIC/Ship planned events for the ship, such as weapons moves, fueling, and training events.
  - (8) Review scheduled PMT/MCA testing that may result in significant new work after the CMAV starts.
  - (9) Establish the CMAV berth for pre-staging material and support equipment.
  - (10) Review adequacy of available testing and support equipment needed for the CMAV.
  - (11) Identify other outside activities participating in the CMAV and associated support requirements.
  - (12) Identify required special evolutions associated with pre-availability tests and inspections. The result of the CMAV WPER should be an executable work package within the CMAV time frame, budget, and Executing Activity capacity.
- n. Re-screen Work Candidates. Re-screen and assign rejected work candidates (in accordance with Part II, Chapter 1 of this volume). Notify ship of final disposition of each item.
- o. Issue Availability Planning Message (Submarines only). **No later than** two weeks prior to start of the CMAV, send the Availability Planning Message prepared in accordance with Appendix F of this chapter and reviewed during the CMAV WPER, to the ship. It should describe the major work scheduled, controlling Executing Activity and Ship's Force Key Events, PMT/MCA testing, PMR jobs scheduled, alterations to be accomplished by the Executing Activity and Ship's Force, any other scheduled evolutions **and 100 hour transition plans**. This message should identify the current numbers of components due or overdue from the Calibration/Weight Test Recall Program.

**4.6.1.3 Issue Availability Planning Response Message (Submarines only).** No later than one week prior to the start of the CMAV, the ship shall certify readiness to transition to a CMAV period, and address any concerns with the Availability Planning Message to TYCOM/ISIC in accordance with Appendix I of this chapter. The following items shall be addressed in the ship's report:

- a. Schedule requirements such as action items from Availability Planning Message, schedule of key events, ability to conduct 100 hour transition plans.
- b. Ship material preparation such as a report status of parts for Ship's Force work and desires for ISIC/TYCOM assistance in procurement and ensuring all outstanding CASREPs, SUBS, ZOZZS and TDENTS are identified in availability planning message.
- c. Ship's Force integrated schedule such as miscellaneous programs (calibration, small valve maintenance, etc.), drills and trainers that will affect Ship's Force ability to support production work, preservation zones and planned maintenance (to include PMS, Reactor Plant PMS, and PMT/KMRCs).
- d. CO's report of readiness or concerns: CO review above items and availability planning message and report readiness and exceptions to transition to CMAV period.

**NOTE: ALL WORK CANDIDATES SUBMITTED AFTER A-30 SHALL BE SCREENED AND CONTROLLED AS LATE WORK IN ACCORDANCE WITH PARAGRAPH 4.4.6 OF THIS CHAPTER.**

4.6.1.4 Arrival Conference. This conference is conducted by the LMA. The Arrival Conference purpose is to provide an executive level brief to the RMC/ISIC, Executing Activity, MST OIC (if applicable) and ship's CO on the total scope of the CMAV effort and shall be conducted as discussed below. Note that the Arrival Conference may be conducted in conjunction with the PB4M.

- a. Attendees. The Arrival Conference is hosted by the responsible FMA and attended by the following personnel:
  - (1) RMC/ISIC Material representative(s).
  - (2) Executing Activity representative(s).
  - (3) Tended ship, (recommended, as applicable, are the CO, Department Heads, and Availability Coordinator).
  - (4) Site PMT/MCA Officer.
  - (5) MST OIC (if applicable).
  
- b. Agenda. The following items comprise the agenda to be covered during the Arrival Conference:
  - (1) Introduction of key FMA, Executing Activity and ship personnel.
  - (2) CMAV material and funding status.
  - (3) Review the CMAV Key Event schedule for potential conflicts.
  - (4) Special evolutions scheduled during the availability.
  - (5) Validate that critical jobs to be accomplished by the Executing Activities and Ship's Force are properly sequenced in the IWS.
  - (6) Introduce the LMA representative as the single point of contact for all elements of the CMAV, including responsibility for coordination of all Executing Activities and Ship's Force. This point of contact may be the Port Engineer, Project Manager, or Ship Superintendent, as applicable.
  - (7) Alterations to be accomplished.
  - (8) Significant material issues.
  - (9) Review status of outstanding DFS, as applicable.
  - (10) Results of arrival inspections and PMT/MCA testing.
  - (11) Issue meeting schedule for the CMAV.
  
- c. Tended Ship Actions. The ship takes the following actions at this conference:

- (1) Submit a list of key Ship's Force personnel, including officers, Leading Petty Officers/Work Center Supervisors, Quality Assurance Inspectors, Calibration Coordinator and Availability Coordinator.
  - (2) Verify that all known work candidates requiring outside assistance have been identified and work candidates submitted to the LMA/TYCOM or submit known late work candidates for immediate screening.
  - (3) Discuss potential Executing Activity/Ship's Force work interface concerns.
  - (4) Identify Ship's Force/MST (if assigned) planned evolutions that could impact scheduled work and verify that they are properly sequenced in the IWS.
- d. RMC/ISIC Actions. During this conference, the RMC/ISIC staff will take the following actions (if not already done):
- (1) Review any late work candidates submitted by the ship not addressed at the Arrival Conference, and screen them appropriately. The entire Executing Activity CMAV work package should have been fully identified at the Arrival Conference. The goal is to control late work in accordance with paragraph 4.4.6 of this chapter. Should the late work presented at the conference require that other work be deferred, that work to be deferred shall be clearly understood. A Business Case Analysis described in Appendix D of this chapter should be conducted.
  - (2) (Submarines and Aircraft Carriers only). Brief the Key Events schedule for the availability. The ship's Key Events should normally be scheduled in the Pre-CMAV/Availability Planning Message, concurred with by the ship's CO on arrival and input to the MDS by the RMC/ISIC prior to the Arrival Conference. CJs controlling the CMAV completion shall be identified for special management attention by the ISIC, LMA, Executing Activity and Ship's Force.

4.6.2 Continuous Maintenance Availability Execution. CMAVs are complex evolutions characterized by detailed management, closely coordinated RMC/ISIC, Executing Activity and Ship's Force work, systems testing, and other sequenced evolutions such as weapons movements, diver operations and training. Successful CMAV execution requires the closest possible communication and coordinated efforts by the RMC/ISIC, Executing Activity and Ship's Force.

4.6.3 Continuous Maintenance Availability Completion Procedures. The following procedures will be utilized for completing a CMAV. Exceptions are provided for those CMAVs of less than four weeks, or are of a minor scope where the PB4M may be an appropriate forum.

4.6.3.1 Management Reports Close-out Procedures. Upon completion of a scheduled availability, the MDS files must be updated to reflect the current status of work. To accomplish this goal and to ensure that all activities understand the status of all work, the following procedures will be followed:

- a. Upon completion of the assigned work, the LMA or Executing Activity will present a copy of the work candidate or a list of completed JCNs with the applicable final action codes to the ship to obtain concurrence that the described work was completed. Ship's Force will complete all AWRs in accordance with reference (a). Within 2 weeks of completion, the Executing Activities who have performed any configuration change shall submit the form 4790 CK of reference (a) to Ship's Force for submission to Configuration Data Managers Database - Open Architecture.
- b. Within two working days after the completion of an availability, all work centers will ensure that final man-hours have been entered. The ship's superintendent may sign off all Executing Activity routines for the ship. Completed work candidates and AWRs will be a product of the CMAV Departure and Assessment Conference of paragraph 4.6.3.2 of this chapter.

- c. On the third working day after the completion of an availability, the Maintenance Team will ensure that the CSMP ship and shore files reflects the current status of the ship's JCNs and request a Selected Job Management Report by priority for the ship.
- d. On the fourth working day after the completion of an availability, the ship's superintendent will annotate each incomplete JCN on the final Selected Job Management Report by JCN as to its present status and actions required in order to complete the item. Lead work centers must update this status into the MDS.
- e. Within seven working days after the completion of an availability, the Executing Activity will forward copies of the annotated Selected Job Management Report to the ship and ISIC.
- f. Review status of outstanding DFSs.

4.6.3.2 End of Scheduled Continuous Maintenance Availability Departure and Assessment Conference. This comprehensive review and critique of the availability is another cornerstone of the continuous improvement policy regarding Fleet maintenance.

- a. Purpose. The CMAV Departure and Assessment Conference is held to:
  - (1) Review the conduct of the availability and identify those improvements necessary to increase the effectiveness of Fleet maintenance.
  - (2) Identify the work that was completed during this CMAV and complete the appropriate documents (e.g., work candidates, AWRs, etc.) or produce the list necessary to update the ship's CSMP to reflect the completed work.
  - (3) Identify and reschedule to a future CMAV, the work deferred during this CMAV.
  - (4) Identify any incomplete work candidates and plan of action to complete items.
  - (5) Establish the basic requirements (i.e., initial work package, sequence number and tentative dates) for the next CMAV.
  - (6) Review status of outstanding DFSs.
- b. Execution. The Departure and Assessment Conference will be held during the last week of the CMAV at a time agreed upon by the Executing Activity Repair Officer/Production Officer and the ship. This meeting may be held in conjunction with the final weekly Management Conference or Progress Review.
- c. Attendees. The Departure and Assessment Conference is chaired by the LMA Repair Officer. The following personnel shall attend this meeting and participate in its agenda:
  - (1) ISIC Supply Materials, Weapons/Combat Systems, Electronics Material Officer, and Submarine Engineering Management, Monitoring and Fleet Maintenance Support Program Office/PMT Staff personnel (as applicable).
  - (2) LMA Repair Officer, Production Officer, and Ship Superintendent, or their designated representatives.
  - (3) Tended ship CO, MST OIC (if applicable), Engineer and Availability Coordinator.
  - (4) Others as directed by the TYCOM, ISIC or Executing Activity CO.
  - (5) Executing Activity representatives.

- d. **Agenda.** The following agenda shall be used for reviewing and assessing the CMAV. Additional items may be added at the discretion of the TYCOM, ISIC, Executing Activity or ship. Attendees will be prepared to address their respective portions of the agenda.
- (1) Review of the CMAV work package to establish status of each item and, for items completed satisfactorily, complete the work candidate/AWR.
  - (2) Review incomplete work candidates that will remain open from this CMAV and identify plan of action to complete these items.
  - (3) Identify and reschedule to a future CMAV the work deferred during this CMAV.
  - (4) Assess the scheduling, execution and quality of work accomplished by each activity during the CMAV.
  - (5) Assess the quality of general services provided by the Executing Activity site.
  - (6) Review recommendations for process improvements and possible LEAN initiatives.
  - (7) Assess lost time that prevented or delayed execution of scheduled work. (Lost time internal to the Executing Activity, e.g., waiting for transportation, assist work center, etc. and lost time caused by the ship such as waiting access, tagout, other Ship's Force support.)
- e. **Results.** The LMA shall consolidate the minutes of this meeting into the Departure and Assessment Report to the ISIC. The report shall include:
- (1) List of completed work and/or completed work candidates/AWRs for direct input into MDS to update the ship's CSMP and Configuration Data Managers Database - Open Architecture.
  - (2) Preliminary establishment of the next CMAV.
  - (3) List of policies and processes identified as requiring review for improvement. Proposed process improvements and corrective actions suggested to improve the effectiveness of future CMAVs.
  - (4) Lessons learned from the availability.

4.6.3.3 **Fast Cruise/Sea Trials.** The ISIC may schedule a one to two day Fast Cruise as part of the CMAV Key Event schedule. This is normally the last major Key Event prior to CMAV completion. As a minimum, the Fast Cruise agenda will include specified drills and evolutions necessary to re-establish proficiency in basic ship operations. It will also include sufficient formal testing to certify that the equipments and systems are fully ready to operate at sea in an operational environment. For CMAVs less than four weeks, the requirement for a Fast Cruise shall be at the ISIC discretion. The necessity of Sea Trials is a function of work performed during a CMAV and may not be required. If the duration or complexity of the CMAV is determined to be sufficient to warrant Sea Trials, the Ship/ISIC/TYCOM (as required by specific Force policy) shall determine if a formal Sea Trial Agenda is necessary, and if required, task the RMC/ship to prepare a formal Sea Trial Agenda for ISIC/TYCOM approval.

4.6.4 **Hot Wash.** For long duration or complex CMAVs, or in cases where there are significant lessons to be learned, Hot Wash will be conducted. The Hot Wash should be within 30 days of completion of the availability. Hot Wash is described in Volume VI Chapter 39 of this Manual. All key NSA, RMC, LMA, Executing Activity and Maintenance Team personnel shall attend it. The agenda and details of the meeting shall be determined by the RMC and Maintenance Team and shall be of appropriate length to evaluate the overall scope of the work accomplished. For small non-complex CMAVs, the intent of Hot Wash may be accomplished in conjunction with another meeting such as a PB4M. The Hot Wash process provides the maintenance and modernization community with a process to

identify, resolve, and provide feedback communication on barriers causing inefficiencies or waste within business processes. While there are several milestone meetings within the availability planning and execution process, the feedback process exists to continually collect information to improve processes.

4.6.5 Maintenance Management Performance Goals. (Submarine Tenders and Assault Craft Units only) The following maintenance management performance goals are established for Submarine Tenders and Assault Craft Unit Repair and Weapons Repair Departments. COs and Repair Officers are responsible for making every effort to attain these goals.

4.6.5.1 Activity Performance Summary. The Activity Performance Summary is a compilation of manpower statistics and production indices that are cumulative on a monthly basis. The following information summarizes the content and use of this report:

- a. This report is produced weekly on a cumulative basis for the current month and analyzed by the Production Officer and Repair Officer. This analysis should help determine the relative accuracy and adequacy of the manhour accounting for each work center. The data reflects how each work center is loaded with production work.
- b. On the last day of the month, a complete monthly cumulative report is produced. A thorough review and analysis is conducted by the Repair Officer and Production Officer, similar to the weekly review.
- c. Following review and analysis, the Repair Officer approves the data and the required reports are submitted to the TYCOM. The TYCOM in turn forwards the data to higher authority.
- d. The Performance Summary provides management with data to determine the capacity of the activity for CMAV maintenance, and subsequent monitoring of the activity maintenance effort conducted on ships. The determination of activity capacity for ship maintenance is the gauge by which managers can evaluate activity productivity while reviewing the report of manhour expenditures.
- e. Activity capacity is a function of both total manpower and the distribution of personnel within the activity. A comparison of Repair Department manning to the manpower authorization should be conducted periodically to ensure activity work centers are not undermanned with respect to rate, Navy Enlisted Classification, and/or number of personnel. This review may determine that local action is required to schedule formal schools leading to the Navy Enlisted Classification acquisition where shortages exist, or may dictate a temporary or permanent reassignment of resources from one work center to another.
- f. Part One of the activity Performance Summary shows the manpower distribution within the Activity. The Analyst Records and Report Section is responsible for collecting manning information from the activity departments and divisions as a basic input to the Performance Summary. The manning level of the Repair Department is monitored to ensure that this department is properly manned across its work centers.
- g. Part Two of the activity Performance Summary provides departmental manpower usage indicators and statistics. The Productivity Index is a key indicator of activity employment. Each Productivity Index is a ratio of production manhours expended to the production manhours available. Available manhours are computed from the number of production personnel assigned each day, assuming an eight hour work day and no more than five working days per week.
- h. Part Three of the activity Performance Summary is a breakdown of activity manhours expended aboard each tended ship.
- i. Part Four of the activity Performance Summary shows the status of work screened for activity accomplishment.

- j. Part Five of the activity Performance Summary provides the same manhour usage information as Part Two, but broken down by work center.

4.6.5.2 Available Production Hours. The standard workday consists of eight hours of available production work each work day, five days a week. Weekends and national holidays are not considered to have available production work hours. It further requires that TYCOMs will establish policies that maximize available production hours within the context of the total activity mission profile. The activity CO shall implement the eight hour production work day for activity personnel. Reduction in this available effort will be for requisite industrial training, skill qualification, facilities maintenance, and capability certification efforts needed to meet the activity's Mission Profile requirements.

4.6.5.3 Performance Indices.

- a. All factors relative to the following indices must be accurately reflected in the baseline of the FMA computer management system. These factors are:
  - (1) Assigned Manhours. The number of personnel assigned to the activity as production and production support, over the normal eight hour work day and the number of days tending (exclusive of weekends, holidays and days underway), comprise the "Assigned (Gross Available) Manhours".
  - (2) Production Manhours. The manhours actually expended in the progress and completion of work requests authorized for activity accomplishment are those expended by personnel assigned to the activity work centers. The expended manhours by personnel from other departments are not included in the activity's indices, but are credited to other special work centers on the Performance Summaries.
  - (3) Productive Support Ratio for the Department is defined as:
 
$$\frac{\text{Total Assigned Support Personnel}}{\text{Total Assigned Production Personnel}}$$
- b. A Productive Support Ratio of between 0.65 and 0.85 shall be maintained. A ratio of greater than 0.85 is indicative of an excessive number of FMA personnel assigned to non-FMA tasks. A ratio of less than 0.65 is indicative of a shortage of personnel in Quality Assurance, Planning and other critical production support work centers.
- c. Supervisory Ratio. The Supervisory Ratio, production personnel to permanent support personnel, must be a minimum ratio of 7:1.
- d. Supply Production Support. Production work centers shall not have supply function production support personnel assigned such as Repair Parts Petty Officers. The supply support function is assigned to the Planning and Estimating and Repair Other Vehicle work centers. When the production work centers must provide technical details for Repair Other Vehicle supply requests, such research time shall be reported as production time against the applicable work request. Production managers must ensure the Automated Material Requisitioning system is fully utilized to preclude wasted labor by activity personnel in copying supply data already available from the computer.
- e. Department Productivity Index.

- (1) The Productivity Index for the Department is defined as:  
$$\frac{\text{Total Production Manhours Expended by Department Personnel for the Reported Period}}{\text{Total Production Personnel} \times 8 \text{ hours per day} \times \text{Total Number of Days Tending for the Reported Period}}$$
- (2) A Productivity Index for the department should average between 0.55 and 0.75. An index of greater than 0.75 indicates:
  - (a) Insufficient assignment of production personnel resulting in significant overtime work or deferral of requisite technical skill training and qualification, and proficiency or general military training.
  - (b) An excessive amount of overtime work caused by improper workloading of an activity by the ISIC.
  - (c) Inaccurate reporting of manhours.
  - (d) Inaccurate accounting of assigned personnel (e.g., 340 assigned personnel working and reporting production hours but only 310 shown in the computer as assigned).
- f. Work Center Productivity Index. A Productivity Index for individual production work centers for the month could range from 0.25 to 1.35 with a norm of 0.85. However, if the quarterly average for a production work center is less than 0.40, the number of personnel should be reduced.
- g. Repair Utilization Index. Repair Utilization Index for the Department is:  
$$\frac{\text{Total Support Manhours} + \text{Expended Production Manhours}}{\text{Total Production and Support Manhours Assigned}}$$

The Department Repair Utilization Index should average between 0.45 and 0.65 for the month.
- h. Long-Term Non-FMA Duty Index. There are two special work center codes established to monitor the total Repair Department (10J) and Weapons Repair Department (10K), if assigned, personnel detailed to non-activity duties for greater than 30 continuous days. These numbers should not exceed ten percent of the total assigned activity personnel averaged for the calendar quarter.

4.7 YEAR LONG CONTINUOUS MAINTENANCE. The CM is a single yearlong availability, for the period 01 October through 30 September, scheduled for each ship every fiscal year. The Year Long Continuous Maintenance (YLCM) availability is for the scheduling and completion of non-emergent work items that are not accomplished during any other scheduled availability.

4.7.1 Year Long Continuous Maintenance Planning. Planning sources and actions are similar to those for the CMAV and are included above. Since the Continuous Availability is a year long it has no specific arrival date as a reference for the planning milestones. As a result the milestone dates for the yearlong availability are consistent with those for the scheduled availability but are referenced to the planned execution date(s) of the work item(s). This approach for non-emergent work is intended to reduce premiums and waste for most work candidates by allowing the work to be planned, resourced with manpower and materials in a routine way. The Planning Milestones are included in Appendix H of this chapter. The definition of Executing Activity scope that takes place in the WPER of a CMAV does not occur in the YLCM availability as a discrete signal point. Rather LMAs should continuously define scope and schedule across the LMA and assigned Executing Activities at the times described in Appendix H of this chapter.

4.7.2 Year Long Continuous Maintenance Work Execution. During the execution period of work items in the YLCM availability, measures should be taken to ensure that Ship's Force, LMA and Executing Activities remain appraised of:

- a. Status of work to be accomplished.
- b. Identities of designated contact personnel.
- c. Status of material and other resources.
- d. Current schedule status.
- e. Special Evolutions that may impact completion of the work items.

4.7.3 Continuous Maintenance Completion. At the end of the fiscal year the availability should be entered as complete and a new availability established for the new fiscal year.

4.8 EMERGENT AVAILABILITY. The EM availability is designed for work of such an urgent nature that the heightened risk of paying premiums is accepted and planning horizons are shortened. This type of availability is for C3/C4 CASREPs, or a C2 CASREP with reasonable potential to become a C3/C4 CASREP. They are identified as emergent maintenance and ordinarily funded from emergent funds. Emergent work will be scheduled to minimize premiums in as much as the operational schedule will permit. C2 CASREPs will normally be corrected using the CM Process. Consideration will be given to schedule all maintenance, including emergent, at an opportune time to reduce premiums. The RMC Commander may, with the respective TYCOM's approval, convert Emergent Maintenance funds to execute CNO availability or CM.

4.8.1 Emergent Availability Planning. Planning sources and actions are similar to those for the CMAV and are included above. In the case of the EM availability, the milestone dates for the availability are not consistent with those for the scheduled availability and produce added risk of disruptions and payment of premiums. This risk is acceptable only because of the affect of the work on the mission capability of the tended ship. The definition of scope and schedule for emergent work occurs after the definition for both scheduled CMAV and unscheduled CM availabilities when Executing Activities may already be fully loaded and material may need extra effort to be expedited. Additionally, it may result in already scheduled work being deferred.

4.8.2 Work Execution. During the execution period of work items in the EM Availability measures should be taken to ensure that Ship's Force, LMA and Executing Activities remain appraised of:

- a. Status of work to be accomplished.
- b. Identities of designated contact personnel.
- c. Status of material and other resources.
- d. Current schedule status.
- e. Special evolutions that may impact completion of the work items.

4.8.3 Availability Completion. At the end of the fiscal year the availability should be entered as complete and a new availability established for the new fiscal year.

4.9 INTERIM DRYDOCKING/PRE-INACTIVATION RESTRICTED AVAILABILITIES. (Submarines Only.) A scheduled availability for repair activity accomplishment of specific maintenance items, such as URO MRCs. The availability, together with a Material Condition Assessment in accordance with reference (1), can request that the CNO extend the ship's operating interval and/or operating cycle. A Pre-Inactivation Restricted Availability (PIRA) is specifically used to extend the operating interval and/or operating cycle to the inactivation availability for

the submarine. An Interim Drydocking (IDD) is specifically used to extend the submarine's operating interval and/or operating cycle to the next CNO scheduled availability other than an inactivation availability. Appendix J of this chapter contains a list of Major Trial and Inspection Milestones for IDD and PIRA availabilities.

4.9.1 Type Commander/Immediate Superior In Command (Group or Squadron) Responsibilities.

- a. Authorize new items and growth industrial work items.
- b. Monitor and approve all changes in established milestones, not internal to industrial activity completion dates.
- c. Issue direction when the quality or completeness of industrial activity work is in question.
- d. Notify the TYCOM when essential Ship's Force work cannot be completed on the scheduled contract or Key Event completion date. Make recommendations for assistance where appropriate.
- e. Periodically assess and monitor shipboard conditions during the availability.
- f. Prior to Fast Cruise, the ISIC Quality Assurance Officer shall conduct a formal audit of Ship's Force Re-Entry Control (REC) and DFS Records. Using the SUBMEPP PMR and URO MRC scheduling reports and current industrial activity/Ship's Force updates to the latest report, ensure all required "D"-Level PMR and URO MRC accomplishment is current. The ISIC shall forward the audit results to the TYCOM via the cognizant Commander, Submarine Group. The ISIC will then report to the TYCOM by message in accordance with message sample format of Appendix K of this chapter the status of the crew/material certification. An update of this certification is needed prior to Sea Trial and following the rescinding of certification noted in paragraph 4.9.9 of this chapter.
- g. Conduct a material inspection of the ship prior to Fast Cruise.

