NOAA SHIP PISCES (R 226)

FY2022
5-YEAR REGULATORY DRYDOCK

DETAIL SPECIFICATION – REV 1
August, 2021

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August 2021 — **Date**

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CHANGES (REV 1)

Work Item Deletions: None

Work Item Relocations: None

Work Item Additions: None

Work Item Modifications:

Item 3.4 - Modified Paragraph 3.4.5.1

Item 3.6 - Added Paragraph 3.6.3.5 and 3.6.3.6
- Modified Paragraph 3.6.4.38

Item 3.15 - Modified Paragraphs 3.15.4.15 and 3.15.4.16

Item 3.21 - Modified Paragraph 3.21.4.1.8

Item 3.26 - Added Paragraph 3.26.3.1 for GFM jib angle sensor
- Added Paragraph 3.26.4.4.5 to install jib angle sensor

Item 3.30 - Added Paragraph 3.30.4.27.6 for fuel flow meter

Item 5.7 - Modified Paragraph 5.7.4.1 and deleted 5.7.4.3.

Item 5.8 - Modified Paragraph 5.8.4.8 and 5.8.4.9

Item 5.10 - Updated Paragraph 5.10.4.1

Item 5.15 - Added Reference 5.15.2.2

Item 5.16 - Modified Paragraph 5.16.4.3

Item 5.21 - Modified Paragraph 5.21.4.1

Item 5.22 - Updated Reference 5.22.2.5

1. SCOPE AND INTENT OF THE DRYDOCK SHIP REPAIR CONTRACT

These detailed specifications contain requirements for NOAA Ship PISCES (R 226) FY22 Regulatory (5-year) Drydocking.

The National Oceanic and Atmospheric Administration (NOAA) operates a fleet of research vessels that supports research and mapping for the National Fisheries Service, National Ocean Service, Office of Atmospheric Research and the National Weather Service, as well as provides support to other Federal agencies. These research missions are time sensitive and therefore the data must be collected at specific times during the sailing season to be meaningful. At the end of each sailing season the vessels enter a repair period (drydock or dockside) to address repairs that have been previously identified, perform upgrades to mission systems or ship systems that either extend the life of the ship or provide new data collection capabilities or for safer operations of ships systems as well as address any emergent work that would adversely affect the ships ability to safely perform its mission on schedule, while meeting all regulatory body requirements (American Bureau of Shipping and United States Coast Guard) and all habitability requirements, including any that may be required as a result of contracts for personnel to augment ship staff.

2. GENERAL REQUIREMENTS

2.1. References

2.1.1. The following references form a part of these Detailed Specifications. All provisions and requirements contained therein are applicable to all work items, including all additional work items, which are authorized by the Contracting Officer. All work procedures and all materials shall meet the ABS Rules.

2.1.2. All NOAA Specific References for the Ship / Ship Class are provided for reference only. The Contractor shall independently verify all pertinent information by field investigation (ship check). See Reference 2.1.4.1 for definitions of common shipboard repair work.

2.1.3. General References

2.1.3.1. ABS: American Bureau of Shipping "Rules for Building and Classing Steel Vessels Under 90 Meters in Length"

2.1.3.2. ABS: American Bureau of Shipping “Rules for Survey After Construction”

2.1.3.3. CFR: U. S. Coast Guard "Subchapter F - Marine Engineering", 46 CFR 50 through 46 CFR 64

2.1.3.4. CFR: U. S. Coast Guard "Subchapter J - Electrical Engineering", 46 CFR 110 through 46 CFR 113

2.1.3.5. Oceanographic Research Vessel (ORV) - 46 CFR chapters 188-196

2.1.3.6. Standard: IEEE Std 45-2002, "IEEE Recommended Practice for Electric Installations on Shipboard"

2.1.4. NOAA Specific References

2.1.4.1. NOAA Standard Specification AMC-000-1H, “General Requirements for Contract Repair Work on NOAA Ships”

2.1.4.2. NOAA Standard Specification MOC-300-3, “General Requirements for Electrical/ Electronic Items”

2.1.4.3. NOAA Standard Specification MOC-631-2D, “Coating Systems for Steel Surfaces”

2.1.4.4. NOAA Standard Specification AMC-631-4, “Coating Systems for Aluminum Surfaces”

2.1.4.5. NOAA Standard Specification AMC-997-1A, “Drydocking and Routine Drydock Work”

2.1.4.6. Drawing 085 FA04, “Docking Drawing” (PISCES only)

2.1.4.7. Drawing FA02, “General Arrangements”

2.1.4.8. Drawing M283-304-FE41 “Penetration Details”

2.1.4.9. Drawing M283-304-FE43 “Bonding and Grounding Details”

2.1.4.10. Drawing M283-304-FE45 “Electrical Installation Details”

2.1.4.11. Drawing FF04, “Painting Schedule”

2.1.4.12. Drawing M283-304-FF03 “Color Coordination Manual”

2.1.4.13. Drawing SH-081-FM10-Equipment Removal Routes

2.1.4.14. NOAA Ship PISCES Hot Work Permit Chit

2.1.5. Frame numbers and space names throughout this specification are derived from ship’s drawings. Equipment changes and space modifications over the ship’s life

span may not all be reflected in the referenced drawings. Therefore, Contractors are encouraged to review all referenced drawings and to perform a field inspection of the ship prior to submitting a bid. Copies of drawings and technical manuals not included herein may be made available for review during any scheduled pre-bid inspection and during the performance period. During the pre-bid inspection, Contractors may review available drawings and technical manuals on board ship.

