



USCGC RESOLUTE (WMEC 620)

SPECIFICATION FOR DOCKSIDE REPAIRS

FY2023

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(Rev-0, 28 March 2023)

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REVISIONS RECORD

This page is used to record specification revisions, which may have occurred subsequent to a Revision 0 (Rev-0) package. Information listed is intended to provide contractors and field unit personnel a means to ensure all the current specification revision pages are present when reviewing or utilizing this specification package.

DATE	REV#	WORK ITEM#	CHANGES MADE

NOTE: All work item and paragraph numbers listed above for a given revision correspond to same numbers in the previous revision. This revised specification is self-contained with all of the above listed changes incorporated.

CONSOLIDATED LIST OF REFERENCES

The below-listed documents form a part of this specification to the extent specified herein. Approval/publication dates or revision dates/numbers are also identified, to ensure that same document versions are used at the time of specification writing and during contract execution.

All Coast guard drawings, technical publications, and standard specifications will be provided to contractors by the Coast Guard at an appropriate time, or upon request, free of charge. Other Government documents may be accessed – free of charge – from links located on the SFLC website. Commercial sites provide access to their respective documents.

COAST GUARD DRAWINGS

Coast Guard Drawing 627 WMEC 514-008, Rev A, Rip-Outs Incidental to the Carrier A/C Plant Install
Coast Guard Drawing 627 WMEC 514-009, Rev B, Mods Incidental to the Carrier A/C Plant Install
Coast Guard Drawing 627 WMEC 514-010, Rev D, Carrier 90RMC025-D-6-D005/MS1 A/C Plant Installation
Coast Guard Drawing 627 WMEC 536-001, Rev C, Diagram Seawater Piping for Mn Engines, Aux & Emergency Gens & A.C. Condenser
Coast Guard Drawing 627 WMEC 536-002, Rev C, Arr. Of S.W. Cooling for Main and Aux Engines and A/C Condensers
NAVSEA Drawing 804-5959214, Rev-, Piping Insulation - Installation Details

COAST GUARD PUBLICATIONS

Coast Guard Commandant Instruction (COMDTINST) M10360.3, Jun 2006, Coatings and Colors Manual
Coast Guard Technical Publication (TP) 3965, Apr 2020, Air Conditioning System, R-134A - Model 90RMC025-D-6-D005/MS1
Fire Prevention and Response
Surface Forces Logistics Center Standard Specification 0000 (SFLC Std Spec 0000), 2022, General Requirements
Surface Forces Logistics Center Standard Specification 0000 (SFLC Std Spec 0000), Latest Version, General Requirements
Surface Forces Logistics Center Standard Specification 0740 (SFLC Std Spec 0740), 2022, Welding and Allied Processes
Surface Forces Logistics Center Standard Specification 0740 (SFLC Std Spec 0740), Latest Version, Welding and Allied Processes
Surface Forces Logistics Center Standard Specification 5550 (SFLC Std Spec 5550), Latest Version,
Surface Forces Logistics Center Standard Specification 6310 (SFLC Std Spec 6310), 2022, Requirements for Preservation of Ship Structures
Surface Forces Logistics Center Standard Specification 6310 (SFLC Std Spec 6310), Latest Version, Requirements for Preservation of Ship Structures

OTHER REFERENCES

- Air-Conditioning, Heating, and Refrigeration Institute (AHRI) 700, Jan 2016, Specifications for Refrigerants
- American Society of Mechanical Engineers (ASME) B31.5, 2016, Refrigeration Piping and Heat Transfer Components
- ASTM International (ASTM) F683, 2014, Standard Practice for Selection and Application of Thermal Insulation for Piping and Machinery
- ASTM International (ASTM) F992, 2017, Standard Specification for Valve Label Plates
- Code of Federal Regulations (CFR) Title 29, Part 1915, Occupational Safety and Health Standards for Shipyard Employment
- Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), SP-58, 2018, Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application and Installation
- NAVSEA Technical Publication T9074-AD-GIB-010/1688, (TP 1688), July 2012, Requirements for Fabrication, Welding, and Inspection of Submarine Structure

CONSOLIDATED LIST OF GOVERNMENT-FURNISHED PROPERTY

The following is a list of property, which the Government will furnish. This list supersedes any other material obligations indicated or implied by referenced drawings.

WORK ITEM	MTI	ITEM DESCRIPTION	NSN/PN	QTY	ESTIMATED COST (\$/UNIT)
1	N	***Condenser, Refrigeration, Kit	PN: 90C02-1182-44	1 ea.	15,993.00

*Government-loaned property, which shall be returned to the vessel upon completion of the availability.

**New or refurbished equipment that the Government may provide for installation in place of existing equipment.

***Government-furnished property, which is to be supplied by either the vessel or the C4IT ServiceCenter

CONSOLIDATED LIST OF CRITICAL INSPECTION ITEMS

The following is a list of work items, which contain Critical Inspection reports, which the Contractor must complete within the first 25% of the availability contract period (see SFLC Std Spec 0000, paragraph 3.2.6.5 (Inspection report particulars)):

Work Item	Title
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This section is not applicable to this package.

PRINCIPAL CHARACTERISTICS

210' WMEC (B-CLASS)	
PHYSICAL	
Length overall	210' 6"
Length between perpendiculars	200' 0"
Beam molded	34' 0"
Depth molded, main deck amidships	19' 6"
Full load displacement	1,170 long tons
Draft, full load to baseline amidships *Baseline is 9" below keel amidships	12' 0"
Design drag between perpendiculars	1' 6"
Highest projection above baseline *VHF-FM ADF antenna	90' 0"
Shore tie voltage requirements	400A / 440V
Frame spacing	1' 0"
MACHINERY	
Main propulsion	2 ALCO Model 16-251-B Diesel Engines, 5,000 BHP total
Ship's service generators	2 Caterpillar Model 3406B Diesel-driven SR4, 250 KW each @ 0.8 power factor, 440VAC, 3 phase, 60 cycle
Emergency generator	Caterpillar Model 3306B Diesel-driven SR4, 180 KW @ 0.8 power factor, 440VAC, 3 phase 60 cycle
Number of propellers	2
Propeller diameter	7' 6"
Number of blades, each	4
Pitch	Controllable
Shaft RPM	300
Shaft diameter	8.25" at exit of hull
Anchor & chain	Two 2,800 lb Navy Stockless Anchors, 7 shots of chain each
TANK CAPACITIES	
Diesel fuel total (95%)	48,427 gal.
Fresh water total (100%)	11,693 gal.
JP-5 fuel total (95%)	4,683 gal.
Lube oil total (95%)	2,390 gal.

General Requirements

1. SCOPE

1.1 Intent. This standard specification invokes general requirements for conducting vessel repairs performed by commercial contractors at a Coast Guard facility for Coast Guard vessels.

1.2 Term interchangeability. The terms 'Contractor', 'CG Yard', 'NAVSTA EVERETT', 'shipyard', 'Base', and 'Coast Guard Industrial' are used interchangeably in this specification. Where the primary service provider is Coast Guard personnel, references to contractor and other noted descriptors within this specification or within drawings, publications, SFLC Standard Specifications or other commercial and military references are deemed the same as prime service provider.