4.9.2 Certification Availabilities (Less Than Six Months) (Submarines Only).

- a. Duties and Responsibilities for Sea Trials and Inspections. Reference (b), as applicable, delineates the TYCOM's responsibility for operational control of assigned submarines during trials and for assuring that the crew and ship have attained satisfactory state of training, administrative, operational and material readiness for at-sea operations during the trials. Appendix L of this chapter provides a Sample Ship Message to ISIC and TYCOM Concerning Material Certification Upon Completion of Sea Trials.
- b. General Instructions for Industrial Activity Availability Trials and Inspections.
  - (1) Fast Cruise may not commence until Dock Trials have been satisfactorily completed and a satisfactory state of crew training (if required) and material readiness (if required), as delineated by this manual, has been certified. The required inspections and tests and their associated time periods may be modified by the TYCOM upon request from the cognizant ISIC.
  - (2) Sea Trials involving escorts will not normally be scheduled to commence on a weekend. When circumstances are such that Sea Trials must be rescheduled or planned to commence on a weekend to avoid costly delays, TYCOM approval will be obtained by the ISIC.
  - (3) Critical operation of reactors while nuclear powered ships are in a naval or commercial industrial activity will be governed by reference (m). The CO may authorize critical operation of the reactor in support of tasks assigned the ship. However, as long as the ship remains in an industrial activity, the CO will notify the Supervising Authority well in advance of any critical operation of the ship's reactor. This notification shall include the nature and duration of such operations.

- (4) In conducting the inspections required herein, inspectors should be guided by the concept that at the start of Fast Cruise, the ship should be, in all respects, ready for Sea Trials with the exception of the additional training the crew will receive during the Fast Cruise.
- (5) The requirement for TYCOM SUBSAFE certification of SUBSAFE boundaries not entered by the industrial activity and the material readiness upon completion of an industrial activity availability imposes additional responsibilities on the ISIC inspectors. Included in the material inspection will be a review of all outstanding Forces Afloat DFS as defined in Volume V, Part I, Chapter 8 of this manual. A review of the Ship's Force REC Records is necessary for SUBSAFE work accomplished by Forces Afloat in accordance with Volume V, Part I, Chapter 5 of this manual, along with a review of the applicable URO MRC status.
- (6) The ISIC certification message, in accordance with Appendix K, will also provide a status report of any outstanding Re-Entries, Forces Afloat DFS and delinquent URO MRCs. The scope and nature of this inspection will vary dependent upon the extent and length of the availability. In this regard:
  - (a) Material certification may be made subject to the correction of specific deficiencies. (Deficiencies are such that they can be readily identified and listed).
  - (b) Material certification should be postponed to a later date when deficiencies are so significant or so numerous as to preclude correction in the time remaining before the scheduled start of Fast Cruise.
  - (c) Deficiencies that could affect the safe operation of the ship during Sea Trials must be corrected, reinspected and reported to the TYCOM as having been corrected prior to the start of Fast Cruise.
- (7) Inspectors must determine that all work/testing necessary to support Sea Trials has in fact been completed or identified for completion prior to the start of Fast Cruise including the following:
  - (a) All ship's systems which affect safe operation during Sea Trials must be operable.
  - (b) All work necessary for safe operation of the ship during Sea Trials which was undertaken by the industrial activity, Ship's Force, FMA, or other outside activities must have been satisfactorily completed and tested. Included must be a check for any special configuration or installations ensuring that they have been authorized by the proper authority, that their impact has been fully assessed and that the Sea Trial Agenda includes these impacts or limitations.
- (8) Following the completion of the required training and material readiness certification, COs must keep the cognizant ISIC fully informed of any changes in personnel, training and/or material status which could affect the validity of certification. Prompt TYCOM notification is required to permit revision or Operational Orders and services required.
- (9) Underway trials following IDD/PIRAs, particularly initial submerged and test depth trials, must be undertaken with the knowledge that the crew lacks recent experience operating as a unit and that the ship's structure and fittings have not been tested in an at-sea environment. All tests and procedures must be conducted carefully and methodically. Systems and components designed to operate at test depth should not be demonstrated at that depth for the sole purpose of proving the design, but instead should be operated at the deepest depth at which they might be used. For example, the hovering system should not be demonstrated at test depth. Trials and tests which are inherently hazardous should not be conducted.

- (10) A schedule is required for each underway, dockside or simulated trial. Prerequisites of the first underway period are: satisfactory ship's material condition as shown by the successful completion of alongside tests, salvage inspection, Ship's Force Dock Trial, and a satisfactory state of training as shown by the successful completion of crew certification inspection and Fast Cruise. Fast Cruise deficiencies affecting safe operations revealed in either material conditions or state of training must be corrected prior to getting underway for Sea Trials.
- (11) The trial schedule shall include a minimum of six hours of Individual Ship Exercises (ISE) for Ship's Force training. This ISE should be sequenced as soon as practical after the initial tightness dive and should include the necessary evolutions to allow each watch section ship control party to familiarize themselves with their assigned stations and duties. The ship should be operated at moderate speed to develop proficiency prior to the deep dive and full power run. Testing may be scheduled during the ISE period on a not-to-interfere basis with training. The time spent in the initial tightness dive, if at moderate speed, may be included as one section's training. The requirement to provide each watch section ship control party with about two hours experience submerged at moderate speed prior to the deep dive and full power run is mandatory for ship's safety.
- (12) All trial periods must be organized such that each member of the command has an opportunity to get six uninterrupted hours of rest during each 24 hour period encompassed by the trials. Sea Trial events which can be accomplished by normal watch sections may be conducted concurrently with crew rest periods.
- (13) Prior to getting underway for Sea Trials, Shipyard, Ship's Force and Type Commander shall jointly agree that the required seven day supply of Oxygen (O<sub>2</sub>) and seven day supply of Carbon Dioxide (CO<sub>2</sub>) removal capacity will be available in each compartment, based upon the number of expected occupants of that compartment, independent of the supply and removal capacity in the other compartment(s).
- (14) After the conclusion of Sea Trials, the submarine shall not be operated at depths greater than 1/2 Test Depth plus 50 feet, unless specifically authorized by the TYCOM, and shall not be released for unrestricted operations until all RECs are closed and the TYCOM issues the unrestricted operations authorization message.
- (15) After the conclusion of Sea Trials, and based upon a review of Sea Trial deficiencies and TYCOM authorization, the submarine may transit to a port other than the industrial activity.

4.9.3 Operating Depth Policy. The TYCOM's policy with respect to maximum allowable operating depths during trials, evolutions to be performed at the various depths, and the prescribed maximum water depth applicable in each case is stated in Volume VI, Chapter 26 of this manual. In every instance where the maximum authorized operating depth is exceeded, a report shall be made in accordance with reference (n), section 3.3.5.c.

4.9.4 Propulsion Plant Tests (If Required). For full power trials provisions of reference (o), Section 6 applies. Submarine depth during the submerged full power trial should be consistent with the applicable Submerged Operating Envelope (SOE), based on the Emergency Main Ballast Tank (EMBT) blow from maximum authorized operating depth being previously accomplished. The full power submerged ahead test for commissioned nuclear powered submarines shall be terminated by a back emergency bell. The duration of the back emergency shall be limited to 45 seconds, to be followed immediately by an appropriate ahead bell. Caution must be exercised to avoid developing stern way.

4.9.5 Phase II Crew/Material Condition Inspection. A Phase II Crew Certification Inspection is normally not required, but should be determined on a case basis by the parent ISIC. If there will be less than 15% personnel turnover, crew certification may be waived. Should the CO determine that alterations accomplished or the transfer of experienced personnel warrant a crew certification, a formal request shall be submitted to the ISIC. When required, crew certification will be performed in accordance with references (p) through (t). The material

certification consisting of an ISIC audit of all Ship's Force SUBSAFE work in accordance with Volume V, Part I, Chapter 9 of this manual will need to be conducted for all industrial activity availabilities since the extent of the availability is such that an independent evaluation by an organization other than Ship's Force is required.

4.9.6 Pre-Critical Inspections. For availabilities where the reactor will be shutdown for 16 weeks or more, it is considered prudent to use an inspection plan similar to that employed by NAVSEA. Normally, the crew's readiness can be assessed within two days using such a plan, which should encompass the following:

- a. An administrative review.
- b. Observation of basic drills and evolutions not requiring reactor operation.
- c. Personnel interviews.
- d. Material inspection.

4.9.6.1 Scheduling of Pre-Critical Inspections. The ISIC Pre-Critical Inspection should be scheduled by the responsible ISIC about four weeks prior to criticality. The TYCOM should be advised as soon as possible in advance of the tentative date for the ISIC Pre-Critical Inspection and confirmed dates should be established about one month in advance of the inspection.

4.9.6.2 Composition of the Inspection Team. The Pre-Critical Inspection Team should consist of:

- a. A nuclear trained member of the cognizant ISIC Staff, usually the Squadron Training Officer.
- b. A qualified nuclear trained officer with experience as an Engineer Officer.

4.9.6.3 Reports of Inspection.

- a. The Senior Inspector should provide the inspected unit with an informal report of findings by the inspection team, copy to the cognizant ISIC and TYCOM.
- b. The ship's CO shall review the findings of the inspection team and make necessary adjustments to his training program to ensure his crew's readiness for criticality. He shall keep the cognizant ISIC advised of his training plan and his assessment of his crew's progress.
- c. The cognizant ISIC shall review the inspection findings, the CO's training plan and progress evaluations and direct follow-up reviews and/or inspections necessary to verify the ship's readiness for criticality.

4.9.7 Dock Trials. Dock Trials must, as a minimum, test those systems/equipments repaired or altered during the availability. The CO should use Appendix M of this chapter as a guide in preparing the Dock Trial Agenda.

4.9.8 Fast Cruise. Fast Cruise may commence immediately upon completion of Dock Trials and shall consist of the minimum requirements as set forth in Appendix N. The requirement for a Fast Cruise may be less than or greater than 24 hours in length depending upon the length of the availability and the time since the crew last operated the ship at sea. The CO, with ISIC concurrence, will determine length of the Fast Cruise. Prior to the ship commencing Fast Cruise, the Supervising Authority shall report to the ship, by message, that all mandatory work approved for accomplishment during the availability is completed. When the ship is ready for sea, with the exception of conducting Fast Cruise and after receipt of the SUBSAFE material certification report from the performing activity as required by reference (u) and Volume V of this manual, the ship will request permission from the ISIC by priority message to commence Fast Cruise. The ISIC will then, if satisfied with the state of crew training and material readiness, authorize the ship to commence Fast Cruise by message, information copy to CNO, Fleet Commander, NAVSEA, and the TYCOM.

- a. A 24 hour rest and repair period will normally be scheduled following Fast Cruise and prior to the start of Sea Trials. This rest and repair period may be extended or reduced at the discretion of the ISIC.
- b. COs should consider the work and alterations accomplished during the availability when determining the extent of the Fast Cruise. The minimum requirements are listed and identified with an asterisk in Appendix **N** of this chapter.

4.9.9 Sea Trials. Following completion of Fast Cruise the ISIC will notify the TYCOM of satisfactory completion of Fast Cruise and readiness for Sea Trials using the message format of Appendix **O**. The submarine TYCOM will authorize the ISIC to allow the ship to get underway for Sea Trials using the message format of Appendix **P**. Sea Trials are required only as necessary to test work completed during the availability but must include those mandatory requirements identified in Appendix **Q** of this chapter. The industrial activity shall include at least two days in the availability for conduct of Sea Trials. The industrial activity shall prepare a Sea Trial Agenda for Sea Trials conducted after an availability at the industrial activity. For an availability at a FMA, the submarine shall prepare the Sea Trial Agenda, assisted by the industrial activity. The submarine involved shall submit the Sea Trial Agenda to the ISIC for approval, with an information copy to the TYCOM. During the Sea Trial the submarine CO will keep the TYCOM aware of the progress of the Sea Trial through periodic Situational Reports using the message format of Appendix **R** of this chapter. The frequency of these Situational Reports will be identified by the TYCOM or the Sea Trial Agenda. Extensions or reductions of the Sea Trial period may be granted where warranted by the scope of the work accomplished. Where extension of the Sea Trial period and a change in the availability schedule is required, requests for such extensions must be submitted by the industrial activity to the TYCOM as early as practical. All deficiencies resulting from Sea Trials will be satisfactorily resolved prior to the completion of the availability. If no Sea Trial deficiencies are found, the availability may be completed with TYCOM occurrence at the completion of Sea Trials.

**NOTE: SUBSEQUENT TO THE MESSAGES, APPENDICES **O** AND **S** OF THIS CHAPTER, ANY DEFICIENCY DISCOVERED AND THE CORRECTIVE ACTION TAKEN WHICH AFFECTS THE WATERTIGHT INTEGRITY, THE RECOVERABILITY OF THE SHIP, THE OPERATIONS OF THE SHIP'S CONTROL SURFACES OR THE SHIP'S SALVAGE CAPABILITY SHALL BE REPORTED TO THE TYCOM BY THE SUPERVISING AUTHORITY/ISIC/TYCOM REPRESENTATIVE BY MESSAGE. PREVIOUS CERTIFICATION MESSAGES SHALL BE SUSPENDED. WHEN A REVIEW OF THE DEFICIENCY IS COMPLETED BY THE TYCOM, THE TYCOM WILL CERTIFY THAT THE SHIP'S SUBSAFE CERTIFICATION BOUNDARY IS SATISFACTORY FOR SEA TRIALS TO A SPECIFIED DEPTH.**

- a. Assignment of Escort Ship.
  - (1) In accordance with reference (v), an escort shall be provided during deep dive submergence trials for ships completing an availability for repair of collision/grounding damage where deformation is observed to be in the hull integrity envelope and/or supporting structure.
  - (2) In accordance with reference (v), the requirement for providing an escort during deep dive submergence trials upon completion of all other availabilities will be evaluated by Commander, NAVSEA on a case basis. Commander, NAVSEA will advise the applicable Submarine Force Commander in writing whether or not an escort will be required based on the scope of work in the availability. In general, an industrial activity availability of less than six months duration should not require an escort, since the work typically performed in these availabilities is limited in scope, is carefully controlled and, therefore, does not result in substantial risk of unidentified or incomplete work adversely affecting the SUBSAFE boundary.

- (3) Escort requirements should be determined early so that an escort satisfying the requirements of Part I, Chapter 3, paragraph 3.6.8.4.7.b.(6), of this volume can be scheduled if required. The TYCOM will in turn request services from the Fleet Commander as applicable. As a general rule, pressure hull work which could not affect hull circularity will not require an escort.
  - (4) Waiver of escort requirements may be requested by message when necessary. The ISIC will request the waiver as soon as possible. The TYCOM will pass the request to Commander, NAVSEA for approval. An escort waiver request message is to include all of the following specific statements, as applicable:
    - (a) A ( ) inch by ( ) inch hull cut between frames ( ) and ( ) including a ( ) inch section of frame ( ) was the only major hull integrity work accomplished during the availability. If no hull frame cut was made, a positive statement to that effect is required.
    - (b) The hull cut weld satisfactorily passed Radiographic Testing and 7 day Magnetic Particle Testing nondestructive tests.
    - (c) Post repair frame circularity check readings are within specifications.
- b. Assignment of Deep Submergence Rescue System During Submarine Sea Trials.
- (1) A Submarine Rescue Diving Recompression System will be placed in a modified alert status at the beginning of Sea Trials requiring an escort following an industrial availability or major maintenance availability for:
    - (a) Ships initial tightness and deep dive events.
    - (b) Subsequent Sea Trials until the completion of the initial dive to design test depth.
    - (c) If, in the TYCOM's judgment, a Sea Trial requires an escort due to major hull cuts.
  - (2) The ship conducting Sea Trials will notify COMSUBDEVRON FIVE in Silverdale, WA when Submarine Rescue Diving Recompression System services are no longer required due to completion of the events in paragraph 4.9.9 of this chapter or due to delay in completing Sea Trials.
- c. The ship's normal loadout of Lithium Hydroxide canisters, Lithium Hydroxide curtains, Emergency Air Breathing masks, Submarine Escape Immersion Ensemble suits and oxygen candles is not sufficient to support this increase in personnel. Therefore, an additional four Lithium Hydroxide canisters, four Lithium Hydroxide curtains, one Emergency Air Breathing mask, one Submarine Escape Immersion Ensemble suit and two Oxygen candles shall be carried for each rider exceeding normal crew manning. Lithium Hydroxide canisters, Emergency Air Breathing masks, Submarine Escape Immersion Ensemble suits and Lithium Hydroxide curtains are to be obtained from the industrial activity.

4.9.10 Interrupted Sea Trials. In the event a Sea Trial is interrupted, or an additional Sea Trial becomes necessary, the following requirements are to be met. These requirements shall be invoked if the ship returns to port for industrial activity repairs which affect SUBSAFE certification or which will require at-sea testing.

- a. The submarine will draft a revised Sea Trials Agenda to support resumption of the trials. This agenda shall be provided to the ISIC for concurrence and TYCOM for information.
- b. Ship's Force will report by message (format of Appendix T of this chapter) that Ship's Force is ready for follow-on sea trials.

- c. The ISIC shall report by message (format of Appendix **U** of this chapter) to the TYCOM that the material condition of those SUBSAFE Certification boundaries that were installed, repaired and/or tested by Ship's Force is satisfactory for resuming Sea Trials.
- d. Upon completion of all of the requirements in paragraphs 4.9.10.a. and b. above, the TYCOM will provide a message (Appendix **V** of this chapter) to the ISIC granting permission to proceed with the conduct of Sea Trials and authorize the ship to dive to the Sea Trial operating depth.

**APPENDIX E1****AVAILABILITY KEY EVENT LIST****(FOR SUBMARINES SEE APPENDIX E2)**

KEY EVENT CODE	ABBREVIATION	SCHEDULING GUIDANCE
01	ARRIVAL	
02	ESTABLISH PLANT CONDITIONS	
03	DIESEL INSPECT	
04	PMT	
05	COMPLETE OPEN AND INSPECT WORK	
06	DRYDOCKING	
07	UNDOCKING	
08	PIER EVOLUTIONS	
09	ADJACENT SHIP EVOLUTIONS	
10	SYSTEM TESTING COMPLETE	
11	WEAPONS MOVEMENT	
12	SHIPS CEREMONY	
13	SHIPS TRAINING EVOLUTION	
14	STORES ON/OFF LOAD	
15	HAZARDOUS EVOLUTIONS	
16	BERTH SHIFT	
17	SAIL CLOSE-OUT	
18	FUEL MOVEMENT	
19	SHIP INSPECTION	
20	PROPULSION PLANT START UP	
21	FAST CRUISE	1-2 DAYS PRIOR TO SEA TRIALS
22	SEA TRIALS	1-2 DAYS AFTER FAST CRUISE
23	UNDERWAY	

KEY EVENT CODE	ABBREVIATION	SCHEDULING GUIDANCE
24	TENDER UNDERWAY	
25	TENDER REPLENISH	
26	FLIGHT DECK OPS	
27	ALL OTHER	
28	ALL WORK COMPLETE	3 DAYS PRIOR TO END OF AVAILABILITY
29	END OF AVAILABILITY	

**APPENDIX E2****CMAV KEY EVENT CODES****(SUBMARINES ONLY BASED UPON TYPICAL MINIMUM 21 PRODUCTION DAY SCHEDULE)**

<b>EVENT #</b>	<b>KEY EVENT</b>	<b>SCHEDULING GUIDANCE</b>
1	ARRIVAL	
2	ESTABLISH PLANT CONDITIONS	PER 100 HOUR PLAN
3	DIESEL INSPECT	AS REQUIRED BY PMS PERIODICITY, COORDINATION WITH ISIC AND DIESEL INSPECTOR
4	FLEET TECH SUPPORT TROUBLESHOOTING COMPLETE	PER 100 HOUR PLAN
5	TEMP SERVICES INSTALLED	PER 100 HOUR PLAN
6	SAIL RACETRACK/STAGING INSTALLED	PER 100 HOUR PLAN
7	VLS PLATFORM INSTALLED	PER 100 HOUR PLAN
8	PMT MONITORING PERIOD COMMENCE	PER 100 HOUR PLAN
9	SALVAGE INSPECTION	AS REQUIRED
10	Rx PLANT COOL DOWN	AS REQUIRED
11	Rx PLANT HEAT-UP	AS REQUIRED
12	NON-AVAILABILITY EVENT, INSPECTION OR EVALUATION THAT MAY IMPACT SCHEDULE	AS REQUIRED
13	BERTH SHIFT	AS REQUIRED
14	FUEL MOVEMENT	AS REQUIRED
15	BALLASTING EVOLUTIONS	AS REQUIRED
16	WEAPONS MOVEMENT	AS REQUIRED
17	DIVER OPERATIONS	AS REQUIRED
18	SHIPS TRAINING EVOLUTION	AS REQUIRED
19	STORES ON/OFF LOAD	AS REQUIRED
20	SHIP TO SHOP WORK CUTOFF	AS REQUIRED
21	O2/N2 LOADING/UNLOADING	AS REQUIRED
22	HAZARDOUS EVOLUTIONS	AS REQUIRED
23	TEMP SERVICES REMOVAL	PRIOR TO FINAL 100 HOURS OF AVAIL

EVENT #	KEY EVENT	SCHEDULING GUIDANCE
24	VLS PLATFORM REMOVAL	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
25	TANK CLOSEOUTS	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
26	SAIL CLOSE-OUT	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
27	TD SYSTEM COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
28	ASW/MSW SYSTEM COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
29	HYDRAULIC SYSTEMS COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
30	ELECTRICAL SYSTEMS COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
31	A/C SYSTEM COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
32	VENTILATION SYSTEM COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
33	REFRIGERATION SYSTEM COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
34	AIR SYSTEMS COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL
35	PROPULSION PLANT WORK COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL (TYPICALLY 20TH PRODUCTION DAY)
36	ALL WORK COMPLETE (INCLUDES PRODUCTION, AIT AND PRIVATE CONTRACTOR WORK)	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL (TYPICALLY 20TH PRODUCTION DAY)
37	PROPULSION PLANT TESTING COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL (TYPICALLY 21ST PRODUCTION DAY)
38	PRODUCTION WORK SYSTEM TESTING COMPLETE	COMPLETED PRIOR TO FINAL 100 HOURS OF AVAIL (TYPICALLY 21ST PRODUCTION DAY)
39	FAST CRUISE PRE-UNDER WAYS	96 TO 4 HRS PRIOR TO FAST CRUISE
40	PRE-UNDER WAYS	96 TO 4 HRS PRIOR TO UNDERWAY
41	DOCK TRIALS COMPLETE	72 HOURS PRIOR TO END OF AVAIL
42	PROPULSION PLANT START UP	PER FINAL 100 HOURS

EVENT #	KEY EVENT	SCHEDULING GUIDANCE
43	FAST CRUISE	1-2 DAYS PRIOR TO SEA TRIALS/UNDERWAY PERIOD
44	SEA TRIALS	1-2 DAYS AFTER FAST CRUISE (AS DIRECTED BY ISIC)
45	END OF AVAILABILITY	
46	ALL OTHER	
47	SHIP'S UNDERWAY	POST KEY EVENT 43

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**APPENDIX F**

**AVAILABILITY PLANNING MESSAGE (SUBMARINES ONLY)**

FM COMSUBRON (SQUADRON NO.)//

TO USS (SHIP NAME AND HULL NO.)//

TYCOM (COMSUBLANT/COMSUBPAC)//

INFO FMA (ACTIVITY)//

BT

(CLASSIFICATION) //N04790//

MSGID/GENADMIN/COMSUBRON// (AS APPROPRIATE)

SUBJ: (SUBS) AVAILABILITY PLANNING FOR USS (SHIP NAME AND HULL NO.)//

REF/ (AS APPROPRIATE)//

RMKS/1. FOL EVENTS PLANNED FOR NEXT AVAIL

A. MAJOR JOBS (ANNOTATE SHIPS FORCE OR FMA)

(1) ESD \_\_\_\_\_

(2) ESD \_\_\_\_\_

(3) ESD \_\_\_\_\_

B. CONTROLLING KEY EVENT/DATES:

(1)

(2)

(3)

C. MAJOR PMR JOBS:

(1)

(2)

(3)

D. ALTS FOR FMA ACCOMPLISHMENT:

(1)

(2)

(3)

E. ALTS FOR S/F ACCOMPLISHMENT:

(1)

(2)

(3)

F. ALTS FOR OUTSIDE ACTIVITY (INDUSTRIAL ACTIVITY, VENDOR, ALT)

G. DEPARTURES FROM SPECIFICATION TO BE CLEARED:

H. OTHER EVOLUTIONS/EVENTS://

I. **FIRST 100 HOUR PLANNING ITEMS**

a. Day 1 (date)

(1)

b. Day 2 (date)

(1)

c. Day 3 (date)

(1)

d. Day 4 (date)

(1)

J. **FINAL 100 HOUR PLANNING ITEMS**

a. Day 1 (date)

(1)

b. Day 2 (date)

(1)

c. Day 3 (date)

(1)

d. Day 4 (date)

(1)

BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

**APPENDIX G**  
**FINAL 100 HOURS FOR SCHEDULED CMAV**

Prior to 100 hrs	96 hours	72 hours	48 hours	24 hours	Transition day
Production days →	C-4	C-3	C-2	C-1	C-0
<ul style="list-style-type: none"> <li>- Production work complete.</li> <li>- Production work Testing complete.</li> <li>- Sail closeout.</li> <li>Pre-under ways.</li> <li>- Fast Cruise.</li> <li>- WAF closeout.</li> <li>- Weapons load complete.</li> <li>- Departure Conference complete.</li> <li>- Production related temp services removed.</li> <li>- Commence Dock Trials.</li> <li>- NRMD Rx Plant Certification.</li> </ul>	<ul style="list-style-type: none"> <li>- Pre-under ways.</li> <li>- Fast Cruise</li> <li>- FINAL WAF AUDIT.</li> <li>- Crew watch bills and berthing bills complete.</li> <li>- (Ships office/Exec Pre-under ways complete).</li> <li>- Rx Startup for Rx Testing.</li> </ul>	<ul style="list-style-type: none"> <li>- Pre-under ways.</li> <li>- Fast Cruise</li> <li>- SUBSAFE /QA Certification complete.</li> <li>- Complete Dock Trials.</li> </ul>	<ul style="list-style-type: none"> <li>- Rx Start-up to support Fast Cruise.</li> <li>- Fast Cruise.</li> <li>- Commence Pre-under ways for all +48hr and sooner Pre-under ways.</li> </ul>	<ul style="list-style-type: none"> <li>- Pre-under ways.</li> <li>- Crew rest and final admin.</li> </ul>	<ul style="list-style-type: none"> <li>- Rx Start-up.</li> <li>- Pre-under ways complete.</li> </ul>

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**APPENDIX H****AVAILABILITY MILESTONE SCHEDULE**

Note: Contracting milestones are located in Part II, Chapter 2, Appendix D of this volume.

