

Install Thermosalinograph and Relocate pCO2

1 SCOPE

The intent of this item is to install the Thermosalinograph, relocate the pCO2 equipment, and to provide a testing station in the port side main deck passageway.

Government Furnished Property: None

2 REFERENCES

Coast Guard Drawings:

420-WAGB 801-1, Rev -; Booklet of General Drawings
420-WAGB 532-2, Rev A; Hot & Cold Potable Water & Brominator System
420-WAGB 801-5, Rev B; Piping Material Schedule
420-WAGB 508-1, Rev D; Piping & Machinery Insulation Schedule
420-WAGB 524-1, Rev F; Diagram Aux Seawater Sys
420-WAGB 529-1, Rev C; Diagram Ballast, Mn Drainage, & Independent Drain Ag

Applicable Documents:

MIL-DTL-24643, Rev B, Sup 1, 8/22/2002; Cables and Cords, Electric, Low Smoke, For Shipboard Use, General Specification for
SFLC Std Spec 3402, Shipboard Electrical Cable Removal, Relocation, Splice, Repair, and Installation
American Society for Testing and Materials (ASTM) F1836M, Standard Specification for Stuffing Tubes, Nylon and Packing Assemblies (Metric)
Tech Pub 5265, 11/1/2003; SN576-Aj-MMC-010-Thermosalinograph
COMDTINST M10360.3, Series; Coatings and Colors Manual
COMDTINST M9085.1, Series; Naval Engineering Computer Aided Design Standards
Naval Ship's Technical Manual (NSTM) Chapter 550, Series; Compressed Gas Cylinders
Naval Ship's Technical Manual (NSTM) Chapter 635, Rev 2, 7/28/1998; Thermal, Fire and Acoustic Insulation
NAVSEA Dwg 803-1385866, Rev E; Penetrations; Bulkhead and Deck
NAVSEA Dwg 804-1385781, Rev E; Pipe Hangers for Surface Ships (Superseding Navsea Dwg 810-1385781)
Surface Forces Logistics Center (SFLC) Standard Specification 0000_STD, 2009 Edition
General Requirements Surface Forces Logistics Center (SFLC) Standard Specification 0740_STD, 2009 Edition
Welding and Allied Processes ASTM International (ASTM) F992, 2011
Standard Specification for Valve Label Plates Institute of Electrical and Electronic Engineers (IEEE) Standard 45, 2002
Recommended Practice for Electric Installations on Shipboard MIL-STD-777
Schedule of Piping, Valves, Fittings, and Associated Piping Components for Surface Ships
pCO2 System User's Manual

3 REQUIREMENTS

The Contractor shall provide all labor and material to accomplish the following in accordance with the General Requirements:

3.1 GENERAL

3.1.1 In the presence of the Coast Guard Inspector, inspect and test all equipment and systems that will be disturbed during the performance of this work to document their original condition. Submit a Condition

Found Report for all such equipment and systems noting any existing (pre-work) discrepancies in their operation.

3.1.2 Tag-Outs – Secure, isolate, and tag-out all affected mechanical, piping, and electrical systems in accordance with the General Requirements.

3.1.3 Interferences – The Contractor shall remove, modify, or protect all interferences to the work. All interferences that are removed shall be tagged to facilitate proper reinstallation. Ensure that all removed equipment is kept in a clean, dry, protected location. Obtain verification from the Coast Guard Inspector for the protective measures taken for equipment not removed.

3.1.4 Gas Free Certification

3.1.4.1 Gas free and certify affected compartments in accordance with the General Requirements. The affected compartments must be certified “Safe for Personnel – Safe for Hotwork” for the duration of work performed under this item.

3.1.4.2 Gas Free Certificates indicating the current status of compartments shall be posted on the Quarterdeck and at each open access to the compartments. Provide one copy to the Coast Guard Inspector.

3.1.5 Drawings – Ripout and installation drawings titled “TSG/PCO2 Equipment Removal and Installation” should be prepared and provided to the USCG for approval before work is commenced. The drawing with bill of material, in USCG drawing format, is needed for proper installation and for documenting the modification. All drawings shall be done in accordance with COMDTINST M9085.1C.

