

FLEET MAINTENANCE SUPPORT BRANCH (FMSB)



Operating Unit Training (OUT)

Lesson Topic Catalog

Revised - June 2018

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FMSB Assistance

In order to streamline your training needs as much as possible, please contact the FMSB Visit Coordinator. He will answer questions, direct you to appropriate SMEs, or schedule training as you require.

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INFORMATION FOR THE TRAINING COORDINATOR

This catalog contains both courses and classes that can be exported to your command. The catalog listings were constructed to define what each provides and allow you, our customer, to request the specific topics you need. In other words, you can order individual topics “ala carte” rather than as part of an overall larger course if that better fits your need. Additionally, FMSB could provide courses back-to-back for a few days and over two-shifts to accommodate a larger throughput of students in a specialized topic (e.g. valve repair).

FMSB is budgeted for travel to provide training to the commands located in specific locations. Hence, the training is “no cost” to commands.

To request courses, commands can contact their Type Commander or FMSB directly to discuss scheduling availability. Commands are encouraged to discuss topic content and potential course/class deviations with FMSB to aid in defining and requesting a training visit. TYCOM authorizes the visits.

For scheduled training visits, FMSB will provide an agenda and report letter to the included commands.

Each hosting command is responsible for the following actions:

- Ensure the security requirements are met for the training location, FMSB staff, and attendees. FMSB will provide staff security clearance information in advance to the host. Time delays have been experienced due to that information not being conveyed to the proper authorities. When selecting a

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training location, the host must provide adequate overnight storage for training materials. Many course materials brought by FMSB are marked NOFORN and must be properly stored after hours.

- **Provide a space (i.e. classroom) to accommodate the anticipated audience size, a staging desk for the instructors, and pre-tested audio-visual (e.g. computer, monitors, etc.) equipment for presentations*. The room must have desks or tables for the students to utilize reference materials (workshops, handouts, drawings), AC power, and a “whiteboard”. Allowing students this space will greatly enhance the training and improve the students' ability to retain information covered in the lessons.**
 - Note: Each FMSB class listing in this catalog identifies a recommended class size which is based on variables including: quality instructor-student ratio, limitations of mock-ups or equipment, the number of references required, the number of student handouts provided. Variations to class size must be approved by TYCOM and FMSB prior to the training.
- Ensure access to the NNPP network for those topics as required (see each topic for specific requirements). Accessibility must be confirmed between the host and FMSB prior to the training session. Furthermore, the host must have a knowledgeable point of contact available each day of training to resolve system access issues.
- Identify a liaison (preferably an E-7 or above) for the entirety of the training dates whose responsibilities will include: directing the prescribed uniform of the day, maintaining military decorum, and accounting for personnel assigned as students.
- Ensure the appropriate target audience to the selected topics. Sending craftsman to package writing topics or sending package writers to hands-on craftsman training is a waste of time and money.
- Provide FMSB a list of projected attendees ten (10) working days prior to the start of the training. The list may be sent by e-mail (preferred), fax, or hand delivery. Please include each attendee's full name, rate/rank, applicable qualification status, command, and division. Provide procurement and storage for any required hazardous materials (lubricants, solvents, etc.). FMSB is not permitted to ship hazardous materials to a training site.

*** If the training site is unable to provide audio-visual (e.g. computer, monitors, etc.) equipment for presentations, FMSB can provide presentation equipment. If this is the case, it is mandatory that the training site have a suitable medium (i.e. monitors, screens, etc.) to project visual training media.**

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

TECHNICAL REFERENCES USAGE

Topic	Technical References Module 1: Technical References Processes
Target audience	Craftsman/Planners/QAO/QAS
Class size	20
Duration	3 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review the basic maintenance principles and how they related to the performance of Quality Maintenance (QM).
- Overview of sources for technical documentation
- Discuss the three principles for using technical references.
- Discuss sources used for the determination of applicability, to task and platform, for nuclear and non-nuclear references
- Discuss sources used for the determination of revision/change level of nuclear and non-nuclear references
- Discuss the method for locating Military Specifications and Standards.

In-Class practical exercises:

- Given a listing of technical manuals, identify the source used to determine applicability and revision/change level

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Applicable JFMM VOL-IV excerpts
- Technical Data Management Information System (TDMIS) Users Guide
- ASSIST Users Guide

Materials to Be Provided by Local Command:

- None

NOTE: Although not required, access to the internet and NNPP Web would greatly enhance this topic

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Topic	Technical References Module 2: Engineering Drawings – Layout and Content
Target audience	Craftsman/WCS
Class size	20
Duration	1.5 hours
Pre-requisites	Quality Maintenance Program PQS 104

Outline of Instruction/Objectives:

- State the four major elements (i.e., title block, reference block, data tables, and typical notes) of drawing content applicable to most drawings
- Provided a drawing, locate its title block, reference block, data tables (various), and typical notes (various)
- Categorize various drawing types (e.g., diagram, arrangement, component, etc.) by reviewing their content
- Provided a drawing and specific component(s), use the zone identification to indicate where each component is located

In-Class practical exercises:

Provided a Drawing:

- Locating and interpreting drawing element data
- Reading and interpreting drawing information
- Categorizing various drawing types by reviewing their content

Materials to Be Provided by FMSSB:

- Drawing Folder with applicable drawings
- Practical Exercises

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Technical References Module 3: Engineering Drawings – Drawing Applicability Determination
Target audience	WCS, Planners
Class size	20
Duration	1.5 hours
Pre-requisites	Quality Maintenance Program PQS 111 Completed

Outline of Instruction/Objectives:

- Select the drawing index for a specific maintenance task on a given hull
- Use the SDI to determine the revision level of engineering drawings
- Use the SDMSL to determine the revision level of engineering drawings (Submarine Commands)
- Use the CBS to determine the revision level of engineering drawings (CVN Commands)
- Use SNVY Library to determine the revision level of engineering drawings
- Use SUBMEPP CD to determine the revision level of Test Pressure Diagrams (TPDs)(Submarine Commands)
- Use the ATIS Engineering Drawings module to determine the revision level of component vendor drawings

In-Class practical exercises:

For Submarine Commands:

- Determine applicable drawing number, revision level, and revision source (index) for Selected Record Drawings (SRDs)
- Determine applicable drawing number, revision level, and revision source (index) for drawings listed on the Standard Drawing Microfilm Status List (SDMSL)
- Determine applicable revision level and revision source (index) for components installed on submarine and submarine prototype platforms

For CVN Commands:

- Determine applicable drawing number, revision level, available revisions, and revision source (index) for CVN nuclear SRDs Determine applicable drawing number, revision level, and revision source (index) for CVN non-nuclear system diagrams
- Determine applicable revision level and revision source (index) for components installed on a CVN

Materials to Be Provided by FMSB:

- TBD – based on ability of command to provide access as described below.

Materials to Be Provided by Local Command: Access to Ship's Drawing Index (SDI), SDMSL (Submarine Commands), SUBMEPP CD (Submarine Commands), SNVY Valve Library, and the CBS (CVN Commands)

NOTE: Access to NNPP Web, for WEB ATIS, or the host command ATIS library would be required for portions of this module

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Technical References Module 4: Technical Research using ATIS
Target audience	Planners/QAO/QAS
Class size	20
Duration	2.0 hours(1 hour breakout sessions available)
Pre-requisites	Quality Maintenance Program PQS 110 Completed

Outline of Instruction/Objectives:

- Select the drawing index for a specific maintenance task on a given hull
- Perform ATIS “search” functions
- Use the SDI to determine the revision level of engineering drawings
- Use the SDMSL to determine the revision level of engineering drawings (Submarine Commands)
- Use the CBS to determine the revision level of engineering drawings (CVN Commands)
- Use the ATIS Engineering Drawings module to determine the revision level of component vendor drawings

In-Class practical exercises:

For Submarine Commands:

- Determine applicable drawing number, revision level, and revision source (index) for Selected Record Drawings (SRDs) and Piping Arrangement drawings on submarine and submarine prototype platforms.
- Determine applicable drawing number, revision level, and revision source (index) for drawings listed on the Standard Drawing Microfilm Status List (SDMSL)
- Determine applicable revision level and revision source (index) for components installed on submarine and submarine prototype platforms

For CVN Commands:

- Determine applicable drawing number, revision level, available revisions, and revision source (index) for CVN nuclear SRDs and nuclear Piping Arrangement drawings
- Determine applicable drawing number, revision level, and revision source (index) for CVN non-nuclear system diagrams and non-nuclear Piping Arrangement drawings
- Determine applicable revision level and revision source (index) for components installed on a CVN

Materials to Be Provided by FMSB: None

Materials to Be Provided by Local Command: Access to NNPP Web, for WEB ATIS, or the host command ATIS library is required for this module. Accessibility must be confirmed between the host and FMSB prior to the training session. Furthermore, the host must have a knowledgeable point of contact available each day of training to resolve system access issues. This training can be provided in a divisional work space if desired. If (1) hour breakout sessions are desired, small groups of up to 5 provide the maximum effectiveness.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Technical References Module 4 – Valve Repair References - Nuclear
Target audience	Craftsman/Planners/QAO/QAS
Class size	20
Duration	3 hours
Pre-requisites	Confidential Security Clearance

Outline of Instruction/Objectives:

- Given examples of component standard identifiers, interpret their meaning with respect to a maintenance scenario
- Given a component standard identifier, locate pertinent technical information (e.g. required tools, torque values, replacement part numbers) from the specific component chapter.
- Given a nuclear component, determine pertinent technical information (e.g. TM, SI, component drawing, number, assembly code, size, material type) from Component Replacement Manual (CRM) tables
- Given a nuclear component, locate authorized replacement components utilizing the applicable class CRM

In-Class practical exercises: Use Standard Naval Nuclear Valves and Auxiliary Equipment and the Applicable Class CRM:

- Locate various pieces of information for a given component using the applicable CRM
- Given several Standard Identifiers (SI), interpret their meaning

Materials to Be Provided by FMSB:

- Excerpts of the applicable class CRM (If NNPP Web access cannot be provided).
- Excerpts of SNNV&AE Ch. 1.1 (If NNPP Web access cannot be provided).

Materials to Be Provided by Local Command:

- NAVSEA 0989-LP-052-8000, SSN 688 Class Component Replacement Manual (If training SSN 688 class personnel).

NOTE: Access to NNPP Web or an equivalent, for both instructor and students, is highly advised for this lesson topic. If access is available, the host command must have a knowledgeable point of contact available each day of training to resolve system access issues. If no access is available, FMSB must be notified at least one month prior to the visit to allow for construction of training materials.

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Topic	Technical References Module 5 – Valve Repair References – Standard Navy Valves
Target audience	Craftsman/Planners/QAO/QAS
Class size	20
Duration	3 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Classify various propulsion plant valves by interpreting component assembly codes
- Explain the precedence between SNV and Valve Assembly Drawings.
- Describe information contained on Valve Assembly Drawings that is not included in SNV
- Use SNV to locate pertinent information regarding commonly performed Organizational Level maintenance actions

In-Class practical exercises:

- Familiarization with Standard Navy Valves manual
- Assembly Code interpretation
- Determine specific information for a Standard Navy Valve given a specific maintenance scenario

Materials to Be Provided by FMSB:

- Excerpts of 0948-LP-012-5000, Standard Navy Valves

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

TECHNICAL WORK DOCUMENTS (TWD)

Topic	TWD Module 1: Introduction to JFMM and Quality Maintenance
Target audience	TWD reviewers, Craftsmen
Class size	8
Duration	2-3 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review the basic maintenance principles and the development of processes (procedures) used to guide craftsmen in the performance of Quality Maintenance (QM) and ensuring Quality Assurance (QA) requirements are met where applicable.
- Overview of Maintenance Procedures
- Overview of Formal Work Packages (FWP)
- Overview of Controlled Work Packages (CWP) requirements and examples of higher authority record requirements.
- Explanation and examples of Formal Work Package elements.