\* Times are in days

<b>NO.</b>	<b>MILESTONE</b>	<b>Responsible Activity</b>	<b>Scheduled CMAV *</b>	<b>Year-Long CM *</b>	<b>Remarks</b>
1	Identify drawing development assignments, including Class Drawings.	PARMs/TYCOM/NAVSEA	A-390	NA	Send to RMC and Planning Yard.
2	Assign drawing development responsibility.	PEO Ships	A-390	NA	
3	Issue Hull Modernization Plan (HMP)/Letter Of Authorization AITs.	SPM/NAVSEA/TYCOM	A-360	NA	HMPs to be issued in March each year to maintenance Teams to support MMBP. Letter of Authorizations will be posted at A-360.
4	Establish Availability in NMD/NEMAIS/LDS/or other work control information system, as appropriate.	Maintenance Team	A-360	NA	Availabilities will be established in the applicable planning data base when known or work is ready to be screened.
5	Request Availability Funding for planning repair work.	NSA	A-345	NA	This provides funds for early executor planning.
6	Task/Fund SID Development.	SPM/NSA/AIT/TYCOM/RMC Manager	A-330	NA	
7	Ship checks completed for alterations.	Planning Yard	A-270	NA	No FFP considerations relate to this date.
8	Screen CMP and TYCOM routines.	TYCOM	A-270	NA	Push CMP work items to CSMP NOT LATER THAN A-270.
9	Provide Incremental Funds for ordering Long Lead Time Material for both repair and Alt/mod work to meet required dates.	SYSKOM/TYCOM	A-270	NA	
10	Issue/Deliver SIDs to NSA for Contractor(s) (KTRs) and AITs.	Planning Yard	A-180	NA	This is a change from A-4. Including all SIDs for AITs. For FFP contracts, this milestone should occur at A-8 when possible and NOT LATER THAN A-180.

NO.	MILESTONE	Responsible Activity	Scheduled CMAV *	Year-Long CM *	Remarks
11	Request Availability Funding for both repair & modernization work.	NSA/RMC	A-180	NA	
12	All Modernization Risk Assessments (including waivers) submitted.	PARM SPM TYCOM	A-175	NA	
13	All Modernization Risk Assessments (including waivers) approved.	TYCOM	A-150	NA	
14	Identification of AIT Support/Schedule/Impact requirements.	AIT Manager	A-135	NA	A-168 for FFP/IDIQ. Need to develop a complete requirements list. Needs to be integrated with repair requirements by the KTR and presented at the WPER.
15	Identification of AIT support/schedule impact requirements.	AIT Manager	A-135	NA	A-168 for FFP/IDIQ.
16	Certification Plan(s) (e.g., ILS, software, etc.) approved. Final date for modernization Ship Change (SC) approval. LOA locked.	SPM PARM PM	A-120	NA	SPM approves Hull Certification. All unresolved planned not authorized PNA modernization Ship Changes (SCs) are removed from the authorization letter at this date. Please note: There is an interim policy covering the Fleet Commanders C5I MP policy for approving the Weapon System Baseline Certification at A-30.
17	Identify all outside activities (e.g., Naval Surface Warfare Center (NSWC), Alteration Installation Team, etc.) participating in the Availability and associated support requirements.	TYCOM	A-90	NA	
18	Award AIT contracts for work not being done by prime KTR.	AIT Sponsor	A-90	NA	

NO.	MILESTONE	Responsible Activity	Scheduled CMAV *	Year-Long CM *	Remarks
19	Solicit Bids.	RMC	NA	NA	A-50 for FFP/IDIQ. If CMAV is to be performed under an IDIQ contract and is over \$500k we may need to add 30 days for solicitation in accordance with Fair Value purchasing policy. This would reset the CMAV solicit bid milestone to A-70.
20	Review CSMP and ensure all deferred maintenance actions intended for accomplishment during the availability identified by priority and submit to the TYCOM/ISIC.	Maintenance Team	A-50	NA	
21	Provide Availability Funding for Modernization to the RMC/LMA.	SYSCOMS/PEO/TYCOM	A-45	NA	Includes funding for AITs support services.
22	Review PMS, Reactor Plant PMS, CSMP, and testing requirements and ensure all Ship's Force maintenance actions scheduled for accomplishment during the availability are identified.	Maintenance Team	A-40	NA	
23	Review PMR/URO requirements and ensure all maintenance actions intended for accomplishment during the availability are identified.	ISIC (Subs only)	A-40	NA	
24	Review TYCOM Alteration Management System/FMP and ensure all authorized alterations intended for accomplishment during the availability are identified by priority based on material availability as identified by the LMA.	TYCOM	A-40	NA	
25	Review the MJC and identify the routine package to be accomplished during the availability.	TYCOM	A-40	NA	

NO.	MILESTONE	Responsible Activity	Scheduled CMAV *	Year-Long CM *	Remarks
26	Review CSMP T/A 2 items. Identify and order LLTM.	FMA	A-40	NA	
27	I-level work package fully brokered.	Maintenance Team/ Ship's Force	A-40	E-14	Intent is to fully broker all known work to I-level by this date. This allows for routine procurement of materials and brokering of work candidates to other Executing Activities if necessary.
28	Establish funding targets for budgeting purposes for the availability.	Funding Activity	A-40	NA	
29	Review the availability work package, begin writing FWPs/TWDs, identify critical jobs and develop the integrated work schedule to aid in tracking and coordination of all work.	LMA	A-40	E-14	
30	100% of D-level maintenance work package 2Ks planned, estimated.	Planning Activity	A-35	E-14	A-60 for FFP/IDIQ.
31	I-level work package fully accepted.	Planning Activity	A-33	E-14	Intent is for I-level to accept or reject all work brokered to it up to this point in time, work entering later in the process will be subject to normal Business Case Analysis. At this point the I-level activity work has been locked. Any remaining work will be re-brokered to another Executing Activity, rescheduled or rejected.
32	100% of maintenance work D level package 2Ks locked.	Maintenance Team	A-30	E-7	A-60 for FFP/IDIQ.
33	Submit I-level work package and schedule to the LMA for integration.	RMC	A-30	E-14	A-15 for FFP/IDIQ.
34	Submit executing activity work package and schedules to the LMA for integration.	All Executing Activities	A-30	E-14	

NO.	MILESTONE	Responsible Activity	Scheduled CMAV *	Year-Long CM *	Remarks
35	Develop recommended Key Events schedule and present to ISIC/Ship's Force/TYCOM.	LMA	A-30	NA	
36	Begin to integrate executing activity schedules.	LMA	A-30	E-7	
37	Review scheduled Ship's Maintenance Monitoring Support Office, PMT, MCA inspections and testing that may result in significant new work for the FMA or Ship's Force or that may impact scheduled Ship's Force and/or FMA work.	TYCOM	A-30	NA	
38	100% of O-level maintenance work package locked.	Maintenance Team	A-30	NA	A-60 for FFP/IDIQ Intent is to provide work to be accomplished so that an integrated execution schedule can be developed for the WPER.
39	Identify to RMC/ISIC /TYCOM rejected work candidates.	LMA	A-30	NA	
40	Begin processing all new work as "late work". See Appendix D for Business Case Analysis.	RMC	A-30	E-30	The intent is that all work regardless of the intended Executing Activity or level (O, I, or D) will have been brokered and accepted. Hence additional work will be treated as "late work".
41	MOA SUBMITTED	AIT Manager/outside activity	A-30	NA	
42	Conduct Planning Availability	Maintenance Team/ LMA (Subs Only)	A-30	NA	Should be prior to the WPER.
43	Cutoff for bidders questions.	PCO	NA	NA	A-30 for FFP/IDIQ.

NO.	MILESTONE	Responsible Activity	Scheduled CMAV *	Year-Long CM *	Remarks
44	Perform risk assessments and verify deliverables O-level, I-level, and D-level work items and AIT schedule requirements to LMA.	Maintenance Team	A-25	NA	This is to confirm that the LMA has all input for his development of the integrated availability schedule. Note that for FFP CMAV LMA will not be identified until A-15, verification with LMA will take place at WPER.
45	MSMO contractor "publish" package in NMD, if applicable.	MSMO Contractor	A-25	NA	MSMO Contracts only.
46	MSMO contractor turn over spec package.	MSMO Contractor	A-25	NA	MSMO Contracts only.
47	MSMO contractor submit final package cost proposal.	MSMO contractor	A-25	NA	MSMO Contracts only.
48	Complete ship checks and order all required material.	Executing Activities	A-25	NA	
49	Conduct Work Package Execution Review (WPER) - finalize funding.	Maintenance Team	A-21	NA	A-10 for FFP/IDIQ. LMA/executing activity presents fully planned execution schedule (could be a Gantt chart) to the full Maintenance Team.
50	Deliver Material (LLTM and Kitted Materials) to Executing Activity.	Planning Yards/PARM	A-20	NA	
51	Complete TAR.	RMC	A-20	NA	
52	Submit Bids.	Contractor	NA	NA	A-20 for FFP/IDIQ.
53	Definitize Work Packages.	Maintenance Team/RMC	A-18	E-7	
54	Award Contract.	RMC	NA	NA	A-15 for FFP/IDIQ.
55	Issue availability planning message prepared in accordance with Appendix F of this chapter.	ISIC (Subs Only)	A-14	NA	
56	Work Specs Developed.	Executing Activity	NA	E-14	
57	Develop strategy for FMA/Ship's Force calibration of gages, instruments and tools.	Maintenance Team/LMA	A-10	NA	
58	Issue availability planning response message prepared in accordance with Appendix I of this chapter.	Ship's Force (Subs Only)	A-7	NA	Send to ISIC and TYCOM
59	Commence First 100 Hours	Maintenance Team/LMA (Subs Only)	A-0	NA	

NO.	MILESTONE	Responsible Activity	Scheduled CMAV *	Year-Long CM *	Remarks
60	Conduct Arrival Conference.	LMA	A-0	NA	
61	Report ships transition to CMAV period.	ISIC (Subs Only)	A-0	NA	Send to ISIC and TYCOM
62	Conduct Progress Review.	LMA	Weekly	NA	
63	Commence Final 100 Hours	Maintenance Team/LMA (Subs Only)	C-4	NA	
64	Complete Availability.	LMA	C+0	30 Sep	
65	Conduct Departure and Assessment Conference.	Maintenance Team/LMA	C+0	NA	
66	Issue Departure and Assessment Report.	LMA	C+21	NA	

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**APPENDIX I**

**AVAILABILITY PLANNING RESPONSE MESSAGE (SUBMARINES ONLY)**

FM USS (SHIP NAME AND HULL NO.)//  
TO COMSUBRON (SQUADRON NO.)//  
TYCOM (COMSUBLANT/COMSUBPAC)//  
INFO FMA (ACTIVITY)//  
BT  
(CLASSIFICATION)//N04790//  
MSGID/GENADMIN/COMSUBRON// (AS APPROPRIATE)  
SUBJ: (SUBS) AVAILABILITY PLANNING READINESS FOR USS (SHIP NAME AND HULL NO.)//  
REF/ (AS APPROPRIATE)//  
RMKS/1. SHIP CONCURS WITH REF A WITH THE FOLLOWING EXCEPTIONS: (NONE OR LIST  
EXCEPTIONS BELOW)  
A. SCHEDULE REQUIREMENTS SUCH AS:  
1. REVIEW ALL ACTION ITEMS FROM AVAILABILITY PLANNING MESSAGE.  
2. REVIEW SCHEDULE OF KEY EVENTS.  
3. ABILITY TO CONDUCT 100HR TRANSITION PLANS.  
B. SHIP MATERIAL PREPARATION  
1. REPORT STATUS OF PARTS FOR SHIP'S FORCE WORK AND DESIRES FOR ISIC/TYCOM  
ASSISTANCE IN PROCUREMENT.  
2. ENSURE ALL OUTSTANDING CASREPS, SUBS, ZOZZS, AND TDENTS ARE IDENTIFIED IN  
AVAILABILITY PLANNING MESSAGE.  
C. SHIP'S FORCE INTEGRATED SCHEDULE:  
1. MISCELLANEOUS PROGRAMS (CAL, SMALL VALVE MAINTENANCE, ETC.).  
2. DRILLS AND TRAINERS THAT WILL AFFECT SHIP'S FORCE ABILITY TO SUPPORT  
PRODUCTION WORK.  
3. PRESERVATION ZONES.  
4. PLANNED MAINTENANCE (TO INCLUDE PMS, RPPMS, AND PMT/KMRCS).  
D. CO'S REPORT OF READINESS OR CONCERNS:  
1. COMMANDING OFFICER REVIEW ABOVE ITEMS AND AVAILABILITY PLANNING MESSAGE  
AND REPORT READINESS AND EXCEPTIONS TO TRANSITION TO CMAV PERIOD.//  
BT  
**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT  
PLAD IS UTILIZED.**

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**APPENDIX J****MAJOR TRIAL AND INSPECTION MILESTONES FOR IDD AND PIRA AVAILABILITIES**

EVENT	COGNIZANCE	APPROXIMATE SCHEDULE	CORRESPONDING APPENDIX
A. Periodic Monitoring Inspections	ISIC/TYCOM Representative	Start to completion	
B. Pre-Criticality Inspection (2 Days - Nuclear Powered Submarines Only)	ISIC (Only required when the reactor has been shutdown greater than 16 weeks)	Within 1 month of criticality	
C. Escort Recommendation (Message) or Waiver Request Message	TYCOM	Sea Trials - 28 days	Appendix B Para 4.9.9 for Waivers
D. NAVSEA Approval of Escort Waiver	NAVSEA	Sea Trials - 14 days	
E. Phase II Crew Certification/Material Inspection	ISIC/Crew Certification not required unless crew turnover greater than 15%. Material Inspection on a case by case basis	Prior to Fast Cruise	
F. Approve Sea Trials Agenda	ISIC	Prior to Fast Cruise (-7 to 14 days)	Guidelines in Appendix <b>Q</b>
G. Dock Trials (1 day or less)	CO of Ship	Sea Trials - 10 days	Guidelines in Appendix <b>M</b>
H. Audit REC, Departure from Specifications, URO MRCs (Formal Report Required)	ISIC	Sea Trials - 4 days	
I. Crew and Material Certification Message	ISIC	Sea Trials - 4 days	Appendix <b>K</b>
J. Supervising Authority SUBSAFE Certification Continuity Report	Supervising Authority	Sea Trials - 4 days	Reference (u), Paragraph 6.3.2.3.1
K. Readiness for Fast Cruise	CO of Ship	Sea Trials - 4 days	Appendix <b>W</b>
L. Grant Permission to Conduct Fast Cruise	ISIC	Sea Trials - 4 days	Appendix <b>X</b>

EVENT	COGNIZANCE	APPROXIMATE SCHEDULE	CORRESPONDING APPENDIX
M. Commence Fast Cruise	CO of Ship	Sea Trials - 3 days (1 to 2 days in duration)	Guidelines in Appendix <b>N</b>
N. Report Ship Readiness for Sea Trials	CO of Ship	Sea Trials - 1 day	Appendix <b>Y</b>
O. Message Update of Material Certification Status and Readiness for Sea Trials	ISIC	Sea Trials - 1 day	Appendix <b>O</b>
P. Authorization to Commence Sea Trials and Depth Authorization Message	TYCOM	Sea Trials - 1 day	Appendix <b>P</b>
Q. Commence Sea Trials	CO of Ship	0	Guidelines in Appendix <b>Q</b>
R. Daily Sea Trials Situation Report/Status Report	CO of Ship	At Least Daily During Sea Trials	Appendix F of Volume II, Part I, Chapter 3
S. Supervising Authority SUBSAFE Certification Continuity Report	Supervising Authority	Follow-On Sea Trials - 1 day	Reference (u), Paragraph 6.3.2.3.1
T. Report Ship Readiness for Follow-On Sea Trials	CO of Ship	Follow-On Sea Trials - 1 day	Appendix <b>T</b>
U. Update of Material Status prior to Follow-on Sea Trials.	ISIC	Follow-On Sea Trials - 1 day	Appendix <b>U</b>
V. TYCOM Authorization to Commence Follow-On Sea Trials and Depth Authorization	TYCOM	Follow-On Sea Trials - 1 day	Appendix <b>V</b>
W. Sea Trials Completion Message	CO of Ship to ISIC and TYCOM	+1 day After Sea Trials	Appendix <b>L</b>
X. URO Message	TYCOM	+1 day After Sea Trials	Appendix <b>S</b>

**NOTE: UNLESS OTHERWISE INDICATED, SCHEDULE DATES ARE REFERENCED TO SEA TRIALS UNDERWAY DATE.**

**APPENDIX K****SAMPLE ISIC MESSAGE TO TYCOM CONCERNING CREW CERTIFICATION AND MATERIAL CONDITION FOR FAST CRUISE AND SEA TRIALS FOR IDD OR PIRA AVAILABILITIES**

FM COMSUB<RON/GRU NO.>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4/40//  
 INFO <SUPERVISING AUTHORITY>//<CODES>//  
 USS <SHIP NAME>//  
 COMSUBGRU<NO.>//N4//  
 BT  
 UNCLAS//N09094//  
 MSGID/GENADMIN/COMSUB<RON/GRU NO.>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> CREW AND MATERIAL CERTIFICATION//  
 REF/A/DOC/COMFLTFORCOM/<DATE>//  
 REF/B/DOC/NAVSEA/<DATE>//  
 REF/C/DOC/NAVSEA/<DATE>//  
 NARR/REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL. REF B IS  
 SUBMARINE SAFETY (SUBSAFE) REQUIREMENTS MANUAL, NAVSEA 0924-LP-062-0010. REF C IS  
 NAVSEA URO MRC TECHNICAL MANUAL//  
 RMKS/1. CREW CERTIFICATION CONDUCTED AND SATISFACTORILY COMPLETED IAW REF A.  
 2. IAW REFS A AND B, COMSUB<RON/GRU NO.> CERTIFIES THE SUBSAFE CERTIFICATION BOUNDARY  
 OF <SHIP NAME/HULL NO.> INSTALLED, REPAIRED AND/OR TESTED BY FORCES AFLOAT IS  
 SATISFACTORY FOR SEA TRIALS TO TEST DEPTH. ALL SUBSAFE CONTROLLED WORK PACKAGES  
 ARE CLOSED. CERTIFICATION REQUIREMENTS OF REF B HAVE BEEN SUSTAINED FOR THE  
 REMAINDER OF THE SUBSAFE CERTIFICATION BOUNDARY. ALL OTHER CONTROLLED WORK  
 PERFORMED BY SHIP'S FORCE HAS BEEN COMPLETED AND SATISFACTORILY RETESTED AND THE  
 APPROPRIATE WORK PACKAGES CLOSED.  
 3. MATERIAL/SALVAGE CONDITION CERTIFIED READY FOR SEA UPON COMPLETION OF THE  
 FOLLOWING CORRECTIVE ACTIONS:  
     A.  
     B.  
 4. THERE ARE NO OUTSTANDING RECS. THE FOLLOWING DEPARTURES FROM SPECIFICATION  
 ARE CURRENTLY OUTSTANDING:  
DEPARTURE NO.   TYPE   SYSTEM/COMPONENT   RESTRICTION (IF ANY)  
     A.  
     B.  
 5. ALL URO MRC AND MANDATORY TESTS/INSPECTIONS SPECIFIED IN REF C HAVE BEEN  
 ACCOMPLISHED OR VERIFIED TO BE WITHIN THE REQUIRED PERIODICITY.  
 6. COMSUB<RON/GRU NO.> REPORTS READINESS OF USS <SHIP NAME/HULL NO.> FOR COMMENCEMENT  
 OF FAST CRUISE. CO USS <SHIP NAME/HULL NO.> CONCURS.//  
 7. SUBJECT TO SATISFACTORY COMPLETION OF FAST CRUISE AND RESOLUTION OF MANDATORY  
 DEFICIENCIES COMSUB<RON/GRU NO.> CONSIDERS USS <SHIP NAME/HULL NO.> MATERIAL CONDITION  
 READINESS SATISFACTORY FOR COMMENCEMENT OF SEA TRIALS.//  
 BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX L****SAMPLE SHIP MESSAGE TO ISIC AND TYCOM CONCERNING MATERIAL CERTIFICATION  
UPON COMPLETION OF SEA TRIALS FOR IDD OR PIRA AVAILABILITIES**

FM USS <SHIP NAME>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 INFO CNO WASHINGTON DC//N77//  
 COMNAVSEASYSKOM WASHINGTON DC//PMS 392/08O/07Q//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>//N43//  
 DIRSSP WASHINGTON DC//{FOR SSBN/SSGN}  
 COMSUBDEVRON FIVE SILVERDALE WA//N4//  
 COMSUBGRU<NO.>//N4//  
 BT  
 UNCLAS //N09094//  
 GENADMIN/COMSUB<RON/GRU NO.>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> SATISFACTORY COMPLETION OF SEA TRIALS//  
 REF/A/DOC/ COMFLTFORCOM/<DATE>//  
 NARR/REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II.  
 RMKS/1. USS <SHIP NAME> REPORTS SATISFACTORY COMPLETION OF SEA TRIALS. ALL TESTING  
 REQUIRED BY THE SEA TRIALS TEST AGENDA AND REF (A) HAVE BEEN COMPLETED. <OR REPORT  
 ALL TESTING NOT COMPLETED PER NOTE 1>.  
 2. THERE WERE NO SUBSAFE DEFICIENCIES IDENTIFIED. <OR REPORT ALL SUBSAFE DEFICIENCIES>.  
 3. THE <SUPERVISING AUTHORITY> TEST DIRECTOR CONCURS WITH THIS REPORT.  
 BT

**NOTE 1: LIST ALL RE-ENTRIES TO MATERIAL CERTIFICATION BOUNDARY AND ALL WORK ON SYSTEMS AFFECTING RECOVERABILITY, SALVAGE, WATERTIGHT INTEGRITY, OR OPERATION OF SHIP'S CONTROL SURFACES WITH CORRECTIVE ACTION SINCE RELEASE FOR FAST CRUISE MESSAGE.**

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX M****DOCK TRIALS GUIDELINES FOR IDD OR PIRA AVAILABILITIES**

1. Dock Trials. Ship's Force Dock Trials provide the opportunity to test and check out systems, components and portable equipment prior to the Fast Cruise training period simulating underway conditions. Although normally a period of one day is assigned for integrated Ship's Force Dock Trials, tests and evolutions performed in the one to two weeks prior to the Dock Trial date may be accepted by the CO as fulfilling the requirements of this paragraph. The purpose of Dock Trials is to afford the ship an opportunity to demonstrate that major systems and equipments are in fact ready to support Sea Trials. It is expected that individual equipments will have been satisfactorily tested prior to commencement of the integrated operational tests afforded by Ship's Force Dock Trials.

1.1 Supervising Authority. The industrial activity may desire to conduct machinery checkouts, or system checks prior to the Ship's Force Dock Trials in order to test the propulsion plant or other ship's systems. In order to support these evolutions, close liaison between the ship's CO and the industrial activity will be required. For these evolutions, completion of repairs or modifications to all ship's systems are not required except for those systems which directly support the proposed tests.

1.2 Scheduling of Tests. The scheduling of Ship's Force Dock Trials is flexible. Ship's Force Dock Trials may be scheduled by mutual agreement between the ship and the supervising authority but must take place prior to certification of crew/material readiness with adequate time allowed for collection of deficiencies discovered during the Ship's Force Dock Trials. Preparation of the agenda and schedule for the Dock Trials is the CO's responsibility.

