NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-11
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Insulation and Lagging; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 MIL-STD-769, Insulation Requirements for U.S. Naval Vessels

2.3 804-5959212, Surface Ship Machinery Insulation - Installation Details

2.4 804-5959214, Piping Insulation - Installation Details

2.5 804-5773931, Insulation for Compartments, Acoustic and Thermal Installation Details

2.6 804-5773932, Insulation for Ducts, Acoustic and Thermal, Installation Details

2.7 803-5184182, Insulation, Passive Fire Protection - Installation Details

2.8 46 CFR Part 164, Materials

2.9 S4823-C-3160935, Fasteners for Insulation and Lagging

3. REQUIREMENTS:

3.1 Install new insulation, lagging, and reusable covers in accordance with 2.2 through 2.7, and the following:

3.1.1 Use of elastomeric foam conforming to MIL-P-15280 and polyphosphazene conforming to MIL-I-24703 is not permitted.

3.1.2 MIL-PRF-22344 insulation shall not be installed on hot piping above one-inch Nominal Pipe Size (NPS) and shall be installed only on piping with a vertical orientation or in low traffic areas.

3.1.3 Install insulation, anti-sweat and refrigerant, thermal foam conforming to MIL-PRF-32514 on anti-sweat and refrigeration piping systems that have an operating temperature of minus 20 degrees to 180 degrees Fahrenheit. (See Note 4.6)

3.1.3.1 Install with adhesive conforming to MIL-A-24179.

3.1.3.2 Install rewettable fibrous glass cloth lagging conforming to MIL-C-20079, Type I, Class 6 or 8, in high traffic areas. In addition to the requirements of MIL-C-20079, rewettable lagging shall meet the requirements of Section 164.009-3 of 2.8, unless otherwise approved by NAVSEA.

3.1.4 Utilize Polyimide foam insulation conforming to MIL-DTL-24688, Type I, for piping and machinery systems other than systems listed in 3.1.3, and with a maximum operating temperature of 400 degrees Fahrenheit.

3.1.5 Accomplishment of welding, fabrication, and inspection requirements for new fasteners (studs) to support insulation and lagging shall be in accordance with NAVSEA Standard Items (See Note 4.3).

3.1.6 Accomplishment of cleaning and painting requirements for surfaces to be insulated with the exception of non-ferrous and corrosion resistant steel (CRES) piping, plating, and vent ducting shall be in accordance with NAVSEA Standard Items (See Note 4.4).

3.1.7 Secure reusable covers using snap fasteners or laced with copper, brass or soft steel galvanized wire through hooks or rings in accordance with 2.9.

3.1.7.1 Stamp the surface of the lacing washers, piece 200 of 2.8, on the reusable cover with one quarter inch high letters, NO AB, located close to the outer edge of the washer and visible when the reusable cover is installed.

3.2 Accomplishment of cleaning and painting requirements for new insulation, lagging, and reusable covers to match surrounding areas shall be in accordance with NAVSEA Standard items (See Note 4.5).

4. NOTES:

4.1 Known source for EB Spec. 4013:

General Dynamics Company
Dept. 447 Material Services
Attn: K. Hamler
75 Eastern Point Road
Groton, CT 06340-4899
Tel: 860-433-2373

4.2 Known sources for rewettable fibrous glass cloth lagging:

BGF Industries, Inc.
3802 Robert Porcher Way
Greensboro, NC 27410
Tel: 800-925-1961

Alpha Associates
Two Amboy Avenue
Woodbridge, NJ 07095
Tel: 732-634-5700

4.3 If welding of fasteners (studs) to support lagging and or insulation of 3.1.5 is required; the use of Category II Standard Item 009-12 “Welding, Fabrication, and Inspection Requirements; accomplish” of 2.1 will be specified in the Work Item.

4.4 If surfaces are to be insulated with the exception of non-ferrous and corrosion resistant steel (CRES) piping, plating and vent ducting of 3.1.6 is required; the use of Category II Standard Item 009-32 “Cleaning and Painting Requirements; accomplish” of 2.1 will be specified in the Work Item.

4.5 If cleaning and painting for the new insulation, lagging, and reusable covers to match surrounding areas of 3.2 is required; the use of Category II Standard Item 009-32 “Cleaning and Painting Requirements; accomplish” of 2.1 will be specified in the Work Item.

4.6 "Electric Boat Specification No. 4013 Anti-Sweat and Refrigerant Insulation Systems (EB Spec. 4013) and MIL-PRF-32514 are equivalent."

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-27
DATE:	18 NOV 2016
CATEGORY:	II

1. SCOPE:

1.1 Title: Material Identification and Control (MIC) for Level I System; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 0948-LP-045-7010, Material Control Standard

2.3 S9086-GY-STM-010/CH-221, Boilers

3. REQUIREMENTS:

3.1 Provide and maintain a Material Identification and Control (MIC) System in accordance with 2.2 for both Government furnished and contractor furnished materials utilized in the installation, alteration, and repair of systems or portions of systems designated as MIC LEVEL I by Work Items in the Job Order. The system shall be described in a written procedure that shall be submitted to the SUPERVISOR for review and approval prior to implementation. The procedure requires a one-time submittal/approval unless the Standard Items change and/or references change or are updated. The Material Identification and Control program for Level I Materials shall be subject to periodic conformity audits by the SUPREVISOR throughout the contract period. This procedure shall specifically address, as a minimum, the following:

3.1.1 Assignments of responsibility for identification and control of LEVEL I material including working level instructions for:

3.1.1.1 Procurement of pre-certified LEVEL I material from an authorized LEVEL I certifying activity or National Stock System.

3.1.1.2 Inspection of pre-certified LEVEL I material in accordance with Section 3.4 of 2.2.

3.1.1.3 Storage of LEVEL I material including segregation from non-LEVEL I materials.

3.1.1.4 Issue of LEVEL I material including transfer of marking for raw materials (e.g., bar, pipe, tube and threaded rod).

3.1.1.5 Identification and control of LEVEL I material during all phases of work (e.g., material movement, manufacturing, repair, ripout, installation).

3.1.1.6 Local manufacturing and testing of LEVEL I components manufactured from certified raw materials.

3.1.1.7 Visually verifying at the time of or subsequent to installation into a system subassembly or aboard ship that the permanent material designator markings, material type for fasteners or grade/type for consumable materials are correct in accordance with the generic material requirements of applicable drawing and/or NAVSEA-approved nonconformances and Engineering Changes.

3.1.1.8 Documentation of installation of LEVEL I material in accordance with Section 3.10.3 of 2.2.

3.2 Accomplishment of a Process Control Procedure (PCP) for all work within the LEVEL I boundary including manufacture, installation and repair of LEVEL I systems, components and material shall be in accordance with NAVSEA Standard Items (See Note 4.2) except for the following actions:

3.2.1 Software replacement (e.g., O-rings, packing glands, body-to-bonnet gaskets, silver seal replacements).

3.2.2 Inspection to support routine maintenance programs or troubleshooting.

3.2.3 Replacement of any non-pressure boundary parts which are not LEVEL I parts.

3.3 Submit one legible copy, in approved transferrable media, of the completed LEVEL I work item including the required installation records to the SUPERVISOR at the completion of work and/or a minimum of one day prior to system testing/operation.

4. NOTES:

4.1 LEVEL I designation applies only to materials specified in 2.2 and Section 221-2.17 of 2.3.

4.2 If a Process Control Procedure (PCP) for all work within the LEVEL I boundary including manufacture, installation and repair of LEVEL I systems, components and material in 3.2 is required; the use of a Category II Standard Item 009-09 “Process Control Procedure (PCP); provide and accomplish” of 2.1 will be specified in the Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-29
DATE:	29 JUL 2004
CATEGORY:	I

1. SCOPE:

1.1 Title: Asbestos-Free Pipe Hanger Liner Material; install

2. REFERENCES:

2.1 None.

3. REQUIREMENTS:

3.1 Install new fibrous glass pipe hanger liners in lieu of liners containing asbestos material. This requirement applies only where hangers and pipes are removed or new hangers are being installed.

3.2 New liner material shall be in accordance with MIL-C-20079, Type II, Class 4, for temperatures over 180 degrees Fahrenheit up to 650 degrees Fahrenheit.

3.3 For services above 650 degrees Fahrenheit where minimum contact area type hanger designs (similar to that shown in MSS SP-58) are required, no liner material is used.

4. NOTES:

4.1 None.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-30
DATE:	18 NOV 2016
CATEGORY:	II

1. SCOPE:

1.1 Title: Boiler Sample Tube; inspect

2. REFERENCES:

2.1 S9221-C1-GTP-010, Main Propulsion Boilers; Repair and Overhaul

3. REQUIREMENTS:

3.1 Remove tubes using tube-sampling methods in accordance with Paragraph 3.4 of 2.1.

3.1.1 Cut generating tubes removed as samples 8 to 10 inches above the water drum.

3.2 Identify and metal-tag tubes, tube stubs, and tube sections removed, with ship's name and hull number, Work Item number, boiler number, tube designation, bottom and top of sections, segment sequence, upstream side (furnace face), and downstream side of gas flow.

3.2.1 Cut tube removed into 3-foot minimum segments and split longitudinally by mechanical method with tube dry (no oil) so that upstream side (furnace face) half is split from side downstream of gas flow half.

3.2.1.1 There shall be 2 distinct, individual halves to each segment, tube stub, and bend.

3.2.1.2 Each half (waterside/steamside and fireside) shall remain intact.

3.2.2 Identify and metal-tag each segment and half in accordance with 3.2 so that full length of tube may be reconstructed and placement oriented.

3.3 Inspect tube segments for the following:

3.3.1 Steamsides/watersides:

3.3.1.1 Oil deposits

3.3.1.2 Loose sludge

3.3.1.3 Hard baked-on sludge

3.3.1.4 Scale

3.3.1.5 Scabs/tubercles

3.3.1.6 Pitting

3.3.1.7 High temperature oxides

3.3.1.8 Waterside grooves

3.3.1.9 Corrosion fatigue fissures

3.3.1.10 General waterside thinning

3.3.1.11 Waterside burning

3.3.1.12 Waterside abrasion

3.3.1.13 Die marks

3.3.1.14 Steam tracking

3.3.1.15 Stress corrosion cracking (caustic embrittlement)

3.3.2 Firesides:

3.3.2.1 General fireside thinning

3.3.2.2 Fireside burning

3.3.2.3 Tube enlargement

3.3.2.4 Swaging

3.3.2.5 Sagging

3.3.2.6 Warping

3.3.2.7 Heat blisters

3.3.2.8 Thermal cracks

3.3.2.9 Mechanical fatigue cracks

3.3.2.10 Steam gouging

3.3.3 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.3 to the SUPERVISOR.

3.4 Collect samples (equal to a heaping tablespoon each) of waterside soft and hard deposits for each boiler.

3.4.1 Soft deposits - Place the tube segments in a vise with the waterside up and wirebrush watersides. Collect loose residue in a bottle. Label bottle with the title Soft Deposits, ship, boiler number, and tube number.