In-Class practical exercises:

Use JFMM excerpts to:

- Define common quality maintenance terms (e.g., certification, Verification, inspection, etc.)
- Determine when a technical work document (TWD) is required.
- Determine the level of TWD required given a maintenance scenario

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts

Materials to Be Provided by Local Command:

- None

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Topic	TWD Module 2: CWP and QA Forms for Craftsman
Target audience	TWD reviewers, Craftsmen
Class size	8
Duration	3 hours (1 hour per each sub-module)
Pre-requisites	Training is enhanced when these topics are given after associated base topic (e.g. TWD, Testing, Material Control, etc.)

Outline of Instruction/Objectives:

- Sub-Module 1 – Maintenance Certification Record / Re-Entry Controls: Block by Block review of QA Form 9 & QA Form 10
- Sub-Module 2 – Assembly Records: Block by Block review of QA Form 34 / 34A
- Sub-Module 3- Common Test Records: Block by Block Review of QA-17 / QA-26

In-Class practical exercises:

Use JFMM excerpts to:

- Document replacement of parts and or testing by filling out the applicable QA Form(s) (e.g. document 2177525 valve stem replacement on a QA-34A, etc.), for a given scenario
- Use JFMM VOL-V-I-11 to identify errors in faulted QA forms

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Reference material for filling out QA forms (e.g., material section of FWP, etc.)

Materials to Be Provided by Local Command:

- None

NOTE: Sub-Modules may-be modified to specific QA Forms (e.g., QA Form -20, etc.).

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Topic	TWD Module 3: CWP and QA Forms for Planners
Target audience	TWD reviewers, Planners
Class size	8
Duration	3 hours (1 hour per each sub-module)
Pre-requisites	Training is enhanced when these topics are given after associated base topic (e.g. TWD, Testing, Material Control, etc.)

Outline of Instruction/Objectives:

- Sub-Module 1 – Maintenance Certification Record / Re-Entry Controls: Block by Block review of QA Form 9 & QA Form 10
- Sub-Module 2 – Assembly Records: Block by Block review of QA Form 34 / 34A
- Sub-Module 3- Common Test Records: Block by Block Review of QA-17 / QA-26

NOTE: Sub-Modules may-be modified to specific QA Forms (e.g., QA Form -20, etc.) and should be determined prior to the visit.

In-Class practical exercises:

Use JFMM and technical reference excerpts to create the applicable QA Forms for a given scenario, examples:

- Submarine – Replace EMBT filter: fill out QA-9, QA-34A and, QA-17
- CVN – Seat repair of Level I , 803-2177525 Valve: fill out QA-9, QA-34A and QA-17.

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Reference material excerpts for filling out QA forms (e.g., QA-11 log, Component Technical Manual, etc.)

Materials to Be Provided by Local Command:

- Host command may be required to provide classified references for students use (e.g. submarine Test Pressure Diagrams (TPD)) This will be determined prior to the scheduled visit .

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 4: Elements of an FWP
Target audience	TWD reviewers, Planners
Class size	8
Duration	3 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review the elements of an FWP
- Determine process to write a clear, concise and, technically correct procedure
- Determine how to incorporate information from reference documents into a FWP
- Discuss how to format a step (i.e.. notes, cautions, margins symbols, etc.)
- Determine required information for an inspection step

In-Class practical exercises:

Given a maintenance scenario, use the JFMM and provided technical reference excerpts to:

- Identify all required elements of an FWP.
- Create clear, concise technically correct work steps.
- Demonstrate the ability to format the step IAW JFMM requirements using margin symbols, work center designation, Notes, Cautions and signature blocks as applicable
- Demonstrate the process to create an enclosure

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Reference material for writing work steps (e.g., MRC, Component Technical Manual, etc.)

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 5: Critical Inspections & Certification Signature Blocks
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Review JFMM requirements for critical inspections
- Review NAVSEAINST 9210.23E requirements for documentation of nuclear signatures
- Review JFMM requirements for incorporating certification signatures blocks (CSB) into FWPs.
- Determine requirements for inspection steps (e.g. state action, provide acceptance criteria, provide a positive statement of compliance, etc.)

In-Class practical exercises:

Given a maintenance scenario, use the JFMM and provided technical reference excerpts to write:

- Technical inspection steps.
- Steps requiring CSBs.

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Reference material for writing work steps (e.g., MRC, Component Technical Manual, etc.)

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 6: Records
Target audience	All
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Review of higher authority record requirements for Nuclear, Level I, and SUBSAFE work.
- The “Stand Alone” philosophy as it pertains to QA Forms
- Retention requirements for FWPs and CWPs.
- Other QA Record retention requirements specific to the maintenance organization.

In-Class practical exercises:

Use JFMM and provided technical reference excerpts to determine:

- Requirements for correcting in situ errors on Quality Maintenance records.
- Retention requirements for FWPs and CWPs.

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Reference material for writing work steps (e.g., MRC, Component Technical Manual, etc.)

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 7: Review and Approval (basic)
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Review and approval requirements for various TWDs, including closeout review and final certification.
- Use of the QA Form 11 log/ 11A log (11 A for submarine commands only)
- Use of the review and approval matrix.
- Determine a process for performing an opening review of a TWD

In-Class practical exercises:

Use JFMM and provided technical reference excerpts to:

- Review excerpts from technical work documents and verify requirements met

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Sample opening review check list

Materials to Be Provided by Local Command:

- None

NOTE: The host command can request an advanced TWD opening review. Allow 4-8 hours.

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Topic	TWD Module 8: Changes to TWDs
Target audience	TWD reviewers, Planners
Class size	8
Duration	1.5 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Pen & Ink, including Technical Pen & Ink changes.
- Rework Addendums.
- Revisions, including Attachments, Supplements, Voiding, Cancelling.

In-Class practical exercises:

Given various maintenance scenarios, use the JFMM and provided technical reference excerpts to:

- Perform technical Pen & Ink changes to TWDs
- Determine the correct change required to TWDs

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Applicable technical reference excerpts
- Faulted portions of TWD's

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 9: Level of Control - Nuclear/Non-Nuclear Interface
Target audience	TWD reviewers, Nuclear Trained Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Interpret the guidance from the source documents(GRPORS)
- Navigate the Nuclear/Non-Nuclear interface drawings
- In class demonstrations of Nuclear Level of Control determination

In-Class practical exercises:

- Given various maintenance scenarios, use the applicable resources (e.g.RPM, Nuclear Interface Drawings, etc.) to determine if a component or portion of a system is considered nuclear or non-nuclear.

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V excerpts
- Nuclear Interface Drawings (unclass)

Materials to Be Provided by Local Command:

- Classified references (e.g., Class RPM, Interface Drawing, GRPORS, etc.)

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 10: Level of Control – Level I Determination (Nuclear)
Target audience	TWD reviewers, Planners
Class size	8
Duration	6 hours (1 hour per each sub-module)
Pre-requisites	None

Outline of Instruction/Objectives:

- Purpose, applicability, and scope of NAVSEAINST 9210.34
- Interpreting the guidance from the source documents (9210.34, JFMM)
- Precedence of documents/drawings for level of essentiality determination
- Using Appendix B of the 7010(Material Control Standard)
- In class demonstrations of system, component, and component part Nuclear Level I determination

In-Class practical exercises:

Use NAVSEAINST 9210.34 (series), System Diagrams and Material Control Standard Appendix B to:

- Determine if a nuclear component or portion of a nuclear system is considered Level I.
- Determine if pressure boundary parts being repaired/replaced are Level I

Materials to Be Provided by FMSB:

- Material Control Standard
- NAVSEAINST 9210.34 (series)

Materials to Be Provided by Local Command:

- If applicable, Classified references (e.g., Selected Record Drawings, System Diagrams, etc.). This requirement will be determined prior to the scheduled training visit.

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Topic	TWD Module 11: Level of Control - Level I Determination (Non-Nuclear)
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Purpose, applicability, and scope of the Material Control Standard
- Precedence of documents/drawings for the level of essentiality determination
- Use Appendix A and Appendix B of the 7010(Material Control Standard) for Level I determination
- Use the Level I Boundary Book (submarines only) for Level I determination
- In class demonstrations of system, component, and component part Level I determination

In-Class practical exercises:

Use Material Control Standard Appendix A and Appendix B excerpts to:

- Determine if a component or portion of a system is considered Level I.
- Determine if pressure boundary parts being repaired/replaced are Level I

Materials to Be Provided by FMSB:

- Material Control Standard
- JFMM Vol. V, Chapter 6
- Applicable class LIBB

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 12: Level of Control - SUBSAFE Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Purpose, applicability, and scope of the Submarine Safety Requirements Manual (SSRM)
- Use the applicable class Submarine Safety Certification Boundary Book (SSCB) to determine whether a component is within the SUBSAFE boundary
- Use SSRM Chap 4, Section 4.3,4.4 and 4.5 definitions to determine whether a component is within the SUBSAFE boundary
- In class demonstrations of system and component, SUBSAFE determination

In-Class practical exercises:

Use SSCB, SSRM and System Diagrams to:

- Determine if a component or portion of a system is considered SUBSAFE

Materials to Be Provided by FMSB:

- Applicable class SSCB
- SSRM

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 13: Level of Control - DSS-SOC Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Purpose, applicability, and scope of the NAVSEA SS800-AG-MAN-010/P-9290
- Purpose, applicability, and scope of the applicable class SOC Notebook
- Use the applicable class SOC Notebook for DSS-SOC boundary determination
- Use provisioning drawings to determine Material Control Division (MCD) level
- System, Component, and Component Part DSS-SOC determination with worked examples

In-Class practical exercises:

Given a maintenance scenario, use the P9290, SOC Notebooks, and Provisioning Drawings excerpts to:

- Determine if a component or portion of a system is within the DSS-SOC Boundary.
- Determine the MCD Level of parts being repaired/replaced

Materials to Be Provided by FMSB:

- Applicable class DSS-SOC Notebook

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 14: Level of Control - FBW-SCS Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Purpose, applicability, and scope of the FBW-SCS Requirements Manual
- Interpret the latest change to the FBS-SCS Requirements versus the applicable class FBS-SCS boundary book
- Use applicable class FBS-SCS Boundary Book for SFCC determination
- In class demonstrations of system, component, and lowest repairable unit SFCC determination

In-Class practical exercises:

Given a maintenance scenario, use the FBS-SCS Requirements Manual and FBS-SCS Boundary Book excerpts to:

- Determine if a system, component, and lowest repairable unit is considered SFCC.

Materials to Be Provided by FMSB:

- Applicable class FBW-SCS Boundary Book

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 15: Nuclear Propulsion Plant Planner Refresher Training
Target audience	TWD reviewers, Planners
Class size	8
Duration	40 hours
Pre-requisites	Previous experience writing and reviewing TWDs

Outline of Instruction/Objectives:

Sub-Module 1 – Research the task

- Review how to interpret AWR/2-Kilos
- Review the process to familiarize the planner with the component
- Discuss the process of performing a ship check
- Identify additional areas of data (e.g., material history, operator logs, etc.)
- Evaluate commands capability/capacity to perform work

In-Class practical exercises:

Use a sample AWR and applicable reference excerpts to:

- Research component and determine feasibility of repair

Sub-Module 2 – Determine the TWD Type

- Use TWD Modules 9 - 14 as applicable to determine the level of work control
- Identify, based on the AWR problem statement and the component technical manual repair procedure, the entire scope of work and testing
- Use the component drawing and APL to determine the repair parts required for the scope of work
- Utilize the JFMM VOL V-I-2.2.4 to determine the minimum TWD requirements

In-Class practical exercises:

Use sample AWR excerpts, APL, component drawing references, and component technical manual excerpts to:

- Create Section “E” Material List
- Determine the minimum TWD required to perform the repair.