1.3 Extent of Trials. Ship's Force Dock Trials are conducted by the Ship's Force and are normally unhampered by repair work. This applies to the entire ship not just the propulsion plant. The trials may be witnessed by the industrial activity.

1.3.1 Tests. The term test shall include, where applicable:

- a. The review and use of a procedure for correct line-up, starting, operation and securing of systems or equipments.
- b. Rigging, connecting and using all hoses, fittings and devices required for the test evolution.
- c. Operation of systems in all modes, such as emergency, hand, override, cross-connected, normal, local, etc.
- d. Checking all electrical and mechanical, local and remote indicators for proper readings.
- e. Testing communications between normal control station and other locations involved in operating the system or performing the evolution.
- f. Calibration and adjustment of equipments, systems and devices where required.
- g. Inventory consumables, fittings, devices and portable test equipment to ensure that sufficient amounts are on board for proper operation throughout the trials.

1.3.2 Specific Test Areas. There are specific tests which relate to both systems and ship safety which must be conducted in preparation for Sea Trials.

- a. The following are specific alongside tests which shall be conducted during Dock Trials:
  - (1) Check the sound powered phone system between all stations.
  - (2) Check the announcing system between all stations.

- (3) Test collision alarm and diving alarm.
- (4) Test general alarm.
- (5) Test each light on BCP.
- (6) Test whistle.
- (7) Check emergency lights.
- (8) Operate all hydraulic plants using each installed pump.
- (9) Conduct a complete air charge using only ship's compressors.
- (10) Conduct a normal battery charge using ship's motor generator on shore power.
- (11) Conduct low pressure blow of all Main Ballast Tanks (MBT). Thereafter conduct dockside operation portion of URO 022 (as appropriate).
- (12) Flood sanitary tanks and then blow/pump them.
- (13) Operate each main vent in hand and power. Following operation, with valves shut, conduct a controlled removal of MBT vent covers, one at a time, to check MBT vents for leaks.
- (14) Operate the outboard induction in hand and power.
- (15) Operate the diesel engine exhaust valve in hand and power.
- (16) Operate inboard induction valves.
- (17) Raise, train and lower periscopes, snorkel, radar and antenna masts and fairings as applicable.
- (18) Test operation of radio transmitters and receivers on all antennas.
- (19) Operate all sonar and radar equipment at rated conditions.
- (20) Take and plot LORAN/OMEGA/NAVSAT fixes using each antenna.
- (21) Test operation of drain pump using each bilge suction.
- (22) Test operation of trim system and pump by pumping to and from each tank and by pumping to and from sea (if applicable).
- (23) Calculate and enter the diving trim compensation.
- (24) Test operation of portable submersible pump from each installed outlet.
- (25) Fire inboard slugs from torpedo room.
- (26) Fire inboard slugs from weapons launch console.
- (27) Test magazine flooding system.
- (28) Operate each lube oil system including pumps, controllers, purifiers and indicators.

- (29) Start the Navigation System and gyrocompasses; determine that they settle out and take an azimuth; check all repeaters.
- (30) Check fresh water system, have water samples analyzed.
- (31) Test the capstans.
- (32) Test bow plane rigging (where applicable).
- (33) Test bow/sail and stern plane tilting in hand, normal power and emergency. Test normal and emergency plane angle indicators.
- (34) Test rudder in hand, normal and emergency power. Test normal and emergency rudder angle indicators.
- (35) Check alignment of periscopes, TBTs and all bearing and range repeaters.
- (36) Test the engine order telegraphs.
- (37) Test Automatic Bus Transfer Devices.
- (38) Operate each watertight door and hatch, each bulkhead flapper and each intercompartment air salvage valve.
- (39) Check operation of escape hatch fittings.
- (40) Operate signal ejectors by impulse and hand using dummy signal. Fire water slugs from all launchers, both locally and remotely.
- (41) Turn on and check running lights for brightness and proper lenses (to be done at night).
- (42) Check freon air conditioning system.
- (43) Check underwater log.
- (44) Check 400 Hz MG sets.
- (45) Check out galley equipment.
- (46) Check fathometer.
- (47) Check bilge flooding alarms.
- (48) Check dummy log.
- (49) Check ship service air system.
- (50) Check out vapor compressor distilling units.
- (51) Check anchor windlass and brake operation.
- (52) Check battery water system.
- (53) Check out atmosphere monitoring equipment, both installed and portable.

- (54) Operate oxygen generator, CO2 scrubbers, CO burners and emergency air breathing system.
- (55) If possible, lower, train, operate and raise the SPM.
- (56) Ensure that all required PMS to ship depth detectors is complete.
- (57) Test diesel engine high vacuum cut-out. Take altimeter to engine room or diesel generator room for test.
- (58) Check main propulsion.
- (59) Ensure seven-day supply of oxygen onboard, test operate the Electrolytic Oxygen Generator(s) (EOG).

**APPENDIX N****FAST CRUISE REQUIREMENTS FOR IDD OR PIRA AVAILABILITIES**

1. Fast Cruise Requirements. Asterisk items are the minimum requirements for an IDD or PIRA availability:

a. All Ships:

- \* (1) Station the maneuvering watch and check each system and piece of equipment for proper operation. (For availability less than six months duration, system/equipment checks are not required.)
- \* (2) Station the normal underway watch (section watches).
- (3) Simulate getting underway and return to port (day and night).
- \* (4) Walk through all major Sea Trial evolutions, including cycling of hull and back-up valves to be tested during the deep dive.
- \* (5) Exercise the reduced visibility detail.
- \* (6) Rig for Emergency Ventilate.
- (7) Spot check storage and availability of spare parts and tools. Verify adequacy of stores and provisions.
- \* (8) Rig for dive and rig for surface.
- \* (9) Simulate diving and surfacing.
- \* (10) Rig for deep submergence.
- (11) Rig for various quiet conditions.
- (12) Drill at loss of power to various circuits including lighting, communications, 400 Hz power, etc.
- (13) Battery charge - Normal or equalizer as required.
- \* (14) Conduct the following emergency drills:
  - \* (a) Fire.
  - \* (b) Collision.
  - \* (c) Flooding.
  - \* (d) Toxic Gas.
  - (e) Abandon Ship.
  - \* (f) Man Overboard.

- (g) Submarine Escape.
  - (h) Loss of AC Power.
  - (i) Emergency Ventilation.
  - (j) Loss of Air Conditioning.
  - (k) Loss of Lighting.
  - (l) Loss of Interior Communications.
  - (15) Exercise the crew at battle stations.
  - (16) Conduct communications and ECM drills.
  - \* (17) Conduct an air charge to all air banks. (For availabilities less than six months duration, conduct an air charge.)
  - \* (18) Bleed oxygen and ventilate ship. Ensure a seven day supply of oxygen is onboard and EOGs are fully operational. Ships without EOGs may provide a seven day supply of oxygen in O2 candle form and have oxygen banks inerted until after availability completion.
  - (19) Anchor.
  - (20) Operate atmosphere control equipment and take air samples.
  - \* (21) Check out all interior communications circuits, including battle telephones.
  - (22) Simulate submerged patrol, performing all evolutions and operating equipment normally used.
  - \* (23) Operate freshwater/seawater heat exchangers at sufficient load to verify proper operation (not fouled with marine growth).
  - (24) Nuclear powered submarines shall meet all requirements of reference (w), Appendix D, Part 3.
- b. Additional requirements for SSBN/SSGNs. SSBN/SSGNs shall conduct exercises in casualties to missile tube breather valves which would result in:
- (1) Flooding.
  - (2) Introducing toxic gases into the missile compartment from gas generators.

## APPENDIX O

## SAMPLE ISIC MESSAGE TO TYCOM CONCERNING FINAL MATERIAL CERTIFICATION PRIOR TO SEA TRIALS FOR IDD OR PIRA AVAILABILITIES

FM COMSUB<RON/GRU NO.>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 INFO COMSUBDEVRON FIVE SILVERDALE WA//N4//  
 COMSUBGRU <NO.>//N4//  
 USS <SHIP NAME>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 BT  
 UNCLAS //N09094//  
 GENADMIN/COMSUB<RON/GRU NO.>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> MATERIAL CERTIFICATION/ READINESS FOR SEA TRIALS//  
 REF/A/DOC/ COMFLTFORCOM/<DATE>//  
 REF/B/RMG/COMSUB<RON/GRU NO.>/<DTG>//{ APPENDIX K }  
 REF/C/RMG/USS<SHIP NAME>/<DTG>//{ APPENDIX Y }  
 REF/D/DOC/NAVSEA /<DATE>//  
 NARR/REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II.  
 REF B IS COMSUB<RON/GRU NO.> REPORT OF CREW CERTIFICATION AND MATERIAL CONDITION  
 FOR FAST CRUISE AND SEA TRIALS. REF C IS SHIP REPORT OF COMPLETION OF FAST CRUISE AND  
 READINESS FOR SEA TRIALS. REF D IS NAVSEA 0924-LP-062-0010, SUBMARINE SAFETY (SUBSAFE)  
 REQUIREMENTS MANUAL.  
 RMKS/1. IAW REFS A AND D, THIS MSG CERTIFIES THAT NO MANDATORY DEFICIENCIES FOR SEA  
 TRIALS HAVE BEEN IDENTIFIED AS REPORTED IN REF B AND C. THERE HAVE BEEN NO RECS  
 OPENED AND NO SUBSAFE DEPARTURES FROM SPECIFICATION PROCESSED SINCE THE START OF  
 FAST CRUISE. <OR, REPORT ANY MANDATORY DEFICIENCIES DISCOVERED WITH CORRECTIVE ACTION, AND IF RECS  
 AND/OR DEPARTURES FROM SPECIFICATIONS WERE PROCESSED SINCE THE START OF FAST CRUISE, REPORT ALL RECS  
 OPENED SINCE THE START OF FAST CRUISE ARE CLOSED AND/OR ALL SUBSAFE DEPARTURES FROM SPECIFICATIONS  
 PROCESSED SINCE THE START OF FAST CRUISE ARE RESOLVED.><sup>(NOTE 1.)</sup>  
 2. THERE ARE NO SUBSAFE DEPARTURES FROM SPECIFICATIONS WITH CONDITIONS WHICH  
 HAVE NOT BEEN SATISFIED. THE FOLLOWING ADDITIONAL DEPARTURES FROM SPECIFICATIONS  
 WERE GENERATED SUBSEQUENT TO REF B. <If None, indicate NONE>  
DEPARTURE NO. TYPE SYSTEM/COMPONENT RESTRICTION (IF ANY)  
 A.  
 B.  
 3. REQUEST PERMISSION TO COMMENCE SEA TRIALS. CO <SHIP NAME/HULL NO.> CONCURS.//  
 BT

**NOTE 1: LIST ALL RE-ENTRIES TO MATERIAL CERTIFICATION BOUNDARY AND ALL WORK ON SYSTEMS AFFECTING RECOVERABILITY, SALVAGE, WATERTIGHT INTEGRITY, OR OPERATION OF SHIP'S CONTROL SURFACES WITH CORRECTIVE ACTION SINCE RELEASE FOR FAST CRUISE MESSAGE.**

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX P****SAMPLE TYCOM MESSAGE TO SHIP CONCERNING SEA TRIALS DEPTH AUTHORIZATION FOR IDD OR PIRA AVAILABILITIES**

FM COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//N87//  
 COMNAVSEASYS COM WASHINGTON DC//PMS 392/08O/07Q//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>//N43//  
 DIRSSP WASHINGTON DC//205// {For SSBN/SSGN only}  
 COMSUBGRU <NO.>//  
 COMSUBRON< NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/COMSUB<LANT/PAC>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> SEA TRIALS DEPTH AUTHORIZATION//  
 REF/A/DOC/<SUPERVISING AUTHORITY>/<DATE>//  
 REF/B/RMG/ COMSUB<RON/GRU NO.>/<DTG>//{APPENDIX Y}  
 REF/C/RMG/ USS <SHIP NAME>/<DTG>//{APPENDIX X}  
 NARR/ REF A IS <SUPERVISING AUTHORITY> SUBSAFE CERTIFICATION CONTINUITY REPORT FOR <SHIP NAME/HULL NO.>. REF B IS COMSUB<RON/GRU NO.> REPORT OF MATERIAL CONDITION OF SHIP NOT WORKED BY THE SHIPYARD. REF C IS SHIP REPORT OF SATISFACTORY COMPLETION OF FAST CRUISE  
 RMKS/1. REF A CERTIFIED THE SUBSAFE MATERIAL CONDITION OF THOSE PARTS OF USS <SHIP NAME/HULL NO.> INSTALLED, REPAIRED AND/OR TESTED BY THE SHIPYARD IS SATISFACTORY FOR SEA TRIALS TO TEST DEPTH.  
 2. REF B CONFIRMS THAT THE CERTIFICATION OF THE REMAINDER OF ITEMS WITHIN THE SUBSAFE CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL NO.> HAS BEEN SUSTAINED. ACCORDINGLY, THE STATUS OF THE SUBSAFE CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL NO.> IS SATISFACTORY FOR SEA TRIALS TO TEST DEPTH.  
 3. REF B AND C REPORTED COMPLETION OF FAST CRUISE AND READINESS TO PROCEED ON SEA TRIALS.  
 4. USS <SHIP NAME/HULL NO.> IS AUTHORIZED TO DIVE UNDER DELIBERATE AND CONTROLLED CONDITIONS TO <SPECIFIED DEPTH>.  
**NOTE: IF AN UNSATISFACTORY CONDITION OR SEAWATER LEAKAGE IN EXCESS OF THE SPECIFICATION IS FOUND DURING THE CONDUCT OF THE CONTROLLED DIVE TO TEST DEPTH, AT THE DISCRETION OF THE COMMANDING OFFICER THE SHIP MAY CONTINUE TO TEST DEPTH UNLESS THE COMMANDING OFFICER DETERMINES IT APPROPRIATE TO ABORT THE DIVE.**  
 5. THIS DEPTH AUTHORIZATION IS AUTOMATICALLY SUSPENDED UPON RE-ENTRY TO THE SUBSAFE CERTIFICATION BOUNDARY OR CASUALTY AFFECTING RECOVERABILITY, SALVAGE, WATERTIGHT INTEGRITY, OR OPERATION OF SHIP'S CONTROL SURFACES. THE SHIP SHALL NOT OPERATE AT A DEPTH GREATER THAN 200 FEET UNTIL RE-ENTRY IS CERTIFIED. TYCOM APPROVAL IS REQUIRED PRIOR TO COMMENCING A SUBSEQUENT DEEP DIVE TO CERTIFY WORK ACCOMPLISHED TO CORRECT SUBSAFE DEFICIENCIES DISCOVERED DURING THE SEA TRIAL UNLESS SPECIFICALLY ADDRESSED IN THE SEA TRIAL AGENDAS.//  
 BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX Q****MINIMUM SEA TRIALS REQUIREMENTS FOR IDD OR PIRA AVAILABILITIES**

1. Sea Trial Agenda. This Appendix delineates the minimum requirements incident to Sea Trials following an IDD or PIRA availability. Additional events listed in Appendix O of Part I, Chapter 3, of this volume. Minimum Sea Trials Requirements for Chief of Naval Operations Availabilities Greater Than Six Months Duration (Submarines only), may be included by the repair activity based on the scope of work accomplished and/or as desired by the CO.
2. Sea Trial Policy. The following policies apply to conduct of trials and tests associated with IDD or PIRA availabilities:
  - a. No test or trial event shall be conducted that requires crew intervention to avoid exceeding normal operating limits. Trial agendas will be based on the expectation that the ship will remain within normal operating limits of the SOE and at angles of less than 30 degrees.
  - b. Any run which will result in exceeding normal operating limits of the SOE or 30 degree angles but which is essential to provide adequate test data must be specifically approved by the TYCOM. The test/trial sponsor will obtain this permission.
  - c. A violation of the SOE limit or exceeding a 30 degree angle, not previously approved, should be reported by unit Situation Report. The TYCOM will resolve the situation.
  - d. Specific written approval by the TYCOM is not required to operate outside the upper limits of the SOE, i.e., shallow and fast, while conducting the following operations during Sea Trials or tests in accordance with an agenda approved by the ISIC, NAVSEA or higher authority:
    - (1) Conducting full power runs or cavitation curves.
    - (2) NAVSEA sponsored acoustic trials in accordance with Naval Surface Warfare Center, Carderock Division acoustic trial agenda.
  - e. In cases where troubleshooting is required, it must meet the following criteria or a formally approved change to the agenda is mandatory.
    - (1) The troubleshooting does not violate any policy listed in paragraphs 2.a through 2.e of this Appendix or any other requirement of the trial agenda.
    - (2) The troubleshooting will not result in the ship being in a certain condition before that condition is reached during the normal testing sequence. For example, troubleshooting requiring the ship to be deeper than 200 feet cannot be done until after the deep dive. Likewise, troubleshooting requiring large angles or turn rates cannot be done until after the completion of the steering and diving operational tests and the large angle tests.
  - f. Each person involved in Sea Trials should be allowed to obtain a minimum of six hours of continuous, uninterrupted sleep during any 24-hour period.
3. Testing Phase. The Sea Trials should be scheduled and phased to support actions en route to the test dive area, in the test dive area, prior to the deep dive, etc., subject to the amplifying notes.
  - a. The following tests and evolutions shall be carried out on the surface en route to the test dive area and prior to the initial tightness dive:

- (1) Underway. Rig for dive.
- (2) Ship's Force instruct Sea Trials riders on the proper use of Emergency Air Breathing System.
- (3) At slow speed, conduct operational test of rudder in all modes (local and remote) in accordance with applicable class operating procedures.
- (4) Navigation system check. Takes fixes by all means available and compare.
- (5) Test underwater log(s) using the base course/reciprocal course method (i.e., inertial reference method) or other approved functional procedures to determine accuracy.
- (6) Test accuracy of all bearing transmitters and indicators. Compare sonar, visual and radar bearings.
- (7) Check operation of all radars. Demonstrate accuracy by conducting simultaneous radar and visual plot.
- (8) Inspect stern tube packing gland/seals and circulating water flow.
- (9) Test fathometer(s) and compare with charted soundings.
- (10) Run ahead, at maximum allowable surface speed, long enough for temperatures to reach a stable value. After readings have stabilized, at maximum allowable surface speed, operate the rudder through full throw in each direction, in **all remote modes of operation**.
- (11) Ahead, at maximum allowable surface speed, to back emergency.  
For SSBN/SSGN 726 Class **only** -Answer ahead standard. Once ship speed has stabilized, perform back emergency for 5 minutes.
- (12) Run astern up to a **back full bell**. Full power run astern to be consistent with the main engine limits of the applicable Steam and Electric Plant Manual. Operate rudder through full throw.  
For SSBN/SSGN 726 Class **only** - Run astern up to a back full bell for 5 minutes, followed by 60 SRPM for 5 minutes. Operate the rudder through full throw (See Note 1).
- (13) Check operation and accuracy of ship's gyro compass.
- (14) Rendezvous with escort, if an escort is required. Conduct radio and sonar communications checks (See Note 2).
- (15) **Rig out bow planes**, if applicable. Test bow/fairwater and stern planes in all modes.
- (16) Flood variable tanks to computed compensation less a safety factor.
- (17) Operate trim and drain pumps.
- (18) Test variable ballast system for proper operation.
- (19) Perform a low pressure, normal and EMBT blow for as long as necessary to verify system operability. A static blow shall not be used to test the EMBT blow system. For SSN 23 only: Perform an MBT 6 normal blow from the BCP for a minimum duration of 2 seconds to verify that air flows into MBT 6 as indicated by a reduction in air bank pressure.
- (20) Check that initial EMBT Blow system actuating air pressure and air bank pressure is within +0 PSIG, -200 PSIG of nominal operating air pressure.

- (21) Ensure all MBT blow systems are in a normal line up configuration.
  - (22) Additional requirements may be imposed at the discretion of the CO.
- b. The following tests and evolutions shall be carried out immediately prior to or during the initial tightness dive:
- (1) Obtain navigational fix and take sounding. Maximum depth of water is 400 feet as specified in reference (b).
  - (2) Rig ship for deep submergence. Line up propulsion plant for maximum reliability. All systems shall be in the maximum secure condition with unnecessary sea systems isolated (See Note 3).
  - (3) Station additional personnel throughout the ship to inspect for leaks.
  - (4) Transmit commencing initial tightness dive message. Submerge the ship per the Ship Systems Manual Operating Procedures. If desired to conduct periscope depth tests, the ship may be submerged to periscope depth.
  - (5) Check operation of ship control systems, including depth indication (See Note 4).
  - (6) When escort is required, communicate with escort on RAC/WQC at each depth increment or at 10-minute intervals, whichever is sooner. If communications are lost, return to depth at which communications can be established before continuing (See Note 2).
  - (7) All hands inspect for leaks and report them.
  - (8) Inspect the discharge of all automatic drains in each EMBT Blow quadrant for sea water leakage prior to the first dive when the ballast tanks are flooded (e.g., at periscope depth).
  - (9) At periscope depth, operate all masts checking optics and leakage. Observe speed and depth restrictions for masts without violation of the SOE (See Note 5). Event may be performed following initial dive, if sea state prevents operation at periscope depth.
  - (10) Test operation of trim and drain system **discharging** to sea.
  - (11) If not at 150 feet for SSN 688 Class submarines (155 feet for SSN 774 Class submarines), (160 feet for SSBN/SSGN 726 and SSN 21 Class submarines), proceed to 150 feet for SSN 688 Class submarines (155 feet for SSN 774 Class submarines), (160 feet for SSBN/SSGN 726 and SSN 21 Class submarines) and obtain SAT 1/3 trim in accordance with the Ship's Operating Manual. Take readings as required to make a check of ballasting.
  - (12) At 200 feet:
    - (a) Adjust trim (See Note 6).
    - (b) Inspect for leaks.
    - (c) Communicate with escort at each depth increment or at 10-minute intervals, whichever is sooner. If communications are lost, return to depth at which communications can be re-established before continuing (See Note 2).
  - (13) At 200 feet, in accordance with reference (x):

- (a) Check accuracy of gauges and repeaters (See Note 4).
- (b) Evaluate signal ejectors or launchers. Conduct operational test of each by hand and impulse methods, as applicable (See Note 7).
- (c) Check shafting bearings and stern tubes for excessive heating, leakage and noise. Main shaft seals must be tested at each depth specified in reference (x) testing one seal for 20 minutes, and shifting to the other seal. Test the second seal for 20 minutes or until the boat is ready to go to the next depth, whichever comes first.
- (d) Cycle rudder and planes through full throw at slow speed to check for binding.

**NOTE: REQUIRED SYSTEMS ARE LISTED IN PARAGRAPH 4b OF REFERENCE (x). OBSERVE RESTRICTIONS ON OPERATION OF SYSTEMS LISTED IN PARAGRAPH 4d OF REFERENCE (x).**

- (e) Operate all Main and Auxiliary Sea Water hull and back-up valves and those other seawater system valves worked during the availability (using remote closures, as applicable, from flooding control stations) that are required to maintain propulsion and other functions vital to the ship's operation.
- (14) Test the SPM (See Note 13 in Appendix O of Part I, Chapter 3 of this volume).
- (15) Additional requirements may be imposed at the discretion of the CO.
- c. The following tests and evolutions shall be carried out following the initial tightness dive and prior to the deep dive:
- (1) Transmit initial tightness dive complete message.
  - (2) A minimum of six hours of **ISE submerged for crew training**.
  - (3) Charge air banks and battery as necessary. The ship may be submerged while charging air banks provided the depth of the ship does not exceed other guidelines in this instruction, or those of the flooding bill or ship's operating procedure.
  - (4) If escort is required, detach escort after initial tightness dive. Escort will then proceed to station for deep dive. Ensure that deep dive rendezvous time and location are clearly established before escort is released. The escort may be retained for additional testing during the transit as described in Part I, Chapter 3, Appendix P of this volume. Transit depths shall not exceed depth as described in Part I, Chapter 3, Appendix P of this volume.
  - (5) Additional requirements may be imposed at the discretion of the CO.
- d. The following tests and evolutions shall be carried out immediately prior to or during the deep dive:
- (1) Check that initial EMBT Blow system actuating air pressure and air bank pressure is within +0 PSIG, -200 PSIG of nominal operating air pressure.
  - (2) Verify MBT systems lined up for normal operation.
  - (3) Take sounding. Accurately fix ship's position within the specified dive area in accordance with reference (b). Transmit commencing deep dive message.