3.4.2 Hard deposits - Place the tube segment in a vise with the waterside up and power wirebrush watersides to remove loose residue. Crimp the tube segment slowly allowing flakes of hard sludge to fall back into the tube. Collect the loose flakes in a bottle. Label bottle with title Hard Deposits, ship, boiler number, and tube number.

3.5 Package tubes, deposit samples, and a copy of report (3.3.3) and send to a laboratory qualified to accomplish chemical analysis.

3.5.1 Analyze the tube samples for the following:

3.5.1.1 Tube wall thickness at zero, 90, 180, and 270-degree positions

3.5.1.2 Extent of pitting (major pit depths and average overall pitting)

3.5.1.3 Thickness of hard scale mineral deposits

3.5.2 Analyze deposit samples for specific mineral composition in percentages of calcium, magnesium, and silicon oxide.

3.5.3 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.5.1 and 3.5.2 to the SUPERVISOR.

4. NOTES:

4.1 Sample tube(s) replacement will be included in the invoking Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-31
DATE:	18 JUL 2014
CATEGORY:	II

1. SCOPE:

1.1 Title: Boiler Waterjet Cleaning; accomplish

2. REFERENCES:

2.1 S6300-AE-MMA-010, Waterjet, Model WBD-150N, Operation, Maintenance, Repair and Overhaul Procedures

3. REQUIREMENTS:

3.1 Accomplish the requirements of this item for waterjet cleaning of boiler watersides, using manufacturer's equipment manual and 2.1 for guidance.

3.1.1 Portable extension lights shall conform to MIL-F-16377/49, Symbol 306.2 or MIL-F-16377/52, Symbol 286.

3.1.1.1 Ground each light fixture at the voltage source.

3.1.2 The high-pressure waterjet cleaning unit shall be operated at no more than 10,000 pounds per square inch (PSI).

3.1.3 Rope off and post warning signs in the areas where the unit is operating, where the high-pressure hose is run, and where the waterjet cleaning is to be accomplished.

3.1.4 Unit shall be stopped immediately if high-pressure leaks occur in pump, piping, high-pressure hose, or hose couplings.

3.1.5 While personnel are waterjetting, lance operator shall be in direct visual contact with control gun operator stationed outside of boiler. Control gun operator shall also maintain direct person-to-person voice communication with pump operator, using telephone, radio, or other positive direct means. Communication relay through intermediaries is not acceptable.

3.1.6 The control gun operator shall be able to regulate the flow of water to permit the system to be pressurized during the actual tube cleaning and have the nozzle pressure reduced to zero while the operator removes the lance from one tube and inserts it into the next tube to be cleaned.

3.2 Cleaning equipment shall meet minimum requirements listed herein:

3.2.1 Supply hose from the pump to the control gun shall be 1/2-inch inside diameter (I.D.) with 30,000 PSI minimum burst pressure and shall not exceed 400 feet in length. A 15-foot length of supply hose shall be attached between the control gun and the flexible lance.

3.2.2 Provide a high pressure return line from the control gun dump connection to the waterjet supply tank, on units that discharge pressure to the bilges between cycles.

3.2.3 Tube cleaning nozzle shall be non-rotating. Orifices in the nozzles shall be angled back 30 degrees. Nozzles shall have a minimum of 18 orifices evenly spaced around the circumference. Each orifice shall be 0.024 inch in diameter, plus or minus 0.001 inch.

3.2.4 Fan pattern nozzle attached to a rigid lance for cleaning drum and header surfaces.

3.2.5 Lance and nozzle burst pressure ratings shall be 25,500 PSI minimum. Lance shall be 0.229 inch or larger I.D. and shall have a smooth Teflon core, and shall not exceed 25 feet in length.

3.2.6 Waterjet cleaning solution shall consist of one pound of sodium nitrite to 100 gallons of clean, fresh water.

3.3 Maintain operating pressures and flow rates for boiler cleaning as follows:

3.3.1 Boiler tube cleaning - 10,000 PSI maximum, 9,000 PSI minimum pump discharge pressure at 20 gallons per minute.

3.3.2 Drum and header surface cleaning - 7,500 PSI maximum, 6,500 PSI minimum pump discharge pressure, at 12 to 14 gallons per minute.

3.4 Verify waterjet cleaning equipment capability prior to commencement of work.

3.4.1 Place the lance and nozzle that will be utilized in waterjet cleaning securely into a container. Ensure lance cannot break loose and that unit output is 20 gallons per minute.

3.5 Accomplish cleaning operations as follows:

3.5.1 Lance and nozzle shall traverse the entire length of every tube cleaned.

3.5.1.1 Downcomer, riser, and support tubes shall be traversed twice.

3.5.2 The lance and nozzle shall traverse the tubes at a maximum rate of one foot per second.

3.5.3 A fan nozzle shall be used to clean entire interior drum surfaces.

3.6 Pump waterjet wastewater effluent from boiler to a holding container or a waterjet wastewater recycling unit. Do not drain wastewater to bilges.

3.6.1 Waterjet wastewater recycling filter process shall be capable of filtering the wastewater effluent to meet the following criteria:

Suspended Solids	< 10 mg/L
Sodium Nitrite	1100 - 1300 mg/L
Ph	6.5 - 8.5
Nitrate	< 10 mg/L
Oil and Grease	< 5 mg/L

3.6.1.1 Recycled wastewater discharge samples shall be taken every 3,000 gallons to ensure levels do not exceed the above criteria.

3.6.2 Remove and dispose of spent chemicals and solutions in accordance with federal, state, and local regulations.

3.6.3 Accomplish a fresh water flush of all internal surfaces cleaned in 3.5.

3.7 Dry tubes, headers, drums, and downcomers using clean, dry air immediately upon completion of waterjet cleaning. Remove pockets of water and dry surfaces using clean rags.

(V)(G) "CLEANLINESS"

3.8 Inspect surfaces to ensure the following requirements are met:

3.8.1 Surfaces shall be dry.

3.8.2 There shall be no evidence of flash rusting.

3.8.3 There shall be a streaking effect seen when looking into the tubes. The streaking effect shall begin within one to 2 inches from the tube end and continue through the visible length of the tube.

3.8.4 Soft deposits and obstructions shall be removed.

3.8.5 Residual sodium nitrite deposits remaining after the surfaces are dried is acceptable.

4. NOTES:

4.1 None.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-38
DATE:	18 NOV 2016
CATEGORY:	II

1. SCOPE:

1.1 Title: Boiler, Catapult Accumulator and Reboiler Dry Lay-up; accomplish

2. REFERENCES:

2.1 S9086-GY-STM-010/CH-221, Boilers

2.2 S9587-B1-MMA-010, Catapult Steam Support Systems for CV/CVN Class Ships

2.3 525-7270424, Steam Accumulator Dehumidification

2.4 0989-036-0000, CVN 68 Class Steam Plant Manual (CONFIDENTIAL)

2.5 S9534-AD-MMA-010, Steam Reboiler

3. REQUIREMENTS:

3.1 Boiler: Prepare boiler for dry lay-up in accordance with Paragraph 221-2.3.3 of 2.1.

3.1.1 Fill or drain water in steam drum to a level below the bottom of the manhole.

3.1.2 Inject 10 pounds of sodium nitrite for each 1,000 gallons of boiler water in a slurry solution to the water in the boiler.

3.1.2.1 If boiler is pressurized, inject sodium nitrite after pressure drops to 100 PSIG or less.

3.1.3 Fill the steam drum to bring water level to the top of the gage glass using water conforming to the following requirements:

CONSTITUENT or PROPERTY	REQUIREMENT
pH	5.8 to 8.0
Conductivity	2.5 micromho/cm (at point of delivery)
Dissolved Silica	0.2 ppm (0.2 mg/L) max
Hardness	0.10 epm (0.10 meq/L) max

3.1.3.1 Prevent water level from carrying the solution over into the superheater.

3.1.4 Do not drain the solution to the bilge.

3.1.5 Remove each drum manhole plate and header handhole plate from boiler.

3.1.5.1 Do not remove seal welded handhole plates.

3.1.6 Blow out horizontal tubes with clean air to remove any water. Dry remaining solution from water walls, economizers, superheater headers, steam and water drums.

3.1.7 Circulate heated air with positive flow through the firesides and watersides, as long as the boiler is in a dry lay-up condition, in accordance with Paragraph 221-2.3.3.1 of 2.1. (See Note 4.1)

3.1.7.1 Introduce and exhaust heated air in accordance with Table 221-2-2 and Table 221-2-3 of 2.1.

3.2 Catapult Accumulator, Drain Accumulator: Open manway access, dry out and remove standing water in accordance with Paragraph 5.5.1 of 2.2.

3.2.1 Install temporary closures (FME) in accordance with Paragraph 5.5.3 of 2.2.

3.2.2 Provide source of heated air to the accumulator through the manway opening in accordance with Paragraph 5.4.4 of 2.2.

3.2.3 Introduce heated air through a 4.0 inch hose penetrating the temporary manhole cover in accordance with Table 221-2-3 of 2.1, Unit Type IV.

3.2.3.1 Manufacture manway cover in accordance with details 10-E through 15-E of 2.3.

3.2.4 Accomplish dehumidified air lay-up in accordance with 2.2, using 2.3 for guidance.

3.3 Reboiler Shell Side, Drain Reboiler: Accomplish dry lay-up in accordance with 2.4 and Chapter 3 of 2.5.

3.3.1 Open manway access, conduct feed water wash down of the tube bundle and internal areas of the shell with high pressure water lance in accordance with Chapter 3 of 2.5.

3.3.2 Dry out and remove standing water.

3.3.3 Manufacture and install a plexiglass cover to seal the manway opening, using details 10-E through 15-E of 2.3 for guidance. Cover shall have a 4.0 inch hole in the middle to allow penetration of air vent duct (supply) and 4 each 0.75 inch holes for air exhaust points in accordance with Chapter 3 of 2.5.

3.3.4 Introduce heated air through a 4.0 inch hose penetrating the temporary manhole cover in accordance with Table 221-2-3 of 2.1, Unit Type I.

3.3.5 Install vent ducting hose (supply) from outlet of the heater through the manway cover to the conical section (rear) of the Reboiler and align air exit points by opening drum vent valve RB-V280 and Bottom Blow valves RB-V105A/105B/108 in accordance with Chapter 3 of 2.5.

(V) "INSPECT BOILER, ACCUMULATOR AND REBOILER LAY-UP"

3.4 Inspect the boiler, accumulator and reboiler daily and at the end of each work shift and ensure dry lay-up conditions are maintained in accordance with Paragraphs 221-2.4.6.2 and 221-2.4.6.3 of 2.1.

3.5 Remove and dispose of spent chemicals and solutions in accordance with federal, state, and local laws, codes, ordinances, and regulations.

4. NOTES:

4.1 For ships using chelant treatment, the use of sodium nitrite prior to placing boiler on hot air or desiccant lay-up is prohibited unless the ship is in a CNO Availability.

4.2 Catapult accumulator and reboiler requirements apply to CVN only.

4.3 Aluminum material may be used to manufacture manway covers when authorized by the SUPERVISOR.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-45
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Tapered Plug Valve; repair

2. REFERENCES:

2.1 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.3 Repair valve as follows:

3.3.1 Machine, grind, or lap and spot-in plug to bore to obtain an 80 percent minimum surface contact, evenly distributed over 100 percent of the area.