Sub-Module 3 – Developing the Procedure

- Review the component technical manual and general information sections
- Develop the base procedure (e.g. disassemble, repair, reassembly, etc.) for the given scenario
- Use TWD Module 5 to demonstrate how to write technical requirements (e.g., sealing surface inspection, assembly procedures, CSBs, critical inspections, etc.) in to the base procedure
- For the given scenario, utilizes applicable references to incorporate cleanliness requirements into the base procedure

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

In-Class practical exercises:

Use JFMM VOL-V-I, Cleanliness Manual, NAVSEA 389-0317, SSRM, etc. excerpts to:

- Outline the basic procedure from the component technical manual to conduct the required repairs
- Incorporate into the base procedure or write sample steps that detail:
 - Required assembly procedures (e.g. inspection criteria, lubrication, torque requirements, etc.)
 - Requirements for critical inspections, certification signatures.
 - Appropriate cleanliness requirements and inspections.

Sub-Module4 – Generating the remaining portions of the FWP.

- Utilize system manuals, component technical manuals, TPDs, and applicable test manuals to determine test requirements
- Utilize system manuals and determine the appropriate plant conditions to support the scope of work and testing
- Use the JFMM VOL-V-I to develop enclosures to provide technical direction that support steps in the base procedure
- Utilize TWD Module 3 and develop the required OQE for the scope of work.
- Utilize the JFMM to review formatting of the FWP Section “J” Procedure
- Utilize the JFMM to review all other sections of the FWP

In-Class practical exercises:

Use system manuals, component technical manuals, test document excerpts to:

- Create Section “K” Test and Inspection”
- Create Section “I” Initial Conditions
- Demonstrate the ability to mark up a reference for use as an enclosure
- Create the appropriate QA forms to document the required OQE for the given scenario

Materials to Be Provided by FMSB:

- Training is based on one maintenance scenario selected by the host command and concurred to by FMSB. Reference material excerpts provided based on the scenario.

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 16: Submarine Safety - SUBSAFE (Overview)
Target audience	TWD reviewers, Craftsmen
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Introduction into the SUBSAFE program with a viewing of both 'A Moment to Fail, A Lifetime to Succeed' or 'You Saved the San Francisco' videos
- Define the SUBSAFE program to include how program is organized, Material certification requirements: Initial and life cycle maintenance
- Introduce the process to determine if a component is within the SUBSAFE boundary using the Submarine Safety Certification Boundary Book (SSCB) and Submarine Safety Requirements Manual (SSRM) when required
- Use JFMM and outline Fleet specific SUBSAFE Program requirements
- Review the requirements for Re-Entry Controls
- Determine if a routine operation or maintenance task is excepted from Re-Entry Controls

In-Class practical exercises:

Given a maintenance scenario, use the applicable class SSCB, the SSRM and JFMM excerpts to:

- Determine whether a component is within the SUBSAFE Boundary using both the SSCB and the SSRM
- Determine if a maintenance task is an exception to Re-Entry Controls

Materials to Be Provided by FMSB:

- Applicable SSRM and class specific SSCB excerpts

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 17: Submarine Safety - SUBSAFE (PLANNERS)
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Define the purpose of the SUBSAFE program
- Review the definitions of “work” with regards to who can work on a SUBSAFE system and when a REC exception is authorized.
- Review the hierarchy/precedence of SUBSAFE documents
- Demonstrate the application of the SSRM Chapter 4, Section 4.3, 4.4, and 4.5 boundary definitions
- Demonstrate how to determine OQE requirements using the SSRM, Chapter 4, Section 4.6
- Demonstrate how to determine the applicable SSCB and interpret figures and reference tables
- Demonstrate the process to evaluate if a component is within the SUBSAFE boundary using the SSCB and SSRM
- Define REC process, evaluate when a REC exception may be used
- Demonstrate the use of a SUBSAFE Mapping Plan to identify joint numbers
- Explain the JFMM VOL V-I SUBSAFE requirements and discuss the differences/additional requirements

In-Class practical exercises:

Given a maintenance scenario, use the SSRM and applicable SSCB excerpts to:

- Evaluate whether a component is within the SUBSAFE Boundary using the SSCB
- Be able to support previous SSCB determinations using the SSRM
- Determine if a maintenance task is an exception to Re-Entry Controls

Materials to Be Provided by FMSB:

- Applicable SSRM and class specific SSCB excerpts

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 18: Unrestricted Operations Maintenance Requirement Card (URO/MRC Requirements (Overview))
Target audience	TWD reviewers, Craftsmen
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Outline the background of the URO Program
 - Inception of program
 - Describe how the URO Program monitors equipment and systems that are integral to the SUBSAFE Program
 - Discuss the negative impact to the Fleet when URO requirements are not met
- Outline all URO/MRCs emphasizing operational MRCs
- Discuss recent lessons learned with URO/MRC program

In-Class practical exercises:

- None

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-VI-25 excerpts

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 19: Unrestricted Operations Maintenance Requirement Card (URO/MRC Requirements and SUBSAFE Testing)
Target audience	TWD reviewers, Craftsmen
Class size	8
Duration	2 hours
Pre-requisites	Module 17: SUBSAFE (PLANNERS)

Outline of Instruction/Objectives:

- Review the SSRM Chapter 4.6 for requirements on the documentation of SUBSAFE testing
- Review the Maintenance Standard of a SUBSAFE component (e.g., SUBSAFE HP air ball valve, stern planes hydraulic actuator, etc.) to determine all testing requirements and documentation requirements
- Outline the background of the URO Program
 - Inception of program
 - Describe how the URO Program monitors equipment and systems that are integral to the SUBSAFE Program
 - Discuss the negative impact to the Fleet when URO requirements are not met
- Outline the process for determining if a URO/MRC is required in addition to normal testing

In-Class practical exercises:

Use SSRM, applicable URO/MRC and Maintenance Standard excerpts to:

- Determine testing requirements and documentation for a given SUBSAFE maintenance scenario
- Determine specific post repair URO/MRC testing requirements for a given maintenance scenario

Materials to Be Provided by FMSB:

- Applicable SSRM excerpts
- Applicable SSCB excerpts
- Applicable JFMM VOL V-I-5 excerpts
- JFMM VOL VI-25
- Applicable URO/MRC excerpts

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 20: Departures from Specification
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Introduce students to the hand-written, naval message, and electronic versions of the QA form 12 as provided by JFMM VOL-V-I-8.
- Introduce terminology associated with DFS
- Review the administrative processing requirements for both submarine and surface ships
- Review the process to determine whether a non-conformance is classified as Major or Minor, temporary versus permanent
- Discuss types of approval (how, when, and who may grant approval)
- Provide familiarization of EDFS program
- Discuss elements required to provide technical rationale for a DFS request

In-Class practical exercises:

Given a maintenance scenario, use JFMM VOL V-I-8 excerpts to:

- Determine whether a nonconformance is classified as Major or Minor
- Document a non-conformance on a QA-12 (blocks 9 through 14)

Materials to Be Provided by FMSB:

- Applicable JFMM VOL-V-I-8 & 11 excerpts

Materials to Be Provided by Local Command:

- Access to the internet for EDFS program familiarization would greatly enhance this lesson however, it is not a requirement.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	TWD Module 21: Deep Submergence-Scope of Certification (DSS-SOC) Introduction
Target audience	TWD reviewers, Planners
Class size	8
Duration	3 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Utilize past deep submergence accidents to explain the purpose and scope of NAVSEA SS800-AG-MAN-010/P-9290
- Determine DSS-SOC boundary requirements for a given maintenance scenario using the applicable SOC Notebook
- Determine REC requirements for a given maintenance scenario using the applicable SOC Notebook
- Determine if any given item is classified as explodable or implodable using the applicable SOC Notebook
- Determine the applicable Material Control Division category of items for a given maintenance scenario
- Locate DSS-SOC specific requirements (e.g., cleanliness, certification of compliance, certification of testing, etc.) on a platform Provisioning Document

In-Class practical exercises:

Given a maintenance scenario, use the P9290, SOC Notebooks, and Provisioning Drawings excerpts to:

- Determine if a component or portion of a system is within the DSS-SOC Boundary.
- Determine the MCD Level of parts being repaired/replaced
- Determine if a REC is required to complete the given maintenance task
- Determine if the given maintenance action is considered a REC exception
- Determine what the record requirements are for the given maintenance action

Materials to Be Provided by FMSB:

- Excerpts from the applicable SOC Notebook and JFMM VOL-V-III (Chapter 2, 6, and 11)

Materials to Be Provided by Local Command:

- None

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Topic	TWD Module 22: Fly-By-Wire Ship Control System (FBW-SCS) Introduction
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Describe the purpose of the FBW SCS governing documents
- Describe how FBW SCS Certification Boundaries are established and maintained
- Describe the FBW SCS & SFCC Boundaries in terms of FBW SCS Certification Boundary Books and FBW Requirements Manual promulgation letter
- Identify FBW SCS Submarine Flight Critical Components (SFCC) & determine required level of work control (CWP/FWP/MP)
- Describe SFCC material control

In-Class practical exercises:

Given a maintenance scenario, use the FBS-SCS Requirements Manual and FBS-SCS Boundary Book excerpts to:

- Determine if a component or portion of a system is within the FBW-SCS Boundary.
- Determine if a REC is required to complete the given maintenance task
- Determine if the given maintenance action is considered a REC exception
- Determine what the record requirements are for the given maintenance action

Materials to Be Provided by FMSB:

- Excerpts of FBS-SCS Requirements Manual and FBS-SCS Boundary Book

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	WORKSHOP - Technical Work Document Determination
Target audience	Anyone who prepares or reviews TWDs
Class size	8
Duration	4 hours
Pre-requisites	Introduction to TWDs - Modules 3,5,6,7, 9-14

Outline of Instruction/Objectives:

- Poses different maintenance scenarios in which students are required to determine the appropriate TWD to perform the given maintenance action.
- Students develop decision processes to determine the appropriate Level of Control (e.g. Nuclear or Non-nuclear, Level I, SUBSAFE, etc.).
- Where CWPs are selected, students determine which QA forms are necessary to be incorporated to adequately document the work and required testing.
- Will be tailored to specific platform and class of requesting activity (SSN 688, SSN 774, SSBN 726, SSGN 726, CVN 68, CVN 78, MTS).

In-Class practical exercises:

- None, this module is a workshop

Materials to Be Provided by FMSB:

- Excerpts of technical manuals pertaining to the maintenance scenario(s) as determined by FMSB and the requesting activity

Materials to Be Provided by Local Command:

- If applicable, the requesting activity will be required to provide classified references (i.e. RPM, SPM, GRPORS, Nuclear/Non-Nuclear Interface Diagram, applicable system SRDs, etc.). The required references will be determined prior to the scheduled visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

STEAM PLANT VALVE REPAIR

Topic	Steam Plant Valve Repair (Consolidated)
Target audience	Craftsman Qualified Machinist's Mates and Work Center Supervisors
Class size	Typically 8 craftsmen (see notes in course description)
Duration	16 hours (Essentially 2 training days which enables 2 complete sessions per 5 day training week and 1 additional day of seat repair or gasket sealing surface repair). Please see the sample schedule included below.
Pre-requisites	QA Craftsman 301, 3M-301

Course Description:

This is a standalone topic that is intended to provide instruction and hands-on familiarization for performing several key maintenance actions to valves manufactured to NAVSHIPS drawing 803-2177525. It is a combination of the following existing exportable steam plant valve repair training topics:

- Body to Bonnet Joint Assembly
- Gasket Sealing Surface Repair
- Graphitic Stem Packing Replacement
- Seat Repair.

These are reduced versions of the individual topics tailored and synchronized together to meet a specific command's training needs. The training will involve required elements of cleanliness and other pertinent manuals (Standard Navy Valves, JFMM, etc.).

Student Billeting:

8 craftsmen (2 craftsmen per workstation; 4 workstations). Under some circumstances, upon request, this may be increased to 12 craftsmen on 6 workstations.

Student Billeting is generally limited to 8 craftsmen due to classroom size and magnitude of tooling and equipment to be shipped. However, additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic

- Suitably sized for 8 students minimum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)

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- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to network preferred, e.g., NMCI or NNPP Web)

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 craftsmen

- Excerpts from technical manuals to support the training. For example, NAVSEA 0948-LP-012-5000 to include Chapter 1, Section 4.1, and Appendix 4/A.1
- Hand tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, and special tools as required.
- Portable workbenches
- Mock-up valves manufactured to NAVSHIPS drawing 803-2177525 (½" or 1", as requested by local command)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 craftsmen

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Colloidal graphite in isopropanol per MIL-L-24131
- Grease, silicon, per A-A-59691 (or equivalent)
- Anti-galling compound per A-A-59004
- Grease per DOD-G-24508

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

Outline of Instruction:

- See the individual exportable topics, outlined in the course description above, for specific outlines of instruction.