- (4) Proceed to normal submergence depth and obtain a 1/3 speed trim. Use conservative angles and speed on initial dive.
- (5) Trim ship to maintain neutral buoyancy (See Note 6).
- (6) Rig ship for deep submergence. Line up propulsion plant for maximum reliability. All systems shall be in the maximum secure condition with unnecessary sea systems isolated (See Note 3).
- (7) Station additional personnel throughout the ship to inspect for leaks.
- (8) At 400 feet and then in increments of 100 feet descending to one-half the maximum operating depth and every 100 feet or other lesser specified increments thereafter down to the maximum authorized operating depth:
  - (a) Adjust trim (See Note 6).
  - (b) Inspect for leaks.
  - (c) Communicate with escort (if escort required) at each 100 foot depth increment or at 10-minute intervals, whichever is sooner. If communications are lost, return to a depth at which communications can be re-established before continuing (See Note 2).
- (9) At depths listed for hull valve cycling in reference (x) including the maximum authorized operation depth:
  - (a) Check accuracy of gauges and repeaters (See Note 4).
  - (b) Evaluate signal ejectors or launchers. Conduct operational test of each by hand and impulse methods, as applicable (See Note 7).
  - (c) Check shafting bearings and stern tubes for excessive heating, leakage and noise. Main shaft seals must be tested at each depth specified in reference (x) testing one seal for 20 minutes, and shifting to the other seal. Test the second seal for 20 minutes or until the boat is ready to go to the next depth, whichever comes first.
  - (d) Cycle rudder and planes through full throw to check for binding. Cycling of rudder and planes through full throws should be limited to 90 % of test depth.

**NOTE: REQUIRED SYSTEMS ARE LISTED IN PARAGRAPH 4b OF REFERENCE (x). OBSERVE RESTRICTIONS ON OPERATION OF SYSTEMS LISTED IN PARAGRAPH 4d OF REFERENCE (x).**

- (e) Operate all Main and Auxiliary Sea Water hull and back-up valves and those other seawater system valves worked during the availability (using remote closures, as applicable, from flooding control stations) that are required to maintain propulsion and other functions vital to the ship's operation at increments of depth specified in reference (x).

**NOTE: TRASH DISPOSAL UNITS (TDU) WITH BALL VALVES WILL NOT BE OPERATED BELOW 200 FEET. TDUs WITH FLAPPER VALVES WILL NOT BE OPERATED BELOW 150 FEET.**

- (f) Operate trim and drain pumps, discharging to sea.

- (g) Cycle main ballast tank vents to check for binding. Main ballast tank vents will be cycled hydraulically except at test depth where they will be cycled manually.
  - (10) Surface fully with EMBT blow in accordance with applicable URO MRC. Check air bank pressures before and after blow. For SSN 23 only: Perform an MBT 6 normal blow from the BCP until MBTs 6A and 6B are blown to residual water levels.
  - (11) Transmit completion of deep dive message.
  - (12) Additional requirements may be imposed at the discretion of the Commanding Officer.
- e. The following tests and evolutions shall be carried out submerged following the deep dive:
- (1) Full power run (See Notes 8, 9 and 10).
  - (2) Emergency stop (See Notes 9 and 10).
  - (3) Steering and diving operation at full speed (See Note 11).
  - (4) Steep angles - operate ship through several depth changes using large up and down angles. Check operation of ship machinery (See Note 9).
  - (5) Time raising each periscope and mast at maximum depth and speed for which they are designed. Check training feature where applicable.
  - (6) Run and observe air conditioning plants throughout trials noting deficiencies. Operate the Lithium Bromide air conditioning plant (if installed) to demonstrate ability to carry entire maximum existing ship's air conditioning load or 100 percent capacity.
  - (7) Additional requirements may be imposed at the discretion of the Commanding Officer.

4. Sea Trial Conclusion. At the conclusion of Sea Trials, and based on a review of Sea Trial deficiencies and TYCOM concurrence, the submarine may transit to a port other than the overhauling activity. During this transit the submarine shall not operate at depths greater than 400 feet (one-half test depth plus fifty feet for SSN 688 class), and shall not be released for unrestricted operations until all RECs are closed and any deficiencies identified during the controlled dive to test depth have been reported and reviewed by the TYCOM and specific TYCOM approval for URO is granted.

#### NOTES

- 1. For SSBN/SSGN 726 Class submarines **only** - This surface evolution, full power run astern, shall be conducted only if maintenance was accomplished on the reduction gears, the astern throttle(s) or the main shaft thrust bearing.
- 2. In the execution of any Sea Trial, whether escorted or not, submarine COs are reminded of their responsibility to communicate with escorts and/or shore authorities within the prescribed previously agreed upon time limits to avoid initiation of lost submarine procedures.
- 3. Reference (x) [C9094.2 (Series)] prescribes procedures for system operation during the deep dive.
- 4. Compare all depth and pressure gauges. Depth and pressure gauges should be checked as soon as each next specified depth is reached.

5. Any evolutions (e.g., mast testing, propeller cavitation data collection, etc.) required by the Sea Trial Agenda, which violate the ship's SOE, must be approved by the TYCOM prior to Sea Trials, in accordance with paragraph 2 of this Appendix.
6. Deep dive should be conducted using moderate speed and constantly adjusting trim at depths indicated in paragraphs 3.b.(12)(a) and 3.d.(8)(a) of this Appendix, to maintain neutral buoyancy. Moderate speed shall be defined as that range of speed that allows the ship to recover from a loss of stern plane control or flooding casualty or as otherwise directed by NAVSEA.
7. Integrity of launchers or signal ejectors shall be established by admitting sea pressure through equalizing lines or flooding connection and the muzzle valve/door operated before conducting operational tests. Shoot water slugs from specified launchers or signal ejectors at depths specified by reference (x). Shoot pyrotechnics on initial dive and at test depth on deep dive **only** if work was accomplished on the launchers or signal ejectors or if an escort vessel is required for the trial.
8. Run full power submerged for at least two hours. Operate at minimum non-cavitating depth, but not to exceed 400 feet, in accordance with reference (b); water depth is not limited for this event.
9. Note that the required sequence of events is initial dive, deep dive, full power run submerged, back emergency, then high speed maneuverability, and steep angle tests. Initial high speed ship control tests, steep angle tests and exercises at major casualties shall be conducted in water that does not exceed one and one-half times design test depth.
10. The submerged full power run with an ahead flank bell is to be terminated with a back emergency bell, consistent with current Main Propulsion Operating Limits (shaft torque is not a limiting factor in this test). The duration of the back emergency bell will be limited to 45 seconds, to be followed immediately by an appropriate ahead bell. The 45 second limit will:
  - a. Standardize the crashback requirements throughout the submarine force.
  - b. Provide a backing transient similar to that experienced in response to a stern plane jam.
  - c. Be short enough that no ship will gather sternway.

For SSBN/SSGN 726 Class submarines **only** - The submerged full power run with an ahead flank bell is to be terminated by reducing the bell to ahead standard until speed stabilizes. The ship is then to conduct a back emergency bell consistent with current Main Propulsion Operating Limits (shaft torque is not a limiting factor in this test). The duration of the back emergency bell will be limited to 45 seconds, to be followed by an appropriate ahead bell. The 45-second limit will avoid developing sternway.

11. At maximum safe speed, operate the rudder and planes through full throw in both directions, in all remote modes of operation.

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**APPENDIX R****SUBMARINE SEA TRIAL SITUATION REPORT  
(SITREP)**

FM USS <SHIP NAME>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>N4//  
 INFO CNO WASHINGTON DC//N77//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>N43//  
 COMNAVSEASYSKOM WASHINGTON DC//PMS 392/080//  
 DIRSSP WASHINGTON DC//205// {For SSBN/SSGN Only}  
 <SUBOPAUTH>// {IF OTHER THAN PARENT TYCOM}  
 COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>N5//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 (OTHER UNITS IN AREA IF APPLICABLE)//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/USS <SHIP NAME>//  
 SUBJ/(TYPE AVAILABILITY) SITREP (SEQUENTIAL NUMBER)//  
 REF/A/DOC/COMFLTFORCOM/<DATE>//  
 REF/B/DOC/AS APPLICABLE/<DATE>//  
 NARR/ REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II.  
 RMKS/1. CO'S SUMMARY, EVENTS 1-9 COMPLETED WITH THE FOLLOWING DEFICIENCIES NOTED:  
 A. SUBSAFE/URO DEFICIENCIES.  
 1) #1 SCOPE HULL GLAND LEAK 1 DPM AT 20% TD  
 2) TDU VENT, TD-104 LEAKS 3 DPM AT 65% TD.  
 3) STERN PLANES AUX ANGLE INDICATOR ON BCP DOES NOT ILLUMINATE, URO-16  
 B. NON-SUBSAFE/URO DEFICIENCIES.  
 1) SCULLERY DRAIN LEAKING AT FITTING F-18, 27 DPM  
 2) 3 FLOOR TILES IN CREWS MESS LIFTED AFFECTING SANITATION  
 3) CO HOT WATER SHOWER RECIRC PUMP FAILED  
  
 2. PREVIOUS DEFICIENCIES REPORTED AND STATUS.  
 (LIST ALL PREVIOUS DEFICIENCIES AND CURRENT STATUS-THE GOAL IS TO CAPTURE THE COMPLETE MATERIAL CONDITION IN EACH MESSAGE) STATUS = REPAIRED (R), CORRECTIVE ACTION REQUIRED (CAR), NOT APPLICABLE (NA)  
  
 EXAMPLE –  
  
 1) SCULLERY DRAIN LEAKING AT FITTING F-18, 27 DPM -R  
 2) 3 FLOOR TILES IN CREWS MESS LIFTED AFFECTING SANITATION - CAR  
 3) CO HOT WATER SHOWER RECIRC PUMP FAILED - CAR  
 4) #1 SCOPE HULL GLAND LEAK 1 DPM AT 20% TD - CAR  
 5) TDU VENT, TD-104 LEAKS 3 DPM AT 65% TD - CAR  
 6) STERN PLANES AUX ANGLE INDICATOR ON BCP DOES NOT ILLUMINATE, URO-16 - R  
 3. ADDITIONAL INFO.  
 1) DESCRIBE ANY ADDITIONAL INFO DESIRED OR LIST "NONE".  
 4. TYCOM, NAVSHIPYD, AND NAVSEA REPS CONCUR-DO NOT CONCUR (AS APPROPRIATE).//  
 BT  
**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX S****SAMPLE TYCOM MESSAGE TO SHIP CONCERNING URO FOR IDD OR PIRA AVAILABILITIES**

FM COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//  
 COMNAVSEASYSYSCOM WASHINGTON DC//392/080/07Q//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>//  
 DIRSSP WASHINGTON DC//{FOR SSBN/SSGN}  
 COMSUBGRU <NO.>//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/COMSUB<LANT/PAC>//  
 SUBJ/(SUBS) UNRESTRICTED OPERATION OF USS <SHIP NAME/HULL NO.>//  
 REF/A/RMG/ USS <SHIP NAME>/<DTG>//  
 REF/B/DOC/COMFLTFORCOMINST 4790.3//  
 REF/C/DOC/ NAVSEA 0924-LP-062-0010//  
 NARR/REF A IS USS <SHIP NAME> MSG CONCERNING COMPLETION OF SEA TRIALS. REF B IS THE  
 JOINT FLEET MAINTENANCE MANUAL. REF C IS THE SUBMARINE SAFETY  
 (SUBSAFE) REQUIREMENTS MANUAL.//  
 RMKS/1. REF A REPORTED THE SATISFACTORY COMPLETION OF SEA TRIALS WITH NO SUBSAFE  
 DEFICIENCIES IDENTIFIED. (IF SPECIFIC SUBSAFE DEFICIENCIES WERE IDENTIFIED BUT WERE NOT DEEP DIVE  
 RETEST FAILURES LIST SPECIFICS – DEEP DIVE TEST FAILURES WILL REQUIRE A FOLLOW-ON SEA TRIALS)  
 2. TYCOM AUTHORIZES, USS <SHIP NAME/HULL NO.> TO CONDUCT OPERATIONS TO <SPECIFIED> DEPTH,  
 SUBJECT TO THE FOLLOWING RESTRICTIONS: <LIST RESTRICTIONS IF THEY EXIST OR STATE "NONE">.  
 3. CONTINUED CERTIFICATION FOR OPERATIONS TO TEST DEPTH IS SUBJECT TO COMPLIANCE  
 WITH REF B AND REF C.  
 BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX T****SAMPLE SHIP MESSAGE TO TYCOM CONCERNING READINESS FOR FOLLOW-ON SEA TRIALS FOR IDD OR PIRA AVAILABILITIES**

FM USS <SHIP NAME>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 INFO COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>//N5//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN//USS <SHIP'S NAME>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.>READINESS FOR <FOLLOW-ON <sup>(NOTE 1)</sup>>SEA TRIALS//  
 REF/A/DOC/<SUPERVISING AUTHORITY>/<DATE>//  
 REF/B/DOC/COMFLTFORCOM/<DATE>//  
 REF/ REF A IS <SUPERVISING AUTHORITY> SUBSAFE CERTIFICATION CONTINUITY REPORT FOR <SHIP NAME/HULL NO.>. REF B IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II//  
 RMKS/1. REF A CERTIFIED THE SUBSAFE MATERIAL CONDITION OF THOSE PARTS OF USS <SHIP NAME/HULL NO.> INSTALLED, REPAIRED AND/OR TESTED BY THE SHIPYARD IS SATISFACTORY FOR SEA TRIALS TO TEST DEPTH.  
 2. USS <SHIP NAME/HULL NO.> AND CREW REPORTED READY TO PROCEED IAW REF B, ON <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA TRIALS WITH THE FOLLOWING EXCEPTIONS:  
     A. REMOVAL OF SHORE SERVICE CONNECTIONS.  
     B.  
 3. MATERIAL CONDITION SUPPORTS ADEQUATE CREW REST FOR UNDERWAY AT <TIME AND DATE>.  
 4. REQUEST PERMISSION TO COMMENCE <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA TRIALS.//  
 BT

**NOTE 1: UPCOMING TRIAL WHICH IS SUBJECT OF THIS CERTIFICATION (E.G., SECOND SEA TRIAL, ETC.).**

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX U**

**SAMPLE ISIC MESSAGE TO TYCOM CONCERNING  
MATERIAL CERTIFICATION FOR FOLLOW-ON SEA TRIALS IN CASES WHERE A PREVIOUS SEA  
TRIAL WAS ABORTED OR CORRECTIVE ACTIONS FOR SEA TRIAL DEFICIENCIES REQUIRE AN  
ADDITIONAL DEEP DIVE FOR IDD OR PIRA AVAILABILITIES**

FM COMSUB<RON/GRU NO.>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 INFO COMSUBDEVRON FIVE SILVERDALE WA//N4//  
 COMSUBGRU <NO.>//N4//  
 USS <SHIP NAME>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID//GENADMIN/COMSUB<RON/GRU NO.>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.>MATERIAL CERTIFICATION/ READINESS FOR <FOLLOW-ON<sup>(NOTE 1)</sup>>  
 SEA TRIALS//  
 REF/A/DOC/ COMFLTFORCOM/<DATE>//  
 REF/B/RMG/COMSUB<RON/GRU NO.>/<DTG>//{APPENDIX Y}  
 REF/C/DOC/NAVSEA /<DATE>//  
 REF/D/RMG/USS <SHIP NAME>/<DTG>//{APPENDIX T}  
 NARR/REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II.  
 REF B IS COMSUB<RON/GRU NO.> MSG TO TYCOM ON MATERIAL STATUS PRIOR TO INITIAL SEA  
 TRIALS. REF C IS NAVSEA 0924-LP-062-0010, SUBMARINE SAFETY (SUBSAFE) REQUIREMENTS  
 MANUAL. REF D IS USS <SHIP NAME/HULL NO.> REPORT OF READINESS FOR FOLLOW-ON SEA  
 TRIALS.//  
 RMKS/1. IAW REF A AND C, THIS MSG CERTIFIES THAT NO MANDATORY DEFICIENCIES FOR  
 <FOLLOW-ON<sup>(NOTE 1)</sup>> SEA TRIALS HAVE BEEN IDENTIFIED. THERE HAVE BEEN NO RECS OPENED AND  
 NO FORCES AFLOAT SUBSAFE DEPARTURES FROM SPECIFICATION PROCESSED SINCE THE START  
 OF THE INITIAL SEA TRIALS <OR, SUBSEQUENT TO REF B, REPORT ANY MANDATORY DEFICIENCIES DISCOVERED  
 WITH CORRECTIVE ACTION, AND IF RECS AND/OR DEPARTURES FROM SPECIFICATIONS WERE PROCESSED SINCE THE  
 START OF THE INITIAL SEA TRIALS, REPORT ALL RECS OPENED SINCE THE START OF INITIAL SEA TRIALS ARE CLOSED  
 AND/OR ALL SUBSAFE DEPARTURES FROM SPECIFICATIONS PROCESSED SINCE THE START OF SEA TRIALS ARE RESOLVED  
<sup>NOTE 2</sup>>  
 2. THERE ARE NO SUBSAFE DEPARTURES FROM SPECIFICATIONS WITH CONDITIONS WHICH  
 HAVE NOT BEEN SATISFIED. THE FOLLOWING DEPARTURES FROM SPECIFICATIONS ARE  
 CURRENTLY OUTSTANDING:  
DEPARTURE NO. TYPE SYSTEM/COMPONENT RESTRICTION (IF ANY)  
 A.  
 B.  
 3. SHIP REPORTED READINESS FOR FOLLOW-ON SEA TRIALS IN REF D.//  
 BT

**NOTE 1: UPCOMING TRIAL WHICH IS SUBJECT OF THIS CERTIFICATION (E.G., SECOND SEA TRIAL, ETC.).**

**NOTE 2 LIST ALL RE-ENTRIES TO MATERIAL CERTIFICATION BOUNDARY AND ALL WORK ON SYSTEMS AFFECTING RECOVERABILITY, SALVAGE, WATERTIGHT INTEGRITY, OR OPERATION OF SHIP'S CONTROL SURFACES WITH CORRECTIVE ACTION SINCE RELEASE FOR FAST CRUISE MESSAGE.**

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX V****SAMPLE TYCOM MESSAGE TO SHIP CONCERNING FOLLOW-ON  
SEA TRIALS DEPTH AUTHORIZATION FOR IDD OR PIRA AVAILABILITIES**

FM COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//N87//  
 COMNAVSEASYS COM WASHINGTON DC//PMS 392/08O/07Q//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>//N43//  
 DIRSSP WASHINGTON DC//{FOR SSBN/SSGN}  
 COMSUBGRU <NO.>//  
 COMSUB<RON/GRU NO.>//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/COMSUB<LANT/PAC>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA TRIALS DEPTH AUTHORIZATION//  
 REF/A/DOC/<SUPERVISING AUTHORITY>/<DATE>//  
 REF/B/RMG/ COMSUB<RON/GRU NO.>/<DTG>//{APPENDIX U}  
 REF/C/RMG/ USS <SHIP NAME>/<DTG>//{APPENDIX T}  
 NARR/ REF A IS <SUPERVISING AUTHORITY> SUBSAFE CERTIFICATION CONTINUITY REPORT FOR <SHIP  
 NAME/HULL NO.>. REF B IS COMSUB<RON/GRU NO.> REPORT OF MATERIAL CONDITION OF SHIP NOT  
 WORKED BY THE SHIPYARD. REF C IS SHIP REPORT OF READINESS FOR <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA  
 TRIALS  
 RMKS/1. REF A CERTIFIED THE SUBSAFE MATERIAL CONDITION OF THOSE PARTS OF USS <SHIP  
 NAME/HULL NO.> INSTALLED, REPAIRED, AND/OR TESTED BY THE SHIPYARD IS SATISFACTORY FOR  
 <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA TRIALS TO TEST DEPTH.  
 2. REF B AND C CONFIRM THAT CREW IS READY FOR <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA TRIALS AND REPORT  
 THE CERTIFICATION OF THE REMAINDER OF ITEMS WITHIN SUBSAFE CERTIFICATION BOUNDARY  
 OF USS <SHIP NAME/HULL NO.> HAS BEEN SUSTAINED. ACCORDINGLY, THE STATUS OF THE SUBSAFE  
 CERTIFICATION BOUNDARY OF USS <SHIP NAME/HULL NO.> IS SATISFACTORY FOR <FOLLOW-ON <sup>(NOTE 1)</sup>>  
 SEA TRIALS TO TEST DEPTH.  
 3. USS <SHIP NAME/HULL NO.> IS AUTHORIZED TO DIVE UNDER DELIBERATE AND CONTROLLED  
 CONDITIONS TO <SPECIFIED> DEPTH IAW THE <FOLLOW-ON <sup>(NOTE 1)</sup>> SEA TRIALS AGENDA CONCURRED  
 IN BY REF B AND APPROVED BY REF C.  
**NOTE: IF AN UNSATISFACTORY CONDITION OR SEAWATER LEAKAGE IN EXCESS OF THE  
 SPECIFICATION IS FOUND DURING THE CONDUCT OF THE CONTROLLED DIVE TO  
 TEST DEPTH, AT THE DISCRETION OF THE COMMANDING OFFICER THE SHIP MAY  
 CONTINUE TO TEST DEPTH UNLESS THE COMMANDING OFFICER DETERMINES IT  
 APPROPRIATE TO ABORT THE DIVE.**  
 4. THIS DEPTH AUTHORIZATION IS AUTOMATICALLY SUSPENDED UPON RE-ENTRY TO THE  
 SUBSAFE CERTIFICATION BOUNDARY OR CASUALTY AFFECTING RECOVERABILITY, SALVAGE,  
 WATERTIGHT INTEGRITY, OR OPERATION OF SHIP'S CONTROL SURFACES. THE SHIP SHALL NOT  
 OPERATE AT A DEPTH GREATER THAN 200 FEET UNTIL RE-ENTRY IS CERTIFIED. TYCOM  
 APPROVAL IS REQUIRED PRIOR TO COMMENCING A SUBSEQUENT DEEP DIVE TO CERTIFY WORK  
 ACCOMPLISHED TO CORRECT SUBSAFE DEFICIENCIES DISCOVERED DURING THE SEA TRIAL  
 UNLESS SPECIFICALLY ADDRESSED IN THE SEA TRIAL AGENDAS.//  
 BT  
**NOTE 1: UPCOMING TRIALS WHICH ARE SUBJECT OF THIS CERTIFICATION (E.G., SECOND  
 SEA TRIALS, ETC.).**  
**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT  
 PLAD IS UTILIZED.**

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**APPENDIX W****SAMPLE SHIP MESSAGE TO ISIC CONCERNING READINESS FOR FAST CRUISE FOR IDD OR PIRA AVAILABILITIES**

FM USS <SHIP NAME>//  
 TO COMSUB<RON/GRU NO.>//  
 INFO COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>//N5//  
 <SUPERVISING AUTHORITY>/<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/USS <SHIP NAME>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> READINESS FOR FAST CRUISE//  
 REF/A/DOC/<SUPERVISING AUTHORITY>/<DATE>//  
 REF/B/RMG/COMSUB<RON/GRU NO.>/<DTG>//{ APPENDIX K }  
 REF/C/DOC/COMFLTFORCOM/<DATE>//  
 NARR/ REF A IS <SUPERVISING AUTHORITY> SUBSAFE CERTIFICATION CONTINUITY REPORT. REF B IS  
 COMSUB<RON/GRU NO.> REPORT OF CREW CERTIFICATION AND MATERIAL CONDITION FOR FAST  
 CRUISE AND SEA TRIALS. REF C IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE  
 MANUAL, VOLUME II.//  
 1. REFS A AND B REPORTED READINESS OF SHIP FOR FAST CRUISE AND SEA TRIALS. USS <SHIP  
 NAME/HULL NO.> AND CREW ARE READY FOR SEA TRIALS IAW REF C WITH THE FOLLOWING  
 EXCEPTIONS:  
     A. COMPLETION OF FAST CRUISE.  
     B. REMOVAL OF SHORE SERVICE CONNECTIONS.  
 2. REQUEST PERMISSION TO START FAST CRUISE.//  
 BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT PLAD IS UTILIZED.**

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**APPENDIX X****SAMPLE ISIC MESSAGE TO SHIP AUTHORIZING COMMENCEMENT OF FAST CRUISE  
FOR IDD OR PIRA AVAILABILITIES**

FM COMSUB<RON/GRU NO.>//  
 TO USS <SHIP NAME>//  
 INFO CNO WASHINGTON DC//N77//  
 COM<LANT/PAC>FLT <NORFOLK VA/PEARL HARBOR HI>//N43//  
 COMNAVSEASYS COM WASHINGTON DC//PMS 392/08O/07Q//  
 COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 DIRSSP WASHINGTON DC //205//{For SSBN/SSGN only}  
 <SUBOPAUTH>// {If other than parent TYCOM}  
 COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>//N5//  
 <SUPERVISING AUTHORITY>/<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN/USS <SHIP NAME>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.> READINESS FOR FAST CRUISE//  
 REF/A/DOC/<SUPERVISING AUTHORITY>/<DATE>//  
 REF/B/RMG/COMSUB<RON/GRU NO.>/<DTG>//{APPENDIX K}  
 REF/C/RMG/ USS <SHIP NAME>/<DTG>//{APPENDIX W}  
 REF/D/DOC/ COMFLTFORCOM/<DATE>//  
 NARR/ REF A IS <SUPERVISING AUTHORITY> SUBSAFE CERTIFICATION CONTINUITY REPORT. REF B IS  
 COMSUB<RON/GRU NO.> REPORT OF CREW CERTIFICATION AND MATERIAL CONDITION FOR FAST  
 CRUISE AND SEA TRIALS. REF C USS <SHIP NAME> IS REPORT OF READINESS FOR FAST CRUISE AND  
 SEA TRIALS. REF D IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL,  
 VOLUME II.//  
 1. REF A REPORTED <SUPERVISING AUTHORITY> ASSIGNED WORK COMPLETE AND READINESS FOR  
 FAST CRUISE AND SEA TRIALS.  
 2. REF B REPORTED REMAINING PORTIONS OF SUBSAFE BOUNDARY NOT WORKED BY  
 <SUPERVISING AUTHORITY> MAINTAINED CERTIFIED AND READINESS FOR FAST CRUISE AND SEA  
 TRIALS.  
 3. REF C REPORTED SHIP'S FORCE READINESS FOR FAST CRUISE AND SEA TRIALS AND  
 REQUESTED PERMISSION TO COMMENCE FAST CRUISE.  
 4. IAW WITH REF D USS <SHIP NAME> IS AUTHORIZED TO COMMENCE FAST CRUISE. <SHIP NAME> IS  
 DIRECTED TO REPORT COMPLETION OF FAST CRUISE AND ALL SUBSAFE DEFICIENCIES  
 IDENTIFIED DURING FAST CRUISE TO COMSUB<RON/GRU NO.>, COMSUB<LANT/PAC> AND <SUPERVISING  
 AUTHORITY>.///  
 BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT  
PLAD IS UTILIZED.**

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**APPENDIX Y****SAMPLE SHIP MESSAGE TO ISIC AND TYCOM CONCERNING READINESS FOR SEA TRIALS  
FOR IDD OR PIRA AVAILABILITIES**

FM USS <SHIP NAME>//  
 TO COMSUB<LANT/PAC> <NORFOLK VA/PEARL HARBOR HI>//N4//  
 COMSUB<RON/GRU NO.>//  
 INFO COMSUBDEVRON FIVE SILVERDALE WA//N3//  
 COMSUBGRU <NO.>//N5//  
 <SUPERVISING AUTHORITY>//<CODES>//  
 BT  
 UNCLAS //N09094//  
 MSGID/GENADMIN//USS <SHIP'S NAME>//  
 SUBJ/(SUBS) USS <SHIP NAME/HULL NO.>READINESS FOR SEA TRIALS//  
 REF/A/DOC/ COMFLTFORCOM/<DATE>//  
 NARR/REF A IS COMFLTFORCOMINST 4790.3, JOINT FLEET MAINTENANCE MANUAL, VOLUME II//  
 RMKS/1. FAST CRUISE COMPLETED <TIME AND DATE>.  
 2. IAW REF A, USS <SHIP NAME/HULL NO.> AND CREW REPORTED READY TO PROCEED ON SEA TRIALS  
 WITH THE FOLLOWING EXCEPTIONS:  
     A. REMOVAL OF SHORE SERVICE CONNECTIONS.  
     B.  
 3. MATERIAL CONDITION SUPPORTS ADEQUATE CREW REST FOR UNDERWAY AT <TIME AND DATE>.  
 4. REQUEST PERMISSION TO COMMENCE SEA TRIALS.//  
 BT

**NOTE: ENSURE MESSAGES ARE IN ACCORDANCE WITH NTP-3 FORMAT AND CURRENT  
PLAD IS UTILIZED.**

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**VOLUME II**

**PART II**

**CHAPTER 1**

**SHIP MAINTENANCE VALIDATION,  
SCREENING AND BROKERING**

REFERENCES.