2.2. Requirements:

2.2.1. Provide a Project Coordinator or equivalent delegated employee to be onsite at all times Contractor or sub-contractor personnel are working on the vessel. Project Coordinator shall oversee the execution of all ongoing work, including sub-contractor work, and shall serve as a point of contact on the vessel to coordinate between COR, Ship's Force, Contractor, and sub-contractor personnel.

2.2.2. Unless otherwise stated in these work items, prepare and coat all new steel, disturbed steel, or otherwise required painted surfaces in accordance with References 2.1.4.3 and 2.1.4.4. If no paint system is identified in the item, then apply the appropriate coating system in accordance with the Paint Schedule, except that the top coat shall match the surrounding area.

2.2.3. All surface preparation and painting of tanks, voids, and surfaces greater than 50 square feet shall be accomplished by an SSPC QP1 certified painting contractor. All other painting, including touch-ups, painting new piping/hangers, foundations, etc. may be accomplished using a professional marine painting contractor.

2.2.4. Unless specifically stated otherwise in an individual work item, the Contractor shall provide all labor and materials, including subcontractors, crane support, and other services, to accomplish all work called for in the Detailed Specification. All items removed or opened for repair, overhaul, rework, testing, etc., shall be re-installed after the work scope is accomplished.

2.2.5. These Detailed Specifications are a combination of "performance specifications" and "design specifications." Whenever possible, the Government has provided performance specifications, giving the Contractor the opportunity to accomplish the work requirements as best as he or she sees fit, while providing a fully functional repair and/or equipment/system installation in accordance with all work requirements. When specific details are required, the Government will provide design/detail specifications; this will be more the exception, than the rule.

2.2.6. All new equipment and furnishings purchased by the Contractor for installation on the ship shall be provided with factory supplied technical manuals, or data sheets, complete with parts listings with detailed information necessary to operate, maintain, troubleshoot, and repair the equipment. Include detailed procedures for disassembly of equipment, parts lists, drawings, inspection criteria, troubleshooting

guides, reassembly, and test procedures. Provide one paper copy of each manual, plus one electronic copy in Adobe Acrobat (.pdf) format. This documentation shall be turned over to the COR after installation is completed and before the end of the Period of Performance.

2.2.7. On repairs or overhauls of existing equipment, Contractor shall follow Original Equipment Manufacturer's (OEM's) recommendations for parts and service in such a manner that the manufacturer's warranty on parts and labor is not voided, where the warranty still applies or equivalent warranty is offered. Unless specified elsewhere in the details specification, all replacement parts shall be new parts from the OEM.

2.2.8. Provide manufacturer's technical representatives where required in the individual work items, to witness and to provide technical guidance during operational testing of equipment and systems. All tests and trials of equipment or systems shall be witnessed by the COR and/or ABS as applicable, to ensure compliance with regulatory body requirements to maintain the ship's ABS class certification, and to complete all requirements of these specifications.

2.2.9. All visual examinations, hydrostatic testing, and non-destructive testing (NDT) shall be in accordance with ABS Rules for Building and Classing Steel Vessels, Survey After Construction 2005, Part 7. All contractors performing NDT and hull gauging shall be certified under the ABS external specialists program.

2.2.10. Provide and maintain a status report of all American Bureau of Shipping (ABS) inspections and technical reviews required by ABS, during the course of this contract, to ensure the ship's ABS certification requirements are in compliance.

2.2.11. All inspection, test, Quality, and Condition Reports shall be provided to the COR in Adobe Portable Document Format (.pdf).

2.2.12. QUALITY ASSURANCE TEST AND INSPECTION PLAN

2.2.12.1. Maintain a Quality Assurance (QA) TEST AND INSPECTION PLAN based off the planned and current Production Schedule applicable to all work items, including all additional work items which are authorized by the Contracting Officer. Update QA TEST AND INSPECTION PLAN monthly and provide a copy to the COR monthly. Include the following minimum information for each work item and additional work item:

a. Specification item and paragraph number
b. Component/Equipment name
c. Test Schedule (Date and time)
d. Test or Inspection description
e. Acceptance Criteria

2.2.12.2. Within the first week after the start of the Period of Performance, Contractor shall schedule and hold a meeting on the ship or other acceptable location between ABS, COR, Contractor QA superintendent, Contractor Project Manager / Ship Coordinator, Ship's CO and Chief Engineer to discuss and schedule all ABS required inspections and surveys. Contractor shall develop a list of all items required for ABS Inspections and provide the list and survey schedule dates to the COR no later than three (QTY 3) days after the meeting. The survey schedule shall list all initial inspections required by the ABS Surveyor.

2.2.12.3. Throughout the duration of the Contract, the Contractor shall schedule the services of an ABS Surveyor as required by ABS for performing inspections of all new installations, hull modifications, tank inspections, gauging inspections, and load tests. NOAA will pay for all ABS surveys associated with work required by these specifications. The Contractor shall provide a credit for any additional ABS charges associated with rescheduling of surveys and rework surveys which are directly under the control of the Contractor.

2.2.13. Provide a copy of ABS approved welding procedures and maintain a list of currently qualified welders.

2.2.14. For all items that are not direct replacements (unit for unit exchange), Contractor shall weigh all materials and items removed, installed, or relocated on the ship. Provide a summary report to the COR, similar to the sample table below, indicating the total weight in pounds of the materials and items with a breakdown of their locations by space, deck, frame, distance from centerline, and height off of the deck.