2. REFERENCES

COAST GUARD DRAWINGS

None

COAST GUARD PUBLICATIONS

Coast Guard Commandant Instruction (COMDTINST) M10360.3 (series), Coatings and Color Manual
Surface Forces Logistics Center Standard Specification 0000 (SFLC Std Spec 0000), Latest Version,
General Requirements

Surface Forces Logistics Center Standard Specification 0740 (SFLC Std Spec 0740), Latest Version,
Welding and Allied Processes

Surface Forces Logistics Center Standard Specification 5550 (SFLC Std Spec 5550), Latest Version,
Fire Prevention and Response

Surface Forces Logistics Center Standard Specification 6310 (SFLC Std Spec 6310), Latest Version,
Requirements for Preservation of Ship Structures

OTHER REFERENCES

Code of Federal Regulations (CFR) Title 29, Part 1915, Occupational Safety and Health Standards for
Shipyard Employment

NAVSEA Technical Publication T9074-AD-GIB-010/1688, (TP 1688), July 2012, Requirements for
Fabrication, Welding, and Inspection of Submarine Structure

3. REQUIREMENTS

3.1 General. The Contractor must conform to all requirements specified in SFLC Std Spec 0000 and in this item, as applicable, during the performance of this availability. The requirements of this WI applies to all work under the scope of this contract, whether explicitly stated in all following work items or not, and to all other work subsequently authorized by changes, modifications, or extensions to the contract.

3.1.1 The Contractor must conform to all requirements specified in SFLC Std Spec 5550 and in the Fire Protection and Response work item, as applicable, during the performance of this availability.

3.1.1.1 Fire Safety Plan submission. The Contractor must submit a copy of the CFR 1915, Subpart P, Fire Safety Plan with the Contractor's bid when work will be conducted in a Contractor-owned facility. Include any MOA(s) with local firefighting facilities.

3.1.1.2 Fire Plan submission. The Contractor must submit a copy of the developed availability specific fire plan as requested in the Fire Protection and Response work item, with the Contractor's bid.

NOTE

NAVSEA drawings listed will be available FOR INSPECTION ONLY from the Coast Guard Port Engineer post-award. SFLC will not redistribute NAVSEA documents. Contractors can apply to NAVSEA headquarters directly for copies.

3.2 Fire watch requirements. The Contractor must refer to 3.3.1.3 (Fire watch requirements) of SFLC Std Spec 0000, in accomplishing the following task:

- Provide portable fire extinguishers for Coast Guard fire watch personnel. Coast Guard fire watch is in lieu of contractor personnel during the hours of 0800-1600, Monday through Friday, and limited to two Coast Guard fire watch personnel.
- Provide fire watch personnel and fire extinguishers for the duration of the availability period, during and beyond noted Coast Guard fire watch support.

3.3 Preservation requirements. The Contractor must accomplish all preservation tasks, including touch-ups, in accordance with SFLC Std Spec 6310.

3.3.1 Brand name approval. Ensure that all contractor-furnished coatings are in accordance with SFLC Std Spec 6310, Appendix C (Authorized Coatings for Use on Cutters and Boats).

3.3.2 Coating colors and system color schemes. The Contractor must obtain a written KO authorization to deviate from any coatings required in SFLC Std Spec 6310 Appendix C before work.

3.3.3 In-process quality control measures. The Contractor must abide by all the safety, preservation, and quality control requirements specified in SFLC Std Spec 0000, paragraph 3.2.4.2 (In-process QC measures for "critical-coated surfaces").

3.3.3.1 Quality control requirements. The Contractor must abide by the following when performing preservation related inspections. The following measurements must be randomly spaced throughout for the purposes of providing a representation of the entire prepared or coated surface.

3.3.3.1.1 Surface profile measurements. One surface profile measurement must be taken for every 200 square feet for the first 1000 square feet; for each additional 500 square feet or less, one profile measurement must be taken.

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Profile measurements must be taken in accordance with SFLC Std Spec 6310, paragraph 3.1.8.3 (Surface profile measurements). A “measurement” for surface profile is defined as follows:

- ASTM D4417, Method B: One profile measurement is the average (mean) of 10 individual readings.
- ASTM D4417, Method C: One profile measurement is the average (mean) of 2 individual readings.

3.3.3.1.2 Soluble salt conductivity measurements. 5 conductivity measurements must be taken every 1000 square feet. For submerged (immersed) applications conductivity measurements must not exceed 30 microsiemens/cm. For non-submerged (non-immersed) applications conductivity measurements must not exceed 70 microsiemens/cm. If a conductivity check fails, clean the surface in accordance with SFLC Std Spec 6310, paragraph 3.1.8.5 (Soluble salt removal).

3.3.3.1.3 Coating thickness measurements. Three area measurements must be taken for the first 1000 square feet; for each additional 1000 square feet, perform an additional area measurement. A “measurements” for coating thickness is defined as follows:

- SSPC-PA 2 defines an area measurement as 5 separate spot measurements randomly spaced throughout a 100 square foot area.
- SSPC-PA 2 defines a spot measurement as 3 gage readings and each new gage reading the probe must be moved to a new location within a 1.5 inch diameter circle defining the spot.

3.4 Welding and brazing requirements. The Contractor must perform all welding and allied processes, and NDE in accordance with SFLC Std Spec 0740.

3.4.1 HY-130 material substitution. The Contractor must be aware that HY-130 steel plating is no longer commercially available. For the purpose of performing flight deck repairs on US Coast Guard WMEC-270 “B-Class” cutters, Weldox 900 steel plating has been approved as a replacement for HY-130. Due to the similarity in material properties and weldability of HY-130 and Weldox 900, all welding procedures and welder qualifications for welding Weldox 900 must be the same as those outlined in NAVSEA TP 1688 as applicable for welding HY-130.

3.4.2 Standard spec modification. For any welding involving HY-130 on the flight deck of WMEC-270 “B-Class” cutters, perform all welding and allied processes, and non-destructive evaluation (NDE) in accordance with NAVSEA TP 1688. The Contractor must be aware that the welding requirements specified in this document take precedence over paragraph 3.3.6 of SFLC Standard Spec 0000 for the purpose of welding involving HY-130.

3.4.3 Approval to weld HY-130. To obtain Coast Guard approval to weld on HY-130 steel for WMEC-270 “B-Class” cutters, the Contractor must provide written Performance Qualification Records (PQR’s) for each process to be used. The PQR’s must be approved by one of the regulatory agencies affirming that the WPS meets the welding requirements of NAVSEA TP 1688. In addition, the Contractor must ensure that all subcontractors, prior to performing welding operations, have qualified procedures by meeting all the requirements set forth in this document.

NOTE

NAVSEA approval is NOT required for welding procedures submitted but the procedures must be reviewed and shown to satisfy the requirements set forth in NAVSEA TP 1688, by a welding regulatory agency. The requirements for welding Weldox 900 are considered the same as those for welding HY-130.