3.2 GENERAL GUIDANCE

3.2.1 Install new piping hangers on all new piping in accordance with NSTM Chapter 505 and NAVSEA Dwg 804-1385781.

3.2.2 Make all new deck and bulkhead penetrations in accordance with NAVSEA Dwg 803-1385866.

3.2.3 Install new lagging in accordance with NSTM Chapter 635.

3.3 LAB SINK INSTALLATION

This section describes the installation of the lab test sink and installation of hot and cold water piping and drains. The lab sink will be a long, custom made, stainless steel sink with no drainboard and one faucet assembly. The faucet assembly and sink will be supplied separately by STARC.

The following CG Drawings are used to perform the work in this subsection: CG Dwg 420 WAGB 801-1, CG Dwg 420 WAGB 532-2, CG Dwg 420 WAGB 801-5, and CG Dwg 420 WAGB 508-1.

3.3.1 The sink will be provided by STARC and is 6’ x 18” x 14”.

3.3.2 The sink will be located in Passageway 1-80-4-L on the outboard bulkhead, at approximately frame 90. Verify the exact location with the Coast Guard Inspector prior to commencing work. Locate the sink as close to the bulkhead as practicable.

3.3.3 Touch up paint the areas damaged by welding.

3.3.4 Attach the sink to the UNISTRUT mounting fixtures, above the ballast overboard pipe. Enough space should be left between the sink and the ballast overboard to allow for a drain to be installed.

3.3.5 Install a high rise faucet assembly, including hot and cold water valves on the sink. Use all stainless steel fittings. The faucet will be provided by STARC.

3.4 HOT AND COLD POTABLE WATER

The following CG Drawings are used to perform the work in this subsection: CG Dwg 420 WAGB 801-1, CG Dwg 420 WAGB 532-2, CG Dwg 420 WAGB 801-5, and CG Dwg 420 WAGB 508-1.

3.4.1 Provide and install hot and cold potable water to the sink.

3.4.1.1 Using CG Dwg 420 WAGB 532-2, locate the hot and cold water supply lines to the water closet located at frame 105.

3.4.1.2 “Tee” into the hot and cold water supply lines to the water closet in the overhead of passageway 1-105-4-L. Hot water pipe size at this location is 5/8 ips and cold water pipe size is 7/8 ips.

3.4.1.3 Route new hot and cold water piping from the new “Tee” connections to the sink. The new piping will follow the overhead of passageway 1-105-4, but may be mounted along the outboard bulkhead of passageway 1-80-4-L if required to avoid excessive penetration of stiffeners. The new piping must penetrate bulkhead 105 and must be made fume tight as it passes through this bulkhead.

3.4.1.3.1 New piping materials shall be seamless drawn copper as shown in CG Dwg 420 WAGB 801-5. Hot water piping will be 5/8 ips and cold water piping will be 5/8 ips.

3.4.1.4 Provide and install shut-off valves located near the sink to allow isolating the sink from the potable water system.

3.4.2 Flush all new potable water lines. Demonstrate to the satisfaction of the Coast Guard Inspector that the lines are clean. Sample the water and provide the sample to the cutter’s medical officer to test and verify that the water supply is not contaminated.

3.4.3 After making all connections, operationally test the water distribution to the sink. Inspect all welds in the presence of the Coast Guard Inspector. Repair all leaks. No additional hydrostatic testing is required.

3.4.4 After demonstrating that the water lines are intact, insulate the new hot and cold potable water lines in accordance with CG Dwg 420 WAGB 508-1.

3.4.5 Run clean water through the lines to remove any contamination and ensure that the water flows freely.

3.5 SINK DRAINS

3.5.1 Provide and install a drain line on the sink. Provide a “P-Trap” and a cut off valve in the drain line.

3.5.1.1 Penetrate the ballast overboard pipe directly below the sink and route a drain pipe to the ballast overboard.

3.6 INSTALL THERMOSALINOGRAPH

Note: UNISTRUT portable mounting fixtures should be installed on bulkheads in the passageway prior to installing the new sink assembly.

3.6.1 Install UNISTRUT portable mounting fixtures in passageway 1-80-4-L at a location specified by the Coast Guard Inspector. The diagram at the end of this specification item shows approximate location and set up of the UNISTRUT assemblies. STARC will provide UNISTRUT.

3.6.2 STARC will mount the Thermosalinograph on the mounting brackets above the new sink. The Thermosalinograph will be located over the test sink in an area compatible with the installation of the new test cabinet above the sink.