In-Class Practical Exercises:

- See the individual exportable topics, outlined in the course description above, for specific outlines of instruction.

Sample Schedule:

- Day 1 (Craftsman Group 1)
 - Instructor led discussion on tasks and related information for the day
 - Bonnet removal, gasket sealing surface inspections and disc/seat inspections
 - Seat repair (resurface the seat and conduct tool to seat blue checks)

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- Day 2 (Craftsman Group 1)
 - Instructor led discussion on tasks and related information for the day
 - Bonnet packing removal / repack
 - Stem/disc assembly replacement
 - Disc to seat blue check
 - Bonnet installation

- Day 3 (Craftsman Group 2)
 - Instructor led discussion on tasks and related information for the day
 - Bonnet removal, gasket sealing surface inspections and disc/seat inspections
 - Seat repair (resurface the seat and conduct tool to seat blue checks)

- Day 4 (Craftsman Group 2)
 - Instructor led discussion on tasks and related information for the day
 - Bonnet packing removal / repack
 - Stem/disc assembly replacement
 - Disc to seat blue check
 - Bonnet installation

- Day 5 Option 1 (Craftsman Group 3)
 - Instructor led discussion on tasks and related information for the day
 - Bonnet removal, gasket sealing surface inspections and disc/seat inspections
 - Seat repair (resurface the seat and conduct tool to seat blue checks)
 - Disc to seat blue check
 - Bonnet installation

- Day 5 Option 2
 - Morning: (Craftsman Group 1)
 - Instructor led discussion on tasks and related information for the day
 - Gasket sealing surface repair
 - Afternoon: (Craftsman Group 2)
 - Instructor led discussion on tasks and related information for the day
 - Gasket sealing surface repair

Special Notes.

- Gasket sealing surface repair is included as Day 5 Option 2 in the example above. Several options exist to add this to the optimum schedule above; however, will take place of the Day 5 additional offering of seat repair. Since gasket sealing surface repair is a half day topic, it can be conducted 2 times on Day 5.

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- In order to begin the training on time the morning of Day 1, FMSB instructors will need access to the training area the day prior. In some cases, this will be on a Sunday or other recognized holiday. Additionally, at the conclusion of Day 5, the FMSB instructors will need assistance to pack and transport training materials to the DLA Shipping Representative.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Steam Plant Valve Repair: Body to Bonnet Joint Assembly
Target audience	Craftsman Qualified Machinist's Mates and Work Center Supervisors
Class size	Typically 8 craftsmen (see notes in course description)
Duration	4 hours
Pre-requisites	QA Craftsman 301, 3M-301

Course Description:

This topic is intended to provide instruction and hands-on familiarization for assembling body-to-bonnet joints of valves manufactured to NAVSHIPS drawing 803-2177525. Training will involve required elements of cleanliness and other pertinent manuals (Standard Navy Valves, JFMM, etc.).

Student Billeting:

8 craftsmen (2 craftsmen per workstation; 4 workstations). Under some circumstances, upon request, this may be increased to 12 craftsmen on 6 workstations.

Student Billeting is generally limited to 8 craftsmen due to classroom size and magnitude of tooling and equipment to be shipped. However, additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic:

- Suitably sized for 8 students minimum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to network preferred, e.g., NMCI or NNPP Web)

Outline of Instruction/Objectives:

- Provide overview of bolted fixed compression body-to-bonnet joint design utilizing Class 5 fit body studs
- Determine applicable sections of technical manual NAVSEA 0948-LP-012-5000, Standard Navy Valves, relevant to body-to-bonnet joint assembly for valves manufactured to NAVSHIPS drawing 803-2177525
- Determine correct replacement graphitic gasket using applicable technical manual excerpts
- Determine correct lubricant using applicable technical manual excerpts

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- Determine applicable torque and tolerance values using applicable technical manual excerpts
- Provide overview of body-to-bonnet joint assembly process IAW applicable technical manual excerpts
- Conduct in-class practical exercise to assemble a body-to-bonnet joint of a valve manufactured to NAVSHIPS drawing 803-2177525

In-Class Practical Exercise:

Assemble the body-to-bonnet joint of a valve manufactured to NAVSHIPS drawing 803-2177525 IAW applicable technical manual excerpts

- Verify correct gasket and install
- Establish method to verify no stud rotation during fastener tightening process
- Apply lubricant to threaded fasteners
- Install bonnet to body
- Install and tighten fasteners to required torque value
- Verify metal-to-metal contact between body and bonnet is achieved and take appropriate actions if metal-to-metal contact is not achieved
- Verify no stud rotation during fastener tightening process

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 craftsmen:

- Excerpts from technical manuals to support the training. For example, NAVSEA 0948-LP-012-5000, Standard Navy Valves, to include Chapter 1, and Section 4.1
- Hand tools, precision measuring tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, and replacement graphitic gaskets
- Portable workbenches
- Mock-up valves manufactured to NAVSHIPS drawing 803-2177525 (½" or 1", as requested by host activity)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 craftsmen

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Anti-galling compound per A-A-59004

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Steam Plant Valve Repair: Gasket Sealing Surface Repair
Target audience	Craftsman Qualified Machinist's Mates and Work Center Supervisors
Class size	Typically 8 craftsmen (see notes in course description)
Duration	4 hours
Pre-requisites	QA Craftsman 301, 3M-301

Course Description:

This topic is intended to provide instruction and hands-on familiarization for performing repairs to the gasket sealing surfaces of bodies and bonnets of valves manufactured to NAVSHIPS drawing 803-2177525. Training will involve required elements of cleanliness and other pertinent manuals (Standard Navy Valves, JFMM, etc).

Student Billeting:

8 craftsmen (2 craftsmen per workstation; 4 workstations). Under some circumstances, upon request, this may be increased to 12 craftsmen on 6 workstations. Student Billeting is generally limited to 8 craftsmen due to classroom size and magnitude of tooling and equipment to be shipped. However, additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic:

- Suitably sized for 8 students minimum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110-V equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to network preferred, e.g., NMCI or NNPP Web)

Outline of Instruction/Objectives:

- Provide overview of valve body and bonnet gasket sealing surface geometry and relevance to proper gasket compression IAW applicable technical manual excerpts
- Identify applicable sections of technical manual NAVSEA 0948-LP-012-5000, Standard Navy Valves, relevant to gasket sealing surface repair for valves manufactured to NAVSHIPS drawing 803-2177525
- Discuss basis for determining need to repair gasket sealing surfaces of valves IAW applicable technical manual excerpts
- Provide overview of repair tooling and processes IAW applicable technical manual excerpts

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

- Conduct in-class practical exercise to repair body and bonnet gasket sealing surfaces of a valve manufactured to NAVSHIPS drawing 803-2177525

In-Class Practical Exercise:

Repair the body and bonnet gasket sealing surfaces of a valve manufactured to NAVSHIPS drawing 803-2177525 using gasket sealing surface refurbishment tooling IAW applicable technical manual excerpts

- Identify necessary parts of tool kit needed for repair of body and bonnet gasket sealing surfaces
- Repair body and bonnet gasket sealing surfaces separately using applicable tool kit parts
- Examine repaired surfaces to verify satisfactory dimensions and geometry (i.e., circular lay and surface finish)

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 craftsmen:

- Excerpts from technical manuals to support the training. For example, NAVSEA 0948-LP-012-5000, Standard Navy Valves, to include Chapter 1, Section 4.1, and Appendix 4/B.1
- Hand tools, precision measuring tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, and gasket sealing surface refurbishment tool kits
- Portable workbenches
- Mock-up valves manufactured to NAVSHIPS drawing 803-2177525 (½" or 1", as requested by local command)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 craftsmen

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Colloidal graphite in isopropanol per MIL-L-24131

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Steam Plant Valve Repair: Graphitic Stem Packing Replacement
Target audience	Craftsman Qualified Machinist's Mates and Work Center Supervisors
Class size	Typically 8 craftsmen (see notes in course description)
Duration	6 hours
Pre-requisites	QA Craftsman 301, 3M-301

Course Description:

This topic is intended to provide instruction and hands-on familiarization for replacing graphitic stem packing materials in valves manufactured to NAVSHIPS drawing 803-2177525. Training will involve required elements of cleanliness and other pertinent manuals (Standard Navy Valves, JFMM, etc).

Student Billeting:

8 craftsmen (2 craftsmen per workstation; 4 workstations). Under some circumstances, upon request, this may be increased to 12 craftsmen on 6 workstations. Student Billeting is generally limited to 8 craftsmen due to classroom size and magnitude of tooling and equipment to be shipped. However, additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic:

- Suitably sized for 8 students minimum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to network preferred, e.g., NMCI or NNPP Web)

Outline of Instruction/Objectives:

- Provide overview of rising stem packing component design
- Discuss single and intermediate graphitic packing ring segment configurations
- Discuss applications for use of corrosion inhibited (Grade I) and non-inhibited (Grade N) graphitic packing materials
- Determine applicable sections of technical manual NAVSEA 0948-LP-012-5000, Standard Navy Valves, relevant to graphitic packing installation for valves manufactured to NAVSHIPS drawing 803-2177525
- Determine correct replacement graphitic packing materials using applicable technical manual excerpts
- Determine correct lubricant using applicable technical manual excerpts

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

- Determine applicable torque and tolerance values using applicable technical manual excerpts
- Provide overview of stem packing replacement process using graphitic packing materials IAW applicable technical manual excerpts
- Conduct in-class practical exercise to replace stem packing with graphitic packing materials for a valve manufactured to NAVSHIPS drawing 803-2177525

In-Class Practical Exercise:

Replace the existing graphitic stem packing materials with new graphitic packing materials for a valve manufactured to NAVSHIPS drawing 803-2177525 IAW applicable technical manual excerpts

- Remove existing graphitic stem packing materials from valve bonnet
- Clean, then examine packing joint parts for damage or other conditions that would require replacement
- Install new graphitic packing materials
- Apply lubricant to threaded fasteners
- Consolidate and stabilize installed graphitic packing segment(s)
- Perform minimum thread and packing gland engagement inspections

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 craftsmen:

- Excerpts from technical manuals to support the training. For example, NAVSEA 0948-LP-012-5000, Standard Navy Valves, to include Chapter 1, and Section 4.1
- Hand tools, precision measuring tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, and replacement graphitic stem packing materials
- Portable workbenches
- Mock-up valves manufactured to NAVSHIPS drawing 803-2177525 (½” or 1”, as requested by local command)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 craftsmen:

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Anti-galling compound per A-A-59004
- Grease per DOD-G-24508

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Steam Plant Valve Repair: Seat Repair
Target audience	Craftsman Qualified Machinist's Mates and Work Center Supervisors
Class size	Typically 8 craftsmen (see notes in course description)
Duration	8 hours
Pre-requisites	QA Craftsman 301, 3M-301

Course Description:

This topic is intended to provide instruction and hands-on familiarization for performing seat repairs to valves manufactured to NAVSHIPS drawing 803-2177525 using carbide cutter and diamond-coated lap kits. Training will involve required elements of cleanliness and other pertinent manuals (Standard Navy Valves, JFMM, etc).