3.5 Environmental protection requirements. The Contractor must adhere to the following environmental protection requirements in accordance with the SFLC Stand Spec 0000:

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3.5.1 Contractor operated (non USCG) facilities. The Contractor must provide and maintain environmental protection as defined in SFLC Std Spec 0000 Appendix A, Requirements for Environmental Protection at Contractor Operated (Non USCG) Facilities, as applicable, during the performance of this availability. Contractor must plan for and provide environmental protective measures to control pollution that develops during normal practice, as well as plan for and provide environmental protective measures required to correct conditions that develop during the project. Contractor must comply with applicable Federal, state, and local laws, codes, ordinances, and regulations in their entirety. Any reference to a specific portion of a Federal, state, or local law, code, ordinance, or regulation in this or any other item must not be construed to mean that relief is provided from any other sections of the law, code, ordinance, or regulation.

3.5.1 USCG facilities. The Contractor must provide and maintain environmental protection as defined in SFLC Std Spec 0000 Appendix B, Requirements for Environmental Protection at USCG Facilities, during the performance of this availability. Contractor must plan for and provide environmental protective measures to control pollution that develops during normal practice, as well as plan for and provide environmental protective measures required to correct conditions that develop during the project. Contractor must comply with applicable Federal, state, and local laws, codes, ordinances, and regulations in their entirety. Any reference to a specific portion of a Federal, state, or local law, code, ordinance, or regulation in this or any other item must not be construed to mean that relief is provided from any other sections of the law, code, ordinance, or regulation.

3.5.1.1 USCG Generator status. The activity Generator Status for the Coast Guard Facility is _____.

3.5.1.2 Plans and permits. The CG Facility has unit specific permits including the following:

- Spill Prevention Control and Countermeasures (SPCC) Plan: Unit has a SPCC Plan which requires certain unit-specific procedures be followed for the storage, inspection, and transfer of petroleum products in containers 55 gallons or greater.
- National Pollutant Discharge Elimination System (NPDES) Storm Water (SW) Permit: Unit has an NPDES SW permit which requires unit-specific procedures be followed for the storage and inspection of equipment and materials which may contribute contaminants to storm water discharges.
- Air Emission Permit: Unit has an Air Emission Permit which requires unit-specific procedures be followed for the emissions of VOCs and hazardous air pollutants.

3.5.2 Test and procedures. The Contractor is required to promptly conduct tests and procedures for the purpose of assessing whether operations are in compliance with applicable Environmental Laws. Analytical work must be done by qualified laboratories; and where required by law, the laboratories must be certified.

3.5.3 Regulatory notifications. The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations. In cases where the Coast Guard must also provide public notification, such as storm water permitting, the Contractor must coordinate with the Contracting Officer or COR, and if work is being performed at a USCG Facility, the local Facility Engineer or Engineering Officer. The Contractor must submit copies of all regulatory notifications to the Contracting Officer and the local Facility Engineer or Engineering Officer prior to commencement of work activities. Regulatory notifications must be provided for including but not limited to demolition, renovation, National Pollutant Discharge Elimination System (NPDES) defined site work, and remediation of controlled substances such as asbestos, hazardous waste, and lead paint.

3.5.4 Environmental manager. The Contractor must appoint in writing an Environmental Manager for the project, who is responsible for coordinating Contractor compliance with Federal, State, local, and station environmental requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements, including hazardous waste handling, storage, manifesting, and disposal; implement the Contractors' Environmental Management Plan; ensure that all environmental permits are obtained, maintained, and closed out;

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ensure compliance with Storm Water Program Management requirements; ensure compliance with Hazardous Materials including storage, handling, and reporting requirements; as well as coordinate any remediation of regulated substances such as lead, asbestos, and polychlorinated biphenyl (PCB). This may be a collateral position; however the individual must be trained to accomplish the following duties; ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements and individual position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out.

3.5.5 HW disposal. Contractor must comply with SFLC Std Spec 0000 Appendix B, Requirements For Environmental Protection At USCG Facilities for HW disposal, and ensure that waste removals are conducted during normal business hours (0800-1600) on Monday through Friday (excluding holidays).

3.5.6 Additional Requirements. The Contractor must be aware of the following:

3.5.6.1 No Contractor or Subcontractor must have the authority to sign a Hazardous Waste Manifest using the Coast Guard facility's EPA Generator ID Number or remove contract generated hazardous waste from the Coast Guard facility without COR or KO-approval.

3.5.6.2 Local environmental regulations at the Government facilities may be more stringent. As with all environmental regulations, the Contractor must prepare for and comply with local and state regulations.

3.5.6.3 Coast Guard facilities do not maintain Facilities Response Plans (FRPs) per 33 CFR 154. Contractor must furnish the FRP when required for over-the-water liquids transfers to and from vessels, and is required for oil/fuel transfers to/from vessels for 250 barrels (10,500 gallons) or more.

3.6 Local Policy. The Contractor must refer to site (e.g. Base) Regulations and Instructions for details regarding local policies (e.g. crane services, parking, or facility usage).

3.7 SFLC Standard Specification approved changes. The Contractor must be aware that the following are approved changes to published SFLC 2020 Edition Standard Specifications and supersede published content:

3.7.1 SFLC Standard Specification 8636. Add missing paragraphs between 3.2 and 3.5 of Std Spec 8636 as follows:

“3.3 Access cut boundaries. The Contractor shall ensure that access cuts comply with the requirements and restrictions detailed in the following and in SFLC Std Spec 0740, and referenced codes.

3.3.1 Location of boundaries. Boundaries of access cuts and closure plates shall, in general, be located between principal ship framing, bulkheads, and other structural members and shall be at least three inches from any of these members or from the toes of other welds. A reduction in this three inch minimum may be approved by the KO on a case by case basis provided sufficient clearance is maintained for welding and inspection requirements. The boundaries of access cuts and closure plates should land on existing butts or seams, wherever practicable. The boundaries of prior access cuts should be

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utilized wherever possible. Boundaries may extend across one or more frames as required for the size of the opening.

3.3.2 Access hole dimensions and arrangements. Holes or access cuts shall be the minimum size necessary and shall be in accordance with the following:

- Rectangular access cuts and closure plates welded into primary hull structure shall be at least 12 inches wide in the lesser dimension.
- For circular access cuts, the minimum diameter shall be $4T$, where T = thickness of the involved structural member, but not less than three inches.
- Circular closure plates for access cuts less than two feet in diameter shall be dished $1/16$ to $1/8$ inch to allow for shrinkage when welded.
- Corners of rectangular access cuts and closure plates shall have a minimum radius of 6 inches except when a boundary lands on an existing hull longitudinal seam or transverse butt weld.
- Corners at an existing seam or butt shall intersect at a 90 degree angle.
- Cuts that are to cross existing butts or seams shall do so at an angle of 90 degrees plus or minus 15 degrees.
- In primary hull structure, existing welds forming the boundary of a cut shall be cut back 3 inches beyond the toe of the access cut, except that the cut back shall not intersect or cross an existing weld, frame, or structural member. In which case, the cut back may be reduced to a minimum of two inches in length.
- Existing welds crossed by the cut shall not be cut back.

3.3.3 Primary hull structure. Primary Hull Structure includes the shell, main strength decks, principal longitudinal bulkheads, vertical keel, deep web girders and stiffeners designed to withstand the ship bending stress.