Description	Add/Remove	Weight	Deck	Frame	P/S	Dist off CL	Ht Abv Dk

2.2.15. In the event lube or fuel oil is off-loaded, the lube or fuel oil shall be returned to the ship through a 10 micron filter system with a hygroscopic (moisture absorbing) compound when it is returned to the ship. Store removed fuel in clean storage facilities. Treat and circulate fuel stored longer than six (6) weeks to prevent water accumulation and biological growth. Fuel or lube oil removed and returned shall be sampled and tested by a chemist prior to being removed and prior to being returned to ensure the fuel is in good condition. Provide sample results to the COR.

2.2.16. Contractor is permitted to use ship's 120vac and 480vac electrical power to throughout the Period of Performance. In the event of an unexpected loss of ship's power, the Contractor may provide temporary power, as needed, to maintain

production schedule. Contractor shall ensure any temporary power rigged does not block primary accesses/egress routes or interfere with the weathertight boundaries of the ship without the authorization of the COR.

2.2.17. Contractor is responsible for providing temporary sanitary and rest/break services for Contractors. Sinks in the AMR and Wet Lab may be used for cleansing & washing hands. Contractor shall clean these two sinks daily.

2.2.18. Contractor is responsible for providing crane services to execute this contract. Contractor shall not operate Ship's Cranes unless as authorized in the detailed specifications.

2.2.19. Ships force will maintain a minimal presence during accomplishment of work to these specifications. Their availability to operate ship's equipment will be limited. Crew availability is generally limited to the hours of 0700 through 1500 local time, Monday through Friday. Unless otherwise specified, provide a minimum of 24-hour prior notice for any equipment operations.

2.2.20. Coordinate with Ships force to operate all new and disturbed machinery for a period sufficient to indicate satisfactory performance, but not less than one hour, after all adjustments and deficiency corrective actions have been made, without further adjustment.

2.2.21. Invoices:

2.2.21.1. Contractor shall submit an updated sub-contractor list with every invoice for progress payments. The sub-contractor list shall contain all sub-contractors working on the vessel along with a point of contact and payment status for each sub-contractor. All approved sub-contractor invoices shall paid in full by the prime contractor in accordance with FAR 52.232-40 Providing Accelerated Payments to Small Business Sub-contractors.

2.2.22. Red-line / As-Built Drawings:

2.2.22.1. The Contractor shall Redline "as-built" drawings for modifications accomplished by these detail specifications. All red-line drawings shall be provided to the COR by the end of the Period of Performance.

2.2.22.2. The Contractor shall provide final CAD and PDF Drawings of final "as-built" configuration as required by individual work items. Final "as-built" PDF drawings shall be delivered to the COR in 11x17 black and white format. All final as-built drawings shall be provided to the COR no later than (NLT) 30 days after completion of the Period of Performance.

2.2.23. Hot Work Permits:

2.2.23.1. Contractor is responsible for daily filling out and completing NOAA furnished Hot Work permits for all hot work on the vessel (inside and outside work included). See Reference 2.1.4.14. Contractor must satisfy all conditions required by the hot work chit for the hot work location and receive all signatures for hot work from the vessel's OOD, CME, and CO. Hot work permits shall be provided to the ship for signature by 0900 daily. Notify the COR of any delays of hot work permits longer than two (QTY 2) hours. Contractor is NOT required to complete NOAA Work Aloft or Confined Space entry requirements prior to confined space entry or work aloft. Contractor shall abide by the CFR requirements for all Work Aloft and Confined Space Entry.

2.2.23.2. One firewatch may cover more than one hot work location as long as line of sight is maintained.

2.2.24. Personal and Contractor safety

2.2.24.1. Contractor shall implement a COVID screening and prevention policy in accordance with current CDC recommendations. If required by the current CDC recommendations or current NOAA policy, Contractor shall wear protective face coverings unless precluded by task required PPE (such as welding, grinding, or while wearing respirators, etc). Contractor shall abide by all legal requirements in accordance with HIPAA. Contractor shall submit a CFR if additional COVID mitigation measures are implemented after contract award that cause additional labor or delay costs.

2.2.24.2. Contractor is responsible for providing all PPE, personal cleaning agents, and personal cleaning stations.

2.2.24.3. Contractor shall set up, maintain, and daily clean sanitary hand-washing stations in the following locations. Handwashing stations shall include running water (ship's water may be utilized on the ship), soap/sanitizer, hand towels, and trash receptacles.

2.2.24.3.1. Contractor break area (off the ship)

2.2.24.3.2. Side Sample Station / Wet Lab (on the ship)

2.2.25. Daily Clean-up

2.2.25.1. To the maximum extent practical and in accordance with Reference 2.1.4.1, clean-up and remove from the ship all dirt, debris, scrap, and all other materials (drink containers, gloves, safety glasses, weld rods, cutting discs, paint chips, residue, grease, etc…) incident to Contractor's work at the end of each work day. Contractor equipment shall not be left energized nor in a

precarious position overnight. Tools shall be secured daily. The work site shall also be swept after each work day.

2.2.25.2. Contractor shall protect and perform daily clean-up of any passageway, ladder or common areas that they use throughout the day to go to and from work areas.

2.2.25.3. Whenever abrasive blasting or other operations on or near the ship causes collection of blasting residue or other foreign particles to collect on exterior decks of the ship, vacuum or sweep the decks to remove the residue and particles prior to the end of the day on which the contamination occurred. Do not wash the residue or particles through the ship's deck drains.