Student Billeting: 8 craftsmen (2 craftsmen per workstation; 4 workstations). Student Billeting is generally limited to 8 craftsmen due to classroom size and magnitude of tooling and equipment to be shipped. However, additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic:

- Suitably sized for 8 students minimum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to network preferred, e.g., NMCI or NNPP Web)

Outline of Instruction/Objectives:

- Provide overview of globe-type valve body seat and disc design
- Discuss valve conditions that can result in excessive seat leakage and differentiate between conditions than can and cannot be corrected by repairing valve body seat
- Identify applicable sections of technical manual NAVSEA 0948-LP-012-5000, Standard Navy Valves, relevant to valve body seat repair for valves manufactured to NAVSHIPS drawing 803-2177525
- Provide overview of repair tooling and processes IAW applicable technical manual excerpts
- Conduct in-class practical exercise to repair the body seat and perform the disc-to-seat final blue check for a valve manufactured to NAVSHIPS drawing 803-2177525

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

In-Class Practical Exercise:

Repair the body seat of a valve manufactured to NAVSHIPS drawing 803-2177525 using carbide cutter and diamond-coated lap seat repair tooling IAW applicable technical manual excerpts

- Perform visual examination and blue checks to determine extent of valve body seat damage and determine need for repair
- Resurface valve body seat and perform in-process blue checks
- Perform final disc-to-seat blue check to verify satisfactory continuity of contact

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 craftsmen:

- Excerpts from technical manuals to support the training. For example, NAVSEA 0948-LP-012-5000, Standard Navy Valves, to include Chapter 1, Section 4.1, and Appendix 4/A.1
- Hand tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, and carbide cutter and diamond-coated lap seat repair tool kits
- Portable workbenches
- Mock-up valves manufactured to NAVSHIPS drawing 803-2177525 (1/2" or 1", as requested by local command)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 craftsmen:

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Colloidal graphite in isopropanol per MIL-L-24131
- Grease, silicon, per A-A-59691 (or equivalent)

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

CLEANLINESS

Topic	Reactor Plant Cleanliness
Target audience	Anyone who prepares or reviews TWDs for Reactor Plant, Craftsman, Inspectors, Supervisors, Division Officers, and Quality Assurance Supervisors.
Class size	8
Duration	5 hours (1 hour workshops)
Pre-requisites	*FMSB request copies of applicable local instructions two weeks prior to the training.

Outline of Instruction/Objectives:

- For a given maintenance scenario, determine which set of cleanliness requirements (i.e., Reactor Plant, Steam Plant, Commercial) apply by using source documents
- Incorporate requirements for *Maintaining Cleanliness* into a TWD for work on a component in a Reactor Plant clean system
- Incorporate requirements for *Control of Detrimental Materials* into a TWD for work on a component in a Reactor Plant clean system
- Incorporate *Cleaning Requirements* into a TWD for work on a component in a Reactor Plant clean system
- Incorporate requirements for *Cleanliness Inspection* into a TWD for work on a component in a Reactor Plant clean system
- Incorporate cleanliness-specific CSB elements into a TWD for work on a component in a Reactor Plant clean system

Module 1 - Determine the cleanliness requirements of your job.

- Determine what maintenance is being performed
- Determine the system level of cleanliness
- Determine the component level of cleanliness

Module 2 - Determine how to maintain cleanliness.

- Determine the requirements for sealing and capping hardware openings
- Determine the clean area requirements
- Determine the accountability requirements

Module 3 – Determine how to manage foreign and detrimental materials

- Determine if the tool(a) required for completing the work meet the detrimental material requirements
- Determine if lubricants, abrasives, and cutting compounds required for completing the work meet the detrimental material requirements
- Check the materials listed in the TWD to ensure they meet the requirements listed in the MQPL/CAPL

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Module 4 – Determine how cleaning will be performed during the work

- Determine the mechanical cleaning requirements
- Determine the requirements for solvent cleaning
- Determine the requirements for ultrasonic cleaning

Module 5 – Determine what inspections are necessary to ensure cleanliness is maintained for the job

- Determine inspection requirements for hardware surfaces
- Determine inspection personnel requirements
- Determine inspection requirements and acceptance criteria

In-Class practical exercises:

Workshop – cleaning requirements determination practice

- within the TWD determine the proper location for the different parts of each phase

Materials to Be Provided by FMSB:

Workshop items (manual excerpts, worked examples, job aids, practice assessments)

Materials to Be Provided by Local Command:

Access to at least one copy of the NAVSEA 0989-064-3000 (Cleanliness Requirements for Nuclear Propulsion Plant Maintenance and Construction)

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Steam Plant Cleanliness
Target audience	Anyone who prepares or reviews TWDs for Steam Plant, Craftsman, Inspectors, Supervisors, Division Officers, Quality Assurance Supervisors.
Class size	8
Duration	5 hours (1 hour workshops)
Pre-requisites	*FMSB request copies of applicable local instructions two weeks prior to the training.

Outline of Instruction/Objectives:

- For a given maintenance scenario, determine which set of cleanliness requirements (i.e., Reactor Plant, Steam Plant, Commercial) apply by using source documents
- Incorporate requirements for Maintaining Cleanliness into a TWD for work on a component in a Steam Plant clean system
- Incorporate requirements for Control of Detrimental Materials into a TWD for work on a component in a Steam Plant clean system
- Incorporate Cleaning Requirements into a TWD for work on a component in a Steam Plant clean system
- Incorporate requirements for Cleanliness Inspection into a TWD for work on a component in a Steam Plant clean system

Module 1 - Determine the cleanliness requirements of your job.

- Determine what maintenance is being performed
- Determine the system level of cleanliness
- Determine the component level of cleanliness

Module 2 - Determine how to maintain cleanliness.

- Determine the requirements for sealing and capping hardware openings
- Determine the clean area requirements
- Determine the accountability requirements

Module 3 – Determine how to manage foreign and detrimental materials

- Determine if the tool(a) required for completing the work meet the detrimental material requirements
- Determine if lubricants, abrasives, and cutting compounds required for completing the work meet the detrimental material requirements
- Check the materials listed in the TWD to ensure they meet the requirements listed in the MQPL/CAPL

Module 4 – Determine how cleaning will be performed during the work

- Determine the mechanical cleaning requirements
- Determine the requirements for solvent cleaning
- Determine the requirements for ultrasonic cleaning

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Module 5 – Determine what inspections are necessary to ensure cleanliness is maintained for the job

- Determine inspection requirements for hardware surfaces
- Determine inspection personnel requirements
- Determine inspection requirements and acceptance criteria

In-Class practical exercises:

Divide class into groups for three practical workshops, 20 minutes each:

- Selection of correct cleanliness plug(s) for a given component
- Installation of cleanliness plug(a) into a piping section
- Installation of cleanliness plugs into valve ports

Materials to Be Provided by FMSB:

- Provide various types of cleanliness plugs, training valves, and piping sections for plug workshops
- Applicable excerpts from the Cleanliness Manual to provide to each student for purposes of the class

Materials to Be Provided by Local Command:

- At least one copy of 989-064-3000 Cleanliness Manual

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

WELDING/BRAZING

Topic	Welder, Brazer, and NDT Program Audit
Target audience	Command's Level III NDT Examiner and anyone who audits the activities welding, brazing, or NDT programs.
Class size	N/A
Duration	16 hours
Pre-requisites	FMSB request copies of applicable local instructions two weeks prior to the training.

Course Description:

FMSB will conduct an audit of the Activities welder/brazer and NDT training program (written procedures) while instructing the activities personnel in the requirements including: the commands welding/brazing written instruction, welder/brazer exams, all brazing, welding and NDT technical references, eye examinations, welder/brazer Identification number log, welder/brazer and NDT qualification records, NDT procedures, and welding TWDs.

Specific actions:

- Assess the effectiveness of Welder training
- Validate individual Welder records
- Assess the effectiveness of Brazer training
- Validate individual Brazer records
- Assess the effectiveness of NDT training
- Validate individual NDT records
- Validate Non-Nuclear NDT weld records
- Validate that a welder assigned to weld a specific component is qualified
- Ensure the Command NDT Examiner understands their responsibilities

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Locating the Correct Welding Technique Sheet for Piping Systems
Target audience	Planners and Weld shop personnel
Class size	8
Duration	6 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Determine welding technical requirements from engineering drawing data.
- Determine the weld joint design for a given maintenance scenario.
- Determine the base material parameters (e.g. type, thickness, specifications) for a given maintenance scenario.
- Determine the welding fabrication standard for a given maintenance scenario.
- Determine the weld class for a given maintenance scenario.
- Determine the WP278 welding technique sheet for a given maintenance scenario.
- Determine the correct filler material for a given maintenance scenario.

In-Class practical exercises:

Determine the welding technical requirements to replace 1MS-V389 from NAVSEA drawing 207-4326798.

- Determine piping Class
- Determine weld joint design
- Determine piping base material parameters (generic material, size, thickness, MIL-SPEC)
- Determine the valve base material type and MIL-SPEC
- Use MIL-SPEC to find base material grouping number (“S” number)
- Use “S” group to select the correct technique sheet
- Determine the correct weld filler material

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 personnel:

- Excerpts from technical manuals to support the training (e.g. NAVSEA S9074-AR-GIB-010-278, NNSY WP-278, MIL-STD-22, and NAVSEA Drawing 207-4326798).

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Welding related CWP development and step writing
Target audience	Planners and Weld shop personnel
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Determine the required NDT inspections for a given maintenance scenario.
- Determine the use of additional NDT inspections in lieu of hydrostatic testing.
- Complete the planner's assigned blocks (i.e., marked with red diamonds) on all QA form 20s for a given maintenance scenario.
- Locate Joint Identification Designators (JIDs) for a specific welding maintenance task on a given hull
- Create locally prepared JID sketches on a QA form 10 for a specific welding maintenance task on a given hull
- Write the weld fit-up steps of a TWD to replace an 803-2177525 socket welded valve.
- Write welding steps of a TWD to replace an 803-2177525 socket welded valve.
- Write the NDT steps of a TWD to replace an 803-2177525 socket welded valve.
- Complete the portions of the FWP Material List for welding material.

In-Class practical exercises:

Determine the welding technical requirements to replace 1MS-V389 from NAVSEA drawing 207-4326798:

- Determine the required NDT inspections
- Determine additional NDT inspections required to perform an operating pressure test
- Complete the planner's assigned blocks (i.e., marked with red diamonds) on all QA form 20s Determine the valve base material type and MIL-SPEC
- Locate JID's or develop joint identification numbers
- Write welding related steps for a TWD
- Complete the portions of the FWP Material List for welding material

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 personnel:

- Excerpts from technical manuals to support the training (e.g. NAVSEA S9074-AR-GIB-010-278, NNSY WP-278, MIL-STD-22, NSTM 505, and NAVSEA Drawing 207-4326798).

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Preparation of the QA-20
Target audience	QAO, Planners, Weld shop personnel, and anyone that audits welding CWP's
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Explain when a weld record is required
- Explain the documentation requires for a QA form 20 blocks 1 though 95
- Validate information documented on QA form 20s Determine welding technical requirements from engineering drawing data.

In-Class practical exercises:

- Determine what welds require a QA-20.
- Determine the required information for blocks 1 thru 95.
- Validate all information documented on a QA-20 is correct.

Materials to Be Provided by FMSB:

- Examples of QA-20s

Materials to Be Provided by Local Command:

- Any TWD's that contain QA-20s

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Brazing Requirements
Target audience	Brazers and anyone preparing to qualify as a brazer
Class size	8
Duration	4 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Determine braze joint classification for a given maintenance scenario
- Determine brazing joint design for a given maintenance scenario
- Determine “P” numbers for a given maintenance scenario
- Determine the correct filler alloy for a given maintenance scenario
- Determine when a braze record is required for a given maintenance scenario

In-Class practical exercises:

Determine the brazing technical requirements to replace HP Air- V100 from NAVSEA drawing 2647505 Zone 3B:

- Determine brazed piping class using NAVSEA drawing 4323960
- Determine piping and fitting base material parameters (generic material, size, thickness, MIL-SPEC)
- Use MIL-SPEC to find base material grouping numbers (“P” number)
- Use “P” group to select the correct filler alloy
- Determine if a braze record is required for this repair

Materials to Be Provided by FMSB:

The following items are provided by FMSB in sufficient quantities to support a class size of 8 personnel:

- Excerpts from technical manuals to support the training (e.g. NAVSEA 0900-LP-001-7000, NNSY BP-7000, NNSY BCP-7000, NAVSEA Drawing 2647505 and 4323960).