3.3.4 Mechanically fastened joints. Welding closer than six inches to a mechanically fastened joint should be avoided. When access cuts cross or come within six inches of a mechanically fastened joint, the fasteners shall be checked for tightness and if necessary, loose fasteners shall be seal welded or removed, and replaced for a distance of 6 inches beyond the edge of the cut. When a cut crosses a mechanically fastened seam the cut plates shall be repaired using single V welds backed with glass tape (MIL-C-20079) to prevent fusion between the mechanically fastened plates.

3.4 Ship integrity maintenance. The Contractor shall maintain safety and ship integrity by installing temporary guarding and coaming, in addition to weathertight and watertight closures. Remove these temporary fabrications after closing the hull access, and grind surfaces flush in way of removals. For shell plating cuts made at or below the waterline where temporary closures are impractical, the Contractor shall secure each vulnerable compartment and subdivision to minimize potential damage to the extent permitted by the scope and urgency of the work.

3.4.1 Guarding. Install temporary guards in accordance with 29 CFR 1915.73.

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3.4.2 Coaming. Ensure that in areas where flammable liquids may be stored, a 4 inch high metal coaming shall be installed on the surface of the deck with tack welds and fully sealed with caulking compound. The coaming shall encircle the access cut in the deck.

3.4.3 Weathertight and contamination closures. Fabricate temporary closures, using fire retardant material, before cutting access openings and install closures whenever access is not in use. Closures shall be:

- Constructed to protect the access from inclement weather and entry of contaminants (shall include a coaming or dam on the deck to redirect rain runoff away from the opening).
- Fitted with fasteners that permit rapid installation and removal.
- Able to support a minimum of 150 pounds per square foot for horizontal deck closures.
- Where the access opening is in way of a removed hatch, scuttle or door, the closure shall be configured to allow normal passage of ship's personnel and equipment.

3.4.4 Watertight closures. Ensure that access openings created four feet or less above the maximum anticipated waterline shall include temporary watertight closures when the vessel is waterborne.

NOTE

NAVSEA S0600-AA-PRO-160/CH16 provides requirements for design, fabrication, and installation of temporary watertight closures."

3.7.2 SFLC Standard Specification 0000. Replace paragraph 3.3.4 Vessel access, as follows:

"3.3.4 Vessel access. During work at the Contractor's facility, provide access and/or egress to and from the vessel in accordance with 29 CFR 1915.74, Subpart E. Provide a minimum of two gangways that have the following:

- Adequate walking surface width and strength and be safely secured.
- A railing, with a mid-rail, on each side of the gangway, and a turn table if necessary.
- Substantial steps properly secured and equipped with at least one handrail, when the upper end of the gangway rests on or is flush with the top of the bulwark of the dock.
- Nets or other suitable protection on both sides, when there is a danger of personnel falling between the ship and the dock. Nets and other suitable protection must extend beyond the projected area of the access and egress points so as to catch a personnel that may be falling outward: i.e., the nets must be wider than the gangway.
- Proper trimming at all times.
- Adequate illumination for their full length.
- Separated by one-fourth the length of the vessel, at a minimum, as to mitigate the possibility that an incident could block both means of escape."

3.7.3 SFLC Standard Specification 8635. Replace and add paragraphs as follows,

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"3.3.10.4.1 Contractor-furnished supporting equipment. Provide all hoses and fittings needed to supply water to the system. Provide pressure gauges at the connection(s) to the ship and the furthest firehose station to allow personnel to clearly read the gage-face to demonstrate or record the required water pressure is available at all energized portions of the system."

"3.2.3 Shipboard access/egress and routing of temporary services. Maintain a primary and secondary means of access/egress for each vessel, where practicable. Pre-plan for the installation of temporary services to minimize the total number of service leads penetrating the hull by maximizing the use of backbones and/or manifolds for industrial services. Pre-planning for the installation of temporary services shall include removal (first in, last out, when no longer required). Pay special attention to transitional spaces (cross passages, top and bottom of stairwells) where services could potentially fall and restrict emergency personnel egress and/or casualty responder access."

"3.2.3.2 Materials used for suspending temporary services. Temporary services shall be suspended at regular intervals, to prevent impeding personnel access/egress and emergency response, using a high temperature line that meets the noncombustibility test requirements contained in reference (e). When using steel wire rope, or other potentially abrasive material, an anti-chafing material shall be used to prevent damage of the temporary service line. When available, temporary service lines may be run through the ship's structural elements (i.e., cable ways, light stanchions, etc.). When the routing of temporary services overhead is not practicable, temporary services, rigging of hoses, welding leads, and temporary lights shall be clear of the decks on temporary "trees" or brackets and be arranged to minimize tripping and other hazards."

"3.2.3.5 Quick Disconnect Fittings. QDFs shall be located within 10 feet of designated vertical and horizontal fire zone boundaries. When practicable, QDFs shall be installed within 10 feet of hull penetrations used for personnel access, to facilitate the deployment of smoke control curtains. QDFs must be capable of being disconnected safely on pressurized or energized systems unless approved for use as described in paragraph 3.2.3.7. Pressurized and disconnected QDFs must prevent wetting of energized equipment. For hull openings used for services only, QDFs are not required, provided the opening is fitted with an air and smoke control "sock" that remains in place around the services. Air and smoke control curtains are not intended to provide an air tight seal of the hull opening. Rather, the curtains or socks, are to ensure that emergency responders can control the flow of air and smoke through the opening to allow for de-smoking of compartments, and minimize "chimney" effects. Curtains shall be made of fire resistant fabric meeting the requirements of NFPA 701."

"3.2.3.7 Service lines crossing fire zone boundaries. When service lines transit a fire zone boundary which cannot be safely disconnected locally (e.g., high voltage cables), the COR shall approve, in advance, the method to safely secure and remove the service."

3.7.4 SFLC Standard Specification 6310.

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3.7.4.1 On page 2, replace REFERENCE “MIL-PRF-24667C, May 2008, Coating System, Non-Skid, for Roll, Spray, or Self-Adhering Application” with “MIL-PRF-24667D, FEB 2021, Coating System, Non-Skid, for Roll, Spray, or Self-Adhering Application”

3.7.4.2 On page 9, replace the NOTE under paragraph 3.1.8.5 as follows:

NOTE

De-ionized water may be used in cases where available fresh water has excessive chloride/chlorine content. Submit a CFR prior to using de-ionized water.

4. NOTES

4.1 QA inspection forms. QA inspection forms (QA-1 thru QA-5), required in SFLC Std Spec 6310 to be completed and submitted during preservation of “critical-coated surfaces”, are provided at the end of this document.