2.2.25.4. Upon completion of all items in the specification, contractor shall thoroughly clean the vessel in all locations contractor worked and return the ship to "as-found" conditions. This includes all surfaces within a space including but not limited to overhead cable runs, fittings, equipment, bulkheads, fixtures, piping, deck plating, and bilges and removal of all temporary protective coverings. COR and Ship's force will inspect cleanliness prior to signing off on completion.

2.2.26. Daily Safety and Housekeeping Inspection

2.2.26.1. During the work day, contractors shall keep a tidy and organized work space that promotes cleanliness and safety while also ensuring no damage is done to surrounding areas and equipment. Contractor shall make every effort to contain dirt, debris, etc. within the immediate vicinity of the item being worked on.

2.2.26.2. COR or ship's designated representative and the Contractor QA Superintendent will conduct a daily safety and housekeeping inspection of all spaces affected by Contractor work. Contractor shall address or take corrective action on all discrepancies within 4 hours after notification.

2.2.27. Protective Coverings

2.2.27.1. Prior to the start of each work item, install protective coverings as needed to affected spaces to protect the ship, ship systems, and equipment from damage and entry of dust, dirt, grit, sand, and other foreign particles in accordance with the requirements of Reference 2.1.4.1.

2.2.27.2. Prior to starting work on interior spaces, protect the decks and deck coverings from damaging spaces where work is to be performed and through which workers will traverse, as follows:

2.2.27.2.1. Cover the decks and deck coverings with temporarily fitted heavy vinyl, plywood or particle board. Deck coverings shall completely cover each passageway from wall to wall. Securely tape all edges and joints of the protective covering to prevent movement and to prevent a tripping hazard. Other materials may be used if pre-approved by the COR.

2.2.27.2.2. For decks over which equipment, valves, piping or other materials will be handled, the plywood or particle board must be of sufficient thickness to protect the deck from damage if the equipment or materials are dropped.

2.2.27.2.3. Maintain the protective coverings in place during the entire contract period. Promptly replace sections which are damaged.

2.2.27.3. Prior to abrasive blasting, or other work operations which create atmospheric contamination on or near the ship, prevent the entry of airborne contaminates.

2.2.27.4. Plug, wrap, blank, cover, or mask openings into the ship as needed.

2.2.27.5. Install industrial foam filter material on the intake and exhaust end of all ventilation systems which will be in use during the blasting operations. Monitor the air flow through the filters and replace the filters when air flow becomes restricted.

2.2.27.6. Whenever abrasive blasting is performed inside the ship, confine the blast materials to the compartment being blasted.

2.2.27.7. After completing the work, remove and dispose of the protective coverings.

2.2.27.8. Re-establish the condition which existed at the start of the work. It is the responsibility of the Contractor to repair and clean all damage and contamination resulting from failure to provide adequate protection.

2.2.28. Contract Kick-off Meeting

2.2.28.1. Unless previously completed after Contract award, on the first day of the Period of Performance and before commencing work on the ship the Contractor shall host a kick-off meeting in the Ship’s Mess at 0800. At a minimum, the meeting shall be attended by the COR, Contracting Officer, and a Contractor's management official having authority to make binding commitments. Other interested parties may attend the meetings as appropriate.

2.2.28.2. The Contractor's baseline Schedule, including start dates for each work item, and QA Test and Inspection Plan shall be submitted for approval by the COR at, or before, the Kick-off/Pre-dockside Meeting. Any potential impacts to schedule, habitability, and material delivery delays, or complex work shall be identified.

2.2.28.3. On the first day of the Period of Performance, the Contractor shall document existing ship conditions with a Ship's Representative designated by the CO. Contractor shall document the pre-work as-found conditions of all spaces the contractor will work in or transit through. Contractor shall complete and save a video recording of the existing ship conditions for documentation purposes.

2.2.29. Weekly Progress Meetings

2.2.29.1. Hold Weekly Progress meetings at a time and place mutually agreeable to the COR and Contractor. The meetings shall be attended by the COR and a Contractor management official who has authority to make binding commitments. Other interested parties may attended, subject to COR and Contractor approval.

2.2.29.2. Submit a written Progress Report to the COR by 6:00pm (1800) the day before the Progress Meeting with the following information:

2.2.29.2.1. Percent complete of each contract item and additional work items authorized by the Contracting Officer.

2.2.29.2.2. Any problems which could impact timely completion, including material delays. Include a problem description, schedule impact estimate, and mitigation plan.

2.2.30. Sequence of Work:

2.2.30.1. Working Hours: Contractor shall schedule working hours between 0600 and 1800 Monday through Saturday. Sundays may be worked only while the ship is in Dry-dock. Contractor shall obtain COR approval for ship work outside of these hours.

2.2.30.2. Unless approved by COR, the ship will not be available for work on the following days:

2.2.30.2.1. Christmas: 25 – 26 December 2021
2.2.30.2.2. New Years: 1 – 2 January 2022

2.2.30.3. Schedule: In addition to the deliverables required under CAR 1352.271-73 of the Solicitation, the Contractor shall provide a schedule to the COR detailing the start and estimated completion dates for each work item no later

than 30 days after Contract award. In addition to start and completion dates for each awarded work item, Contractor shall also list the following Contract Milestones provided below. Schedule shall be submitted in PDF format:

a. Start Work
b. Ship Uninhabitable
c. Drydock Ship
d. Undock Ship
e. Crew Move-aboard (Ship habitable)
f. Start Final Ship Cleaning (5 days prior to dock trials)
g. Final Bilge Washing
h. SSDG ABS Testing (1 day prior to dock trials)
i. Dock Trials
j. Sea Trials
k. Contract Completion