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

TESTING

Topic	Writing Test and Inspection Steps
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Incorporation of testing procedures, requirements, and parameters into a fluid step within a TWD.

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to develop Section K, Tests and Inspections, of a TWD.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Submarine Nuclear Pressure Testing Type Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review of scope of work determination and how it relates to testing
- Testing requirements from the RPM
- Familiarization with and use of the System Hydrostatic Test Requirements Manual

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to determine the testing required to certify the maintenance action.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Submarine Nuclear Pressure Testing Parameters
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Describe how to determine the following:
 - Inspection Points
 - Test Pressure
 - Test Duration
 - Test Medium
 - Acceptance Criteria

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and ascertain the above parameters for certification testing.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Carrier Nuclear Pressure Testing Type Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review of scope of work determination and how it relates to testing
- Testing requirements from the RPM
- Familiarization with and use of the System Hydrostatic Test Requirements Manual

In-Class practical exercises:

- Given maintenance scenarios, use the applicable references to research to devise the post work testing required to certify the maintenance action.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Carrier Nuclear Pressure Testing Parameters
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Describe how to determine the following:
 - Inspection Points
 - Test Pressure
 - Test Duration
 - Test Medium
 - Acceptance Criteria

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and ascertain the above parameters for certification testing.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Nuclear Valve Seat Leakage Testing
Target audience	TWD reviewers, Planners
Class size	8
Duration	1.5 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review what work requires a seat leakage test as certification
- Determination of seat leakage testing requirements
- Testing requirements and procedures from the RPM
- Testing requirements and procedures from Standard Naval Nuclear Valves and Auxiliary Equipment

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and develop testing requirements related to seat leakage for a nuclear valve

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Standard Naval Nuclear Valve Packing Leakage Testing
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Determination of SNNVAE requirements for contaminated valves
- Determination of SNNVAE requirements for uncontaminated valves

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and develop testing requirements related to packing for a valve covered by SNNVAE

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Submarine Non-nuclear Pressure Testing Type Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

Review of scope of work determination and how it relates to testing

- Testing requirements from, familiarization with and use of the Submarine Non-Nuclear Piping Systems Manual

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to determine the testing required to certify the maintenance action.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SEPM, SUBSAFE Mapping Diagrams, TPDs, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Submarine Non-nuclear Pressure Testing Parameters
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Determine the following:
 - Inspection Points
 - Test Pressure
 - Test Duration
 - Test Medium
 - Acceptance Criteria

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and ascertain the above parameters for certification testing.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SEPM, SUBSAFE Mapping Diagrams, TPDs, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Carrier Non-nuclear Pressure Testing Type Determination
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Review of scope of work determination and how it relates to testing
- Testing requirements from, familiarization with and use of the Joint Fleet Maintenance Manual, Chapter 7
- Testing requirements from, familiarization with and use of the Naval Ship's Technical Manual, Chapter 11

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to determine the testing required to certify the maintenance action.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SPM, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Carrier Non-nuclear Pressure Testing Type Parameters
Target audience	TWD reviewers, Planners
Class size	8
Duration	2 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Determination of the following:
 - Inspection Points
 - Test Pressure
 - Test Duration
 - Test Medium
 - Acceptance Criteria

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and ascertain the above parameters for certification testing.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SPM, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Non-nuclear Valve Seat Leakage Testing
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Review what work requires a seat leakage test as certification
- Determination of seat leakage testing requirements
- Research applicable technical manual specific requirements and decide if these requirements need to be met in order to certify work
- Determination of the general seat leakage testing requirements from the JFMM and NSTM 505.
- Apply exceptions to requirements, where applicable

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and develop testing requirements related to seat leakage for a non-nuclear valve

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SPM/SEPM, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Standard Navy Valve Package Leakage Testing
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Determination of SNV requirements for valves with compression and pressure activated packing

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and develop testing requirements related to packing for a valve covered by SNV

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, Class SPM/SEPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Testing Related QA Forms
Target audience	TWD reviewers, Planners
Class size	8
Duration	1 hour
Pre-requisites	None

This course addresses the following QA forms:

QA-17, QA-17A, QA-17B, QA-17C, QA-17D, QA-17SI, QA-17W, QA-26, QA-26A, QA-27, QA-27A, and QA-28

A copy of each will be provided with instructions from the JFMM

Outline of Instruction/Objectives:

- Determine when/if a record is required for testing
- Based on record and testing requirements, choose the correct QA form to be used to document testing
- Properly fill out and/or verify properly filled out all applicable blocks on all required forms to certify a maintenance action

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and determine and use all required testing QA forms

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, Class SPM/SEPM, GRPORS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	System/Component Recertification Testing (Nuclear)
Target audience	Anyone who prepares or reviews TWDs.
Class size	12
Duration	4 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Using relevant nuclear maintenance scenarios:
 - Determine, based on the scope of the work, the required testing for each scenario
 - Using the RPM and other nuclear references, ascertain all testing required to certify maintenance based on RPM requirements
 - Determine the parameters for all required testing for each scenario
 - Write steps for each test for each scenario

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and determine all required testing, parameters, and procedures

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	System/Component Recertification Testing (Non-Nuclear)
Target audience	Anyone who prepares or reviews TWDs.
Class size	12
Duration	4 hours
Pre-requisites	None

Outline of Instruction/Objectives:

- Using relevant non-nuclear maintenance scenarios:
 - Determine, based on the scope of the work, the required testing for each scenario
 - Using the applicable references, ascertain all testing required to certify maintenance
 - Determine the parameters for all required testing for each scenario
 - Write steps for each test for each scenario

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and determine all required testing, parameters, and procedures

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SPM/SEPM, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	WORKSHOP – Nuclear Pressure Test Determination
Target audience	Anyone who prepares or reviews Technical Work Documents, Quality Assurance Supervisors, Quality Assurance Officers, Leading Chief Petty Offices and Division Officers.
Class size	
Duration	1 hour
Pre-requisites	FMSB request copies of applicable local instructions two weeks prior to the training.

Outline of Instruction/Objectives:

- Given a nuclear maintenance scenario, determine the testing required to certify the work

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and determine all required testing

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing System Diagrams, Class RPM, GRPORS, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	WORKSHOP – Non-Nuclear Pressure Test Determination
Target audience	Anyone who prepares or reviews Technical Work Documents, Quality Assurance Supervisors, Quality Assurance Officers, Leading Chief Petty Offices and Division Officers.
Class size	
Duration	1 hour
Pre-requisites	FMSB request copies of applicable local instructions two weeks prior to the training.

Outline of Instruction/Objectives:

- Given a non-nuclear maintenance scenario, determine the testing required to certify the work

In-Class practical exercises:

- Given a maintenance scenario, use the applicable references to research and determine all required testing, parameters, and procedures

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material to allow the determination of required retests

Materials to Be Provided by Local Command:

- If applicable, Classified reference excerpts (e.g., Selected Record Drawing, System Diagrams, Class SPM/SEPM, etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Liaison Action Request (LAR)
Target audience	Anyone who prepares or reviews LARs.
Class size	12
Duration	1 hour
Pre-requisites	None

Outline of Instruction/Objectives:

- Reactor Plant Planning Yards/Prime Contractors/Support Organizations Services
- Identifying the Addressee
- LAR Format
- Minimum Required Information
- Required Copies
- Responses to an LAR
- Nuclear Liaison Inquiries (NLI)
- Steam Plant Liaison Inquiries (SPLI)/Steam Plant Action Request (SPAR) (For CVN platforms only)

In-Class practical exercises:

- None

Materials to Be Provided by FMSB:

One of the below as applicable to the requesting activity:

- Appendix 4 of the Commissioned Surface Ship GRPORS
- Appendix 7 of the Commissioned Submarine GRPORS

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Controlled Material (Nuclear and Non-nuclear)
Target audience	Anyone who orders, controls, handles, or installs Controlled Material.
Class size	8
Duration	4 hours without access to SECNET or NNPP web (7 Hours if digital access available for students)
Pre-requisites	FMSB request copies of applicable local instructions two weeks prior to the training.

Outline of Instruction/Objectives:

Option 1 (Without access to NNPP Web/SECNET/NR WAN)

- Determine the LOE of any given nuclear system
- Determine the LOE of any nuclear component (including whole component and its individual parts)
- Determine the LOE of any given non-nuclear system
- Determine the LOE of any non-nuclear component (including whole component and its individual parts)
- Describe the purpose and meaning of a SMIC
- Determine which nuclear SMIC items are issued with RFI tags
- Discuss the QA Forms associated with Controlled Material (i.e. QA-1, QA-2, QA-3)
- Determine the Storage and Handling requirements associated with Controlled Material
- Determine the record requirements, including record retention, for controlled material.
- Describe the temporary controlled jobsite requirements
- Describe the record requirements for controlled material in transit between temporary controlled jobsites

Option 2 (With access to NNPP Web/SECNET/NR WAN)

All objectives listed in Option 1 and the following:

- Determine the required nuclear repair parts given a specific maintenance scenario
- In support of parts research, use the graphics section on engineering drawings
- In support of parts research, use the List of References on engineering drawings to determine other source documents for a specific hull
- Determine the material list data for nuclear repair parts using multiple sources (e.g. CRM, APL/AEL, technical manuals, drawing data tables, etc.)
- Given a specific component, identify the technical requirements for software replacement.
- Given a specific component, determine the proper software (O-ring seals, gaskets, acceptable substitutes).

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

In-Class practical exercises:

Option 1:

- Receipt Inspection Workshop
- Level of Essentiality Determination (System/Component) Workshop.

Option 2:

- Nuclear repair part determination for a given maintenance scenario
- Receipt Inspection Workshop
- Level of Essentiality Determination (System/Component) Workshop

Materials to Be Provided by FMSB:

- Excerpts of applicable technical references to support this lesson topic (e.g. Material Control Standard, NAVSEAINST 9210.34, Standard Navy Valves, etc.)

Materials to Be Provided by Local Command:

- If applicable, Classified references (e.g., Selected Record Drawings, System Diagrams, RPM, GRORPS etc.). This requirement will be determined prior to the scheduled training visit.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

PRIMARY VALVE OPERATION

Topic	Primary Valve Operator - Advanced (PVO-A)
Target audience	Candidates must be Primary Valve Operator – Basic (PVO-B) qualified prior to attending the Advanced Course. There is no exception to the minimum qualification level.
Class size	8 PVO-A Candidates based on 2 Instructors and 2 Mockups. If only 1 Mockup is available, the daily course length is increased to suit.
Duration	32 hours
Pre-requisites	PVO- B qualified

Outline of Instruction/Objectives:

The ~~Primary Valve Operator-Advanced~~ (PVO-A) Course (S-661-0018) is a four-day course that teaches nuclear trained personnel the technical and radiological requirements and correct techniques for operating primary system valves within the reactor compartment, those primary valves outside the reactor compartment whose caps are torqued, and all primary vent and drain valves. This training includes proper position verification, system line-ups and tagouts. This course is specifically designed for personnel aboard ships that are scheduled for an imminent availability.

This course covers the skills and knowledge needed to train Navy personnel for advanced or critical primary valve operations using the requirements and techniques of NAVSEA 0989-150-0000, Standard Naval Nuclear Valves and Auxiliary Equipment, Chapter 1.1 and NAVSEA S9213-33-MMA-000, Radiological Controls for Ships, .

In-Class practical exercises:

- Removal and Installation of valve caps
- Valve Inspection and Operation
- Adapter Installation and Removal to a Vent and Drain Valve

Materials to Be Provided by FMSB:

- FMSB will supply all necessary consumables (i.e. o-rings, cotton liners, tape, etc.)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 students:

- Colloidal graphite in isopropanol per MIL-L-24131
- Sufficient reference material so that no more than two students share manuals.
- PVO Mockup(s) and Tooling previously supplied by FMSB
- Radiological supplies that are typically re-usable (PVO Containments, yellow bags, gloves, etc.)