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QA-1 - QUALITY ASSURANCE INSPECTION FORM
(PRESERVATION CHECKLIST)

VESSEL NAME	HULL #	WORK ITEM #	WORK ITEM TITLE
LOCATION OF WORK (INCL. FRAME #'S)		AREA (SQFT)	

CHECKPOINT 1 – COATING SYSTEM COMPLIANCE				
Ensure all coatings are in compliance with SFLC Std Spec 6310, Appendix C.				
CHECKPOINT 2 - PAINT STORAGE				
Ensure all coatings are kept at a temperature of 65 to 85°F at all times, unless otherwise specified by the coating mfg.				
CHECKPOINT 3 - AMBIENT CONDITIONS				
Ensure surface and surrounding temperatures are each between 50 and 90°F for water-containing coatings, and 35 and 95°F for other coatings, unless otherwise specified by the coating manufacturer(s).				
Ensure maximum relative humidity (RH) is as follows, from surface preparations through final curing of topcoat: 50% for tanks, voids, and vent plenum; and 85% for all other areas, unless otherwise specified by manufacturer(s).				
Ensure surface temperature is at least 5°F above the dew point, unless otherwise specified by the coating mfg.				
CHECKPOINT 4 - PRE-SURFACE PREPARATION				
Remove surface contaminants (soluble salts, loose rust, mud, and marine growth) with low pressure fresh water wash down (maximum 5,000 psi). If oil and grease are present, perform solvent cleaning, as per SSPC SP-1.				
Verify equipment setup, blast media, and surface preparation methods match designated test coupon.				
CHECKPOINT 5 - SURFACE PREPARATION				
Verify environmental conditions (see CHECKPOINT 3).				
Ensure cleanliness of prepared surface is as per specification (i.e.: SSPC SP-11, SP-10, SP WJ-2...).				
Verify surface anchor profile using ASTM D4417-Methods B or C against SFLC Std Spec 6310. Conduct profile readings at a minimum of 5 locations for the first 1000-sqft area, and 2 locations for each succeeding 1000-sqft area.				
Measure soluble salt conductivity in accordance with SSPC-Guide 15. Conduct 5 measurements per each 1000-sqft area (max. threshold: 70 microsiemens/cm for non-submerged surfaces, 30 microsiemens/cm for submerged surfaces).				
CHECKPOINT 6 - PRIMER COAT APPLICATION				
Verify environmental conditions (see CHECKPOINT 3).				
Verify proper mixing and stand-in (induction) times.				
Ensure no paint is applied when the temperature is expected to drop to freezing before the paint has dried.				
Ensure surfaces are completely dry, unless otherwise allowed by the coating manufacturer(s).				
Verify wet film thickness (WFT) at random, to prevent under or over application. Verify final DFT.				
Brush out all runs, sags, drips, and puddles.				
Perform visual inspection for holidays and other defects.				
CHECKPOINT 7 – STRIPE COAT APPLICATION				
Verify environmental conditions (see CHECKPOINT 3).				
Ensure overcoating window is as per manufacturer's instructions.				
After primer coat (mist coat after inorganic zinc), brush-apply un-thinned coat of same primer paint over edges, weld seams, cut-outs, and areas of complex geometries @ 3-4 mils wet film thickness (WFT).				
CHECKPOINT 8 – TOP COAT APPLICATION				
Verify environmental conditions (see CHECKPOINT 3).				
Ensure overcoating window is as per manufacturer's instructions.				
Verify proper mixing and stand-in (induction) times, as applicable.				
Verify wet film thickness at random, to prevent under or over application.				
Brush out all runs, sags, drips, and puddles.				
CHECKPOINT 9 – FINAL INSPECTION				
Verify final system dry film thickness. Conduct 5 sets of 3 readings for each of the first 3 100-sqft areas, followed by 5 sets of 3 readings for each succeeding 1000-sqft area.				
Ensure that system cure is in accordance with manufacturer's recommendation for intended service.				
Ensure potable water tank exhaust ventilation is maintained continuously from and during coating application through final system cure, to exhaust all solvent to the atmosphere and to prevent solvent entrapment.				
For immersion coatings (including tank U/W body), record date and time of the following events: Final coat application: / ; Return to service or removal from environment controls: /				
CHECKPOINT 10 – RECORD KEEPING				
Complete, sign, and submit all provided QA Inspection Forms.				
NAME OF QP-1/NACE INSPECTOR		SIGNATURE	CERT. #	DATE / TIME
NAME OF CG REPRESENTATIVE		SIGNATURE	UNIT	DATE/TIME

USCGC RESOLUTE (WMEC-210B) DOCKSIDE AVAILABILITY FY2023
 QA-2 - QUALITY ASSURANCE INSPECTION FORM
 (ENVIRONMENTAL READINGS)

VESSEL NAME	HULL #	WORK ITEM #	WORK ITEM TITLE

Use one sheet for each activity. Record conditions every four hours from before surface preparation to application of final coating system coat.

DATE & TIME	ACTIVITY (SURFACE PREPARATION, PRIMER COAT, BARRIER COAT, TOP COAT, ETC...)	LOCATION (FRAME & DECK, RELATION TO EQUIPMENT, ETC.)	TEMPERATURE				% REL. HUMIDITY
			DEW PT.	SURFACE	AMBIENT	ΔT DP - SURFACE	
NAME OF QP-1/NACE INSPECTOR		SIGNATURE			CERT. #	DATE / TIME	
NAME OF CG REPRESENTATIVE		SIGNATURE			UNIT	DATE/TIME	

USCGC RESOLUTE (WMEC-210B) DOCKSIDE AVAILABILITY FY2023
QA-3a - QUALITY ASSURANCE INSPECTION FORM
(SURFACE PROFILE LOG FOR PROFILE MEASUREMENTS IAW ASTM D4417-METHOD-C)

VESSEL NAME	HULL #	WORK ITEM #	WORK ITEM TITLE
LOCATION OF WORK (FRAME REFERENCES)			AREA (SQFT)

SURFACE PREPARATION METHOD		PROFILE ACHIEVED (MILS)		
		MIN	MAX	MEAN
SSPC-SP-10/NACE No. 2	<input type="checkbox"/>			
SSPC-SP WJ-2/NACE WJ-2	<input type="checkbox"/>			
SSPC-SP-3	<input type="checkbox"/>			
SSPC-SP-11	<input type="checkbox"/>			
SSPC-SP-11 (inaccessible area)	<input type="checkbox"/>			
Brush-blasting (non-metallic substrate)	<input type="checkbox"/>			
ABRASIVE MANUFACTURER:		ABRASIVE SIEVE SIZE:		

PLACE SURFACE PROFILE REPLICA TAPES IN THE SPACES PROVIDED BELOW, TO SERVE AS PERMANENT QA RECORD. MAINTAIN A SEPARATE LOG FOR EACH LOCATION. WHEN AN AREA IS DIVIDED INTO SEPARATE SECTIONS, MAINTAIN A SEPARATE LOG FOR EACH SECTION.					
Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here	
Reading (mils):		Reading (mils):		Reading (mils):	
Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here	
Reading (mils):		Reading (mils):		Reading (mils):	
Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here	
Reading (mils):		Reading (mils):		Reading (mils):	
Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here	
Reading (mils):		Reading (mils):		Reading (mils):	
Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here		Place Surface Profile Replica Tape Here	
Reading (mils):		Reading (mils):		Reading (mils):	
MEAN MIL READING (IAW ASTM D4417-METHOD C) FOR ABOVE 15 READINGS:					

NAME OF QP-1/NACE INSPECTOR	SIGNATURE	CERT. #	DATE / TIME
NAME OF CG REPRESENTATIVE	SIGNATURE	UNIT	DATE/TIME

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QA-3b - QUALITY ASSURANCE INSPECTION FORM
(SURFACE PROFILE LOG FOR PROFILE MEASUREMENTS IAW ASTM D4417-METHOD-B)