2.2.30.4. Milestone Contract Completion Dates: THE CONTRACTOR IS RESPONSIBLE FOR MEETING THE MILESTONE CONTRACT COMPLETION DATES PROVIDED BELOW. As soon as the Contractor knows, or should have known, that a Milestone Contract Completion Date will not be met, Contractor shall provide notice to the COR along with reasons why the milestone date will not be met as well as steps the Contractor will take to mitigate the impact on the project schedule and milestones. Milestone Contract Completion Dates are provided below:

a. SSDG Replacement parts of Work Item 516 shall be ordered within 10 days of Contract award.
b. Ship shall be drydocked within the first 25 days of start of the Period of Performance.
c. Other than shipboard testing, the work of Work Item 516 SSDG Generator overhauls shall be completed with 60 days of start of Period of Performance
d. Crew Move-aboard (Ship habitable) – No-Later-Than (NLT) 85 days after start of the Period of Performance.
e. Dock Trials – NLT 90 days after start of Period of Performance
f. Sea Trials - NLT 94 days after start of Period of Performance
g. Contract Completion – 12 March 2022

2.2.31. Hazardous Materials

2.2.31.1. NOAA Ship PISCES was constructed between 2006 and 2009. There was no asbestos used during construction. Asbestos requirements contained in referenced Standard Specifications do not apply to this ship.

2.2.31.2. The Contractor is responsible for the control, handling, and disposal of all hazardous materials generated during accomplishment of this contract.

2.3. Metrication

2.3.1. A combination of Standard English units of measure (feet – pounds) and Metric System International (SI) units of measure (millimeter - kilogram) were used in the builders' drawings, specifications and reference materials for construction, operation, maintenance and repair of this ship. In this specification for NOAA Ship PISCES, there is a combination of Standard English units and metric units.

2.4. Notes

2.4.1. Descriptive data of NOAA Ship PISCES (M283):

Length Overall:	208.6 feet
Beam (Molded):	49.2 feet
Displacement:	1,766 metric tons Light Ship 2,479 metric tons Full Load
Draft:	20.35 feet Full Load Centerboard Retracted 29.7 feet Full Load Centerboard Extended
Cruising Speed:	12 knots [Max speed 14 knots]
Propulsion:	Diesel Electric, Single Propeller, Fixed Pitch, with two, in-line 1508 hp DC Motors
Generators:	Caterpillar 3508B, 3512B (two each) 600 volts AC
Bow Thruster:	Elliott 40T3S, 360 Degree
Electric Service:	480 volts AC
Year Built:	Commissioned November 2009
Builder:	VT Halter Marine Inc,. Moss Point, MS
ABS ID:	9161926
IMO Number:	9349071
Construction:	Welded Steel Hull, Aluminum Superstructure
Crew size:	22
Bunks:	39
Homeport of Record:	Pascagoula, MS
Dockside Location:	NOAA Gulf Marine Support Facility (151 Watts Avenue, Pascagoula, MS 39567) or Singing River Island Pier in Pascagoula, MS

2.4.2. Possible and Expected Long Lead Time Materials are identified below. Contractor is expected to procure all materials required by the Contract in sufficient time to complete all work within the Period of Performance. Contractor shall notify COR of any anticipated or expected material receipt delay.

2.4.2.1. Lineshaft Bearing Refurbishment – Paragraph 3.6.4.16

2.4.2.2. Telescoping Crane Load Pin – Paragraph 3.26.4.1
2.4.2.3. Data Coupling – Paragraph 3.31.4.2
2.4.2.4. Tank Level Indicators - Paragraph 3.32.4.2
2.4.2.5. Split Type AC Plant – Paragraph 5.4.4.2
2.4.2.6. Electric Duct Pre/Reheaters – Paragraph 5.6.4.1
2.4.2.7. Acoustic Tiles – Paragraph 5.9.4.1
2.4.2.8. Main Motor and BT Motor Drive Cabinet Parts – Paragraph 5.11.4.3
2.4.2.9. SSDG Generator Parts – Paragraph 5.16.4.2
2.4.2.10. Camera System Parts - Paragraph 5.22.4.1
2.4.2.11. Bow Thruster Overhaul Kit - Paragraph 3.20.4.1

2.4.3. All contractors, vendors, and visitors are encouraged to make pre-arrival arrangements for the pre-bid inspection in advance by calling the Port Engineer at 251.776.3099.

END OF ITEM

3.0 BASIC ITEMS (ORF)

3.1 ITEM 301: TEMPORARY SERVICES

3.1.1. Scope

3.1.1.1. Provide temporary services for the ship for the entire time the ship is at the Contractor's facility

3.1.2. References

3.1.2.1. NOAA Standard Specification AMC-000-2D, "Temporary Services at Contractor Facilities"

3.1.2.2. NOAA Standard Specification AMC-000-1H, "General Requirements for Contract Repair Work on NOAA Ships"

3.1.3. Government-Furnished Material (GFM)

3.1.3.1. None.

3.1.4. Requirements

3.1.4.1. Provide all temporary services required in accordance with Reference 3.1.2.1 with shore connection details and additional requirements as follows for the entire performance period:

3.1.4.2. Electrical Shore Power - Provide two, shore power cables, rated for 480 VAC as measured from the ship's EOS Shore Power Panel, 3-Phase, 60-Cycle, 400-Amp service each (800 amps total). Connect directly to ship's Russell-Stoll NATO- style receptacles, located on the 01-Deck, aft junction box. Properly rated shore power cables shall be the Contractor's responsibility. All power supplied to the ship shall be clean, with no indications of ground faults on the ship's main switchboard. All ground fault deficiencies associated with the Contractor's power supplied to the ship, shall be corrected at the Contractor's expense.