3.6.3 STARC will mount the flourometer, flow meter, pressure gauge, and debubbler, as shown in the diagram.

3.6.3.1 Provide piping connections for the flow meter, debubbler, flourometer, and pressure gauge in the piping leading to the Thermosalinograph.

3.7 PIPING CONNECTIONS FOR THE THERMOSALINOGRAPH

The Thermosalinograph is served by two (2) ½-inch PVC piping connections, a seawater inlet connection, a seawater outlet connection.

CG Dwg 420 WAGB 524-1 was used in the preparation of this drawing. Unless otherwise noted, all material used in this section will be as per the science seawater material list referenced in CG Dwg 420 WAGB 524-1.

3.7.1 Seawater Inlet-Tap into the new Science Seawater Piping (located approximately 10 ft. away) to provide a salt water supply to the Thermosalinograph. The science seawater piping is glass reinforced pipe. The new piping will be glass reinforced piping as per CG Dwg 420 WAGB 524-1. The new connection will be in the overhead of the compartment at approximately frame 92. Approximately 10 ft. of the new piping and one new valve is involved.

3.7.1.1 Install a Titanium alloy root valve (material as per CG Dwg WAGB 524-1) and lead the new piping connection to the seawater intake of the Thermosalinograph.

3.7.1.2 Install a valve on the Science Seawater piping forward of the tap for the Thermosalinograph to prevent stagnant water from the forward part of the ship sloshing back to the Thermosalinograph.

3.7.2 In the presence of the Coast Guard Inspector, operationally test each of the new piping connections and demonstrate that there are no leaks. (Note: Hydrostatic testing of this low pressure piping is not required, operational test only to verify all connections are tight.)

3.7.3 After completion of operational testing install new lagging on all new seawater supply piping to the Thermosalinograph. Insulation to be closed cell foam, double thickness, as existing on the science seawater system. Paint and mark the piping in a similar manner to the existing science seawater piping.

3.8 THERMOSALINOGRAPH INSTALLATION

3.8.1 STARC shall mount previously removed NEMA Junction Box to bulkhead near Prep Table. STARC will identify the mounting location of NEMA Junction Box. STARC shall also mount Thermosalinograph near Prep Table. STARC shall supply all mounting hardware and bracket to mount the NEMA Junction Box and Thermosalinograph.

3.8.2 Thermosalinograph equipment layout is shown at the end of the specification.

3.8.3 STARC shall re-connect all wiring from the NEMA Junction Box to Thermosalinograph.

3.8.4 STARC shall re-connect all cables from Thermosalinograph to Computer.

3.8.5 Reinstall cable connecting the Thermosalinograph, computer connections and the salinity cell as described in the technical manual for the Thermosalinograph. Perform functional Power “ON-OFF” of new installation.

3.8.6 The Contractor shall install a new power supply cable (LSTSGU-4) from Power Panel (XX-XX XX), and shall provide, install and wire two (2) 120 VAC, 15 A Duplex Convenient Outlets. The Coast Guard Inspector will identify mounting location of the Duplex Convenient Outlets.

3.8.7 Duplex Convenient Outlets shall be rated at 15 Amp and shall be UL Approved. The Contractor shall mount Duplex Convenient Outlet with J-BOX. Ground terminal of the Duplex Convenient Outlet shall be grounded to hull. The Contractor shall install new cable (LXM-4) from Power Panel. The Coast Guard Inspector will identify the Power Panel and Spare Circuit.

3.8.8 The Contractor shall supply and install nylon stuffing tubes in accordance with the ASTM F 1836 for each cable.

3.9 pCO₂ RELOCATION

The pCO₂ system is located in the Wet Lab, compartment 1-117-1-Q. It is currently mounted on a piece of plywood that is blocking access to a door. STARC will remove the pCO₂ system from the Wet Lab and reinstall in the Port Passageway 1-80-4-L on the UNISTRUT mounting fixtures. STARC will also move the CO₂ and Nitrogen bottles to the Port Passageway, in accordance with the drawing at the end of this specification and to the approval of the Coast Guard Inspector. STARC shall reconnect the pCO₂ system and perform functional power “ON-OFF” of installation.