VESSEL NAME	HULL #	WORK ITEM #	WORK ITEM TITLE
LOCATION OF WORK (INCL. FRAME #'S)			AREA (SQFT)

SURFACE PREPARATION METHOD		PROFILE ACHIEVED (MILS)		
		MIN	MAX	MEAN
SSPC-SP-10/NACE No. 2	<input type="checkbox"/>			
SSPC-SP WJ-2/NACE WJ-2	<input type="checkbox"/>			
SSPC-SP-3	<input type="checkbox"/>			
SSPC-SP-11	<input type="checkbox"/>			
SSPC-SP-11 (inaccessible area)	<input type="checkbox"/>			
Brush-blasting (non-metallic substrate)	<input type="checkbox"/>			
ABRASIVE MANUFACTURER:		ABRASIVE SIEVE SIZE:		

RECORD MEASUREMENTS TAKEN IN THE SPACES PROVIDED BELOW, TO SERVE AS PERMANENT QA RECORD. MAINTAIN SEPARATE LOG FOR EACH LOCATION. WHEN AN AREA IS DIVIDED INTO SEPARATE SECTIONS, MAINTAIN A SEPARATE LOG FOR EACH SECTION.

Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					
Reading (mils):					

Mean Mils Reading (IAW ASTM D4417-Method B for above 10 readings (by column):

Mean Reading (mils)					
---------------------	--	--	--	--	--

NAME OF QP-1/NACE INSPECTOR	SIGNATURE	CERT. #	DATE / TIME
NAME OF CG REPRESENTATIVE	SIGNATURE	UNIT	DATE/TIME

USCGC RESOLUTE (WMEC-210B) DOCKSIDE AVAILABILITY FY2023
QA-4 - QUALITY ASSURANCE INSPECTION FORM
(SURFACE SOLUBLE SALT CONDUCTIVITY LOG)

VESSEL NAME	HULL #	WORK ITEM #	WORK ITEM TITLE
LOCATION OF WORK (INCL. FRAME #'S)			AREA (SQFT)

SOLUBLE SALT CONDUCTIVITY MEASUREMENTS IAW SSPC-GUIDE 15.			
DATE	TEST LOCATIONS	CONDUCTIVITY (MICROSIEMENS/CM)	
NAME OF QP-1/NACE INSPECTOR		SIGNATURE	CERT. #
NAME OF CG REPRESENTATIVE		SIGNATURE	UNIT

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QA-5 - QUALITY ASSURANCE DATA FORM
(COATING THICKNESS)

(Use one sheet for each sequence)

VESSEL NAME	HULL #	WORK ITEM #	WORK ITEM TITLE

COATING MFG	PRODUCT NAME	BATCH #	INDUCTION TIME	COATING SYSTEM SEQUENCE (PRIMER/TOUCHUP/3RD COAT, ETC.)

DRY FILM THICKNESS (DFT) MEASUREMENTS IAW SSPC-PA 2.						
SPOT	1	2	3	4	5	AVERAGE VALUE
*BASE METAL READING (BMR)						
*Required, If Magnetic Pull-Off (Type I/Banana) Gauge Is Used.						

LOCATION (FRAME REFERENCE):								
SPOT	1	2	3	4	5	OVERALL AVG. DFT	ADJUSTMENTS	
1							AVG. BMR	DEVIATION
2								
3						BEFORE ADJUSTMENTS	AFTER ADJUSTMENTS	
AVG.								
LOCATION (FRAME REFERENCE):								
SPOT	1	2	3	4	5	OVERALL AVG. DFT	ADJUSTMENTS	
1							AVG. BMR	DEVIATION
2								
3						BEFORE ADJUSTMENTS	AFTER ADJUSTMENTS	
AVG.								
LOCATION (FRAME REFERENCE):								
SPOT	1	2	3	4	5	OVERALL AVG. DFT	ADJUSTMENTS	
1							AVG. BMR	DEVIATION
2								
3						BEFORE ADJUSTMENTS	AFTER ADJUSTMENTS	
AVG.								
LOCATION (FRAME REFERENCE):								
SPOT	1	2	3	4	5	OVERALL AVG. DFT	ADJUSTMENTS	
1							AVG. BMR	DEVIATION
2								
3						BEFORE ADJUSTMENTS	AFTER ADJUSTMENTS	
AVG.								

APPLICATION METHOD (AIRLESS, CONVENTIONAL SPRAY, ROLLED)	AVERAGE DFT

NAME OF QP-1/NACE INSPECTOR	SIGNATURE	CERT. #	DATE / TIME
NAME OF CG REPRESENTATIVE	SIGNATURE	UNIT	DATE/TIME

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4.2 Tank and Void Assessment form.

SFLC-ESD-25		TANK AND VOID ASSESSMENT FORM	
PRINT	RESET		
GENERAL DATA Note: Use SFLC-ESD-29 for Compartments other than Tanks & Voids.			
Inspector's Name:		Organization:	Contact Info:
Cutter Name:		Cutter Class:	Hull:
Tank:	Service:	Tank Area:	Gallons:
Solid Balast:	Access Compt:	Date:	Assessment Reason:
ACCESS DATA			
Manhole and cover condition:		Tank Penetration Condition:	
VENT OVERFLOW DATA			
Present: <input type="radio"/> Yes <input type="radio"/> No		Check Valve Installed: <input type="radio"/> Yes <input type="radio"/> No	Check Valve Operates Properly: <input type="radio"/> Yes <input type="radio"/> No
LADDER DATA			
NR of Ladder(s) Present: <input type="radio"/> Yes <input type="radio"/> No		Ladder Damaged: <input type="radio"/> Yes <input type="radio"/> No	Ladder Material:
TANK LEVEL INDICATOR (TLI) DATA			
TLI Present in Tank: <input type="radio"/> Yes <input type="radio"/> No		TLI Damaged: <input type="radio"/> Yes <input type="radio"/> No	TLI Type:
SOUNDING TUBE DATA			
Sounding Tube Present in Tank: <input type="radio"/> Yes <input type="radio"/> No		Sounding Tube Damaged: <input type="radio"/> Yes <input type="radio"/> No	
Striker Plate Damaged (>50%): <input type="radio"/> Yes <input type="radio"/> No			
CATHODIC PROTECTION DATA			
Cathodic Protection in Tank: <input type="radio"/> Yes <input type="radio"/> No		Total Zincs:	Number of Zincs > 50% Depleted:
1-6 Cleanliness & Housekeeping			
Clean to light layer or residue		1-2 (G)	Comments:
Loose accumulation scale		3-4 (Y)	
Impending residue and sediments		5-6 (R)	
% 1-6 Coating Systems			
All Painted Surfaces		1-2 (G)	Comments:
		3-4 (Y)	
		5-6 (R)	
% 1-6 Structural			
Corrosion		1-2 (G)	Comments:
		3-4 (Y)	
		5-6 (R)	
Pitting & Grooving		1-2 (G)	Comments:
		3-4 (Y)	
		5-6 (R)	

SFLC-ESD-25	<h1 style="margin: 0;">TANK AND VOID ASSESSMENT SHEET</h1>
<div style="border: 1px solid black; padding: 2px; display: inline-block;">PRINT</div>	