- (a) OPNAVINST 4700.7 - Maintenance Policy for U.S. Naval Ships

LISTING OF APPENDICES.

- A Availability Creation and Numbering

1.1 PURPOSE. This chapter provides procedures and guidance regarding ship maintenance work candidate validation, screening and brokering processes. These processes affect **all** Type Commanders (TYCOM), Regional Maintenance Center (RMC) **Commanding Officers** and ship Maintenance Teams.

1.2 MAINTENANCE.

1.2.1 Regional Maintenance Centers. The command with overall responsibility for efficient planning, brokering and execution of all ship maintenance and modernization for assigned ships is the local RMC. The RMC is a subordinate command to Naval Sea Systems Command (NAVSEA). The RMC shall report Additional Duty to the appropriate Lead TYCOMs. This reporting relationship ensures that the TYCOMs continue to effectively carry out their responsibilities relating to material readiness of their ships. The Regional Maintenance Center locations are identified in Volume VI, Chapter 35 of this manual. Contact information for the RMCs can be found in Appendix A of Volume VI, Chapter 2 of this manual.

1.2.2 Maintenance Team. Each ship shall have a formally structured Maintenance Team. The team, is led by the Ashore Ship's Maintenance Manager who works with the ship's Commanding Officer, and consists of representatives from the ship and the supporting shore maintenance infrastructure (as identified in Volume VI, Chapter 41 of this manual). The primary responsibility of the Maintenance Team is to execute the maintenance policies, directives and regional business rules of the Fleet Commander, Platform TYCOM and the RMC to ensure all maintenance is validated, screened, brokered and completed. While core team members are permanent, augmentation may be required during the ship's interdeployment period. Core team members may be assigned responsibilities for more than one ship.

- a. The core Maintenance Team shall consist of the following members:
- (1) Ship's Commanding Officer.
    - (a) Ensure Ship's Force identifies and properly documents material deficiencies.
    - (b) Ensures Ship's Force complies with the Fleet Commander and TYCOM maintenance and modernization policy, budgets and technical direction.
    - (c) Identifies maintenance priorities.
  - (2) Ashore Ship's Maintenance Manager (Port Engineer for surface ships).
    - (a) Team leader.

- (b) Manages all maintenance, including assessments, requiring "off ship" assistance.
  - (c) Validates maintenance requirements and schedules for accomplishment.
  - (d) Acts as "Owner's Representative" supporting Fleet Commander/TYCOM policies and directives.
- (3) Ship Material Maintenance Officer.
- (a) Provides shipboard schedule inputs.
  - (b) Coordinates Maintenance Team activities with Ship's Force personnel.
- (4) RMC Waterfront Operations Department Ship Superintendent.
- (a) Manages RMC Production Department work for Continuous Maintenance Availability (CMAV) and Chief of Naval Operations (CNO) availabilities.
  - (b) Coordinates Maintenance Team activities with the RMC Production Department.
  - (c) Provides maintenance availability scheduling and status updates.
  - (d) Responsible for the integration, oversight and verification of all work accomplished by all activities (see responsibilities as Naval Supervisory Authority, Part I, Chapter 2 of this volume).
- (5) RMC Project/Program Manager.
- (a) Manages planning and execution of planned CNO/CMAV availabilities.
  - (b) Establishes and maintains planning and execution milestones.
  - (c) Coordinates Maintenance Team activities with the RMC Engineering Department.
  - (d) Coordinates Maintenance Team activities with the RMC contracting functions for contracted work.
  - (e) Prepares and tracks all funding documentation.
- (6) Multi Ship/Multi Option Contractor Program Manager (if applicable). Manages authorized contractor/company work.
- (7) Maintenance Support Team (MST) Officer In Charge (if applicable).
- (a) Provides MST schedule inputs.
  - (b) Coordinates Maintenance Team activities with MST personnel.
- b. Additional Maintenance Team members, such as technical representatives from within the RMC, may be fully dedicated, as needed, or have split assignments.
- c. The TYCOM will prescribe the requirements for periodic meetings of the Maintenance Team.
- d. When a crew swap occurs that rotates a different crew to a hull, the non-crew members of the Maintenance Team shall remain with the hull and provide continuity in planning and execution.

1.2.3 Class Maintenance Plan. The Class Maintenance Plan (CMP) database is an engineered set of Intermediate and Depot-level maintenance tasks, including the following: material condition assessment tasks (I-tasks), qualified repair and life renewal tasks (Q-tasks), availability routine tasks (R-tasks) and authorized Fleet and Program ship change tasks. Tasks are either scheduled or unscheduled.

- a. Scheduled tasks are those tasks the cognizant technical authority (usually the designated In-Service Engineer) requires to be accomplished on a periodic basis. These tasks have been identified, using Reliability Centered Maintenance, to be both applicable and effective. The CMP system automatically pushes scheduled tasks for Maintenance Team screening and brokering based on last accomplished date and task periodicity. In general, scheduled tasks are pushed to the shore Current Ship's Maintenance Project (CSMP) six quarters before the deadline date, unless the periodicity is such that the task is due in less than 18 months. These tasks are mandatory, and must be completed by the due date or approved for deferral or cancellation by the Ship Design Manager (SDM) (see paragraph 1.4.5.e of this chapter).
- b. Unscheduled tasks are pulled by the Maintenance Team based on evidence of need. This includes unscheduled assessment tasks, qualified repair tasks, approved ship changes with their associated support and service tasks and availability routine tasks. Additionally, if the need arises for a scheduled task to be accomplished before it has been pushed into the CSMP, the Maintenance Team has the ability to pull that scheduled task, and the last accomplished date will be appropriately updated.

### 1.3 WORK CANDIDATES.

1.3.1 Current Ship's Maintenance Project Composition. An accurate, up-to-date CSMP is essential for a well-maintained ship. The importance of documenting all discrepancies cannot be overemphasized because the CSMP is the basis for all funding. Only work that is documented in the CSMP will be authorized for accomplishment. The CSMP is maintained in two files, the organizational unit file and the shore file.

- a. Shipboard File. This file contains information regarding all known material discrepancies that require corrective maintenance. These discrepancies are normally discovered either by Ship's Force personnel during routine operations and planned maintenance or by non-Ship's Force personnel during material assessment, training and assist visits. Non-Ship's Force personnel that discover a discrepancy shall provide a "maintenance ready" 2-Kilo (Naval Operations (OPNAV) 4790/2K) to the ship's Maintenance and Material Management (3-M) Coordinator. The 3-M Coordinator shall notify the Work Center Supervisor responsible for the planned maintenance on the equipment of the discrepancy. The Work Center Supervisor shall cause the discrepancy to be entered into the ship file. The ship's 3-M Coordinator will ensure proper screening of work candidates before non-Ship's Force personnel complete their business and leave the ship. The criticality of the discrepancy determines the maximum length of time allowed to document and upload the information regarding the discrepancy to the RMC responsible for managing the shore file. Exceptions to this policy are made within the considerations of bandwidth availability and Operational Security conditions.
  - (1) C2 Casualty Reports shall be documented and uploaded within 24 hours.
  - (2) C3/C4 Casualty Reports (Emergent repairs) shall be documented and uploaded within four hours.
- b. Shore File. This file contains the material discrepancies uploaded from the shipboard file, other work identified by shore-based managers and tasks from the CMP. Tasks from the CMP include pushed scheduled tasks, pulled tasks, authorized program and Fleet modernization work and availability support routines. The Type Desk Officer and Port Engineer are responsible for pulling CMP tasks as required based on evidence of need, availability support routines and Fleet and Program alterations into availability work packages. Although only on the CSMP shore file, this work is visible to Ship's Force on the weekly Excel-version CSMP report sent electronically to the Executive Officer by the TYCOM.

1.3.2 Requirements. All work requiring an expenditure of man-hours, material or a combination of both requires a work candidate (OPNAV 4790/2K) to document the identified requirement. Pushed and pulled CMP tasks are already formatted as OPNAV 4790/2Ks when transferred to the CSMP shore file. The OPNAV 4790/2K requires certain information to be included by the identifying activity to support the maintenance request and may be authored by activities other than the affected ship. There are three levels of the validation process:

- a. The ship (ship's maintenance officer or 3MC) shall do an initial validation of the work statement to determine if there is enough information for the RMC's designated representative (i.e., Port Engineer, Fleet Maintenance Activity Ship Superintendent, Project Manager, etc.) to understand the requirement.
- b. The Port Engineer working with members of the Maintenance Team is responsible for requirement validation, and will determine whether there is real need (objective evidence) and, if so, will also verify the requirement's urgency.
- c. Final validation is the responsibility of the Port Engineer. The Port Engineer ensures that the scope of the work is adequately defined and technically accurate before authorizing the work. This is the final product screened and brokered to a planning or execution activity. A properly validated work candidate will not be returned to the Port Engineer for further information.

1.3.3 Elements. A valid work candidate will provide the following key data elements at a minimum. The blocked numbers to the right of each item reference a OPNAV 4790/2K data block.

- a. Configuration information automatically entered from the master configuration database (Configuration Data Manager's Database/Ship's Configuration and Logistics Support Information System) by the shipboard system:

(1)	Ship Unit Identification Code	[1]
(2)	Work Center Job Control Number	[2]
(3)	Allowance Parts List/Allowance Equipage List	[4]
(4)	Ship Name	[A]
(5)	Ship Hull Number	[B]
(6)	Equipment Noun Name	[5]
(7)	Equipment Identification Code	[14]
(8)	Location	[16]
(9)	Ship Work List Item Number	[56]
(10)	References	

- b. Job Sequence Number [3]
- c. Equipment Status Code [7]
- d. When Discovered Date [17]
- e. Deferred Date [26]
- f. Symptoms and Supporting Information [35]

g.	First Contact Name	[38]
h.	Priority	[41]
i.	Type Availability - (Recommended Accomplishment Level)	[42]
j.	Required Delivery Date	[28]
k.	Recommended resolution	[35]
	(1) Master Job Catalog, if applicable	
	(2) Port Engineer's Notes	
	(3) Additional references	
l.	Maintenance Action Requested	[35]
	(1) Assessment	
	(2) Repair	
	(3) Modernization	
m.	Maintenance Figure of Merit	In CSMP Shore File
n.	Initial Estimate (man days & material)	In CSMP Shore file
o.	TYCOM Screening Code	[45]
p.	TYCOM Screening Remarks	In CSMP Shore File

1.3.4 Guidelines. After a work candidate is created and uplined by an assessment activity or provided and entered into the CSMP shore file by the CMP or other means, it will be reviewed by the Port Engineer with the Maintenance Team. The Port Engineer will use the guidelines below to validate each work statement.

- a. Initial validation will be conducted on each new work candidate to ensure there is sufficient information to understand the requested maintenance action. The originator must populate configuration data elements from the master database by selecting the correct configuration item in a configuration-based system and complete data elements 1 through 7 listed in paragraph 1.3.3 of this chapter. If the ship is the originator then data element 8 must also be present. All work candidates created in an ad-hoc mode or with an incorrect configuration item (and therefore incorrect configuration data) will be returned to the originating activity for cancellation and recreation. Correction and/or inclusion of the remaining requested information may be done on the shore file by the Port Engineer, or the work candidate may be returned to the originator for revision.
- b. If configuration data in the master data base is incorrect (e.g., Allowance Parts List/Allowance Equipage List, Hierarchical Structure Code (Ship Work List Item Number) references, location, etc.), the Port Engineer shall act to correct the data at its source. The Port Engineer may request additional logistic assistance from the Configuration Data Manager to determine and document the correct data.
- c. When an initially validated work candidate is accepted as complete, the Port Engineer will then determine if there is enough objective evidence of need to validate the requirement. If not valid, the work candidate will be returned to the originator and cancelled.

- d. **CMP** material assessments may be accomplished outside of a depot maintenance period to allow for proper planning and preparation to perform the work during the depot maintenance period. However, **CMP** maintenance should be scheduled and executed during depot maintenance periods.
- e. **If during validation, the Maintenance Team finds inaccurate configuration data or has questions concerning the necessity of a “Pushed” CMP work candidate, they will contact the appropriate maintenance planning activity prior to returning or cancelling the work candidate.**

1.3.5 Validation. Validation is the process of reviewing an off-ship work statement to ensure that the correct configuration item (lowest repairable unit, equipment, system, etc.) is properly identified and that there is enough information to determine if the work candidate is required (objective evidence) and, if valid, contains enough information to:

- a. Properly determine the correct resolution inclusive of the root cause.
- b. Screen to the right maintenance period to support ship operations.
- c. Broker to the right activity to perform the work at the most practicable level.
- d. Pass to history.

The goal of the validation process is to provide a work candidate that is sufficiently defined, contains correct and complete information, provides an accurate diagnosis, and provides an applicable, effective, and feasible recommended resolution. A properly validated work candidate should provide the planning and executing activities with the ability to understand the requirement without expending additional manpower or time obtaining needed information. The Port Engineer along with the Maintenance Team validates all off-ship (Type Availability 1, 2 and 3) work candidates before screening them to the planning activity by review of 2-Kilo documentation, personal shipboard observation of conditions, and knowledge of the quality of work candidates written by selected work centers or through additional technical assistance. All validated work candidates should be ship-checked by the Port Engineer or designated representative when practicable. The purpose of this check is to determine the best maintenance action and add to Block 35 (data elements k. and l. in paragraph 1.3.3 of this chapter).

1.3.6 Verification. The Port Engineer may request additional assistance to determine and document the best corrective action. The recommended action will include all pertinent interferences, integration issues, verification of urgency and an initial estimate (data element n. in paragraph 1.3.3 of this chapter). The initial estimate for each job includes mandays, manday rate and material costs. When validated, the Port Engineer will assign a TYCOM Screening Code (data element o. in paragraph 1.3.3 of this chapter) to the work candidate. This shows the job as valid and ready for screening and brokering.

#### 1.4 SCREENING/BROKERING.

1.4.1 Screening and Brokering Work Candidates. The Port Engineer reviews and screens work candidates continuously as they are documented. Work integration may entail screening multiple work candidates together when possible. Work screening also entails selecting the appropriate level of repair and the best opportunity in which to accomplish the work. The Port Engineer makes recommendations on the lowest level of executing activity with the capability and the capacity to accomplish the work during the required time frame, following the guidance of the RMC Business Rules in Volume VI, Chapter 31 of this manual.

- a. Management of ship maintenance is best performed by individuals most familiar with the condition of the ship, budgetary considerations and available workforce. For Surface Force TYCOM ships, the Port Engineers coordinate the work of the waterfront Maintenance Teams. They directly support the RMC Commanding Officer, who prioritizes the day-to-day maintenance focus for ships keeping TYCOMs well informed. These team members accomplish the maintenance identification, planning and execution with supporting functions from other commands and activities.

- b. Supporting the waterfront Maintenance Team are other activities which provide requested support to the Maintenance Team in assessing material condition, determining maintenance requirements, identifying and programming ship modernization and funding and contracting issues.

1.4.2 Screening/Brokering. Although accomplished simultaneously, screening and brokering are actually two distinct processes.

- a. Screening. Determines and assigns the work candidate to the right time period and maintenance availability. Determination includes balancing operational schedule, material readiness requirements and cost concerns to maximize maintenance productivity (material readiness/related maintenance cost).
- b. Brokering. Determines and assigns the right activity to perform the work based on business case analysis, material availability, experience, tool requirements, personnel requirements, special considerations (Environmental, Health and Safety) and capacity.
- c. All OPNAV 4790/2Ks in the Master File should be screened and brokered to a maintenance availability within eight days after being uploaded from the Shipboard File.

1.4.3 Key Data.

- a. The validated work candidate contains the following key data elements to aid in the screening and brokering process:
  - (1) Configuration Item (maintenance object) identification.
  - (2) Symptom (OPNAV 4790/2K - Block 35).
  - (3) Expected scope of preventive/corrective/alterative maintenance (OPNAV 4790/2K - Block 35).
  - (4) Required Completion Date (RCD).
  - (5) Level of Maintenance (TYCOM Code 1,2,3).
  - (6) Identification of a Master Spec Catalog item (pre-planning data).
  - (7) Priority (Figure of Merit).
- b. Work candidates will be brokered to the lowest level of maintenance activity with the capability and capacity to accomplish the work during the required time frame. When practicable, Fleet Maintenance Activity capacity will be utilized first.
- c. Available capacity will be judged after applying Figure of Merit and RCD.
- d. The cause and effect relationship between screening and brokering must be exercised to maximize maintenance productivity. This may require negotiation with the ship and/or maintenance activity to adjust the RCD.
- e. Other considerations for screening and brokering:
  - (1) Synergistic relationship between work candidates exist.
  - (2) Splitting responsibility.

- (3) Third party access.
- (4) Port loading.
- (5) RMC Production Department training requirements.

1.4.4 Guidelines.

- a. After validation, screening and brokering will be accomplished continuously. The Ship's Maintenance Manager will provide recommendations to the Port Engineer. The Port Engineer will use the guidelines below to screen and broker work candidates to the proper availability.
- b. All work will be screened to an availability. Availabilities are created and numbered in accordance with the business rules in Appendix A of this chapter.
- c. Work candidates shall be screened to the following type of availabilities: CNO, Continuous Maintenance (CM), emergent or unfunded. No other type of availability shall be used in the Surface Force.
  - (1) CNO Availability. The work candidate is best performed during the scheduled CNO availability. These work candidates include major Ship Alterations and repairs that require support services and coordination.
  - (2) Continuous Maintenance Availability. Based on ship availability, priority of the job, business case analysis, periodicity or other consideration, the maintenance should be performed during a scheduled CMAV or during a window of opportunity permitted by ship's schedule.
  - (3) Emergent Availability. Emergent work is performed at greater cost than work planned and completed in other availabilities. The criteria to be used to qualify work as emergent is provided in Volume VI, Chapter 31, Paragraph 31.3.3 of this manual.
  - (4) Unfunded Availability. This availability is reserved for work candidates, which should be shown as backlog or are of such low priority they are unlikely ever to be accomplished.
- d. Brokering shall be as follows:
  - (1) Work candidates for technical assistance, assessment or inspection will be brokered to the RMC or another technical activity.
  - (2) Work candidates will be brokered to the lowest level of maintenance activity, filling Fleet Maintenance Activity capacity first, based on the following criteria:
    - (a) Material availability.
    - (b) Capability:
      - 1 Experience.
      - 2 Available Production Resource Tools.
      - 3 Available qualified/certified personnel.
      - 4 Ability to comply with Environmental, Health and Safety regulations.

- (c) Work center capacity.
- (d) Funding.

1.4.5 Additional Requirements for Scheduled Jobs Pushed by CMP. Since jobs pushed to the CSMP by the CMP are mandatory tasks directed by proper Technical Authority, further screening and brokering restrictions apply.

- a. Certain fields on the work candidate cannot be changed, including job summary, problem description, recommended solution, deadline date and maintenance level.
- b. The task must be accomplished by an off-ship maintenance activity, not by Ship's Force. Organizational-level requirements are scheduled by Planned Maintenance System (PMS), not by CMP.
- c. The job cannot be cancelled or passed to history by the Maintenance Team, or customer completed without being screened to an availability.
- d. Generally, the job should be screened to a defined maintenance period instead of to the year-long continuous maintenance availability. When operational, equipment condition requirement or other scheduling issues make this impractical, the year-long continuous maintenance availability may be used for non-depot jobs. However, jobs screened to this availability will be considered to be in Limbo after the jobs deadline date without consideration of the availability end date (see paragraph 1.4.5.h.(2) of this chapter).
- e. The job may not be screened to an emergent maintenance period. Planned maintenance does not warrant the use of emergent maintenance money. This requirement does not preclude pulling a task from the CMP when needed and screening it to an emergent maintenance period.
- f. If the job is screened to the unfunded availability or to an availability that begins more than 90 days after the job's deadline date, a "notification" is triggered by the CMP software to notify the appropriate Technical Authority and a Departure From Specification (DFS) shall be submitted. The Port Engineer's comments will be reviewed and the Technical Authority will either approve or disapprove the DFS. The Port Engineer shall then rescreen the job to an appropriate availability in accordance with the guidance provided in the DFS. This functionality is referred to as the "Notification Process".
  - (1) If the Port Engineer determines that the job should not be accomplished (as opposed to not accomplished until after the deadline date), the task should be screened to the unfunded availability and comments entered. Depending on whether the notification is administrative or technical, the job will be adjudicated in the following manner:

**NOTE: THE SUBSTITUTED WORK CANDIDATE WILL BE SUBJECT TO THE SAME PUSHED TASK RESTRICTIONS DESCRIBED IN THIS SECTION.**

- (a) Administrative: If the intent of the task was completed since the Last Accomplished Date by a non-CMP work candidate, provide that Job Control Number in the comment field. If the Planning Activity Engineer agrees that the intent of the task was met by the non-CMP job, the Planning Activity Engineer will cancel the pushed job from the CSMP. If the intent of the task is covered by a non-CMP work candidate that is currently open and in planning or execution, the Planning Activity Engineer will substitute the pushed job with the non-CMP work candidate and cancel the pushed job from the CSMP. If the job cannot be accomplished because the component/system no longer exists on the ship, the Planning Activity Engineer will cancel the pushed job from the CSMP and update the configuration records. For all administrative notifications, if the Planning Activity Engineer does not agree with the Port Engineer's comments, the notification will be forwarded to the SDM for resolution.