(V) "INSPECT CONTACT"

3.3.1.1 Inspect contact using blueing method.

3.3.1.2 Vertical misalignment of ports in the plug valve and body with the plug fully seated shall not be of a degree that will restrict flow.

3.3.2 Chase and tap exposed threaded areas.

3.3.3 Dress and true gasket mating surfaces.

3.4 ***Assemble each valve installing new packing, each gasket and each fastener in accordance with manufacturer's specification or instruction.***

3.4.1 Lubricate each MIL-V-24509 valve with grease conforming to SAE-AMS-G-6032.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation shown on Table 504-6-1 of 2.1. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(I) "SEAT TIGHTNESS"

3.5.2 Test for seat tightness with valve in closed position with opposite side open for inspection.

3.5.2.1 Plug shall be seated by hand force.

3.5.2.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage or, in the event of visible leakage, until accurate determination of leakage can be made.

3.5.2.3 Maximum allowable leakage for a metal-to-metal seated valve: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

3.5.2.4 Allowable leakage for soft seated plug: None.

(I) "SEAT TIGHTNESS"

3.5.3 Test plug valve of duplex strainer to each strainer chamber with unpressurized side top cover removed (2 tests per strainer). Allowable leakage: With the drain valve closed the non-pressurized side shall not fill within one hour.

4. NOTES:

4.1 Test pressures of 3.5.2 and 3.5.3 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-46
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Butterfly Valve, Synthetic and Metal Seated; repair

2. REFERENCES:

2.1 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.3 Repair valve as follows:

3.3.1 Polish stem to remove raised edges and foreign matter.

3.3.2 Chase and tap exposed threaded areas.

3.3.3 Machine, grind, or lap and spot-in metal-to-metal seat to disc to obtain a leakage rate at or below that allowed in 3.5.5.

3.3.4 Polish seating surface of synthetic seated valve to remove high spots, nicks, and burrs.

3.4 Assemble valve installing new ***each*** bushing, ***each*** O-Ring, ***each*** V-Ring, ***each*** valve liner, ***each*** seat assembly, ***each*** washer, ***each*** pin, and ***each*** fastener in accordance with manufacturer's specifications or instructions.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.1. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(I) "SEAT TIGHTNESS"

3.5.2 Test for seat tightness alternately on each side of the disc with opposite side open for inspection.

3.5.3 Disc shall be seated by hand force.

3.5.4 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made.

3.5.5 Leakage rate of metal-to-metal seated valves:

3.5.5.1 Valves conforming to MIL-V-22133, Type II shall not exceed the following criteria:

Valve size inches	Leakage rate gal/min	Valve size inches	Leakage rate gal/min
2	1.5	10	35
2-1/2	2.25	12	50
3	3.25	14	60
4	6	16	80
5	9.5	18	100
6	14	20	140
8	25	24	200

3.5.5.2 Valves conforming to MIL-V-24624 shall have a maximum seat leakage rate of 10 cubic centimeters per inch of nominal pipe size per hour.

3.5.6 Allowable leakage for synthetic seated valve: None.

4. NOTES:

4.1 The test pressure of 3.5.2 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-47
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Gate Valve; repair

2. REFERENCES:

2.1 S9086-CJ-STM-010/CH-075, Fasteners

2.2 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

2.3 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

2.4 S9086-RK-STM-010/CH-505, Piping Systems

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean internal and external surfaces free of foreign matter (including paint), and inspect each part for defects.

3.2.1 The removal of body-bound studs only to determine the condition of threads is not required.

(I) or (V) "TORQUE TEST" (See 4.3)

3.2.2 Torque test each body-bound stud in accordance with Section 075-8.6.3.2(d) of 2.1.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Dress and true each gasket mating surface.

3.3.4 Machine, grind, or lap and spot-in gate to seats (including backseat) to obtain a 360-degree continuous contact.

(I) or (V) "INSPECT CONTACT" (See 4.3)

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line shall not exceed 3/16-inch in width and shall appear within the lower 75 percent of the gate seating surface.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble ***each*** valve installing new packing, ***each*** gasket and ***each fastener*** in accordance with the manufacturer's specifications.

3.4.1 Pack feedwater, condensate, and steam valves with valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.2.

3.4.2 Pack valves of systems other than feedwater, condensate, or steam with valve stem packing conforming to MIL-P-24396, Type B.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.3. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.2 Test for seat tightness alternately on each side of gate for double seated valves, and on outboard side only on single-seated valves, with the opposite side open for inspection.

3.5.2.1 Do not exceed the handwheel closing force specified in Table 505-11-2 of 2.4.

3.5.2.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

4. NOTES:

4.1 The test pressures of 3.5.2 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

4.5 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-48
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Pressure Seal Bonnet Valve Shop Repair; accomplish

2. REFERENCES:

2.1 S9086-CJ-STM-010/CH-075, Fasteners

2.2 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.3 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.4 803-6074287, Repair Guide, Pressure Seal Valves

2.5 803-5001021, Pressure Seal Rings Standard and Oversize Valve Pressure Class 600-1500

2.6 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

2.7 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

2.8 S9086-RK-STM-010/CH-505, Piping Systems

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.2.1 The removal of body-bound studs only to determine the condition of threads is not required.

I

(I) or (V) "TORQUE TEST" (See 4.3)

3.2.2 Torque test each body-bound stud in accordance with Section 075-8.6.3.2(d) of 2.1.

(I) "LIQUID PENETRANT INSPECT"

3.2.3 Accomplish liquid penetrant inspection of seats (including back seat), discs, or gate and body inlay area in accordance with 2.2.

3.2.3.1 Acceptance criteria shall be in accordance with Paragraph 7 of 2.3, except hairline cracks in hard-faced areas of seats and discs or gate are acceptable provided the valve does not show evidence of leakage.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square (RMS) finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Dress and true each gasket mating surface.

3.3.4 Inspect and repair sealing surfaces of each inlay area and bonnet as follows:

(I) or (V) "VISUAL INSPECT" (See 4.3)

3.3.4.1 Inspect valve body to verify that stainless steel inlay is free of steam cuts and cracks and diameter of inlay area is round to within 0.003 inch and free of non-design taper. Measure diameter at top and bottom of inlay area in increments of 45 degrees, on each circle.

3.3.4.2 For the inlay, correct out-of-round, non-design tapered condition and provide 32 RMS finish. Finished inlay diameter shall provide 0.002 to 0.005 inch clearance on the standard size diameter for seal rings described by 2.4.

3.3.4.3 Machine valve bonnet tapered area for concentricity and design angle to within 0.002 inch total indicator reading and 32 RMS finish.

3.3.5 Machine, grind, or lap and spot-in discs or gate to seats (including back seat) to obtain a 360-degree continuous contact.

(I) or (V) "INSPECT CONTACT" (See 4.3)

3.3.5.1 Inspect contact using blueing method.

3.3.5.2 Transfer line for gate valve shall not exceed 3/16 inch in width and shall appear within the lower 75 percent of the gate seating surface.

3.3.5.3 Transfer line for globe valve shall not exceed 1/16 inch in width.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble ***each*** valve ***installing*** new ***each*** fastener for those removed in 3.2 ***in accordance with manufacturer's specification or instruction***.

3.4.1 Install new seal ring in accordance with 2.4, using 2.5 for guidance.

3.4.1.1 The SUPERVISOR must approve fitting new seal ring to inlay bores above first oversize.

3.4.1.2 Attach a metal identification tag to the valve bonnet indicating the size of seal ring installed, straight or tapered body neck, name of installing activity, and date of installation.

3.4.2 Install new valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.6.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.7. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.2 Test for seat tightness alternately on each side of gate for double seated valves, and on outboard side only on single seated valves, with the opposite side open for inspection.

3.5.2.1 Do not exceed handwheel closing force specified in Table 505-11-2 of 2.8.

3.5.2.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.3 Test globe valve in the direction tending to open valve.

3.5.3.1 Do not exceed the handwheel closing force specified in Table 505-11-2 of 2.8.

3.5.3.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

4. NOTES:

4.1 The test pressures of 3.5.2 and 3.5.3 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

4.5 Reference 2.5 provides guidance with respect to applicable APLs and other information not in direct conflict with the material and hardness requirements for seal rings specified in 2.4.

4.6 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-49
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Pressure Seal Bonnet Valve In-line Repair; accomplish

2. REFERENCES:

2.1 S9086-CJ-STM-010/CH-075, Fasteners

2.2 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.3 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.4 803-6074287, Repair Guide, Pressure Seal Valves

2.5 803-5001021, Pressure Seal Rings Standard and Oversize Valve Pressure Class 600-1500

2.6 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean free of foreign matter (including paint), and inspect each part for defects.

3.2.1 The removal of body-bound studs only to determine the condition of threads is not required.

(I) or (V) "TORQUE TEST" (See 4.3)

3.2.2 Torque test each body-bound stud in accordance with Section 075-8.6.3.2(d) of 2.1.

(I) "LIQUID PENETRANT INSPECT"

3.2.3 Accomplish liquid penetrant inspection of seats (including back seat), discs or gate, and body inlay area in accordance with 2.2.

3.2.3.1 Acceptance criteria shall be in accordance with Paragraph 7 of 2.3, except hairline cracks in hard-faced seats and discs or gate are acceptable provided the valve does not show evidence of leakage.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square (RMS) finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Inspect and repair sealing surfaces of each inlay area and bonnet as follows:

(I) or (V) "VISUAL INSPECT" (See 4.3)

3.3.3.1 Inspect valve body to verify that stainless steel inlay is free of steam cuts and cracks and that diameter of inlay area is round to within 0.003 inch and free of non-design taper. Measure diameter at top and bottom of inlay area in increments of 45 degrees, on each circle.

3.3.3.2 For the inlay, correct out-of-round, non-design tapered condition and provide 32 RMS finish. Finished inlay diameter shall not exceed oversize number one diameter, plus 0.002 to 0.005-inch clearance described by 2.4.

3.3.3.3 Machine valve bonnet tapered area for concentricity and design angle to within 0.002-inch total indicator reading and 32 RMS finish.

3.3.4 Machine, grind, or lap and spot-in discs or gate to seats (including back seat) to obtain a 360-degree continuous contact.

(I) or (V) "INSPECT CONTACT" (See 4.3)

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line for gate valve shall not exceed 3/16-inch in width and shall appear within the lower 75 percent of the gate seating surface.

3.3.4.3 Transfer line for globe valve shall not exceed 1/16-inch in width.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble ***each*** valve, ***installing*** new ***each*** fastener for those removed in 3.2 ***in accordance with manufacturer's specification or instruction***.

3.4.1 Install new seal ring in accordance with 2.4, using 2.5 for guidance.

3.4.1.1 The SUPERVISOR must approve new seal rings to inlay bores above first oversize.

3.4.1.2 Attach a metal identification tag to the valve bonnet indicating the size of seal ring installed, straight or tapered body neck, name of installing activity, and date of installation.