Structural Integrity Data			
Estimated Total Linear Feet of Structure Requiring Repair:		Estimated Total Square Feet of Plating Requiring Repair:	
Cracks/ Fractures Present:	<input type="radio"/> Yes <input type="radio"/> No	Buckling/Deflections/ Distortions Present:	<input type="radio"/> Yes <input type="radio"/> No
Holes Present:	<input type="radio"/> Yes <input type="radio"/> No	Material Wastage Present:	<input type="radio"/> Yes <input type="radio"/> No
All Welds Intact:	<input type="radio"/> Yes <input type="radio"/> No	Structural Evaluation Recommended:	<input type="radio"/> Yes <input type="radio"/> No
PHOTOGRAPHS			
Pictures Taken (enter quantity):			
Note: To add pictures to this form, Work Station must have Adobe Acrobat (not Reader) installed. Add all photos and photo comments to a word document and save file. Open this form and click "Combine Files". Add the document with photos you've just saved and save as a new combined .pdf files.			
Additional Comments:			

*S_51400_PpngRnwl_SWIT_ESD_0921_SWIT
S23_NNN_51400_PpngRnwl_SWIT_CJ_0323_620*

WORK ITEM 1: 25 Ton Condenser, Piping, Valves, Fittings and Insulation Renew

1. SCOPE

1.1 Intent. This work item describes the requirements for the Contractor to renew port 25-ton Condenser, renew designated raw water piping, renew valves and fittings and renew chill water piping and evaporator insulation located in the Marine Sanitary Device (MSD) Space (Compartment 4-84-0-E).

1.2 Government-furnished property.

MTI	ITEM DESCRIPTION	NSN/PN	QTY	ESTIMATED COST (\$/UNIT)
N	***Condenser, Refrigeration, Kit	PN: 90C02-1182-44	1 ea.	15,993.00

***Government-furnished property, which is to be supplied by either the vessel or the C4IT Service Center.

2. REFERENCES

COAST GUARD DRAWINGS

Coast Guard Drawing 627 WMEC 514-008, Rev A, Rip-Outs Incidental to the Carrier A/C Plant Install

Coast Guard Drawing 627 WMEC 514-009, Rev B, Mods Incidental to the Carrier A/C Plant Install

Coast Guard Drawing 627 WMEC 514-010, Rev D, Carrier 90RMC025-D-6-D005/MS1 A/C Plant Installation

Coast Guard Drawing 627 WMEC 536-001, Rev C, Diagram Seawater Piping for Mn Engines, Aux & Emergency Gens & A.C. Condenser

Coast Guard Drawing 627 WMEC 536-002, Rev C, Arr. Of S.W. Cooling for Main and Aux Engines and A/C Condensers

NAVSEA Drawing 804-5959214, Rev-, Piping Insulation - Installation Details

COAST GUARD PUBLICATIONS

Coast Guard Technical Publication (TP) 3965, Apr 2020, Air Conditioning System, R-134A - Model 90RMC025-D-6-D005/MS1

Surface Forces Logistics Center Standard Specification 0000 (SFLC Std Spec 0000), 2022, General Requirements

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Surface Forces Logistics Center Standard Specification 0740 (SFLC Std Spec 0740), 2022,
Welding and Allied Processes

Surface Forces Logistics Center Standard Specification 6310 (SFLC Std Spec 6310), 2022,
Requirements for Preservation of Ship Structures

OTHER REFERENCES

American Society of Mechanical Engineers (ASME) B31.5, 2016, Refrigeration Piping and Heat Transfer Components

Air-Conditioning, Heating, and Refrigeration Institute (AHRI) 700, Jan 2016, Specifications for Refrigerants

ASTM International (ASTM) F683, 2014, Standard Practice for Selection and Application of Thermal Insulation for Piping and Machinery

ASTM International (ASTM) F992, 2017, Standard Specification for Valve Label Plates

Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), SP-58, 2018, Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application and Installation

3. REQUIREMENTS

3.1 General.

3.1.1 CIR.

None.

3.1.2 Tech Rep.

None.

3.1.3 Protective measures. The Contractor must furnish and install all protective measures in accordance with SFLC Std Spec 0000, (Vessel component, space, and equipment protection).

3.1.4 Interferences. The Contractor must handle all interferences in accordance with SFLC Std Spec 0000, (Interferences). Known interferences include, but are not limited to the following:

- A/C chill water piping
- A/C system refrigerant lines
- Refrigerant
- A/C mounting skid (2 sections)
- Deck plates
- Insulation
- Diesel Fuel Tank 4-84-2-F (2040-gallon capacity)
- A/C system
- Scuttles and Hatches

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3.1.4.1 Fluid removal. Remove up to 2040 gallons of diesel fuel to facilitate gas-freeing.

3.1.4.2 Fluid disposition, disposal. Dispose of all removed fluids in accordance with all applicable Federal, state, and local regulations. Refer to paragraph 4.1 (Tank content restoration).

3.2 Fluid handling. The Contractor must remove and dispose of removed fluids from the affected piping system, in accordance with all applicable Federal, state, and local regulations.

WARNING

Do not drain ANY fluids, including fresh water, into any space, bilge, or exterior location.

3.3 Personnel qualification. The Contractor must ensure that all personnel servicing Air Conditioning and Refrigeration (AC&R) equipment that uses CFC or HCFC refrigerant hold a current Environmental Protection Agency (EPA) Technician Certification, Type IV (Universal Certification), and meet all State and local regulations and licensing requirements.

3.3.1 Refrigerant draining and recovery. The Contractor must ensure all vessels' AC unit refrigerant is drained, recovered and disposed of into a container in accordance with all federal, state and local environmental regulations.

3.4 Renewal. The Contractor must accomplish the following tasks for the 25-ton Air Conditioning unit as designated by the Coast Guard Inspector and using Coast Guard Drawings 627 WMEC 514-008, 627 WMEC 514-009 and 627 WMEC 514-010 and Tech Pub 3965 as guidance.

3.4.1 Evacuate all remaining refrigerant from the system.

3.4.2 Crop and remove the existing condenser from the ship.

3.4.3 Install the Government furnished condenser back to the original configuration with new type 316 stainless steel fasteners and neoprene gaskets.

3.4.4 System flush. The Contractor must flush the refrigerant system and all associated components of any contaminants that would cause the refrigerant to become contaminated below AHRI 700 Standard for new refrigerants. The flushing medium must be an agent approved by the EPA for such use. Perform flush in accordance with manufacturer's instructions. Standard refrigeration industry practices must be adhered to at all times.

3.4.4.1 After flushing, evacuate the system to a minimum of 1000 microns, in accordance with TP 3965.

3.4.4.2 If the flushing medium instructions dictate evacuation of the system at a lower pressure, meet the more restrictive requirement. Follow the same evacuation procedure in accordance with TP 3965.

3.4.5 Recharge refrigerant. The Contractor must recharge the system with refrigerant in accordance with TP 3965.

3.5 Piping, valves and fittings renewal particulars. The Contractor must accomplish the following tasks for the raw water piping as designated by the Coast Guard Inspector and using Coast Guard Drawings 627 WMEC 536-001 and 627 WMEC 536-002 as guidance:

- Crop and renew 70 linear feet of (2.5 inch inside diameter and 2.875 inch outside diameter)

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90/10 copper nickel raw water piping.