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Notes:

- The PVO-A course is inherently part of the Primary Valve Operator-Train The Trainer (PVO-TTT) Course when run as S-661-0017.
- FMSB can build a modified version of PVO-A refresher training for personnel already qualified PVO-A who are entering a maintenance availability or other project where normally capped valves and vent and drain valves will be uncapped/operated.
- FMSB will request written confirmation (email, letter, etc.) that the command is prepared for the course in terms of a roster, training space, tools, supplies and so forth. FMSB should be notified of any tools or materials not available a month prior to the course convening.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Primary Valve Operator – Train the Trainer (PVO-TTT)
Target audience	Senior E-5, E-6, RM CPOs and RM Technical Assistants (per COMNAVAIRPAC/ COMNAVAIRLANT Instruction 1512.3) that will be conducting the PVO training. Candidates must be PVO-A qualified prior to attending the TTT Course. There is no exception to the minimum qualification level.
Class size	8 Trainer Candidates (TCs) for Weeks 1 and 2, 8 PVO-A Candidates for Week 2 based on 2 Instructors and 2 Mockups. If only 1 Mockup is available, the daily course length is increased to suit (i.e. Japan).
Duration	60 hours
Pre-requisites	PVO Advanced Qualified

Outline of Instruction/Objectives:

The PVO-TTT Course is a nine day course which builds on prospective instructor/trainer knowledge of the technical and radiological requirements and techniques for training Navy personnel on the correct manner in which to operate primary system valves, including position verification and tagouts. This course also provides training in the execution and management of the PVO-A Course. Certified PVO trainers will deliver the aforementioned course material to their command's personnel as directed.

FMSB will conduct the entire PVO course (S-661-0017) with the TCs during week 1. During Week 2, each TC will be required to present a portion of the lecture phase of the course using the FMSB provided Instructor Guide. Each TC will be required to conduct both a familiarization cycle and a graded practical. Immediate feedback will be provided to the TC and a summary will be provided to the command. The command qualifying officer (Reactor Mechanical Assistant, Staff Training Officer, and/or Division Officer) is encouraged to attend when practical. The command has the final authority in determining each candidate's fitness to present the course.

This course covers the skills and knowledge needed to train Navy personnel for primary valve operations using the requirements and techniques of NAVSEA 0989-150-0000, Standard Naval Nuclear Valves and Auxiliary Equipment, Chapter 1.1, and NAVSEA S9213-33-MMA-000, Radiological Controls for Ships, .

Upon completion of the course, FMSB will make a recommendation to the command whether or not the candidate should be qualified to deliver the course.

Materials to Be Provided by FMSB:

FMSB will supply all necessary consumables (i.e. o-rings, cotton liners, tape, etc.)

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 8 students:

- Colloidal graphite in isopropanol per MIL-L-24131
- Sufficient reference material so that no more than two students share manuals.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

- PVO Mockup(s) and Tooling previously supplied by FMSB
- Radiological supplies that are typically re-usable (PVO Containments, yellow bags, gloves, etc.)

NOTE: FMSB will request written confirmation (email, letter, etc.) that the command is prepared for the course in terms of a roster, training space, tools, supplies and so forth. FMSB should be notified of any tools or materials not available at least 2 weeks prior to the course convening. This will allow time for FMSB to supplement the visit with the necessary items to ensure training value is not degraded.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	(CVN ONLY) 4" Valve Just-in-Time Training (JIT)
Target audience	Reactor Mechanical personnel assigned to uncap and operate a 4" valve.
Class size	8 to 10
Duration	~4 hours per group
Pre-requisites	PVO Advanced PVO-A qualified (Valve Operators) PVO Basic PVO-B qualified (Assisting Personnel)

Outline of Instruction/Objectives:

Four inch valve ~~Just-in-Time~~ JIT training is designed to familiarize CVN Sailors tasked with uncapping/operating these valves with the necessary knowledge, skills and abilities to complete an evolution such as throttle valve position change. The training consists of 1 hour of instructor led discussion and tooling familiarization followed by 3 hours of hands-on training to remove the upper cap, remove the coupling (where installed), install the adapter assembly, reposition the valve, remove the adapter assembly, install the coupling/lock the valve and install the upper cap.

This course covers the skills and knowledge needed to train Navy personnel for advanced or critical primary valve operations, using the requirements and techniques of: NAVSEA 0989-036-7000, A4W Reactor Plant Valves and Auxiliary Equipment; NAVSEA 0989-150-0000, Standard Naval Nuclear Valves and Auxiliary Equipment, Chapter 1.1; NAVSEA S9213-33-MMA-000, Radiological Controls for Ships, .

Target Audience: In accordance with the Section 3.8.3.1 of NAVSEA S9213-41-MAN-000(R), Engineering Department Manual for Naval Nuclear Propulsion Plants, PVO-A qualification is required for all operations involving these valves. As such, PVO-A is the minimum requirement for this course. PVO-B qualified Sailors may attend for familiarization at the command's discretion. The hands-on portion of the training is best suited with at least 5 PVO-A qualified sailors, 1 to 2 supervisors (PPWS) and at least 1 ELT.

Class Size: 8 to 10 sailors meeting the qualification levels in the target audience section above.

A typical training day would consist of 2 Groups, one morning and one afternoon. The number of days is set by the requestor, which is normally 3 to 4 days. Other supervisors or shop codes may attend and do not count against the target audience. The most limiting factor is the training space itself in terms of additional observers.

Materials to Be Provided by FMSB:

- Consumable items (Cap O-rings, cotton liners, lint free cloths, etc.)
- All special tooling and adapter required to uncap and operate the valve.
- For Norfolk area commands, FMSB supplies the 4" Valve mockup and all radiological supplies.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Materials to Be Provided by Local Command:

- Radiological supplies that are typically non-consumable (containment(s), yellow bags, gloves, etc.)
- The 4" Valve mockup (PSNS, San Diego, Japan)
- Colloidal graphite in isopropanol per MIL-L-24131

Notes:

- The Four Inch JIT is available at NNSY B276A, PSNS Shop 38 Mockup Area, San Diego and Japan.
- FMSB provides the JIT Training Instructor(s), tooling and cap O-rings for the training.
- The hosting command is responsible for all necessary radiological supplies (containment, gloves, liners, etc.) unless otherwise agreed upon.
- FMSB can provide a modified Four Inch JIT training session in conjunction with the PVO-A course upon request.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	(SLC ONLY) Primary Valve Operator – Advanced PVO-A Instructor Certification
Target audience	SLC prospective PVO trainers
Class size	Identified prior to training.
Duration	32 hours
Pre-requisites	PVO Advanced Qualified (By Completion of S-661-0018)

Outline of Instruction/Objectives:

Instructors will be certified by FMSB in accordance with NAVSEA letter Ser 08M/02-01717 dated 14 March 2002 as part of their qualification.

In order to obtain Instructor Certification, each candidate must have previously completed a formal PVO-A Course (S-661-0018). FMSB will observe the instructor candidate's delivery of the course (S-661-0018) to the maximum extent practical and will provide direct feedback/training to the instructor candidate during the certification. The instructor candidate will receive turnover of advanced instructional materials (when applicable). Upon completion of the course, FMSB will make a recommendation to the command whether or not the candidate should be certified to deliver the course.

Target Audience: Instructors assigned to a SLC who are tasked with administering the PVO training programs at their site.

Class Size: Typically 1 Instructor Candidate is evaluated; however, more can be evaluated on a case basis during a single visit. Contact FMSB for additional instructor certification details and scheduling.

Materials to Be Provided by FMSB:

- None.

Materials to Be Provided by Local Command:

- All items required to conduct the course.

Notes:

- An Instructor Certification is conducted at a SLC during a normally scheduled PVO-A Course.
- In cases where an Instructor Candidate has not attended a formal PVO-A Course, FMSB can expand the visit to cover 2 weeks, where week 1 is the PVO-A course administered by FMSB with the Instructor Candidate in attendance. Week 2 then becomes the Instructor Candidate's course to deliver and be evaluated.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Escape Steam Valve Just-in-Time Training (JIT)
Target audience	Sailors and Supervisors assigned to make a setpoint adjustment of the valve or to make a pilot valve packing adjustment in order to correct nozzle tell-tale leakage.
Class size	Limited by classroom size and mockup area. The course is best delivered to 3-5 Sailors at a time due to the intricate nature of the work.
Duration	~ 3 hours per group
Pre-requisites	None

Outline of Instruction/Objectives:

FMSB has a full scale mockup of an Escape Steam Valve that is available for mockup training. A typical training session is approximately 1 hour of instructor-led discussion on the valve construction and procedural overview for either setpoint adjustment or pilot valve packing adjustment. This is followed up with 2 hours of hands on familiarization where the attendees will adjust packing gland nut torque and adjust the setpoint.

This course covers the skills and knowledge needed to train Navy personnel on the setpoint adjustment or pilot valve packing adjustment using the requirements and techniques of NAVSEA 0989-150-0000 Standard Naval Nuclear Valves and Auxiliary Equipment, Chapters 1.1 of and 8.2.

Materials to Be Provided by FMSB:

- All necessary tooling, procedures, parts and consumable items.

Materials to Be Provided by Local Command:

- FMSB recommends the local command bring the special tools (modified wire cutter and modified chisel) to the training session. If the command desires assistance to make these special tools, this can be negotiated during the scheduling process.

Notes:

- This training is being piloted at NNSY B276A. A possibility exists to conduct the training at an OUT site by shipping the trainer mockup to and from sites as necessary.
- This training is best timed for operating commands who will be conducting setpoint testing of the valves in the near-term or are in need of packing adjustment to correct nozzle tell-tale leakage.
- FMSB will provide the necessary consumable and special tools required for the training. The individual command should procure its own set of special tools.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Propulsion Plant Trade Skills Course (CIN: S-661-1026)
Target audience	Craftsmen Qualified Machinist's Mates, Work Center Supervisors, QAIs
Class size	12 craftsmen (2 craftsmen per workstation; 6 workstations) Student Billeting is generally limited to 12 craftsmen. Additional personnel are encouraged to attend as observers.
Duration	80 hours
Pre-requisites	Craftsman 301, 3M-301

Outline of Instruction/Objectives:

- Overview of types of procedures
- Analyze procedures for adequacy and accuracy to include:
 - DSO Clean and Inspect
 - Raised face flange to raised face flange
 - Ground seat union
 - WOG valve repair/replacement
 - ½" 803-2177525 valve repair
- Summarize steam plant clean requirements to a given scenario.
- Determine applicable sections of given references for disassembly, inspection, and reassembly of mechanical joints
- Conduct in-class practical exercises to disassemble, inspect, and reassemble various mechanical joints
- Determine correct replacement software for various mechanical joints using applicable technical manual excerpts
- Determine correct lubricant using applicable technical manual excerpts

This course is intended to provide instruction and hands-on familiarization for disassembly, inspection, repair, and reassembly of flanged, metal-to-metal unions, and body to bonnet joints. Instruction will include discussions involving lubrication, cleanliness and quality controls (QA forms, controlled materials, etc.).

Classroom Configuration: The following is considered an optimum classroom configuration for this training topic:

- Suitably sized for 12 students, to include seating (tables or desks) with additional space to accommodate 6 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to a network preferred, e.g., NMCI or NNPP Web)

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Materials to Be Provided by FMSB:

- Excerpts from technical manuals to support the training. For example, NAVSEA 0948-LP-012-5000 to include Chapter 1, Section 4.1, and Appendix 4/A.1
- Hand tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, and special tools as required.
- Portable workbenches
- Mock-up valves manufactured to NAVSHIPS drawing 803-2177525 (½" or 1", as requested by local command)
- Raised-face to raised face flanged mock ups
- Metal-to-metal union mock ups

Materials to Be Provided by Local Command:

The following items shall be provided by the local command in sufficient quantities to support a class size of 12 craftsmen

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Colloidal graphite in isopropanol per MIL-L-24131
- Grease, silicon, per A-A-59691 (or equivalent)
- Anti-galling compound per A-A-59004
- Grease per DOD-G-24508

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

Outline of Instruction:

- Each lesson builds upon the previous lesson. This reinforces the information and processes each craftsman are taught. Basic elements include tool usage, good shop practices, steam plant clean requirements, and various mechanical joint repairs. Students will also perform a full repair of 803-2177525 valves: clean, inspect, disassembly, seat repair, packing replacement, and reassembly.
- P02: distinguishes and evaluates types of technical work documents.
- P03: applies common work practices to complete a DSO FWP; including tool usage and steam plant clean requirements.
- P04: evaluates drawings for a given scenario; fastener theory is also covered.
- P05: performs mechanical joint disassembly/assembly.
- P06: executes WOG valve replacement, union mechanical joint disassembly/assembly, and seat replacement.
- P07: use Standard Navy Valve Manual to locate pertinent information regarding commonly performed organization level maintenance actions
- P08: perform the complete repair of a ½" 803-2177525 valve.