3.4.2 Install new valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.6.

4. NOTES:

4.1 Operational test of the valve will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-50
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Horizontal Swing Check Valve; repair

2. REFERENCES:

2.1 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.3 Repair valve as follows:

3.3.1 Chase and tap each exposed threaded area.

3.3.2 Dress and true each gasket mating surface.

3.3.3 Machine, grind, or lap and spot-in disc to seat to obtain 360-degree continuous contact.

(V) "INSPECT CONTACT"

3.3.3.1 Inspect contact using blueing method.

3.3.3.2 Transfer line for swing check valve shall not exceed 1/16-inch in width.

3.4 Assemble ***each*** valve installing new ***each*** gasket, ***each*** bushing, ***each*** disc retaining nut, ***each*** hinge pin, and ***each*** plug in accordance with manufacturer's specifications or instruction.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.1. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(I) "SEAT TIGHTNESS"

3.5.2 Test for seat tightness in the direction tending to close the valve (back pressure) for a minimum of 5 minutes. Allowable leakage as follows:

VALVE SIZE (NOM)	LEAKAGE RATE
Up to 2 inches inclusive	25 cc/hr./in. dia.
2-1/2 inches - 10 inches inclusive	50 cc/hr./in. dia.
Over 10 inches	100 cc/hr./in. dia.

The back pressure applied shall be in accordance with the following:

VALVE PRESSURE RATING	TEST BACK PRESSURE
150 PSIG and Below	50 PSIG
Over 150 PSIG	100 PSIG

4. NOTES:

4.1 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-51
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Globe, Globe Angle, and Globe Stop Check Valve; repair

2. REFERENCES:

2.1 S9086-CJ-STM-010/CH-075, Fasteners

2.2 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

2.3 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

2.4 S9086-RK-STM-010/CH-505, Piping Systems

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.2.1 The removal of body-bound studs only to determine the condition of threads is not required.

(I) or (V) "TORQUE TEST" (See 4.3)

3.2.2 Torque test each body-bound stud in accordance with Section 075-8.6.3.2(d) of 2.1.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Dress and true each gasket mating surface.

3.3.4 Machine, grind, or lap and spot-in disc to seat to obtain a 360-degree continuous contact.

(I) or (V) "INSPECT CONTACT" (See 4.3)

3.3.4.1 Inspect contact using blueing method (soft seated valves excluded).

3.3.4.2 Transfer line (hard seated valves) shall not exceed 1/16-inch in width.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble ***each*** valve installing ***each*** new gasket and ***each fastener for those removed in 3.2*** in accordance with manufacturer's specification ***or instruction***.

3.4.1 Pack feedwater, condensate, and steam valves with valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.2.

3.4.2 Pack valves of systems other than feedwater, condensate, or steam with valve packing conforming to MIL-P-24396, Type B.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.3. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.2 Test for seat tightness in the direction tending to open valve.

3.5.2.1 Do not exceed the handwheel closing force specified in Table 505-11-2 of 2.4.

3.5.2.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.3 Back pressure test globe stop check valve with stem in the open position. Allowable leakage as follows:

VALVE SIZE (NOM)	LEAKAGE RATE
Up to 2 inches inclusive	25 cc/hr./in. dia.
2-1/2 inches - 10 inches inclusive	50 cc/hr./in. dia.
Over 10 inches	100 cc/hr./in. dia.

The back pressure applied shall be in accordance with the following:

VALVE PRESSURE RATING	TEST BACK PRESSURE
150 PSIG and below	50 PSIG
Over 150 PSIG	100 PSIG

4. NOTES:

4.1 The test pressures of 3.5.2 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

4.5 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-52
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Relief Valve; repair

2. REFERENCES:

2.1 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each parts for defect.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish and remove raised edges and foreign matter.

3.3.2 Machine, grind, or lap and spot-in metallic disc to seat to obtain a 360-degree continuous contact.

(V) "INSPECT CONTACT"

3.3.2.1 Inspect contact using blueing method. Transfer line shall not exceed 1/16-inch in width.

3.3.3 Dress and true each gasket mating surface.

3.3.4 Chase and tap each exposed threaded area.

3.4 Assemble valve installing new packing, ***each*** soft seat, ***each*** gasket, ***and each fastener*** in accordance with manufacturer's specifications ***or instruction***.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.1. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(I) "SHOP TEST"

3.5.2 Set valve to lifting pressure. (***See Note 4.1 through 4.3.***)

3.5.3 Seat tightness test shall be accomplished for a minimum of 3 minutes. Allowable leakage: None.

3.5.4 Purge valve of test medium.

3.5.5 Install wire and lead lock seals.

3.6 Attach a metal tag to valve, stamped with the following information:

3.6.1 Ship name and hull number

3.6.2 Valve number or identification

3.6.3 Valve lifting pressure

3.6.4 Date valve tested and set

3.6.5 Name of repair facility

4. NOTES:

4.1 Test medium, seat tightness, and lifting pressures will be specified in Work Item.

4.2 Steam relief valves shall have setpoint established using steam as the test medium.

4.3 Steam system service and heating boiler pressure relief valves constructed to MIL-DTL-20065, ASME BPVC Section VIII or ASTM F1508 shall have setpoint established using steam, nitrogen/dry, oil-free air or a combination of water and nitrogen/dry, oil-free air as the test medium, as specified in the work item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-53
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Bolted Bonnet Steam Valve Shop Repair; accomplish

2. REFERENCES:

2.1 S9086-CJ-STM-010/CH-075, Fasteners

2.2 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.3 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.4 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

2.5 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

2.6 S9086-RK-STM-010/CH-505, Piping Systems

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.2.1 The removal of body-bound studs only to determine the condition of threads is not required.

(I) or (V) "TORQUE TEST" (See 4.3)

3.2.2 Torque test each body-bound stud in accordance with Section 075-8.6.3.2(d) of 2.1.

(I) "LIQUID PENETRANT INSPECT"

3.2.3 Accomplish liquid penetrant inspection of each seat (including back seat), discs, or gate in accordance with 2.2.

3.2.3.1 Acceptance criteria shall be in accordance with Paragraph 7 of 2.3, except hairline cracks in hard-faced areas of seats and discs or gate are acceptable provided the valve does not show evidence of leakage.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Dress and true each gasket mating surface.

3.3.4 Machine, grind, or lap and spot-in gate or discs to seats (including back seat) to obtain a 360-degree continuous contact.

(I) or (V) "INSPECT CONTACT" (See 4.3)

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line for gate valve shall not exceed 3/16 inch in width and shall appear within the lower 75 percent of the gate seating surface.

3.3.4.3 Transfer line for globe valve shall not exceed 1/16 inch in width.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble valve, installing new ***each*** gasket ***and each fastener for those removed in 3.2*** in accordance with the manufacturer's specification ***or instruction***.

3.4.1 Install new valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.4.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.5. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.2 Test for seat tightness alternately on each side of gate for double seated valves, and on outboard side only on single seated valves, with the opposite side open for inspection.

3.5.2.1 Do not exceed handwheel closing force specified in Table 505-11-2 of 2.6.

3.5.2.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.5.3 Test globe valve in the direction tending to open valve.

3.5.3.1 Do not exceed the handwheel closing force specified in Table 505-11-2 of 2.6.

3.5.3.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage, or in the event of visible leakage, until accurate determination of leakage can be made. Maximum allowable leakage: 10 cubic centimeters (cc) per hour, per inch of nominal pipe size; 10 cc maximum per hour for valve sizes less than 1-1/2 inches.

(V)(G) or (I)(G) "BACK PRESSURE TEST" (See 4.4)

3.5.4 Back pressure test globe stop check valve with stem in the open position. Allowable leakage as follows:

VALVE SIZE (NOM)	LEAKAGE RATE
Up to 2 inches inclusive	25 cc/hr./in.dia.
2-1/2 inches - 10 inches inclusive	50 cc/hr./in.dia.
Over 10 inches	100 cc/hr./in.dia.

The back pressure applied shall be in accordance with the following:

VALVE PRESSURE RATING	TEST BACK PRESSURE
100 PSIG and Below	50 PSIG
Over 150 PSIG	100 PSIG

4. NOTES:

4.1 The test pressures of 3.5.2 and 3.5.3 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

4.5 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-54
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Bolted Bonnet Steam Valve In-Line Repair; accomplish

2. REFERENCES:

2.1 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.2 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.3 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean free of foreign matter (including paint), and inspect each part for defects.

(I) "LIQUID PENETRANT INSPECT"

3.2.1 Accomplish liquid penetrant inspection of each seat (including back seat), discs or gate in accordance with 2.1.

3.2.1.1 Acceptance criteria shall be in accordance with Paragraph 7 of 2.2, except hairline cracks in hard faced areas of seats and discs or gate are acceptable provided the valve does not show evidence of leakage.

3.3 Repair valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Clean and spot-in each bonnet to body gasket mating surface.

3.3.4 Machine, grind, or lap and spot-in gate or discs to seats (including back seat) to obtain a 360-degree continuous contact.

(I) or (V) "INSPECT CONTACT" (See 4.3)

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line for gate valve shall not exceed 3/16-inch in width and shall appear within the lower 75 percent of the gate seating surface.

3.3.4.3 Transfer line for globe valve shall not exceed 1/16-inch in width.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble valve installing new ***each*** gasket, and ***each*** fastener in accordance with the manufacturer's specification ***or instruction***.

3.4.1 Install new valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.3.

4. NOTES:

4.1 Operational test of valve will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-55
DATE:	***01 OCT 2017***
CATEGORY:	II

1. SCOPE:

1.1 Title: Regulating/Reducing Valve; repair

2. REFERENCES:

2.1 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.2 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.3 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

(I) "LIQUID PENETRANT INSPECT"

3.2.1 Accomplish liquid penetrant inspection of hard-faced each metallic seat and disc in accordance with 2.1.

3.2.1.1 Acceptance criteria shall be in accordance with Paragraph 7 of 2.2, except hairline cracks in hard-faced areas of seats and discs are acceptable provided the valve does not show evidence of leakage.

3.3 Repair valve as follows:

3.3.1 Straighten stems and pushrods to within 0.002-inch total indicator reading. Polish stems and pushrods to a 32 Root-Mean-Square finish in way of packing or seal surfaces and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Dress and true each gasket mating surface.

3.3.4 Machine, grind, or lap and spot-in metallic discs to seats to obtain a 360-degree continuous contact.

(V) "INSPECT CONTACT"

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line shall not exceed 1/16-inch in width and shall appear within the lower 75 percent of the seating surface.

3.4 Assemble valve installing new packing, ***each*** gasket, ***each*** diaphragm, ***each*** spring, and ***each*** soft seat ***and each fastener*** in accordance with manufacturer's specification ***or instruction***.

3.5 Hydrostatically test valve as follows:

3.5.1 Hydrostatic test equipment shall have the following capabilities:

3.5.1.1 Manual overpressure protection release valve.

3.5.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.5.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.3. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.5.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(I) "SHOP TEST"

3.5.2 Test and set valve in shop.

3.5.2.1 Test shall be applied for a minimum of 3 minutes.

3.6 Attach a metal tag to valve, stamped with the following information:

3.6.1 Ship name and hull number

3.6.2 Valve number or identification

3.6.3 Valve regulation range and set point

3.6.4 Date valve tested and set

3.6.5 Name of repair facility

4. NOTES:

4.1 Test medium and test pressure for valve inlet and regulated pressure/temperature, shall be specified in the invoking Work Item.