- (b) Technical: The Port Engineer can technically challenge pushed jobs using the Notification Process. Reasons for technically challenging a job include: non-modernization configuration change, permanent or temporary DFS exists, authorized modernization upgrade to equipment, if the Planning Activity or SDM disapproves the notification, the CMP software will send an email to the Port Engineer stating (as applicable) of task accomplished during a visit/certification/inspection, ship about to decommission and task is low risk, unable to execute task as written, challenge to scope or periodicity of task, etc. All technical challenges will be reviewed by the Planning Activity or SDM for resolution.
- (2) If the Port Engineer determines that the job should be accomplished, but not by the due date, the task should be screened to the recommended availability and comments entered. Reasons for deferring a job past its due date include: a temporary DFS exists making the task unnecessary before the due date, lack of an appropriate maintenance availability by the due date, unable to set required assessment conditions because of a related casualty or other issue, lack of capability/capacity to accomplish the job by due date, etc. Deadline challenges shall be documented using a DFS and must be reviewed and approved by the Planning Activity or for approval and a DFS may be required.
- g. A job not progressing towards execution or approval in the Notification Process is considered to be in "Limbo". The purpose of Limbo is to draw management attention to violations of NAVSEA Technical Authority so that mandatory tasks will be executed or exceptions approved. Port Engineers, RMCs and TYCOMs should resolve Limbo tasks promptly. Jobs should not be in Limbo because all pushed jobs can be challenged using a DFS and the Notification Process. Limbo categories are:
  - (1) Unscreened after 30 days. Per the Maintenance Continuous Improvement Team process, all 2-Kilos must be screened within 8 days of entry into the shore CSMP; however, CMP tasks not screened after 30 days of being pushed require extra attention to ensure execution or documentation via the CMP Notification Process.
  - (2) Open and overdue. Often, tasks are screened to an appropriate availability but are never executed. Sometimes, task deferrals are approved through the Notification Process but then are moved to a later availability without Planning Activity or SDM approval. Open and overdue jobs are particularly troublesome because they are now past the deadline date and do not have deferral approval from Technical Authority via a DFS and the CMP Notification Process. Specific types of open and overdue Limbo jobs include:
    - (a) Job is open, screened to a year-long CM availability and past its deadline date.
    - (b) Job is open, screened to an acceptable numbered availability (one that starts no later than 90 days after the deadline date or one approved in the Notification Process by the Planning Activity or SDM), but past both the job's deadline date and the availability end date plus 60 days.
    - (c) Job is open, screened to an availability that was overturned by SEA 21 and past its deadline date.
    - (d) Job is open, unscreened and past its deadline date.
  - (3) Overturned and not rescreened. When a task is challenged by the Port Engineer via DFS and the CMP Notification Process but that challenge is overturned by Technical Authority, the Port Engineer receives an email stating that the job must be rescreened to an appropriate availability for accomplishment. Jobs not rescreened to an appropriate availability within 30 days after the Port Engineer is made aware of the ruling are considered in Limbo.

- h. Deferral notifications approved by the Planning Activity or SDM are approved for the availability to which the job was screened when the job triggered a notification. If a job is subsequently rescreened to a later availability, the approval is removed and the screening action must be acted on by the Planning Activity or SDM again. Otherwise, the job will go into Limbo.

## 1.5 ASSESSMENTS.

### 1.5.1 Maintenance Team.

- a. All material condition assessments, including tasks for Combat Systems Command, Control, Communications and Computer Readiness Assessments, shall be derived from the CMP. Scheduled condition assessments have been validated by an approved Reliability Centered Maintenance analysis to be applicable and effective, and are pushed by the CMP system to the CSMP shore file for the Port Engineer's action, based on the ship's last accomplished date and task periodicity. Unscheduled material condition assessments are not, without further evidence of need, considered effective and are thereby not pushed into the CSMP shore file, but can be pulled from the CMP by the Port Engineer or his representative if there is evidence of need (such as degraded performance, errors, or other indication of problems). Scheduled tasks can also be pulled if circumstances warrant, and the Last Accomplished Date will be properly updated. The Port Engineer with help from the Maintenance Team shall review all 2-Kilos pushed from the CMP system just as for any other offship 2-Kilo, and broker to the appropriate assessing activity.
- b. Only assessment tasks in the CMP or assessment procedures in the PMS database may be used for assessments. Information addressing assessment requirements found not to be included within the CMP or PMS databases, such as local practices, In-Service Engineering Activity unique items, RMC practices, etc., shall be forwarded using the Technical Feedback Report for review and approval as an acceptable addition to the CMP and PMS databases. If not approved, these practices shall not be used by any activity.
- c. The Port Engineer will make the preliminary determination of the most appropriate source for all off-ship activity work for its assigned ships. Decisions made by the Port Engineer, with concurrence from the Maintenance Team, shall be in compliance with policies in this instruction, reference (a), and guidance provided by the cognizant RMC.

1.5.2 Type Commander. The TYCOM shall develop and execute a Memorandum of Agreement in accordance with Volume II, Part I, Chapter 3 of this manual with each supporting RMC to define reporting and administrative relationships between the TYCOM and the RMCs.

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## APPENDIX A

## AVAILABILITY CREATION AND NUMBERING

1. Specifying Availabilities. A uniform method of specifying availabilities is an essential part of availability management and data collection. No deviation from these protocols is permitted. **An availability is defined as a specified period of time during which maintenance is conducted. Only Type Desk Officers, Type Desk Program Managers, and Port Engineers are authorized to create availabilities. Availabilities shall include all work completed during a specific time period regardless of executing activity. With exception of the emergent availability, availabilities shall not overlap and work by every activity (depot, Intermediate Maintenance Activity (IMA), Alteration Installation Team, tech assist and Ship's Force) shall be entered into the same availability. Availability numbers are not to be used as a method of segregating the executing activity or the level of work performed.**
  
2. Availability Numbering. The availability number consists of the first four digits -- the availability category code and the availability serial number. The Funding Activity Code (FAC) is used to identify the source of funding for any job and is entered at the time of job screening and authorization. The availability numbering system shall consist of:
  - a. A one-digit availability category code.
  - b. A three-digit availability serial number.
  - c. A two-digit funding activity code.
  
3. Availability Category Code: This code is the first character of the four-digit availability number. These codes are used by all TYCOMs and, therefore, not all codes are applicable to **all** ships. The stand alone "I" availability is no longer used by the Surface Force.

<u>CODE</u>	<u>TITLE</u>
A	ALONGSIDE SCHEDULED CONTINUOUS MAINTENANCE
B	DOCKING SELECTED RESTRICTED AVAILABILITY (DSRA)
C	SELECTED RESTRICTED AVAILABILITY (SRA)
D	COMPLEX OVERHAUL
E	EXTENDED INCREMENTAL SELECTED RESTRICTED AVAILABILITY
F	EXTENDED DOCKING SELECTED RESTRICTED AVAILABILITY (EDSRA)
G	EXTENDED SELECTED RESTRICTED AVAILABILITY (ESRA)
H	DOCKING INCREMENTAL SELECTED RESTRICTED AVAILABILITY (DISRA)
I	INTERMEDIATE MAINTENANCE AVAILABILITY
J	INCREMENTAL SELECTED RESTRICTED AVAILABILITY
K	INTERIM/EMERGENT DRY DOCK

L	DOCKING PHASED MAINTENANCE AVAILABILITY
M	PHASED PLANNED MAINTENANCE AVAILABILITY
N	INACTIVATION AVAILABILITY (INAC)
O	POST DELIVERY AVAILABILITY
P	CONTINUOUS AVAILABILITY (YEAR LONG CM)
Q	POST SHAKEDOWN AVAILABILITY
R	REGULAR OVERHAUL
S	SELF AVAILABILITY/SHIP TO SHOP AVAILABILITY
U	UNFUNDED
V	PLANNED INCREMENTAL AVAILABILITY (PIA)
W	DEPOT MODERNIZATION PERIOD
Z	VOYAGE REPAIRS (PER TITLE X)/STRIKE FORCE INTERMEDIATE MAINTENANCE ACTIVITY
1	DOCKING PLANNED INCREMENTAL AVAILABILITY (DPIA1)
2	DOCKING PLANNED INCREMENTAL AVAILABILITY (DPIA2)
3	DOCKING PLANNED INCREMENTAL AVAILABILITY (DPIA3)
4	PLANNED INCREMENTAL AVAILABILITY (PIA1)
5	PLANNED INCREMENTAL AVAILABILITY (PIA2)
6	PLANNED INCREMENTAL AVAILABILITY (PIA3)
7	REFUELING COMPLEX OVERHAUL (RCOH)
8	NOT USED

4. Availability Serial Number. The availability serial number is the same three character serial field currently used in RMAIS. This entry is made in the "serial" field of the RMAIS availability editor window. This entry is also used in Navy Enterprise Maintenance Automated Information System availability field. There are five authorized serial codes used to designate availabilities.

- a. Alongside Availability (XAZ). The XAZ availability is intended to be a planned CM availability, such as a CMAV, over a specified period of time determined by the ship's operational schedule. The TYCOM will schedule the availability during the normal fleet scheduling process. A nominal time frame for availability length is no less than two weeks and no more than six weeks. A ship is not to get underway during any period of the availability. There is no limit to the number of XAZ availabilities that may be scheduled during a year. The first character indicates FY at availability start. The last character indicates a specific XAZ availability during that FY. If the number of availabilities in a single FY results in the Z character being greater than 9, alphabetical characters will then be used beginning

- d. Master work items and templates shall be centrally filed and maintained by a CPA. Only the CPA will be allowed to store, modify, delete or change the status of a master specification or master template stored in the central library.
- e. MSC task lists will adhere to a specific format. The format is defined in:
  - (1) Appendix 4E of reference (a) for D-level items.
  - (2) Enclosure (1) of the I-level MSC process manual for I-level specifications and templates.
- f. Master work items are reviewed prior to approval for use as a master specification. No additional planning review is required prior to use of a master specification to accomplish a maintenance task.
- g. Although master work items do not require planning review, they are subject to established release, scheduling and integration planning processes.

2.4.5.2 Prorate Distribution Process. The prorate distribution process map (Appendix C) summarizes the steps in arriving at an equitable distribution of prorate costs. The prorate distribution process follows the milestones below:

- a. April prior to execution fiscal year:
  - (1) RMC/TYCOM/Program Executive Officer (PEO) SHIPS issues the Maintenance and Modernization Business Plan Guidance. This is the baseline for prorate distribution.
  - (2) The TYCOM input to the MMBP will provide total dollars budgeted for the Fleet Modernization, Maintenance and Repair scheduled for each availability.
  - (3) The Program Modernization input to the MMBP is the Extended Planning Hull Maintenance Plan which provides man-days and material costs for each scheduled SC. The RMC multiplies the current port man-day rate by the total number of program man-days, by appropriation, and adds locally procured material costs to provide total "installation dollars" for Program Modernization.

**NOTE: THE TOTAL DOLLARS USED TO DETERMINE THE PRORATE PERCENTAGES DO NOT INCLUDE SERVICES, GROWTH OR AWARD FEES.**

- (4) The proportion of TYCOM dollars and Program dollars relative to the total dollars will provide the percentage of prorate costs assigned to TYCOM and Program respectively.
- b. In accordance with Maintenance and Modernization Process milestones as shown in Appendices D<sub>1</sub> and D<sub>2</sub>:
  - (1) At A-360 TYCOM/PEO SHIPS issues the Letters of Authorization for all modernization.
  - (2) At A-240 the work package that began definition at A-360 is further refined with a 50% lock on repair items at A-240. The Project Manager provides a list of expected prorated items, with work item numbers assigned, using Appendix A for guidance, for all Program and Fleet Letter of Authorization authorized modernization and TYCOM repair items.
  - (3) At A-120 all SCs listed in the Letter of Authorization, except ST1 and ST2 SCs, are mature, impact approved or are removed from the Letter of Authorization (except for ST1 and ST2 SCs, Programmed but not Authorized SCs will be removed at this time). This locks the prorate distribution percentages. This milestone obligates the cost of prorates based on the locked Letters of Authorization and MMBP budget of the repair and maintenance package.

- (4) After A-120 if one of the participants elects to remove maintenance, repair or modernization work from the availability work package, that participant is still responsible for payment of the actual prorate costs incurred, as of the date of the withdrawal, on execution planning for the removed work. In the event a Program SC owner declines to comply with paying the prorate charges, payment of the delinquent charges will be a prerequisite for adding the SC to the Letter of Authorization for the next availability for which the SC is programmed.
  - (5) If new modernization work is added after A-120, the activity requesting the SC will incur all additional prorate costs generated as a result of the additional work.
  - (6) At A-75 a 100% lock is placed on all repair items. Funding is requested from the participating activities. The Naval Supervisory Authority (NSA) must receive funding no later than A-45 to support definitization.
  - (7) At A-35 the modernization, maintenance and repair package is definitized.
- c. If the availability is extended, the additional prorate requirements are paid for by the party(ies) causing the extension.
  - d. Once the originally planned growth pool is expended, large increases due to growth (exceeding 2% of the total work package costs) will result in reallocation of prorates.

2.4.5.3 Prorate Factors. The prorate factor is used in the budget process for modernization, repair and maintenance, in order to ensure adequate funding for planned work. The following prorate factors are to be applied to total estimated ship repair cost to forecast the portion of total cost for “Prorate” effort. These factors are based on data from selected Departure Reports for ship repairs completed in 2003 through 2005 and are subject to periodic updates.

	Prorate Factor		
	<u>East coast</u>	<u>West coast</u>	<u>Navy-Wide Average</u>
All Prorate work	33%	33%	33%

2.5 MILESTONES. Package preparation milestones have been developed that support the continuous maintenance philosophy. These milestones are designed to allow a more continuous flow of work to create a work package. Rather than requiring all work to be “locked” at A-240, the milestones now require that only 50% of the work, measured by 50% of the budgeted funds for the availability being committed, be “locked” at A-240. It is expected that the majority of this work will be the modernization work, mandatory shipyard routines (e.g., boiler inspections, docking requirements, support services) and major industrial work that is generally known well before A-240.

Every effort should be made to include unscheduled and unaccomplished mandatory Class Maintenance Plan work items in the ship’s Baseline Availability Work Package (BAWP) in the work package. Once work is placed in the package, and funding for that work is committed, the EA is authorized to plan that work, order material and expend other funds as necessary to execute the work. It should be the rare exception that work is ever removed from a work package. TYCOM will obtain technical adjudication for any BAWP items prior to the removal of any BAWP item from the work package. It is extremely important that the right work at the right time is placed in the work package. The Maintenance Figure Of Merit is a numerical expression indicating the criticality of a job and provides a sequentially ranked Current Ship’s Maintenance Project in order of priority and provides a tool for the Maintenance Team to help make the right choices.

2.5.1 Committed Work at A-120. The milestones require that 80% of the depot level work package be committed at A-120, and 100% of the Ship’s Force and I-level work that is planned to be executed during the availability concurrently with the depot level work be identified. This provides a period of time during which this work can be evaluated and placed in the depot level package if necessary. Additionally, all AIT support requirements must be identified no later than A-120. AIT installations not being performed by the prime contractor will have their contracts awarded no later than A-150.

2.5.2 Committed Work at A-75. At A-75, 100% of the depot level package must be identified, with the activity accomplishing the planning to complete planning by A-60. The EA will then have 30 days to produce an integrated work schedule that will be reviewed at a Work Package Execution Review at A-30. By delaying the final commitment of the last 20% of the depot level work package until A-75 there should no longer be any reason to front load “insurance” work. The new entitled work package preparation process will better reflect the most current priority of maintenance that needs to be performed on the ship. The milestones described above are designed for use by those ships supported with MS/MO contracts. Appendix D<sub>1</sub> describes milestones to be used with Firm Fixed Price (FFP) contracts. Where MS/MO contracts are not in effect and no existing Indefinite Delivery, Indefinite Quantity (IDIQ) contracts cover the work contemplated, work packages for Continuous Maintenance Availabilities (CMAV) must be submitted to meet local contracting milestones.

2.5.3 Flow Metric. In order to track the progress of creation of the work package, a work package flow metric has been created. This metric will provide the maintenance team a tool to manage their work package preparation progress. It also provides the RMC Commander and the maintenance teams a leading indicator of the manner in which the ship's Maintenance and Modernization Business Plan is being executed.

2.6 CONTINUOUS MAINTENANCE AVAILABILITIES. CMAVs are intended to provide the maintenance team with the flexibility required to do the right maintenance at the right time for the right price. An additional intent of CMAVs is to provide the agility required to support the fleet response plan.

2.6.1 Continuous Maintenance Availability Types. CMAVs are established as the only type of availability that will be accomplished on surface ships outside of CNO availabilities for non-emergent maintenance. Fleet Maintenance Activity Availabilities, Restricted Availabilities, Technical Availabilities are no longer authorized to describe ship maintenance availabilities. There are two basic types of CMAVs, scheduled (XAZ) and unscheduled (XCM). CMAV schedules will be reviewed at each Planning Board for Maintenance and will be adjusted as ship's operational schedules dictate. Schedule adjustment should be requested by the ship via naval message to the Immediate Superior In Command (ISIC), information to the applicable RMC.

2.6.2 Continuous Maintenance Availability Business Rules. The following CMAV business rules have been established to provide guidance for developing work items associated with scheduled and unscheduled repair and modernization availabilities, managing assigned work brokered to both CNO and CMAV availabilities for FFP and MS/MO contracts, and establishing priorities for the executing activity to accomplish planning and execution of Work Candidates into work items. This enables the Vision of Entitlement to be realized. The Vision of Entitlement requires a somewhat continuous flow of the planned work items to allow for a continual estimating, work item review and cost definitization process.

2.6.2.1 Applicability. This process is applicable to all personnel involved with writing work items for repair and modernization contracts using work items developed/maintained in NMD in accordance with all COMNAVSURFOR 4700 NOTICES and this manual. The start and stop points of the process are when a Work Candidate is brokered from Regional Maintenance Automated Information System (RMAIS) into an availability in NMD and the production period of the maintenance availability is completed.

2.6.2.2 Ship Specification Package. The Project Manager on behalf of the Maintenance Team shall:

- a. Establish a SSP within NMD Planning for scheduled and unscheduled CMAVs ((XAZ), (XCM) and (XEM)) and set up the availability in NMD to receive Automatic Work Requests (AWR) from (RMAIS) electronically in accordance with references (b) through (d) and this manual.
- b. For each Work Candidate that is brokered to the availability in NMD, ensure that the planning date, the “Deadline Date” and the “Availability Number” (in which an availability period can be entered) listed on the Work Candidate is correct, and also include a preliminary man-hour and material cost estimate. Work must be planned and estimated (man hours and material cost) with Long Lead Time Material (LLTM) identified prior to being routed into any NMD execution availability. This planning estimate is necessary to more accurately predict, for a CNO availability, what percent of the package (in dollars), has been authorized at the 50%, 80% and 100% milestones, and for a CMAV (XAZ) and (XCM)

availability, will allow us to know if we have adequate funding available in the budget. A minimum of **fourteen calendar days** should be allowed for planning unscheduled (XCM) availabilities before routing a job to an NMD execution availability.

2.6.2.3 Planning. With the creation of an SSP in NMD, the actual Planning start and stop dates for the execution of the work within that SSP will be established. The one exception to this will be the year long CMAV, Scheduled/Unscheduled CMAV (XAZ) and (XCM) (XEM) availabilities.

- a. All valid maintenance items will have a specification prepared in the NMD Planning module in accordance with references (b) through (d) and this manual as applicable. All new work will also be written in the planning module of NMD.
- b. When a valid maintenance item is ready for brokering, review of the currently scheduled SSP availabilities in NMD Planning will then determine to which SSP the item should be added. All SSPs existing within NMD Planning will have a date established when that package should be “locked” per the advance planning milestones contained in Appendix D<sub>1</sub> of this chapter. No valid work items can be added to an existing SSP if the current date is past the “lock” milestone date without providing a written detailed description of the rationale used to add it in the “Work Item” comments field.
- c. The priorities for the Planning Activity are then established by the next scheduled availability milestone that is coming due in accordance with Appendix E and F. This could be a CNO, the next scheduled CMAV (XAZ) or year long XCM availability. Process flowcharts appear in Appendices G<sub>1</sub> through G<sub>4</sub> of this chapter. The year long XCM SSP availability will be a work load leveling mechanism for the planning activity and the goal would be to have these items brokered, planned, material ordered, funded, scheduled and ready to start work within 14 calendar days prior to start. The valid maintenance items in the XCM SSP availability will become candidates for scheduled CMAVs and unscheduled XCM execution availabilities (windows of opportunity) that are identified on short notice. These planned work items for MS/MO contracts will be routed to NMD execution availabilities that branch off of this year long NMD XCM planning availability. Re-broker those remaining AWRs at the end of the fiscal year, into the next fiscal year long XCM and scheduled CMAV (XAZ) SSP availability. Refer to Appendices G<sub>1</sub> through G<sub>4</sub>. Refer to Appendix E to assist in determining priority of planning work.
- d. If the urgency to accomplish any emergency maintenance repairs does not allow for development of a work item prior to the start of work and a work item does not exist in the MSC, then a work item will be prepared after completion of work to document it within NMD. Route these emergent Work Candidates to the applicable SSP planning availability, which can then be forwarded to the NMD execution availabilities where the emergency maintenance work was executed.
- e. The Project Manager will check NMD daily for AWRs received in NMD SSP planning availability, review and validate each AWR to determine scope of work. If the information contained in the AWR is insufficient to write a work item, the Project Manager shall coordinate and manage any required shipchecks.
- f. The RMC will determine who should plan a given availability (other than CNO) based on manpower available either at the MS/MO contractor or the Government. (Check Contract Line Item Number verbiage for actual contract requirements.)

2.6.2.4 Planners and Estimators.

- a. Determine if the information contained in the AWR is adequate enough to write a work item. If yes, continue development. If no, check the inadequate box and note reasons for inadequacy, then continue.
- b. Review for MSC Templates as follows:

- (1) Identify appropriate Ship Work List Item Number that applies for AWR to be planned under.
- (2) Check/search for an appropriate Master Specification Template such as a Class Standard Work Template, Standard Work Template or Local Work Template that addresses the scope of work identified in AWR.
  - (a) If no applicable template is found, check/search for a previously written work item that is applicable and addresses the scope of work identified in AWR.
  - (b) If no previously written work item is found that is applicable, check/search for a "basic" work item template/format.
- c. Select appropriate Master Specification Template, previously written work item or "basic" work item template/format and initiate planning the work item in accordance with mandatory requirements of references (b), (c) and (d).
- d. Identify and validate all references, including Liaison Action Requests/Reverse Liaison Action Requests required to complete the work item.
- e. Identify test requirements needed to complete work item. If test procedures are required, obtain from execution site design group, planning yard contractor or In-Service Engineering Activity.
- f. Identify security and certification requirements. Develop technical requirements and Planning Estimate.
- g. Identify repair material required to include long lead-time items and submit to material specialist for procurement.
- h. Determine if there is Hazardous Material involved with the work item.
- i. Review the completed work item for candidacy as a new or revised template for inclusion into the MSC. If a candidate, submit the new or revised template to the local NSA Standards Person for review and subsequent routing to the MSCMO for processing and inclusion into the catalog.
- j. Route completed work item in its preliminary state to the Program Manager queue in NMD to be included in a final review work package compiled in NMD.

#### 2.6.2.5 Maintenance Team Program Manager.

- a. Route review work package of work items to Pre-lim Spec review web site. Web Site Address: <https://www.spear.navy.mil/onlineSpecReview.aspx>.
- b. Review and respond to comments on pre-lim work item review web site.
- c. Route and approve work items to "APPROVED" work item review web site.
- d. Process entire work package and issue.

2.6.2.6 Advanced Planning Manager. Publish CNO MS/MO Package in NMD at A-60 and the CMAV MS/MO at A-25. This is an important milestone/metric captured within NMD.

#### 2.6.2.7 Scheduled Availabilities.

- a. Scheduled XAZ availabilities are normally 2 to 6 weeks in duration and are nominally scheduled once per non-deployed quarter during a period when the ship will be in port at least three continuous weeks. Scheduled XAZ dates should not include the one-week minimum between the end of any availability and the ship's next underway date. No production work should be scheduled during this period. The ship, via the ISIC, will schedule XAZ availabilities. RMC requirements will be addressed to the ship via the maintenance team. Adjustments to XAZ availability start dates are inevitable; however, the start dates may not move "forward" if package preparation and work package "lock" milestone dates would be violated by the new start date. In this case, the applicable XAZ CMAV availability must be rescheduled to support the entitled process milestone dates. In general, CMAVs will be scheduled to start on the first weekday after arriving in port and will be scheduled to complete one week prior to the scheduled underway day. The minimum length of a ship's uninterrupted period will be 3 weeks if an XAZ availability is to be scheduled, with the XAZ availability preferably being a minimum length of two weeks. Any XAZ availability that is scheduled without adhering to these minimums should be avoided and work required during that timeframe will be conducted as XCM. Ships and ISICs shall ensure that other in port requirements (training, inspections, etc.) are not scheduled concurrent with an XAZ availability if these requirements will impede scheduled production.
- b. CMAVs will not normally start on weekends or holidays when support for tag-outs and availability start up is limited, and will not be the same day the ship arrives in port. As a result of requiring the XAZ availability to complete one week prior to getting underway, a reduction in premiums is expected by eliminating the last minute rush to complete work to support the scheduled underway. Maintenance teams must ensure that work scheduled for an XAZ availability can realistically be accomplished in the production window. When operational schedule changes occur early enough to allow the scheduling of an additional XAZ availability without violating the milestones discussed in paragraph 2.4.5.2 of this chapter, a new XAZ availability should be scheduled when possible rather than executing maintenance in the unscheduled XCM availability. Additionally, the length of an existing XAZ availability may be increased to accommodate changes in operational schedules provided none of the scheduling rules are violated.