3.9.1 All gas cylinders must be installed and stowed IAW NSTM 550 (Compressed Gas Cylinders).

3.10 ACCEPTANCE TESTING

3.10.1 Clearing Tags – As needed for testing, restore all affected systems and clear tags in accordance with the General Requirements.

3.10.2 Test Performance – All acceptance tests shall be performed in the presence of the Coast Guard Inspector. Provide a written report to the Coast Guard Inspector of all test results within one week of test completion.

3.10.3 Hydrostatic Test – Test components or systems where pressure boundary parts were replaced to 150% of rated pressure using potable water or other suitable liquid compatible with the system. Rated pressure shall be the lowest rated pressure of the components being tested together. No leakage shall be allowed after holding test pressure for a minimum of 10 minutes.

3.10.3.1 No hydrostatic testing will be performed on these low pressure piping components.

3.10.4 Tightness Test – Test components or systems where seals were disturbed to 100% of rated pressure using potable water or other suitable liquid compatible with the system. Rated pressure shall be the lowest rated pressure of the components being tested together. Tightness testing may also be performed by running the system at its highest normal operating pressure. No leakage shall be allowed after holding test pressure for a minimum of 10 minutes.

3.10.4.1 Operationally test all newly installed piping system. Demonstrate to the Coast Guard Inspector that all piping and joints are tight before installing any insulation on the piping systems.