4.2 Nitrogen or air may be used for shop test of steam valves.

4.3 Repairs to pilot control will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO:	009-56
DATE:	18 NOV 2016
CATEGORY:	II

1. SCOPE:

1.1 Title: Main Propulsion Boiler Wet Lay-Up; accomplish

2. REFERENCES:

2.1 S9086-GX-STM020/CH-220, Boiler Water/Feedwater Test and Treatment

3. REQUIREMENTS:

3.1 Accomplish carbohydrazide wet lay-up of each boiler.

3.2 Notify the SUPERVISOR one day prior to lay-up of each boiler.

3.3 Provide the volume of water required to fill each boiler, superheater, economizer, and associated piping by consulting Table 220-22-11 of 2.1. Include an additional 500 gallons for reserve in the total amount required in Table 220-22-11 of 2.1. Water used for lay-up shall conform to the following requirements:

CONSTITUENT or PROPERTY	REQUIREMENT
SHORE STEAM AND CONDENSED SHORE STEAM USED AS FEEDWATER	
pH	8.0 to 9.5
Conductivity	15 micromho/cm max
Dissolved Silica	0.2 ppm max
Hardness	0.10 epm max
Total Suspended Solids	0.10 ppm max
SHORE PROCESSED FEEDWATER (DEMINERALIZERS, REVERSE OSMOSIS)	
Conductivity	2.5 micromho/cm max (at point of delivery)
Silica	0.2 ppm max

3.3.2 The use of filming amines to control steam/steam condensate pH is prohibited.

3.3.3 Provide a pierside tank that will hold the quantity of feedwater required. The tank shall be used to mix the carbohydrazide layup solution.

3.3.4 For each 2,000 gallons of feed quality water to be treated, one-gallon of 6.5 percent carbohydrazide and 1/2 quart of 40-percent morpholine shall be used, in accordance with Paragraph 220-22 of 2.1.

3.3.4.1 Transfer the required amount of carbohydrazide and morpholine to a narrow mouthed polyethylene bottle as appropriate to the volume needed. Pour the carbohydrazide and morpholine into the tank.

3.3.4.2 Immediately fill the tank with feed quality water to the level calculated in 3.3.

3.3.5 Remove water from the boiler, superheater, and economizer. Close boiler drains and openings with the exception of steam drum, superheater, and economizer vents.

3.3.6 Immediately fill the boiler, including superheater and economizer, taking suction from the carbohydrazide lay-up solution treated tank.

3.3.6.1 While filling the boiler, close each vent in turn as the treated water overflows. After the boiler is filled as shown by an overflow from the highest vent, crack each lower vent in turn to ensure that there are no trapped air pockets.

3.4 Maintain positive pressure on each boiler, not to exceed 150 PSIG, using a head tank, or shore steam in accordance with Paragraph 220-1.1 of 2.1.

3.5 Determine the carbohydrazide concentration on the day each boiler is placed under lay-up and weekly thereafter.

3.5.1 Draw a sample through the boiler water sample line after allowing the boiler water to flow for 5 minutes to flush the line. Rinse the sample bottle with boiler water sample prior to filling. Allow the sample bottle to overflow before capping the bottle to eliminate trapped air.

3.5.1.1 Determine the carbohydrazide concentration immediately after sampling.

3.5.1.2 If the carbohydrazide concentration falls below 2.0 ppm, the layup is lost and the boiler shall be dumped and retreated or changed to an authorized layup.

3.6 Drain the superheater and bring each boiler to operating level. Dispose of removed solution in accordance with local, state, and federal regulations.

3.6.1 Do not drain the solution to the bilge.

4. NOTES:
4.1 None.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-62
DATE: 18 NOV 2016
CATEGORY: II

1. SCOPE:

1.1 Title: Boiler Handhole, Manhole Seat and Plate; inspect

2. REFERENCES:

2.1 S9221-C1-GTP-010, Main Propulsion Boilers; Repair and Overhaul

2.2 803-841216, Handhole Plates and Arch Bars for Boilers

3. REQUIREMENTS:

3.1 Remove each handhole and manhole plate from each header and drum of boiler. Each plate shall be identified and tagged as to respective boiler.

3.2 Wire brush clean to bare metal each handhole, manhole plate, stud, strongback , and fastener. Wire brush clean to bare metal each handhole and manhole gasket seating surface using a power driven wire cup brush. Ensure complete removal of rust and gasket material.

3.2.1 Wire brush clean to bare metal external surfaces in way of "B" and "C" measurement contact areas using a power-driven wire wheel or needle gun.

3.3 Visually inspect each gasket seating surface of handhole and manhole plates and the drum and header for erosion, corrosion, gouges, steam cuts, crack indications, excessive pitting, grooves, and any irregularities that may cause poor or leaky joints. Inspect external surfaces of headers in way of "B" and "C" measurement areas for erosion and corrosion. Inspect studs and nuts for deterioration and damaged and stripped threads.

3.3.1 Visually inspect, measure, and record the following handhole and manhole gasket seating surface criteria in accordance with Paragraph 5-8.2 of 2.1 and Attachment A.

3.3.1.1 Seat taper: Use template of flat stock and feeler gage to measure maximum taper around periphery of handhole and manhole seats.

3.3.1.2 Minimum wall thickness: Measure header wall thickness using a point micrometer at each side of the header cross sectional minor axis.

3.3.1.3 Minimum seat thickness: Measure header seat thickness with a flat-faced micrometer at the 4 points of the header cross sectional major and minor axis.

3.3.1.4 Handhole Plate Overlap: Measure maximum gap clearance between shoulder of the handhole plate and handhole with handhole plate located in the most extreme misaligned position. Subtract the measurement from the plate seat width to establish the amount of plate overlap. Handhole plates used for measurements shall conform to 2.2.

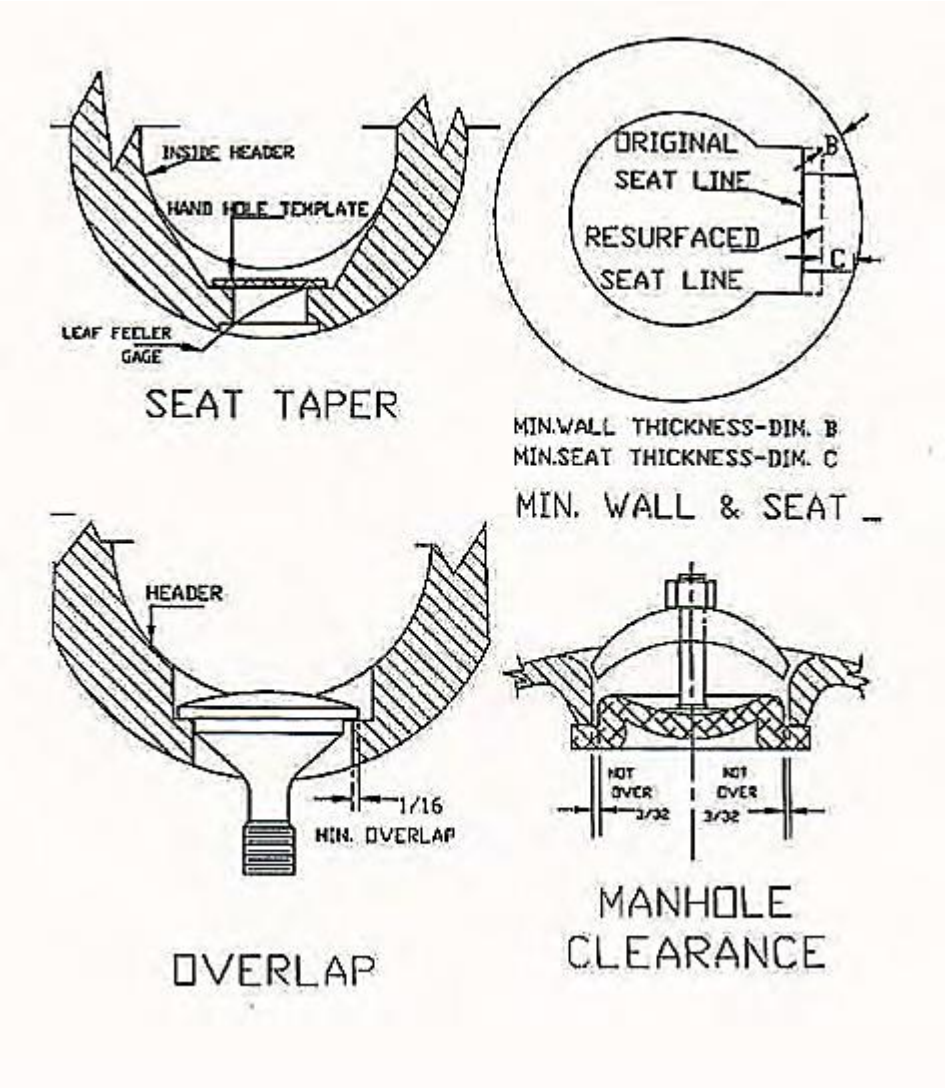
3.3.1.5 Manhole Plate Clearance: Measure clearance between shoulder of manhole plate and manhole at 8, 45-degree increments, with the manhole plate accurately centered.

3.4 Submit one legible copy, in approved transferrable media, of a report listing results of the requirements of 3.3 to the SUPERVISOR. Report shall list each handhole and manhole seat which failed to meet the minimum allowable values listed in Appendices 5D, 5E, and 6C of 2.1.

3.5 Install each handhole and manhole plate, using new gaskets conforming to MIL-G-15342 and applicable boiler technical manual.

4. NOTES:

4.1 Equipment technical manual will be listed in the invoking Work Item.



ITEM NO: 009-62
FY-19

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-68
DATE: ***01 OCT 2017***
CATEGORY: II

1. SCOPE:

1.1 Title: Bolted Bonnet Valve; repair

2. REFERENCES:

2.1 S9086-CJ-STM-010/CH-075, Fasteners

2.2 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.3 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

2.4 S9253-AD-MMM-010, Maintenance Manual for Valves, Traps, and Orifices (Non-Nuclear), User's Guide and General Information

3. REQUIREMENTS:

3.1 Matchmark each valve part.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean free of foreign matter (including paint), and inspect each part for defects.

3.2.1 The removal of body-bound studs only to determine the condition of threads is not required.

(I) or (V) "TORQUE TEST" (See 4.3)

3.2.2 Torque test each body-bound stud in accordance with Section 075-8.6.3.2(d) of 2.1.

(I) "LIQUID PENETRANT INSPECT"

3.2.3 Accomplish liquid penetrant inspection of each seat (including back seat), disc, or gate in accordance with 2.2.

3.2.3.1 Acceptance criteria shall be in accordance with Paragraph 7 of 2.3, except hairline cracks in hard-faced areas of seats and

discs or gate are acceptable provided the valve does not show evidence of leakage.

3.3 Repair each valve as follows:

3.3.1 Straighten stem to within 0.002-inch total indicator reading. Polish stem to a 32 Root-Mean-Square finish in way of packing surface and remove raised edges and foreign matter.