3.1.4.3. Potable Water --- One, 1-1/2 inch hose providing a minimum of 100 gallons per minute in a range of 40 to 60 psi. The hose will be used only to fill the ship's potable water tanks; the ship is not configured to operate directly on shore- side water pressure. Potable water only designated hoses shall be used for potable water system use.

3.1.4.4. High-Speed, Broadband Internet Connectivity --- Internet connections via local Internet Service Provider (ISP). High-speed, broadband internet is

defined as Digital Subscriber Service (DSL) or cable internet service with typical minimum download speeds of 20 Mbps. The service shall be a business-type account that supports Virtual Private Network (VPN) connections, if available, and shall include necessary DSL or cable modem provided by the ISP. Provide the proper number of connections necessary to satisfy the ship's wet berth and drydock locations. All necessary cabling, DSL or Cable modem(s), or fiber translators shall be provided for an RJ-45 network connection to the ship and office(s) routers. Provide a minimum of one Internet Protocol (IP) address with Directory Name Server (DNS) service for each of the ship and dockside office(s) locations. Make ship's connection available while the ship is dockside and while the ship is in the dry dock.

3.1.4.5. Sanitary– Ship is set up to operate sanitary system using fresh water; salt water shall not be used. Contractor shall dispose of ship's sewage within 24 hours of request. Provide temporary toilet facilities for all times the ship's sanitary system is disrupted. Temporary toilet facilities and hand-washing facilities shall be located pierside adjacent to the ship, as needed, and cleaned/serviced daily.

3.1.4.6. Sewage Disposal- One, 2-inch cam lock quick-disconnect fitting and hose.

3.1.4.7. Cooling Water- Provide one 2-inch cooling water hose for the HVAC condensers. Water flow shall be adjustable, up to 100 gallons/minute with operating pressures at the condenser from 45-60 PSI.

3.1.4.8. Potable Water – provide drinking water for all times the ship's Potable Water System is off-line.

3.1.4.9. Garbage- One dumpster located within 50-feet of the ship's gangway. Dumpster shall be emptied within 24 hours of request.

3.1.4.10. Vehicle Parking Spaces- A minimum of six spaces inside the gate, near the dockside office spaces or the ship, plus a minimum of six more spaces outside the gate.

3.1.4.11. Dockside Office Spaces- Three dockside office spaces and a meeting/ready room for ship's crew. Provide three sets of keys to each space to the COR. Dockside office spaces shall have an operational toilet facility, running water, refrigerator, and coffee machine. Office Spaces shall also have a designated outside phone for conference calls.

3.1.4.12. Security- Security services to make rounds of the ship hourly [this is an increase from every two hours required in reference 3.1.2.1 on weekdays from 1600 – 0800, on weekends from 1600 Friday to 0800 Monday, and 24 hours on all federal holidays.

3.1.4.13. Crane Service- Provide crane service including operator and riggers for ship's force equipment and material lifts as needed during normal working hours. Provide crane lifts with a 5-ton minimum capacity. Provide COR with a procedure to request crane services with nominal four hours advance notice. For bidding purposes, assume 20 hours of crane service in total. If additional crane service is needed beyond estimated twenty hours, then the COR will provide an additional item request to the Contracting Officer for negotiated contract modification.

3.1.4.14. Engine Room Bilge Cleaning - In addition to disposing of oily water in engine room bilges in reference 3.1.2.1, pump out and dispose of an estimated 500 gallons of waste oil from Oil Residue Tank (4-47-1) and an estimated 500 gallons of oily water from Bilge Holding Tank (4-47-2). Access these tanks through manhole covers in AMR / Engineers Workshop (3-39-01). After pumping out these tanks, close access covers with new gaskets.

3.1.4.15. Temporary Storage – provide 400 square feet of secure, covered storage for ship’s equipment, supplies, and stores. Provide three sets of keys to the COR.

3.1.4.16. Disruption of Temporary Services: In the event temporary services are reduced due to the extent of contract work and disruption to services provided to the ship, rendering the ship uninhabitable, an equitable adjustment to the contract shall be negotiated. The daily temporary service charge for all services as bid, but not provided shall be reduced and a credit provided to the government for the remainder of the contract period services are disrupted. Contractor shall make every effort to maintain all facilities and services required by this specification in a safe manner, so as not to render the ship uninhabitable.

3.1.4.17. Contractor shall be responsible to bring the ship into a loading condition required for drydocking. If offloading, storage, and bunkering of fuel is required, Ship’s Force shall pump down selected tanks to below the tank top whereupon the tanks may be opened and tanks emptied by the Contractor according to local, State, and Federal regulations. Fuel be metered off and on through a filtered, de-watering system. Contractor shall offloaded fuel and return to the ship after undocking. For bidding purposes, Contactor shall estimate offloading, storage, and bunkering of 20,000 Gallons of Diesel Oil. A credit shall be provided to the Government for fuel quantity offloaded less than the estimated amount. The Government will reimburse the Contractor for associated costs that exceed offloading, storage, and restoring the estimated amount.

3.1.4.18. Provide an on-site Quality Control Superintendent who shall be onsite for the duration of the Period of Performance. Quality Control Superintendent shall be a minimum of Level II certified and familiar with marine work. The Quality Control Superintendent shall be on-site and shall assist the Contractor's Project Manager to ensure, maintain, and oversee Contractor quality. Specific duties are included below:

3.1.4.18.1. Manage the Contractor's quality for all work including material receipt, welding, piping, painting, electrical, testing, and retaining Material Test Reports (MTRs), etc.