In-Class Practical Exercises:

- Review various FWP's associated with lesson plan
- Steam Plant Clean practices during various maintenance tasks
- Gasket replacement of raised face to raised face flange
- WOG valve and seat replacement
- 803-2177525 valve repair

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Audits and Surveillances
Target audience	Quality Assurance Supervisors, Quality Assurance Officers, Leading Chief Petty Offices and Division Officers
Class size	12
Duration	2 hours (1 hour workshop)
Pre-requisites	*FMSB request copies of local A&S instructions and recent audit findings two weeks prior to the training.

Outline of Instruction/Objectives:

- Define the key elements of an effective Audit and Surveillance (A&S) Program
- Explain the difference between a vertical and horizontal audit
- Identify the Audit, Surveillance & Evaluations (AS&E) program requirements
- Generate methods to accomplish surveillance and audit requirements (e.g., random spot checks, work center maintenance schedule, etc.).
- Develop an attribute checklist based on requirements and past performance (if one has not been provided by the host command)
- Use an attribute checklist (or the developed one) to evaluate a portion of a TWD (provided by the host command)
- Derive an effective deficiency comment. (e.g. “Contrary to *specific technical reference, specific deficiency...*”)

In-Class practical exercises:

- Practice effective comment writing using provided A&S findings

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material

Materials to Be Provided by Local Command:

- Local instructions governing audits and surveillances
- Recent audit findings
- Current attribute checklists (if not contained in local instruction)
- A closed out TWD (FWP or CWP).

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Training Programs
Target audience	QAO/AQAO/QAS/QA Division Personnel
Class size	12
Duration	2 hours (1 Hour Lecture, 1Hour Small Group Seminars)
Pre-requisites	

Outline of Instruction/Objectives:

An overview of the training responsibilities, training requirements and topics, organization and implementation of the training plan, testing and evaluation processes. Information is referenced from the JFMM and PQS.

In-Class practical exercises:

- Participants in the second hour will apply the knowledge gained in the first hour by assessing their current training program.

Materials to Be Provided by FMSB:

- Excerpts of applicable reference material

Materials to Be Provided by Local Command:

- Local instructions governing audits and surveillances
- Current attribute checklists (if not contained in local instruction)
- Participants must bring a copy of their QA Training program for self-assessment during the second hour.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Qualification Programs
Target audience	QAO/AQAO/QAS/QA Divisional Personnel
Class size	12
Duration	2 hours (1 Hour Lecture, 1Hour Small Group Seminars)
Pre-requisites	

Outline of Instruction/Objectives:

An overview of the responsibilities of the QAO for the QA Qualification program. Using Volume V-I-3 of the JFMM, the qualification requirements for each subject area listed will be reviewed. Methods used to modify PQS will be discussed. Methods of synthesizing oral board interview questions for PQS qualification will be discussed. Lastly, an overview of the qualification retention requirements in accordance with the JFMM will be conducted.

In-Class practical exercises:

In a small group setting:

- Participants will review excerpts from NAVEDTRA 43523, Personnel Qualification Standard for Quality Maintenance Program. From this review, participants will derive three (3) oral interview questions that you would use based on the contents of those sections.
- Review excerpts from NAVEDTRA 43523 103, Quality Maintenance Program Fundamentals. Select a work center that is assigned at your next/current command and identify any attributes that you would recommend for addition or deletion.

Materials to Be Provided by FMSB:

- NAVEDTRA 43523
- Applicable excerpts from the JFMM.

Materials to Be Provided by Local Command:

- None

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Mechanical Joint Assembly – Flanges and Unions
Target audience	Craftsmen Qualified Machinist’s Mates, Work Center Supervisors, QAIs
Class size	8 craftsmen (2 craftsmen per workstation; 4 workstations) Student Billeting is generally limited to 8 craftsmen. Additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).
Duration	6 hours
Pre-requisites	Craftsman 301, 3M-301

Outline of Instruction/Objectives:

- Provide design overview of raised face to raised face flange and union joints, and associated software
- Determine applicable sections of NSTM Chapter 505 for disassembly, inspection, and reassembly of raised-face flanged and metal-to-metal union joints
- Determine correct replacement software for raised-face flanged and metal-to-metal mechanical joints using applicable technical manual excerpts
- Determine correct lubricant using applicable technical manual excerpts
- Provide overview of process to disassemble, inspect, and reassemble flanged joints IAW applicable technical manual excerpts
- Provide overview of process to disassemble, inspect, and reassemble metal-to-metal joints IAW applicable technical manual excerpts
- Conduct in-class practical exercises to disassemble, inspect, and reassemble a raised-face flanged joint and a metal-to-metal union joint

This topic is intended to provide instruction and hands-on familiarization for disassembly, inspection, and reassembly of flanged and metal-to-metal union joints. Instruction will include discussions involving lubrication, cleanliness and quality controls (QA forms, controlled materials, etc.). Technical publications that govern these discussion points will be provided during instruction.

Classroom Configuration: The following is considered an optimum classroom configuration for this training topic

- Suitably sized for 8 students minimum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants

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- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to a network preferred, e.g., NMCI or NNPP Web)

In-Class Practical Exercises:

- Disassemble, inspect, and reassemble a raised-face to raised face flanged joint
- Disassemble, inspect, and reassemble a metal-to-metal union mechanical joint

Materials to Be Provided by FMSB:

The following items are provided in sufficient quantities to support a class size of 8 craftsmen:

- Excerpts from technical manual NSTM Chapter 505
- Excerpts from technical manual NSTM Chapter 75
- Excerpts from technical manual NSTM Chapter 78 (V2)
- Excerpts from technical manual NAVSEA 389-0317
- Excerpts from technical manual NAVSEA S9505-AM-GYD-010
- Drawing 525-6937327
- Hand tools, precision measuring tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, replacement graphitic spiral-wound gasket assemblies, and replacement union joint O-ring assemblies
- Portable workbenches
- Mock-up raised-face to raised face flanged mechanical joint assemblies
- Mock-up metal-to-metal union mechanical joint assemblies

Materials to Be Provided by Local Command:

The following items shall be provided in sufficient quantities to support a class size of 8 craftsmen:

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Anti-galling compound per A-A-59004

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Mechanical Joint Assembly – Bite-Type/Compression Fittings
Target audience	Craftsmen Qualified Machinist’s Mates, Work Center Supervisors, QAIs
Class size	8 craftsmen (2 craftsmen per workstation; 4 workstations) Student Billeting is generally limited to 8 craftsmen. Additional personnel are encouraged to attend as observers (e.g. Work Center Supervisors).
Duration	3 hours
Pre-requisites	Craftsman 301, 3M-301

This topic is intended to provide instruction and hands-on familiarization for presetting flareless mechanical bite-type fittings, and joint assembly.

Outline of Instruction:

- Provide design overview of flareless mechanical bite-type fitting joints
- Provide overview of methods for identifying flareless mechanical bite-type ferrules and other joint parts
- Determine applicable sections of NSTM Chapter 505 for presetting ferrules and assembling joints of non-nuclear flareless mechanical bite-type fitting joints
- Determine applicable sections of NAVSEA 389-0317 for presetting ferrules and assembling joints of nuclear flareless mechanical bite-type fitting joints
- Discuss cautions relating to mixing of non-compatible bite-type and compression fitting parts
- Provide overview of process to preset new ferrules to tubing and the required inspections IAW applicable technical manual excerpts
- Provide overview of process to assemble flareless mechanical bite-type fitting joints IAW applicable technical manual excerpts
- Conduct in-class practical exercises to preset and inspect new ferrules to tubing, then assemble flareless mechanical bite-type fitting joints IAW applicable technical manual excerpts

In-Class Practical Exercises:

Install a flareless mechanical bite-type ferrule to a length of prepared tubing and assemble the joint IAW applicable technical requirements, to include:

- Verify provided ferrule is correct material and design
- Prepare end of provided tubing in preparation for presetting ferrule
- Install and preset ferrule on tubing
- Perform inspection to determine satisfactory installation of ferrule on tubing
- Assemble joint

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic:

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- Suitably sized for 8 students maximum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Electrical outlet(s) available for use of 110v equipment (e.g., portable vacuum cleaners, etc.)
- Authorized for use of hazardous materials within, to include cleaning solvents (e.g., alcohol) and lubricants
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to a network preferred, e.g., NMCI or NNPP Web)

Materials to Be Provided by FMSB:

The following items are provided in sufficient quantities to support a class size of 8 craftsmen:

- Excerpts from technical manual NSTM Chapter 505
- Excerpts from technical manual NAVSEA 389-0317
- Hand tools, consumable items (cleaning brushes, wiping clothes, etc.), safety glasses/goggles, tubing, and replacement ferrules
- Portable workbenches

Materials to Be Provided by Local Command:

The following items shall be provided in sufficient quantities to support a class size of 8 craftsmen:

- Cleaning solvent, alcohol (denatured, isopropyl, etc.), 200 proof
- Colloidal graphite in isopropanol per MIL-L-24131

NOTE - Disposal of all waste generated during training topic to include hazardous materials (lubricants, etc.) shall be the responsibility of the local command.

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Topic	Locking Devices
Target audience	Craftsmen Qualified Machinist's Mates, Work Center Supervisors, QAIs
Class size	8 craftsmen (2 craftsmen per workstation; 4 workstations) Student Billeting is generally limited to 8 craftsmen; exceptions may be made to allow additional personnel as participants or observers.
Duration	3.5 hours
Pre-requisites	Craftsman 301, 3M-301

Objectives:

- Provide overview of uses for Lock Tabs, Lockwire and Locking Cable
- Provide overview of requirements between the use of Lockwire and Locking Cable.
- Determine applicable sections of MIL-STD-763(current Rev)
- Discuss cautions relating to the use of Lock Tabs, Lockwire and Locking Cable
- Provide overview of process Lock single and multiple fasteners on a component
- Provide overview of process on the use of Lockwiring
- Provide overview of process on the use of Locking Cable installation tools
- Provide overview of process on the use of Lock Tabs
- Conduct in-class practical exercises to Lockwire two and three fasteners together
- Conduct in-class practical exercises using Lock Cable on two and three fasteners

In-Class practical exercises:

- Install Lockwire and Locking Cable on multiple fasteners.
- Verify Locking Cable ferrule is correctly installed
- Perform the correct twist on Lockwire during installation
- Install Lockwire and Locking Cable in the correct pattern (reverse S)
- Perform inspection of Lockwire and Locking Cable for proper twist, tension, length, routing as applicable
- Determine the correct size of Lockwire, Locking Cable and Lock Tab
- Practice Lockwiring fasteners with various sizes of Lock wire

Classroom Configuration:

The following is considered an optimum classroom configuration for this training topic:

- Suitably sized for 8 students maximum, to include seating (tables or desks) with additional space to accommodate 4 portable workbenches spaced sufficiently to allow 2 students per workbench to work in a safe and efficient manner
- Well-lit to allow reading of training materials
- Configured with computer workstation and overhead projector to display electronic training media and technical publications (FMSB personnel access to a network preferred, e.g., NMCI or NNPP Web)

FLEET MAINTENANCE SUPPORT BRANCH TRAINING TOPICS

Materials to Be Provided by FMSB:

- Lock Tabs, Locking Cable, Lock Wire
- Locking cable tools
- Lock wire pliers
- Mock ups

Materials to Be Provided by Local Command:

- Disposal of all waste generated during training topic shall be the responsibility of the local command.