3.3.2 Chase and tap each exposed threaded area.

3.3.3 Clean and spot-in bonnet to body gasket each mating surface.

3.3.4 Machine, grind, or lap and spot-in gate or discs to each seat (including back seat) to obtain a 360-degree continuous contact.

(V) "INSPECT CONTACT"

3.3.4.1 Inspect contact using blueing method.

3.3.4.2 Transfer line for gate valve shall not exceed 3/16 inch in width and shall appear within the lower 75 percent of the gate seating surface.

3.3.4.3 Transfer line for globe valve shall not exceed 1/16 inch in width.

(I)(G) "VERIFY LEVEL I PARTS"

3.4 Assemble valve, installing new ***each*** gasket ***and each fastener*** in accordance with the manufacturer's specification ***or instruction***.

3.4.1 Pack feedwater, condensate, and steam valves with valve stem packing conforming to MIL-P-24503/24583 combination in accordance with Chapter 6 of 2.4.

3.4.2 Pack valves of systems other than feedwater, condensate, or steam with valve stem packing conforming to MIL-P-24396, Type B.

4. NOTES:

4.1 Operational test of valve will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-71
DATE: 18 NOV 2016
CATEGORY: II

1. SCOPE:

1.1 Title: Piping System; test

2. REFERENCES:

2.1 S9086-RK-STM-010/CH-505, Shipboard Piping Systems

2.2 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

2.3 S9074-AR-GIB-010/278, Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

2.4 T9074-AS-GIB-010/271, Requirements for Nondestructive Testing Methods

2.5 MIL-STD-2035, Nondestructive Testing Acceptance Criteria

3. REQUIREMENTS:

3.1 Accomplish testing of each new and disturbed piping systems in accordance with 2.1.

(V) "GAGE CHECK"

3.1.1 Each master and backup test gage shall conform to gage range and graduation shown on Table 504-6-1 of 2.2. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.1.1.1 Each master and backup test gage used for vacuum testing shall consist of 2 compound gages with a 30 inch-0-30 PSI range.

(I)(G) "LIQUID PENETRANT INSPECTION" or "MAGNETIC PARTICLE INSPECTION"

3.1.2 Accomplish liquid penetrant or magnetic particle test on root layer of all P-1 and/or P-LT welded joints in accordance with Paragraph

505-11.1.2.6.a(1) of 2.1, and the requirements of 2.3 and 2.4 in systems which exceed the reduced energy criteria of operating conditions of 200 degrees Fahrenheit or 500 PSIG. The accept or reject criteria shall be in accordance with Class One of 2.5. (See 4.2)

(I)(G) "LIQUID PENETRANT INSPECTION"

3.1.3 Accomplish liquid penetrant tests on final layer of all P-1 and/or P-LT welded joints in accordance with Paragraph 505-11.1.2.6.a(1) of 2.1 and the requirements of 2.3 and 2.4 in systems which exceed the reduced energy criteria of operating conditions of 200 degrees Fahrenheit or 500 PSIG. The accept or reject criteria shall be in accordance with Class One of 2.5. (See 4.2)

(I)(G) "LIQUID PENETRANT INSPECTION"

3.1.4 Accomplish liquid penetrant tests on final layer of all Class P-2 welds in accordance with Paragraph 505-11.1.2.6.a(2) of 2.1 and the requirements of 2.3 and 2.4 in systems which operate above 200 degrees Fahrenheit. The accept or reject criteria shall be in accordance with Class 2 of 2.5. (See 4.2)

(V)(G) or (I)(G) "VISUAL INSPECTION - SHOP TEST" (See 4.3)

3.1.5 Accomplish a shop hydrostatic test of replacement piping, fittings, and components for evidence of external leakage and/or deformation. Allowable external leakage and/or deformation: None.

(V)(G) or (I)(G) "VISUAL INSPECTION - HYDROSTATIC, LOW PRESSURE AIR, VACUUM, OR OPERATING PRESSURE TEST" (See 4.3)

3.1.6 Visually inspect the pressurized system or system under vacuum for evidence of external leakage and/or deformation. Allowable external leakage and/or deformation: None.

3.1.6.1 Each joint requiring inspection shall remain uninsulated and unpainted until completion of successful inspection.

3.1.6.2 Provide a sketch of that portion of the system to be tested, showing the location of blanks, isolation valves, test connection, and the location of air vents to vent air. Sketch shall be on the test site during the accomplishment of the test.

(I) "STATIC TEST"

3.2 Accomplish a static head pressure test of each new and disturbed gravity drain piping (unpressurized piping), using clean, fresh water for a minimum of 30 minutes. Allowable leakage: None.

(V)(G) "OPERATIONAL TEST"

3.3 Accomplish an operational test of each new and disturbed gravity drain piping for proper operation and unobstructed flow.

(V)(G) "OPERATIONAL TEST"

3.4 Accomplish an operational test of each new and disturbed sounding tube piping by inserting a 16-inch theft sampler into sounding tube until it bottoms. Accomplish the test a minimum of 4 times for each sounding tube. There shall be no binding or sticking of sampler during this test.

4. NOTES:

4.1 Boiler pressure vessel piping is defined as, "The piping from the pressure vessel drum or header up to the first valve off the pressure vessel drum or header."

4.2 Nondestructive testing requirements in 3.1.2, 3.1.3, and 3.1.4 apply only when the operating pressure test option has been selected.

4.3 The paragraph referencing this note is considered an (I)(G) if the system is P-1, P-LT, or P-3a. If the system is P-2 or P-3b, then the paragraph is considered (V)(G).

4.4 Test pressure and test medium will be specified in invoking Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-84
DATE: ***01 OCT 2017***
CATEGORY: ***I***

1. SCOPE:

1.1 Title: Threaded Fastener Requirements; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 S9086-CJ-STM-010/075, Fasteners

3. REQUIREMENTS:

3.1 General

3.1.1 Replace the following non-Level I fasteners 1/2-inch nominal diameter and smaller with new fasteners of the same material, strength and design;

3.1.1.1 Monel, QQ-N-281, FF-S-85, ***ASTM 468 Alloy 400***

3.1.1.2 CRES, 300 Series, FF-S-85

3.1.1.3 Steel, ASTM A193***/A193M B16***

3.1.1.4 Steel, Grade 5 and Grade 8

(V) "INSPECT FASTENER"

3.1.2 Inspect ***each*** fastener intended for reuse for wear and defects. ***For the exposed portion of each body-bound stud use 075-8.2 of 2.2 for accept or reject criteria. For each other fastener, use Attachment A and paragraph 075-8.3 of 2.2 for accept or reject criteria.***

3.1.3 Fasteners larger than 1/2-inch nominal diameter shall be retained for reuse to the maximum extent possible. Reuse existing fasteners if the acceptance criteria of Attachment A and paragraph 075-8.3 of 2.2 are met.

3.1.3.1 Maintain fastener accountability to ensure fasteners meeting the criteria of this item are reused in the same joint from which they came.

3.1.3.2 Clean each fastener free of foreign matter (including paint).

3.1.3.3 Chase and tap exposed threaded areas.

3.1.4 Install new threaded fasteners, washers, and lock washers in place of those identified to be missing or defective.

3.1.4.1 Utilize table one ***and 2.2*** to select each replacement fastener when necessary.

3.1.5 Use of black-oxide coated brass threaded fasteners (BOCBTF) is prohibited in the accomplishment of any work. BOCBTFs are most commonly marked with "462", "464", "F467C", "F467D", "F468C", and "F468D."

3.1.6 Fasteners, body-fitted bolts, and studs requiring a permeability factor of 2.0 or less shall conform to 500 Series Monel, 316L CRES, or 304 CRES where required.

3.2 Externally threaded fastener installation acceptance criteria unless otherwise specified or approved:

3.2.1 The minimum thread protrusion for ***each*** male threaded fastener shall be one full thread beyond the face of the nut. The maximum thread protrusion for ***each*** male threaded fastener is ***10*** full threads beyond the face of the nut.

3.2.2 For self-locking (plastic insert) nut installations, the minimum thread protrusion for bolt or stud end may be flush with the face of the nut after the threaded fastener(s) have been installed and tightened. The maximum thread protrusion for self-locking nuts shall be 5 threads after the threaded fastener(s) have been installed and tightened.

3.3 Internally threaded fastener installation acceptance criteria shall be in accordance with paragraph 075-7.6 of 2.2.

3.4 Use of Temporary Fasteners

3.4.1 Maintain a single log/file of installed/removed temporary fasteners with the following information:

3.4.1.1 System

3.4.1.2 Component (valves, flanges, foundations, brackets)

3.4.1.3 Location (deck, frame, port, starboard, tank, manhole)

3.4.1.4 Company name/badge number/name of mechanic

3.4.1.5 Date installed/date removed

3.4.2 Paint temporary fasteners blaze orange unless an alternate color has been authorized by the SUPERVISOR. Minimum requirements for painting fasteners are as follows:

3.4.2.1 Nut Bearing faces (top)

3.4.2.2 Bolt Top of bolt head

3.4.2.3 Stud Both ends of stud

3.4.2.4 Washer Faces (edge and bottom of washer)

3.4.3 Remove temporary fasteners prior to any testing, lagging, and/or painting of systems or components.

3.4.4 Logging-in of temporary fasteners shall be accomplished no later than the end of the work shift.

3.4.5 Existing system fasteners used for blanking that will be reused for installation are excluded from the requirement of 3.4.2.

4. NOTES:

4.1 For purposes of this item, temporary fasteners are defined as those fasteners that are installed in lieu of the final fasteners that are specified for system installation. Examples would include temporary fasteners used to hold fittings, valves, or machinery in place.

4.2 One complete thread or one thread length is defined as one complete rotation (360 degrees on a single thread), starting at a point along the thread.

The following criterion applies to the inspection of fasteners:

1 General inspection: Fasteners shall bear markings identifying material to be compatible with the system. Black-oxide coated fasteners and fasteners without markings are not acceptable. Joints with mixed material fasteners are not acceptable.

2. Engaged Thread Area: Cracks are not acceptable.

2.1 Broken, chipped, or missing threads or other indications of brittle material failure, are not acceptable.

2.2 Galling, spalling, or pitting is not acceptable.

2.3 Major defects are not acceptable. A major defect is a single defect (after removal of sharp edges and raised metal) that has a depth over one-half the thread depth.

2.4 Isolated minor defects are acceptable. A minor defect is a single nick, gouge, or flattened thread (after removal of sharp edges and raised metal) that has a depth greater than 1/64-inch, but less than one-half the thread height (depth), and a width less than the thread spacing (pitch). Defects less than 1/64-inch deep may be ignored.

2.4.1 An isolated minor defect that exceeds the width criterion for a minor defect is acceptable when the total length of the defect does not exceed 15 percent of one thread length in any one complete thread.

2.4.2 Any combination of minor defects is acceptable when the total combined length of the defects does not exceed 15 percent of one thread length in any one complete thread.

2.5 Repaired threads that engage with a non-self-locking Class 3-B fit nut, turned with fingers, are acceptable.

3. Non-Engaged Thread Area:

3.1 Cracks are not acceptable.

3.2 For externally threaded fasteners, no minimum thread form is required, except as needed to provide initial thread engagement and passing of the nut.