3.1.4.18.2. Scheduling Contractor inspections with the Contractor, COR, Ship, and ABS. QA Superintendent shall ensure accomplishment of Contractor pre-tests and that the Contractor is ready to present work to the COR and/or ABS at the scheduled time.

3.1.4.18.3. Scheduling ABS inspections and keeping survey reports

3.1.4.18.4. Maintaining ship cleanliness

3.1.4.18.5. Addressing any urgent cleaning and quality issues identified by COR.

3.1.4.18.6. Ensuring machinery and surrounding machinery components are covered and protected.

3.1.4.18.7. Attending production meetings

3.1.4.18.8. Providing a daily Inspection Schedule to the Contractor, COR, Chief Engineer, and CO no later than 1700 CDT on the day before the scheduled inspection. Inspection schedule shall include all ABS call-outs, intermediate and final testing, and anything that will require the support of Ship's Force (other than routine lock outs and tag outs)

3.1.4.18.9. Compile and turnover to the COR a completed quality control package including all inspection reports, welding certifications, MTRs, test certificates, etc.

3.1.4.19. Provide an on-site full-time cleaning crew to maintain the ship and work area cleanliness for the duration of the Period of Performance. The cleaning crew shall be a minimum of one worker dedicated to maintaining ship cleanliness, deck, and machinery coverings. Cleaning crew shall report to the Quality Control Superintendent.

3.1.4.20. Five (QTY 5) days before scheduled Dock Trials, conduct a ship-wide cleaning to include wiping down all surfaces and bulkheads on Main Deck and the Bridge, removal of all deck coverings, removal of all machinery coverings, cleaning of all ladderwells, cleaning the upper and lower engine room surfaces, and a final bilge cleaning.

3.1.4.21. Engine Room Bilge Cleaning – Remove all trash and debris from the engine room bilge and engine foundations and shall clean the engine room bilges by flushing with a fresh water and detergent solution (to remove all oil and other debris) and pump the bilges dry. Contractor shall dispose of all generated oily waste.

3.1.4.22. Paint all handrails on the ladderwells and touch-up all disturbed surfaces on bulkheads and decks that were the fault of the Contractor.

3.1.5. Quality Assurance

3.1.5.1. COR inspections in accordance with Reference 3.1.2.1.

3.1.6. Notes

3.1.6.1. Steam is not required.

END OF ITEM

3.2 ITEM 302: ABS SPECIAL SURVEY NO. 1

3.2.1. Scope

3.2.1.1. Provide labor and materials to support completion of all ABS Annual Surveys and Inspections to reset PISCES Survey Window (Regulatory Drydocking) and address outstanding ABS requirements or deficiencies.

3.2.2. References

3.2.2.1. NOAA Standard Specification MOC-100-1A, “ABS Load Line Survey”

3.2.2.2. Drawing M282-085-FA02 “General Arrangements”

3.2.2.3. Drawing No. FC05-001-01, “Tank Capacity Curves.”

3.2.2.4. Drawing No. SH-100-FH02, “Hull Forebody Scantlings Frame 0-18”

3.2.2.5. Drawing No. SH-110-FH03, “Hull Midbody Scantlings Frame 19-49”

3.2.2.6. Drawing No. SH-100-FH04, “Hull Sternbody Scantlings Frame 49-82”

3.2.2.7. Drawing No. SH-100-FH-05, “Hull Transom Scantlings Frame 82-Transom”

3.2.2.8. Drawing No. SH-101-FH11, “Fwd House Scantlings, 01-03 Level, Fr 39-Fwd”

3.2.2.9. Drawing No. SH-101-FH12, “Aft House Scantlings, 01-03 Level, Fr 39-Aft”

3.2.2.10. Drawing No. SH-101-FH14, “Pilothouse Scantlings 03-04 Level”

3.2.2.11. Drawing No. SH-111-FH17, “Bulwarks Layout and Scantlings”

3.2.2.12. Drawing No. SH-111-FH-18, “Bossing and Stern Frame Scantlings”

3.2.2.13. Drawing No. SH-161-FH-19, “Centerboard Bottom Void Scantlings”

3.2.2.14. NOAA Standard Specification AMC-505-2, “Hydrostatic Pressure Tests”

3.2.3. Government-Furnished Material (GFM)

3.2.3.1. None

3.2.4. Requirements

3.2.4.1. All work shall be conducted in accordance with Reference 3.2.2.1.

3.2.4.2. Schedule the services of an American Bureau of Shipping (ABS) Surveyor to accomplish all inspections required for Classification of NOAA Ship PISCES. Provide all labor and materials to enable the local ABS surveyor to complete annual ABS Classification Surveys in accordance with reference 3.2.2.1 to reset the PISCES ABS Survey Window through a Regulatory (5-year) Drydocking. Required surveys for ABS Classification include Annual Load Line Survey No.1, Annual Automation Survey 1, Annual Hull Survey 1, Annual Machinery Survey 1, Drydocking Survey, and the Cargo Gear Annual Inspection. All inspections will be accomplished with COR, or other government representative present. New ABS findings not already covered by this Specification shall be considered a topic of additional work.

3.2.4.3. Government will compensate ABS for survey costs under a separate purchase order. Contractor shall prepare the vessel for various survey parts in accordance with the survey test schedule Contractor produced in Paragraph 2.2.12.2 and bear cost of re-survey due to improper/ inadequate vessel preparation. Neither Government nor Contractor shall be compensated by the other for delay of a scheduled survey if delay is caused by ABS for which neither Contractor nor Government is at fault.