**NOTE: XCM AVAILABILITIES ARE NOT TO BE USED AS HOLDING QUEUES FOR MAINTENANCE ITEMS.**

2.6.2.8 Unscheduled Availabilities.

- a. The unscheduled XCM availability is a single yearlong availability, for the period of 01 October through 30 September, scheduled for each ship every fiscal year. This yearlong availability is used to accomplish maintenance when a ship is not in a scheduled XCM availability or CNO availability. Since the XCM CMAV Windows Of Opportunity (WOO) are potentially short notice, a reduced set of D level milestones is established. Read in three columns as follows:

<u>TASK</u>	<u>RESPONSIBLE ACTIVITY</u>	<u>MILESTONE</u>
WORK SPECS DEVELOPED	RMC OR MSR	WOO-14
WORK PACKAGE DEFINITIZED	RMC OR MSR	WOO-7

- b. No length requirement exists for an XCM availability. These are accomplished as WOOs become available. If a work item is determined to require more than one WOO to accomplish in its entirety, then it may be executed during multiple WOOs provided that it can be broken into several shorter period requirements.

2.6.3 Continuous Maintenance Availability Applicability. The CMAV business rules apply to all XAZ availabilities and XCM. Since the potential exists for CMAVs to become increasingly more complex, an NSA will be assigned for every CMAV. The NSA will typically be the applicable RMC, or naval shipyard (if applicable).

2.6.4 Work Included in Continuous Maintenance Availabilities. All levels of work (organizational, intermediate and depot) shall be included in a single CMAV for a specific availability period regardless of the executor (Ship's Force, RMC production personnel or contractor). The intent is to integrate all types of work into a single production schedule for a specific CMAV. Separate intermediate and depot availabilities will not be established for the same period of time, except internally to the RMC production department as required to facilitate the use of I-level management systems. Dependent upon complexity of the scheduled maintenance and/or modernization and the number of maintenance activities involved, the Ashore Ship's Maintenance Manager may include a work item for production scheduling and integration in the work package or bid specifications. If this work item is not used, then the Ashore Ship's Maintenance Manager will perform this function.

2.6.5 Concurrent Continuous Maintenance Availabilities. It is incumbent upon the Ashore Ship's Maintenance Manager to ensure that two non-emergent availabilities are not in progress at the same time. Additionally, CMAVs are not to be scheduled concurrently with CNO availabilities. As required, XCM work items meeting the requirements of paragraph 2.4.5.2 of this chapter that are being accomplished in WOOs may overlap with XAZ and CNO availabilities.

2.6.6 Ship Movement During a Continuous Maintenance Availability. In order to maintain focus on the maintenance work package and minimize premium costs, no ship shall get underway during a CMAV other than to support the maintenance availability or to complete sea trials. Maintenance that prevents a ship from being ready for sea within 96 hours will normally only be screened to XAZ availabilities. Ships will notify their ISIC of any production item that will prevent the ship from getting underway within 96 hours. If this work is being conducted within a scheduled XAZ availability, a waiver is not required. It is imperative that the ISIC take a proactive role in ensuring that the integrity of the scheduling process be maintained as it relates to CMAVs. CMAVs must be incorporated into the ship's operational schedule and must remain as a priority for completion.

2.6.7 Continuous Maintenance Availability Metrics. In order for accurate metrics to be obtained, it is imperative that all CMAVs be planned and executed utilizing the NMD (D level) and the NEMAIS (I-level). For those sites that do not presently have NEMAIS installed, use of local I-level management system is authorized and expected. The following placement and oversight metrics will be collected to measure the effectiveness of the CMAV process. This is not a complete listing of all CMAV metrics. For a complete listing, refer to Volume VI, Chapter 36 of this manual.

- a. Award on time delivery (XAZ only). Scheduled CMAV "on time award" is defined as the percentage of time contract award is made on time or early.
- b. Completion on time delivery (XAZ only). The CMAV completion on time delivery metric calculates the percentage of occasions when a CMAV availability is completed on or before the CMAV end date as recorded in NMD.
- c. Availability churn (XAZ only). The CMAV availability churn percentage is a monthly capture of the dollar value of work items changed, deleted or added in a CMAV work package from contract award until availability completion versus the dollar value of the work package at award for all CMAV availabilities that ended in the current measurement month and the previous two months. This metric is collected by availability and reported in the month the availability completes.
- d. Growth and New Work Premiums. The Growth and New Work Premiums metric is a measure of late work premiums paid as a percent of growth and new work monthly. It does not include authorized work included at the start of the availability as growth reserves for specific work items or execution of pre-priced option items if executed within the scope and schedule as pre-priced. This metric is collected weekly with each change to the original contract award (FFP) or definitization (MS/MO) work package transaction being reported one time in the data call for the week in which it was settled for scheduled CMAVs.

2.6.8 Continuous Maintenance Availability Late Work Premium (XAZ only). The CMAV late work premium metric is a measure of the total dollar value of late work premiums paid for CMAV availabilities completed in the current month divided by the sum of the execution contract award (FFP) or definitization (MS/MO) and the settled cost of all Request for Contract Changes for that availability.

2.6.9 Continuous Maintenance Planning. Continuous maintenance is the process of scheduling and accomplishing work outside of CNO availabilities. MS/MO contracts create a long-term relationship with the EA that accomplishes the continuous maintenance to maintain the ship at an acceptable readiness level. The Ashore Ship's Maintenance Manager will use every scheduled in-port period as an opportunity to accomplish continuous maintenance. Funding for continuous maintenance is included in the ship's Maintenance and Modernization Business Plan. In order to prevent premiums from being accrued, a minimum of 30 days will be allotted between the time depot level work is brokered to the EA and the time work is scheduled to start. A minimum of 40 days will be allotted for work brokered to I-level activities. This will provide for adequate time to plan the work and acquire the necessary material in an efficient manner. This will allow a Work Package Execution Review to take place at A-20 and for all work to be definitized at A-10. If these minimum thresholds cannot be complied with the work should be postponed until the next continuous maintenance opportunity. The Ashore Ship's Maintenance Manager may run a business case analysis if there are other factors that might justify the addition of work inside these preferred windows.

2.7 ADVANCE PLANNING STATUS MESSAGES. The Advance Planning Status Messages required by reference (e) should continue to be issued by the activity responsible for planning the ship's CNO availability. Messages should commence at A-360. These messages play a vital role in keeping all concerned parties informed of the status of the planning effort. The messages document the successful accomplishment or failure to achieve milestones and produce deliverables. The Work Package Execution Review meeting, held to review the integrated work production schedule that has been prepared by the EA, takes place at A-30 for CNO availabilities and at A-20 for Continuous Maintenance Availabilities (CMAV). This is the final opportunity to resolve any work interface or production support issues between the different activities before actual production work begins.

2.8 MAINTENANCE TEAMS EXECUTING MAINTENANCE WITH FIRM FIXED PRICE CONTRACTS. MS/MO contracts are not in place for all surface ships in the Navy's inventory. Some classes of ships will not receive MS/MO contracts as they will be decommissioning soon, others have such a small number in their class that it is not worthwhile to do this. Ships that fall in this category will continue to have their work planned via the existing Ship Availability Planning and Engineering Center (SHAPEC) process and have their work contracted using FFP contracts. A modified planning milestone table for FFP contracts is included in Appendix D<sub>1</sub>.

APPENDIX D<sub>1</sub>

SURFACE SHIP PLANNING PROCESS MILESTONES

EVENT #	Task/Milestone	Responsible Activity									Comments/Remedial Action	
			Modernization Critical	CNO MSMO (entitled)	CNO MSMO <\$20M (optional)	CNO MSMO >\$20M (optional)	CNO FFP	CMAV MSMO (entitled)	CMAV MSMO (optional)	CMAV FFP/IDIQ		
1	Establish CNO/CM Availability Schedule	TYCOM		A-720	A-720	A-720	A-720					FRP Baselines are developed on a 3 year cycle. ID CNO avails IAW with that cycle.
2	Fund Modernization Procurement & Installation - Decision Point 3	OPNAV/ FLEET		Varies	Varies	Varies	Varies					Depends on development and procurement timeline requirements.
3	Issue Execution Planning Hull Modernization Plan (EHMP)	SPM		Varies	Varies	Varies	Varies					EHMP issued in March each year to support MMBP development.
4	Issue 2-year rolling Advance Planning Hull Modernization Plan (AHMP)	SPM/		Varies	Varies	Varies	Varies					AHMP issued in July each year to support long lead time planning by RMCs.
5	Identification of initial list HCPM for Ship Changes	PARM/ Planning Yard		A-660	A-660	A-660	A-660					HCPM - HQ Centrally Procured Material. This should be for the entire ship class. This should include all known requirements.
6	Provide Incremental Funding for HCPM/LLTM to meet req'd delivery dates	PARM/SPM		A-600	A-600	A-600	A-600					
7	Initiate procurement of HCMP LLTM	PARM/SPM		A-600	A-600	A-600	A-600					
8	PY Submit Funding Request for work assigned	Planning Yard		A-480	A-480	A-480	A-480					
9	Ship Change (SC) Design/Planning Funds provided	NAVSEA/ TYCOM		A-420	A-420	A-420	A-420					SPAWAR generally funds in FY prior to execution year.
10	Interface Control Drawing (ICD) delivered to alteration developer/PY	PARM		A-420	A-420	A-420	A-420					
11	Identify drawing development assignments, including Class Drawings	PARMS/ TYCOM/ NAVSEA		A-390	A-390	A-390	A-390	A-390	A-390	A-390	A-390	Send to RMC and Planning Yard.

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APPENDIX D<sub>1</sub>

SURFACE SHIP PLANNING PROCESS MILESTONES (Con't)

EVENT #	Task/Milestone	Responsible Activity	Modernization Critical								
				CNO MSMO (entitled)	CNO MSMO <\$20M (optional)	CNO MSMO >\$20M (optional)	CNO FFP	CMAV MSMO (entitled)	CMAV MSMO (optional)	CMAV FFP/IDIQ	Comments/Remedial Action
12	Issue Initial Letter Of Authorization (including AITs)	SPM/TYCOM	A-360	A-360	A-360	A-360	A-360				
13	Establish Availability in NMD	Maintenance Team		A-360	A-360	A-360	A-360	A-360	A-360	A-360	Select the appropriate set of milestones based on the size of the MMBP: CNO MSMO "Entitled", CNO <\$20M, CNO >\$20, or CMAV MSMO (optional). Enter the selected set of milestones as "Revised" Milestones in NMD.
14	Request Availability Funding for planning repair work	NSA		A-345	A-345	A-345	A-345	A-345	A-345	A-345	This provides funds for early executor planning.
15	Task/Fund SID Development	SPM/NSA/AIT/TYCOM/RMC Manager	A-330	A-330	A-330	A-330	A-330	A-330	A-330	A-330	
16	Shipchecks completed	Planning Yard		A-270	A-270	A-270	A-270	A-270	A-270	A-270	No FRP considerations relate to this date.
17	Screen CMP/TYCOM routines	TYCOM PC		A-270	A-270	A-270	A-270	A-270	A-270	A-270	Push CMP work items to CSMP NLT A-270.
18	Provide incremental funds for ordering LLTM for both repair and alt/mod work to meet req'd dates	SYSCOM/TYCOM		A-270	A-270	A-270	A-270	A-270	A-270	A-270	
19	50% of D-level maintenance work package 2K's locked based on \$	Maintenance Team		A-240	A-240	A-240	A-240	NA	NA	NA	Intent is that the planning activity continually develops specs in the most cost effective manner and not batch this work in front of the next pkg development milestone.
20	MSMO contractor complete planning and estimating of work assigned as required by the above A-240 milestone	MSMO Contractor		A-190	A-190	A-190					Intent is to have a continuous flow of planning quality estimates to eliminate churn in the work package.

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**VOLUME II****PART II****CHAPTER 3****SURFACE SHIP MAINTENANCE WORK CLOSEOUT****REFERENCES.**

- (a) NAVSEA SI 009-99 - Private Shipyard Contractual Item to Provide Departure Reports
- (b) NAVSEAINST 4790.8 series - Ship's Maintenance and Material Management (3-M) Manual
- (c) NAVSEAINST 4790.14 series - Ship Departure and Alteration Completion Reports

3.1 **PURPOSE.** This chapter provides procedures and guidance regarding surface ship maintenance and modernization work candidate closeout. These rules apply to Maintenance Activities (MA), Maintenance Teams (MT), Regional Maintenance Centers, Fleet Maintenance Activities (FMA), Naval Shipyards, Systems Commanders sponsoring Program Alterations and other Alteration Installation Team sponsors.

3.2 **SCOPE.** One of the major SHIPMAIN efforts is to close completed work candidates (Naval Sea Systems Command (NAVSEA) 4790/2K, referred to as 3-M Maintenance Action Forms (2-kilo) in this instruction) promptly and record completion information in Ship's Maintenance and Material Management (3-M) History. This chapter covers the process and responsibilities for closing all 2-kilos that were screened and brokered to an activity other than Ship's Force.

3.3 **BACKGROUND.** Prior to the work closeout changes directed by SHIPMAIN, 2-kilos executed in shipyards (public and private) often did not get closed until long after the work was completed, and then often by someone unfamiliar with the actual work accomplished. Additionally, even though shipyards provide completion data in the form of departure reports following an availability, that information was either not captured in Ship's 3-M History or captured manually. This means that useful data was not seamlessly making its way into the Navy's maintenance data warehouse. Since this data is used to determine troubled systems, identify trends in system health, identify causes and solutions to expensive growth work, update cost estimates in the Master Specification Catalogs, update return costs in the Open Architecture Retrieval System database, program for future maintenance budgets, identify the most cost-efficient periodicity for scheduled assessments, and identify candidates for alterations or assessments, it is critical that it be captured and made readily available to all users. This chapter provides the required means to report accurate completion data for capture in Ship's 3-M History.

**3.4 WORK CLOSEOUT PROCEDURES.****3.4.1 Depot Maintenance Activity Responsibilities.**

3.4.1.1 **Private Shipyards Using the Navy Maintenance Database.** Comply with reference (a) for submission of cost and completion information directly in Navy Maintenance Database (NMD) for each work specification and Request for Contract Change (RCC). No other ship departure reports should be created or distributed because stakeholders can print standardized departure reports that contain the required data directly from NMD. Submission of cost and completion information is required within 30 days after the completion of an availability (including Continuous Maintenance Availability), or within 30 days after completion of the work for emergent maintenance or unscheduled continuous maintenance. This data can be entered either directly in NMD Planning or through a computer-to-computer connection to NMD.

- a. If the work item is an Class Maintenance Plan (CMP) scheduled maintenance task or assessment, include the As Found Condition as part of the Final Action code (see paragraph B-2.5.2 of Appendix B to reference (b) for code definitions). Scheduled CMP tasks contain the following phrase in the Block 35 Remarks/Description field of the 2-kilo: PROVIDE "AS-FOUND MATERIAL CONDITION" CODE IN THE SECOND POSITION OF THE "FINAL ACTION TAKEN" FIELD (2-KILO, BLOCK 64) IAW NAVSEAINST 4790.8B.

- b. For Firm-Fixed-Price contracts, the completion costs are, by definition, the award costs for original work and the Regional Maintenance Center-approved RCC costs for growth work. As such, cost information for Firm-Fixed-Price contracts is entered by the contracting officer and is not editable by the MA. However, completion information (Final Action and Completion Date) must still be entered in NMD just as it is for Cost-Plus or Multi-Ship/Multi-Option contracts.
- c. Once the MA enters the required information and the MT closes the availability, NMD automatically prorates completion costs from the work specification to the 2-kilos that make up the specification based on the proportion of the most recent planning estimates. The MA can override the default proportions for a specification if it believes the proportions will not properly prorate the costs. NMD also submits a "growth 2-kilo" for each completed RCC. A growth 2-kilo is used strictly for documentation purposes, getting its information from the "parent" 2-kilo and cost/completion data from the RCC. It requires no additional actions by, and should be transparent to, the MA or MT.

3.4.1.2 Naval Shipyards Using Advanced Industrial Management. Comply with reference (c) for submitting Ship Departure Reports. Advanced Industrial Management currently does not support transmitting cost and completion information to Regional Maintenance Automated Information System (RMAIS). Until changes can be made to Advanced Industrial Management to support automated reporting, Naval Shipyards should continue to follow local instructions for Advanced Industrial Management operations. NAVSEA will ensure cost information at the 2-kilo level from Ship Departure Reports is entered into the Ship's 3-M History records.

3.4.1.3 Depot Maintenance Activities Not Using Navy Maintenance Database or Advanced Industrial Management. The MA is responsible for providing to the MT, within thirty days after completion of the work, the man-days, labor costs, material cost, total cost, date completed, and the Final Action code (see paragraph B-2.5.2 of Appendix B to reference (b) for code definitions) for each 2-kilo. Additionally, if the 2-kilo was a scheduled task generated by the CMP, the MA must report the As Found Condition (the second character in the Final Action code). Scheduled CMP tasks contain a statement in the Remarks/Description field of the 2-kilo stating that the As Found Condition is required.

#### 3.4.2 Fleet Maintenance Activity Responsibilities.

3.4.2.1 Fleet Maintenance Activities Using the Navy Enterprise Maintenance Automated Information System. Navy Enterprise Maintenance Automated Information System (NEMAIS) properly transmits cost and completion information to RMAIS. FMAs should continue to follow local instructions for NEMAIS operations.

3.4.2.2 Fleet Maintenance Activities Using Logistics Data System or the Compass Maintenance Management Software. Logistics Data System and Compass Maintenance Management Software transmit a portion of the required cost and completion information to RMAIS. The information that is transmitted can be used to calculate the missing information with a reasonable level of accuracy. Naval Sea Logistics Center has implemented a procedure in Ship's 3-M History to calculate and fill in the missing information. FMAs should continue to follow local instructions for Logistics Data System or Compass Maintenance Management Software operations.

3.4.2.3 Fleet Maintenance Activities Not Using Navy Enterprise Maintenance Automated Information System, Logistics Data System or Compass Maintenance Management Software. The FMA is responsible for providing to the MT, within thirty days after completion of the work, the man-days, labor costs, material cost, total cost, date completed, and the Final Action code (see paragraph B-2.5.2 of Appendix B to reference (b) for code definitions) for each 2-kilo. Additionally, if the 2-kilo was a scheduled task generated by the CMP, the FMA must report the As Found Condition (the second character in the Final Action code). Scheduled CMP tasks contain a statement in the Remarks/Description field of the 2-kilo stating that the As Found Condition is required.

#### 3.4.3 Ship's Force Responsibilities.

- (b) Perform an audit on the accuracy of charges direct versus indirect. This will involve observing the recording of cost against selected JONs.
  - (2) Perform post closeout audit of the expenditure charge for selected Controlled Work Packages (CWP). Determine if the total direct expenditures recorded were within the range of what was expected. The CWPs selected should be representative of the maintenance efforts performed during the period.
  - (3) Written audit guides shall be used for each audit. The activity performing the audit will develop audit guides based on the unique nature of the audit planned. The audit guides should be tailored and customized for the specific organization or area being audited. One successful technique is to acquire a collection of audit findings from other FMAs and incorporate these into the audit guides. Once an audit guide is prepared, it will be filed and reused when similar audits are performed. It is also recommended that the FMAs share audit guides.
  - (4) The results of each step in the audit guides will be documented sufficiently to support the final conclusion/finding.
  - (5) Audits should be conducted on an annual basis unless a shorter period is specified. Those areas identified as weak should be followed-up on more frequently. The periodicity of these audits shall be adjusted by the Financial Management Officer (FMO) based upon the results of previous audits.
  - (6) Report results of all audits to the Commanding Officer with copies to the FMO and cognizant Department Head/Division Officer.
  - (7) A copy of the final report will be provided to the Commander, Navy Regional Maintenance Center or appropriate ISIC after the FMA Commanding Officer has accepted and implemented the corrective actions.
- b. Evaluations. The FMA FMO will conduct a semi-annual evaluation of the overall adequacy and effectiveness of the FMA's direct versus indirect program. This effort is less than an audit, requiring less documentation and of shorter duration. The results of this evaluation will provide an indication of the effectiveness of the program. If the results indicate a significant, widespread problem the evaluation will be expanded into an audit.
  - (1) Results of this evaluation will be provided to the FMO, appropriate Department Head, and Commanding Officer if the results indicate a significant problem.
  - (2) A copy of the final report will be provided to the Commander, Navy Regional Maintenance Center or appropriate ISIC after the FMA Commanding Officer has accepted and implemented the corrective actions.

### 5.3.2 Management Metrics for Direct Versus Indirect Costing.

#### 5.3.2.1 Metric Number 1, Total Indirect Time.

5.3.2.1.1 Activity Goal. Recognizing that establishing an activity goal for indirect cost before the FMAs have had an opportunity to evaluate and implement the guidance is arbitrary and will probably require adjustment after more detailed information is accumulated. The initial goal for indirect expenditures is 10% of total expenditures. Total expenditures are the sum of total direct mission funding plus the total of reimbursable order expenditures. This metric is computed at the organizational level.

5.3.2.1.2 Activity Level. On a monthly basis, the financial manager will determine the total expenditures for the overall FMA; this includes both direct mission funding expended and reimbursable order funding expended for the period. Based on the collection of cost information using the guidance in Volume II, Part III of this manual, determine the total indirect cost reported by the FMA for the period. Using this information and the following formulas, determine the percentage of expenditures which are attributable to indirect efforts. The following formula will be used:

$$\begin{aligned} & \text{Direct Mission Funds Expended} \\ & \text{Plus + Reimbursable Order Funding Expended} \\ \text{Equals = } & \text{Total Expenditures by Maintenance Activity for Period} \end{aligned}$$

$$\begin{aligned} & \text{(Total Indirect Expenditures for Period) Divided by/} \\ & \text{(Total Expenditures by Maintenance Activity for Period)} \\ \text{Equals = } & \text{(Percentage of Indirect Expenditure for Period)} \end{aligned}$$

If the total indirect percentage exceeds the goal, the FMA should determine what events caused the increase. The FMA should identify what actions are necessary to bring the indirect into the acceptable range. The results of the evaluation will be provided to the Commander, Navy Regional Maintenance Center not later than the 15<sup>th</sup> day following the close of the month.

RATINGS: GREEN 10% or less      RED More than 10%

5.3.2.2 Metric Number 2, Direct Positions Charging Indirect.

5.3.2.2.1 Activity Goal. The goal of the FMA with regard to direct versus indirect costing is to minimize indirect expenditures. Minimizing indirect expenditures will help maximize the return that the Fleet gets from resources committed to maintenance efforts. The FMA is staffed with personnel who are primarily working on direct maintenance efforts and some personnel who would primarily be performing overhead assignments. For personnel who are primarily working on direct maintenance efforts, occasionally they will be required to charge their efforts against an indirect Job Order Number (JON). Charging personnel who are primarily assigned to the activity to perform direct maintenance efforts against indirect JONs should be minimized. Therefore, another metric that should be measured is the amount and percentage of indirect cost generated by personnel in direct maintenance positions.

5.3.2.2.2 Activity Level. On a quarterly basis, obtain a listing of all personnel who charged to an indirect JON for the preceding month. Determine if personnel who normally work on direct maintenance efforts are identified on the list. If any of the direct personnel charged over 10% of their available efforts to an indirect JON, determine why the indirect JON was used. Document the results. If the charges were inappropriate, document corrective actions taken to prevent a reoccurrence of the error.

Using the same listing, review the charges for personnel who potentially could have charged a direct effort, such as contract specialists, and identify their direct charges for the period. Determine if there were other opportunities for them to charge a direct JON.

RATINGS: GREEN 10% or less      RED More than 10% without adequate explanation

5.3.2.3 Metric Number 3, Indirect Charges Against Reimbursable Orders.

5.3.2.3.1 Activity Goal. The FMA is allowed to pass along all direct costs incurred in the completion of a reimbursable order. Those costs include materials, direct labor, and contracts or any other cost that must be incurred to complete the work requested. All indirect costs must be borne by the activity using direct mission funding. The indirect cost must be captured because in certain instances, such as performing work for private parties or foreign government, they must be recouped.