4. Self-locking nuts shall have positive reinstallation torque. Cuts, tears, or looseness in self-locking elements or the adjacent metal are not acceptable.

4.1 Determine adequate torque values (i.e., positive reinstallation, breakaway, running) in accordance with Table 075-5-1 of 2.2.

5. Deformed or damaged flats on fasteners are not acceptable.

6. Discard fasteners not meeting the acceptance requirements of this item.

ATTACHMENT B

VALVE BODY MATERIAL

	1/ Alloy Steel	Carbon Steel	2/ Nonferrous
3/ Studs and Bolts to MIL-DTL-1222	Grade B-16	Grade B-16	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A 4/
Nuts to MIL-DTL-1222	Grade 4 or 7	Grade 4 or 7	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A or Class B 5/
Socket Head Cap Screws	FF-S-86	FF-S-86	

NOTES

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end and Class 5 fit on the stud and, except that a Class 3 fit with a thread locking compound may be used where temperatures do not exceed 250 degrees Fahrenheit. The thread locking compound shall conform to ASTM D 5363. Check Class 3 fit stud ends in accordance with SAE-J2270.

4/ Fasteners of Nickel Copper Aluminum shall be the only type used on sea chest and hull valves.

5/ Nuts of Nickel Copper Alloy, conforming to QQ-N-281 Class A or B, or Nickel Copper Aluminum conforming to QQ-N-286 shall be the only type used on sea chest and hull valves.

ATTACHMENT C (DDG-51 Class)

VALVE BODY MATERIAL

	1/ Alloy Steel/Carbon Steel	2/ Nonferrous
3/ Studs and Bolts to MIL-DTL-1222	5/ For services up to and including 650 degrees Fahrenheit; Grade 5 steel	4/ 5/ Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A
	For services to 775 degrees Fahrenheit; Grade B-7 or B-16	
	For services to 1,000 degrees Fahrenheit; Grade B-16	
	For services in which JP-5 lubricating oil, or inflammable gas or liquid of any kind, regardless of pressure and temperature, which are within 3 feet of hot surfaces (above 650 degrees F) and where steel tubing is required; Grade 2, 5 or 8 steel	
	Bolting subject to seawater corrosion (other than hull integrity bolting; for hull integrity bolting see Note 4) Connections in contact with bilge regions. Where strength requires ferrous bolting and is exposed to the weather; Class A Nickel - Copper alloy to QQ-N-281 or silicon bronze to ASTM B 98 with dimensions of MIL-DTL-1222. Where greater strength is required, use Nickel - Copper - Aluminum alloy QQ-N-286.	
Nuts to MIL-DTL-1222	5/ For services up to and including 650 degrees Fahrenheit; Grade 5 steel	Phosphor Bronze - Any Grade Silicon Bronze - Any Grade Nickel Copper - Class A or Class B 4/ 5/
	For service to 775 degrees Fahrenheit; Grade 2H or 4 steel	
	For services to 1,000 degrees Fahrenheit; Grade 4 steel	
	For services in which JP-5, lubricating oil, or inflammable gas or liquid of any kind, regardless of pressure and temperature which are within 3 feet of hot surfaces (above 650 degrees F) and where steel tubing is required; Grade 5 or 8 steel	
	Nuts subject to seawater corrosion. Connections in the bilge regions. Where strength requires ferrous material and is exposed to the weather; Class A or B Nickel Copper Alloy to QQ-N-281 or Silicon Bronze to ASTM B 98 with dimensions to MIL-DTL-1222.	

NOTES

1/ Alloy steel is of Composition A - 2-1/4 percent Chromium, one percent Molybdenum, Composition B - 1-1/4 percent Chromium, 1/2 percent Molybdenum, and Composition C - Carbon Molybdenum.

2/ Nonferrous Alloy except Aluminum.

3/ Studs shall be Class 2 or 3 fit on the nut end and Class 5 fit on the stud end, except that a Class 3 fit with a thread locking compound may be used where temperatures do not exceed 200 degrees Fahrenheit. The thread locking compound shall conform to ASTM D 5363. Check Class 3 fit stud ends in accordance with SAE-J2270.

4/ Fasteners of Nickel Copper Aluminum shall be the only type used on sea chest and hull valves.

5/ Where these materials would constitute part of a galvanic couple, proposals for alternate materials shall be submitted for approval.

TABLE ONE
REPLACEMENT FASTENERS MATERIAL

Application	Fastener	Nut	Other	Comments
Temporary Access (009-05)	MIL-DTL-1222, Grade 304			
Meter Installation (009-13)	ASTM A 449, Type I, Zinc Coated for Bolts	ASTM A 563 Zinc Coated		May be selected and identified in accordance with SAEJ 2280
Gages, Switches & Thermometers (009-14)	ASTM A 449, Type I, Zinc Coated for Bolts	ASTM A 563 Zinc Coated		May be selected and identified in accordance with SAEJ 2280
Rotating Electrical Equipment (009-17, 009-33)	MIL-DTL-1222 Type I or II, Grade 5, Zinc Coated	Lock Nuts shall conform to requirements of the Equipment Technical Manual	Lock Washers shall conform to requirements of the Equipment Technical Manual	Self-Locking Hex Nuts shall conform to NASM 25027, excluding body fitted bolts and studs.
Electrical Controllers (009-36)	MIL-DTL-1222 Type I or II, Grade 5, Zinc Coated	Lock Nuts shall conform to requirements of the Equipment Technical Manual	Lock Washers shall conform to requirements of the Equipment Technical Manual	Self-Locking Hex Nuts shall conform to NASM 25027, excluding body fitted bolts and studs.
Woodwork (009-37) Fasteners subject to contact with sea water and bilge water shall be coated with a light viscosity epoxy resin prior to installation.	Nickel copper alloy conforming to QQ-N-281, Grades 400 or 405. Nickel copper aluminum alloy conforming to QQ-N-286 (UNS N05500) where greater strength is required. Copper silicon alloy conforming to ASTM B 98, Grades 651 or 655.	Nuts shall conform to MIL-DTL-1222.	Flat washers shall conform to FF-W-92, Grade I. Lock washers shall conform to FF-W-100.	Bolts, studs, and cap screws shall conform to MIL-DTL-1222. Wood screws shall conform to FF-S-111. Lag bolts (screws) shall conform to ASME B18.2.1. Round head bolts shall conform to ASME B18.5, Type I, Class One.

TABLE ONE
REPLACEMENT FASTENERS MATERIAL

Woodwork (009-37) Aluminum and aluminum alloy components and structural members. To avoid bi-metallic corrosion, fastener material composition shall be the same material composition as that of the metal components and structural members that they are fastening except as noted in this table.	Corrosion resistant steel (CRES) conforming to SAE-AMS-STD-66, Grades 304 or 316.		Install non-metallic (epoxy plastic, phenolic, polyimide [nylon], Teflon) sleeves over CRES fasteners where they come in contact with the aluminum and aluminum alloy components and structural members.	Fasteners with compositions of copper alloys shall not be used in contact with aluminum and aluminum alloy components and structural members.
Shipboard Electrical / Electronic Cable (009-73)	MIL-DTL-1222, Type I			Grade 316, stainless steel, for areas exposed to weather and high moisture areas Grade 2 or 5, carbon steel, zinc plated, for other areas to support work required by individual Work Items
Rotating SIS Electrical Equipment (009-113)	MIL-DTL-1222, Type I or II, Grade 5, zinc coated	NASM-25027, self-locking hexagon nuts, excluding body-fitted bolts and studs.	Lock Washers shall conform to requirements of the Equipment Technical Manual	
Valves (009-45, 009-47 through 009-55, 009-68 and 009-96) – See Attachment B or C (for DDG-51 class).				

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-95
DATE: ***01 OCT 2017***
CATEGORY: II

1. SCOPE:

1.1 Title: Mechanically Attached Fitting (MAF); install

2. REFERENCES:

2.1 MIL STD 777, Schedule of Piping Systems, Valves, Fittings, and Associated Piping Components for Naval Surface Ships

2.2 S9086-RK-STM-010/CH-505, Shipboard Piping Systems

3. REQUIREMENTS:

3.1 Provide control over the use of mechanically attached fittings (MAFs) when approved in accordance with 4.46 of 2.1 as an alternative to the standard welding or brazing of fittings in shipboard piping systems. Select and install MAFs in accordance with Paragraph 505-6.8 of 2.***2***.

3.2 Prepare a written procedure for approval by the SUPERVISOR identifying the specific MAF process that may be utilized. The procedure requires a one-time submittal/acceptance unless Standard Items and/or references change or contractor's status changes.

3.2.1 The procedure shall be in accordance with 2.2 and shall include quality control requirements, inspection and documentation forms, safety requirements, installation criteria (procedures), responsibilities, and training program requirements.

3.2.2 Submit one legible copy, in approved transferrable media, of the procedure to the SUPERVISOR at least 7 days prior to initial implementation of procedure.

3.2.2.1 Submit updated or changed procedures to the SUPERVISOR at least 3 days prior to implementation.

3.3 Accomplish the requirements of the approved procedure.

3.3.1 Submit one legible copy, in approved transferrable media, of a report to the SUPERVISOR identifying the type of MAF, location (space), and system where the contractor exercises the option to install MAFs in lieu of weld fittings.

4. NOTES:

4.1 None.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-96
DATE: ***01 OCT 2017***
CATEGORY: II

1. SCOPE:

1.1 Title: Ball Valve; repair

2. REFERENCES:

2.1 S9086-RJ-STM-010/CH-504, Pressure, Temperature and Other Mechanical and Electromechanical Measuring Instruments

3. REQUIREMENTS:

3.1 Matchmark valve parts.

(V) "INSPECT PARTS FOR DEFECTS"

3.2 Disassemble, clean each internal and external surface free of foreign matter (including paint), and inspect each part for defects.

3.3 Repair valve as follows:

3.3.1 Polish the seating surface of the valve ball to a 32 Root-Mean-Square finish to remove high spots, nicks, and burrs.

3.3.2 Remove each existing and install new valve soft seats using those compatible with the system fluid, in accordance with manufacturer's specifications.

3.3.3 Chase and tap exposed threaded areas.

3.3.4 Dress and true gasket mating surfaces.

(I)(G) "VERIFY LEVEL I PARTS AND CLEANLINESS"

3.4 Assemble ***each*** valve installing new each packing, ***each*** gasket, ***each*** diaphragm, ***each*** spring, and ***each*** soft seat, ***and each fastener***, in accordance with the manufacturer's specifications ***or instruction***.

3.4.1 Lubricate each MIL-V-24509 valve with grease conforming to SAE-AMS-G-6032.

(I) or (V) "INSPECT ALIGNMENT" (See 4.3)

3.5 Inspect alignment of ports in the ball valve and body with the ball fully seated. Ball misalignment shall not be of a degree that will restrict flow.

3.6 Hydrostatically test valve as follows:

3.6.1 Hydrostatic test equipment shall have the following capabilities:

3.6.1.1 Manual overpressure protection release valve.

3.6.1.2 Self-actuated and resetting relief valve with a set point no greater than 100 PSIG above the test pressure or 10 percent above the test pressure, whichever is less.