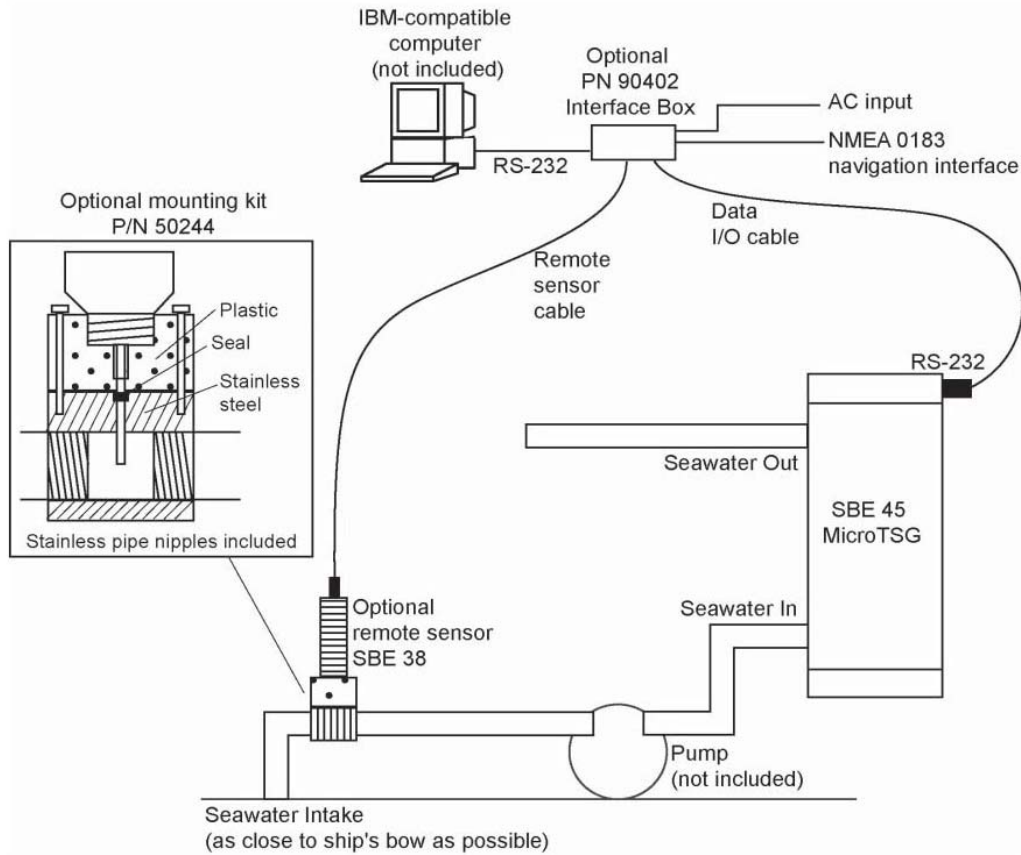
3.11 RESTORATION

3.11.1 Prepare and paint all new and disturbed surfaces in accordance with the General Requirements.

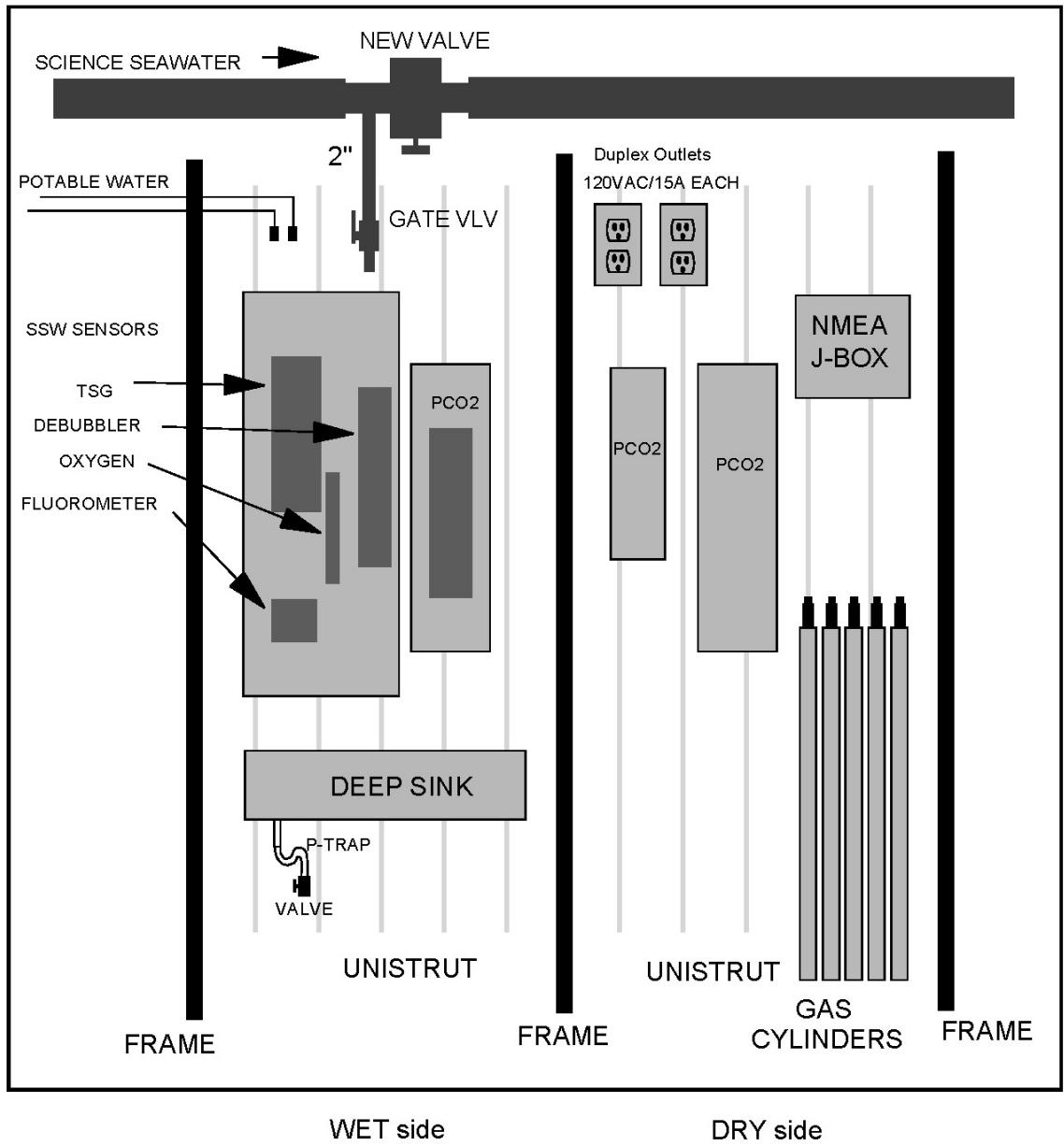
3.11.2 Restore all interferences to the original condition in accordance with the General Requirements.

3.11.3 Clearing Tags – Restore all affected systems and clear any remaining tags in accordance with the General Requirements.

System Schematic: SBE 45 with Optional PN 90402 Interface Box and Remote Temperature Sensor



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Theromosalinograph, pCO₂, and associated equipment diagram in the Port Passageway

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