- Crop and renew 10 linear feet of (3 inch inside diameter 3.5 inch outside diameter) 90/10 copper nickel raw water piping.
- Crop and renew 10 linear feet of (2 inch inside diameter 2.375 inch outside diameter) 90/10 copper nickel raw water piping.
- Crop and renew twelve 2.5-inch 90-degree elbow.
- Crop and renew two 3-inch 90-degree elbow.
- Crop and renew three 2-inch 90-degree elbow.
- Crop and renew seven 2.5-inch 45-degree elbow.
- Crop and renew five 2.5-inch and two 2-inch tee fitting.
- Crop and renew two 2.5-inch and three 2-inch globe valve.
- Crop renew two 2.5-inch expansion joint (6-inch-long rubber end to rubber end).
- Crop and renew two 2.5-inch to 3-inch and seven 2.5-inch to 2-inch coupling.
- Crop and renew seventeen 2.5-inch and four 2-inch flange.
- Crop and renew four 2-inch threaded union.
- Braze six $\frac{3}{4}$ inch bungs.
- Crop and renew one 2.5-inch pipe adapter to 2.5-inch threaded female coupling.
- Crop and renew one 2-inch pipe adapter to 2 inch threaded male coupling.
- Crop and renew one 2.5-inch to 1 inch coupling.
- Crop and renew one 2.5-inch and one 1-inch water regulating valve.

3.5.1 Pipe hangers. Furnish, fit, and install new pipe hangers in accordance with MSS SP-58.

3.5.2 Pipe labeling. The Contractor must label affected piping as follows:

3.5.2.1 Stencil the following onto the pipe surfaces:

- Name of the piping system service.
- Destination, where feasible.
- Direction of flow, indicated by an arrow three inches long pointing away from the lettering (for reversible flow, point an arrow away from each end of the lettering).

3.5.2.2 Ensure all lettering and arrow(s) are as follows:

- In general, black color except white for dark-colored piping.
- Applied in conspicuous locations and preferably near control valves.

3.5.3 Valve labeling. The Contractor must renew all missing and damaged valve label plates, and install new valve label plates on new valves, in accordance with ASTM F992.

3.5.4 Pipe flushing. The Contractor must flush all new and disturbed seawater and chill water piping with clean fresh water until all debris is removed but no longer than five minutes. Ensure flushing fluid is directed to move scale and foreign debris away from installed machinery to prevent possible damage upon operational testing. Submit a CFR documenting date and time of flushing process and level of pipe cleanliness.

3.5.4.1 Dispose of flushing fluid in accordance with all applicable Federal, state, and local regulations.

WARNING

Do not drain ANY Fluids (including fresh water) into any space, bilge, or exterior location.

3.6 Testing. After all work has been completed, the Contractor must, in the presence of the Coast Guard Inspector, accomplish the following tasks, and submit a CFR:

3.6.1 Hydrostatic test. After all authorized repairs, the Contractor must hydrostatically test all new and disturbed piping and components of the affected piping system in accordance with SFLC Std Spec 0740, Appendix C, Hydrostatic Test. Ensure zero leakage from or permanent deformation of pressure-containing parts by repairing all leaks, deformations, and discrepancies. Submit a CFR.

NOTE

Coast Guard personnel will operate all shipboard machinery and equipment.

3.6.2 Operational test, post repairs. After completion of work, the Contractor must thoroughly test, in the presence of the Coast Guard Inspector and demonstrate A/C unit, A/C condenser, raw water piping and fittings that have been disturbed, used, repaired, altered, or installed to be in satisfactory operating condition. Submit a CFR.

3.7 Touch-up preservation. The Contractor must prepare and coat all new and disturbed surfaces to match existing adjacent surfaces in accordance with SFLC Std Spec 6310, paragraph 3.1.13 (Touch-ups and minor coating repairs.)

3.8 Piping insulation installation. The Contractor must install new insulation materials over the exposed pipe surfaces at thicknesses appropriate to the application and temperature ranges specified in ASTM F683 Tables identified in Table 1 below as designated by the Coast Guard Inspector and in accordance with details in NAVSEA Drawing 804-5959214 and Coast Guard Drawing 627 WMEC 514-003

- Associated pipe hangers.
- Valves
- Fittings
- Flanges

CAUTION

Use glass cloth lagging only in high traffic areas where insulation is subject to damage.

NOTE

Although pipe lengths, routes, and sizes are detailed in the specified drawings, the as-built configuration may vary slightly in routes, lengths, and sizes.

- Crop and renew 30 linear feet of 1-inch-thick insulation around 2-inch diameter chill water piping.
- Crop and renew 30 feet of 1-inch-thick insulation around 1.5-inch diameter chill water piping.
- Crop and renew 20 sq-ft of 1-inch-thick insulation around 5-ton and 25-ton evaporators.

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3.8.1.1 Insulation thickness requirements. Thickness of all insulation materials installed shall be of at least the minimum thickness designated in ASTM F683-14 or NAVSEA Drawing 804-5959214 as applicable to insulation type specified for the system application.

3.8.1.2 Removal. Remove all existing insulation material over the designated pipe surfaces, including associated pipe hangers, valves, fittings, and flanges. Dispose of all removed materials in accordance with all applicable Federal, state, and local regulations.

NOTE

For chill water piping, other surfaces/fittings affected include: brackets, bulkhead penetrations, flat work, and all other protrusions or fixtures that will condense due to relative humidity from surrounding atmosphere.

3.8.1.3 Surface preparation. The Contractor must clean all exposed pipe and pipe component surfaces with a soft bristle brush and a mild detergent solution to remove all visible surface contaminants.

3.8.1.4 New insulation installation. Select new insulation and lagging materials and thicknesses for the application and temperature ranges as specified in ASTM F683-14 Tables S1.1, S1.2, S1.4, and S1.5 subject to the restrictions in paragraph 3.2.3. Install new insulation on the exposed pipe surfaces, including associated pipe hangers, valves, fittings, and flanges, in accordance with details in NAVSEA Drawing 804-5959214.

NOTES

In order to minimize the occurrence of condensation and mold, the Contractor is encouraged to maximize use of insulation thickness designated for “Non-air conditioned spaces” as much as practicable.

Glass cloth lagging is required only in high traffic areas where insulation is subject to damage.

TABLE 1 - PIPING SYSTEMS INSULATION INSTALLATION REFERENCES

PIPING SYSTEMS APPLICATION	TEMPERATURE RANGE	ASTM F683 TABLES
Interior gas, steam, hot water, and oil piping	125 to 1200 Deg. F	S1.1; S1.2; S1.4
Interior refrigerant, hot water, cold water, and chill water piping	-20 to +180 Deg. F	S1.1 and S1.5

3.8.2 Coat the newly installed insulation using the system specified for “Insulation Surfaces, Fiberglass Sheet/Closed Cell PVC Foam” in SFLC Std Spec 6310, Appendix B (Cutter and Boat Interior Painting Systems).

4. NOTES

4.1 Tank content restoration. The ship’s forces will procure new fluids as needed and refill all tanks at the appropriate time.