(V) "GAGE CHECK"

3.6.1.3 Master and backup test gages with gage range and graduation in accordance with Table 504-6-1 of 2.1. The backup gage shall be cross-checked to the master hydrostatic test gage up to the maximum test pressure just prior to start of testing. Master and backup gages shall track within 2 percent of each other.

3.6.1.4 Protection equipment shall be accessible and test gages shall be located where clearly visible and readable to pump operator and inspector.

(V)(G) or (I)(G) "SEAT TIGHTNESS" (See 4.4)

3.6.2 Test for seat tightness alternately on each side of ball valve with the opposite side open for inspection.

3.6.2.1 Ball shall be seated by hand force.

3.6.2.2 Test shall be continued for a minimum of 3 minutes if there is no evidence of leakage or, in the event of visible leakage, until accurate determination of leakage can be made.

3.6.2.3 Allowable leakage for a soft-seated ball valve: None.

4. NOTES:

4.1 Test pressures of 3.6.2 will be specified in Work Item.

4.2 Repair of valve operating gear will be specified in Work Item.

4.3 The paragraph referencing this note is considered an (I) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V).

4.4 The paragraph referencing this note is considered an (I)(G) if the valve is Level I. If the valve is not Level I, the paragraph is considered a (V)(G).

4.5 Test medium will be specified in Work Item.

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-107
DATE: ***01 OCT 2017***
CATEGORY: II

1. SCOPE:

1.1 Title: Piping System Cleanliness Restoration (Non-Nuclear); accomplish

2. REFERENCES:

2.1 Standard Items

2.2 S9AAO-AB-GOS-010, General Specifications for Overhaul of Surface Ships (GSO)

2.3 0902-018-2010, General Specifications for Deep Diving SSBN/SSN Submarines

2.4 S9086-RK-STM-010/CH-505, Shipboard Piping Systems

2.5 MIL-STD-1330, Precision Cleaning and Testing of Shipboard Oxygen, Helium, Helium-Oxygen, Nitrogen Systems, and Hydrogen Systems

2.6 MIL-STD-419, Cleaning, Protecting, and Testing Piping, Tubing, and Fittings for Hydraulic Power Transmission Equipment

2.7 MIL-STD-1622, Standard Practice for Cleaning of Shipboard Compressed Air Systems

2.8 S9086-RW-STM-010/CH-516, Refrigeration Systems

3. REQUIREMENTS:

3.1 Accomplish the general cleaning requirements of 2.2 through 2.4 for new, modified, or repaired non-nuclear piping systems and components of nuclear and non-nuclear powered naval vessels. Accomplish the system cleaning requirements of 2.5 through 2.8.

3.1.1 Clean to the following acceptance standard:

3.1.1.1 Cleanliness Level II: Surface shall be visually free of grease, oil, flux, scale, dirt, loose particles and any other contamination foreign to the base metal. Tap water residues on all metals and light superficial rust on carbon steel surfaces, caused by short time exposure to the atmosphere, are permitted. Light dust on cleaned surfaces is not objectionable, provided that the quantity and size of the particle does not adversely affect system operations.

3.1.1.2 Cleanliness Level III: Surface shall be reasonably free of contamination and any remaining residue on the surface does not interfere with system operations or damage system components.

3.2 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of compressed air systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 551 of 2.2 and 2.7.

(I)(G) "VERIFY CLEANLINESS"

3.2.1 Verify cleanliness in accordance with acceptance standards.

3.3 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of oxygen, nitrogen, and helium systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 552 of 2.2 and 2.5.

(I)(G) "VERIFY CLEANLINESS"

3.3.1 Verify cleanliness in accordance with acceptance standards.

3.4 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of hydraulic systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 556 of 2.2 and 2.6.

(I)(G) "VERIFY CLEANLINESS"

3.4.1 Verify cleanliness in accordance with acceptance standards.

3.5 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of fuel oil systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 541 of 2.2.

(I)(G) "VERIFY CLEANLINESS"

3.5.1 Verify cleanliness in accordance with acceptance standards.

3.6 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of steam systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 253 of 2.2.

(I)(G) "VERIFY CLEANLINESS"

3.6.1 Verify cleanliness in accordance with acceptance standards.

3.7 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of condensate systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 255 of 2.2.

(I)(G) "VERIFY CLEANLINESS"

3.7.1 Verify cleanliness in accordance with acceptance standards.

3.8 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of lube oil systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 262 of 2.2.

(I)(G) "VERIFY CLEANLINESS"

3.8.1 Verify cleanliness in accordance with acceptance standards.

3.9 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of ***each*** fresh water system shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 532 of 2.2.

(I)(G) "VERIFY CLEANLINESS"

3.9.1 Verify cleanliness in accordance with acceptance standards.

3.10 Accomplishment of a Process Control Procedure (PCP) for each cleaning operation of refrigerant systems shall be in accordance with NAVSEA Standard Items (See Note 4.3) and 2.8.

(I)(G) "VERIFY CLEANLINESS"

3.10.1 Verify cleanliness in accordance with acceptance standards.

3.11 Accomplishment of a Process Control Procedure (PCP) for the cleaning, flushing, and acceptance criteria of HP/LP steam drains shall be in accordance with NAVSEA Standard Items (See Note 4.3) and Section 534 of 2.2.

(I)(G) "VERIFY CLEANLINESS"

3.11.1 Verify cleanliness in accordance with acceptance standards.

4. NOTES:

4.1 This Standard Item does not apply to systems of nuclear-powered ships covered by NAVSEAINST 9210.36, Steam Plant Cleanliness Control, or nuclear piping systems on nuclear-powered ships.

4.2 See Attachment A for Level II and Level III piping systems.

4.3 If a Process Control Procedure (PCP) of 3.***2*** through 3.***11*** is required; the use of Category II Standard Item 009-09 "Process Control Procedure (PCP); provide and accomplish" of 2.1 will be specified in the Work Item.

ATTACHMENT A
CLEANLINESS LEVEL II AND III

CLEANLINESS LEVEL II PIPING SYSTEMS:

- DIVERS AIR (NOTE 1)
- ELECTRONICS DISTILLED WATER COOLING (NOTE 1)
- HIGH PRESSURE AIR (NOTE 1)
- HYDRAULIC PIPING SYSTEMS (NOTE 1)
- LUBRICATING OIL SYSTEMS (NOTE 1)
- MISSILE HEATING AND COOLING
- REFRIGERANT SYSTEM (FREON AND LITHIUM BROMIDE) (NOTE 1)
- OXYGEN SYSTEM (NOTE 1)
- AIR CONDITIONING CHILLED WATER SYSTEM
- AUXILIARY STEAM SYSTEM
- CONDENSATE SYSTEM (NOTE 1)
- DIESEL FRESHWATER COOLING
- AIR FOR DIESEL CONTROL, VITAL AIR, ELECTRONICS SYSTEMS, ABC SYSTEMS AND PNEUMATIC CONTROL (NOTE 1)
- EXHAUST PIPING (STEAM)
- FEEDWATER SYSTEM (NOTE 1)
- POTABLE WATER SYSTEM (NOTE 1)
- FUEL SERVICE SYSTEM (NOTE 1)
- DISTILLATE PIPING SYSTEMS
- FUEL TRANSFER SYSTEM (NOTE 1)
- GASOLINE SYSTEM
- HIGH AND LOW PRESSURE DRAIN SYSTEM (NOTE 1)
- MAIN STEAM SYSTEM (NOTE 1)
- MEDIUM PRESSURE AIR (ABOVE 250 PSI AND BELOW 1500 PSIG) (NOTE 1)
- NITROGEN PIPING SYSTEM (NOTE 1)
- JP-5 PIPING SYSTEM
- OTHER SYSTEMS AS SPECIFIED BY THE SUPERVISOR

NOTE 1: SEE INDIVIDUAL GSO SECTIONS FOR ADDITIONAL SPECIAL CLEANING REQUIREMENTS

CLEANLINESS LEVEL III PIPING SYSTEMS:

- AIR ESCAPE (TANK VENT)
- AIR CONDITIONING SEAWATER COOLING SYSTEM
- AFFF CONCENTRATE AND AFFF/SW SYSTEMS

- AUXILIARY SEAWATER SYSTEM
- CO2 SYSTEM
- DIESEL EXHAUST SYSTEM
- DIESEL SEAWATER COOLING SYSTEM
- DISTILLING PLANT, BRINE OVERBOARD DISCHARGE SYSTEM
- DISTILLING PLANT, SEAWATER FEED SYSTEM
- ESCAPE PIPING (STEAM)
- FIREMAIN SYSTEM
- HALON
- MAIN SEAWATER COOLING SYSTEM
- PLUMBING SYSTEM
- SANITARY AND FLUSHING PIPING SYSTEM
- SHIP SERVICE LOW PRESSURE AIR SYSTEM (NON-VITAL)
- OTHER SYSTEMS AS SPECIFIED BY THE SUPERVISOR

NAVSEA
STANDARD ITEM

FY-19

ITEM NO: 009-116
DATE: 30 JUL 2015
CATEGORY: II

1. SCOPE:

1.1 Title: Auxiliary and Waste Heat Boiler Sodium Nitrate Wet Layup; accomplish

2. REFERENCES:

2.1 S9086-GX-STM-020/CH-220, Boiler Water/Feedwater Test and Treatment

2.2 S9086-GY-STM-010/CH-221, Boilers

3. REQUIREMENTS:

3.1 Accomplish sodium nitrite wet layup of each auxiliary/waste heat boiler.

3.2 Notify the SUPERVISOR one day prior to layup of each boiler.

3.3 The sodium nitrite layup solution shall be prepared with sufficient solution to fill boiler and to provide a reservoir in a pier side tank or ship's feedwater tank.

3.3.1 For each 100-gallons of feed quality water (conductivity maximum of 15-micromho/cm) to be treated, dissolve one pound of sodium nitrite in accordance with Paragraphs 220-29.24.3 and 220-30.29.4 of 2.1.

3.3.1.1 Mixing is accomplished by dissolving the sodium nitrite in feed quality water (10 pounds will dissolve in 2-gallons of water), and then adding the dissolved chemicals to the feedwater in the tank. The tank is then circulated for 30-minutes to mix the solution.

3.3.2 A head tank is the easiest and preferred method of maintaining positive pressure. If a head tank method is used, locate and pipe the head tank above the highest boiler vent.

3.3.3 Fill the boiler with the sodium nitrite layup solution and maintain pressure using a head tank or feed pump.

3.3.4 Provide an authorized source of heat to the fireside/gas-side areas to prevent corrosion in accordance with 2.2.

3.4 Layup is lost when the head tank level or pump discharge pressure is not maintained and cannot be reestablished. Apply dry layup if layup is lost.

3.5 To prepare for boiler operation, dump the boiler, feed tanks and associated piping. Flush by refilling the boiler, feed tanks, and associated piping with feed-quality water. Do not light-off with sodium nitrite layup solution in the boiler, DFT (if applicable) or feed tank. Dispose of removed solution in accordance with local, state, and federal regulations.

3.5.1 Do not drain the solution to the bilge.

4. NOTES:

4.1 None.