3.2.4.4. Coordinate with the COR and PISCES Chief Engineer for transferring fuel oil, lube oil, ballast water, and potable water between ship's fuel oil tanks, ballast tanks, and potable water tanks as required to accomplish all ABS required tank boundary inspections. Boundary inspections must be accomplished under a full head of liquid. Boundary inspections may be accomplished dockside or while vessel is on drydock at Contractor's discretion. If accomplished while on drydock, identify sequence to ensure transfer of fluids will not cause instability or damage to vessel or drydock. Contractor shall provide all fresh water required to accomplish boundary inspections.

NOTE: ABS may require boundary inspections for each Ballast Tank. Boundary Inspections may require opening tanks in sequence depending on ship's fuel loading and stability requirements for the vessel to be drydocked.

3.2.4.5. In accordance with the "Tank Inspections" requirements of Reference 3.2.2.1, open, clean, and certify the following tanks are certified "Safe for Entry" and "Safe for Hot Work" by a certified Marine Chemist. Provide competent personnel to daily maintain space certifications. Cleaning shall include power washing followed by removal of all residual water and power washing residue. Reference 3.2.2.3 provides detailed information regarding the

tanks. Contractor shall preserve and paint removed man-hole covers in accordance with the Paint Schedule. Tanks will be pumped to low suction by Ship's Force prior to opening. Submit a CFR in the event fuel oil must be offloaded.

Ballast Tanks:

3.2.4.5.1. Forepeak Ballast Tank (4-1-0)
3.2.4.5.2. #3C Ballast Tank (4-39-0)
3.2.4.5.3. #3 Port Ballast Tank (4-29-2)
3.2.4.5.4. #3 Starboard Ballast Tank (4-29-1)
3.2.4.5.5. #4C Ballast Tank (4-39-01)
3.2.4.5.6. Roll Stabilization Tank (02-22-0)

Note: All ballast tanks also have work associated with other work items.

Fuel Oil Tanks:

3.2.4.5.7. #1F Port Fuel Oil Tank (4-7-2)
3.2.4.5.8. #1F Starboard Fuel Oil Tank (4-7-1)
3.2.4.5.9. #2 Port Fuel Oil Tank (4-19-2)
3.2.4.5.10. #2 Starboard Fuel Oil Tank (4-39-1)
3.2.4.5.11. #4 Port Fuel Oil Tank (4-39-2)
3.2.4.5.12. #4 Starboard Fuel Oil Tank (4-39-1)
3.2.4.5.13. Port Fuel Oil Day Tank (3-39-2)
3.2.4.5.14. Starboard Fuel Oil Day Tank (3-39-1)
3.2.4.5.15. Emergency Generator Tank (01 Level FR 55 Starboard)

Note: All fuel tanks have work associated with other work items.

Lube Oil Tank:

3.2.4.5.16. Lube Oil Tank (3-47-01)

Potable Water Tanks:

3.2.4.5.17. Port Potable Water Tank (3-19-2)
3.2.4.5.18. Starboard Potable Water Tank (3-19-1)

Note: Potable water tanks have work associated with other work items.

Miscellaneous Tanks:

3.2.4.5.19. Oil Residue / Waste Oil Tank (4-47-2)
3.2.4.5.20. Bilge Holding / Oily Waste Tank (4-47-1)
3.2.4.5.21. Waste Water Tank (4-29-0)
3.2.4.5.22. Incinerator Tank (in Trash Room 1-65-2)
3.2.4.5.23. Mission Trawl Winch HPU Tank (Oceographic Winch Room STBD at FR 75)

Note: Waste Water tank has work associated with other work items.

3.2.4.6. In accordance with Reference 3.2.2.1, open and certify the following voids are cleared for entry and safe for hot work. Provide competent personnel to maintain space certifications. Preserve and paint removed man-hole covers in accordance with the Paint Schedule.

3.2.4.6.1. STBD Oceanographic Winch Room Void (3-78-1)
3.2.4.6.2. Port Oceanographic Winch Room Void (3-78-2)
3.2.4.6.3. Void Shaft Bossing (4-78-0)
3.2.4.6.4. Port Chain Locker (2-5-0)
3.2.4.6.5. STBD Chain Locker (2-5-0)

3.2.4.7. Facilitate inspection of all opened tanks and voids in accordance with Reference 3.4.1.1, section 3.4 "Tank Inspections". Inspections shall include inspecting the structural integrity of the tank, cleanliness, striker plate condition, sounding tubes, and all remote operated valves in each tank. Operate and lubricate each reach rod joint.

3.2.4.8. Replace and paint the striker plates at the bottom of each sounding tube in the following tanks:

3.2.4.8.1. Bilge Holding / Oily Waste Tank (4-47-1) – replace striker plate with ½-thick steel
3.2.4.8.2. Forepeak Ballast Tank (4-1-0)
3.2.4.8.3. #3C Ballast Tank (4-39-0)
3.2.4.8.4. #3 Port Ballast Tank (4-29-2)
3.2.4.8.5. #3 Starboard Ballast Tank (4-29-1)
3.2.4.8.6. #4C Ballast Tank (4-39-01)

3.2.4.9. Preserve and paint the man-hole cover foundations on all opened tanks and voids in accordance with the Paint Schedule. Chase the threads for all through and counter-sunk bolt holes on each tank man-hole foundation. Clean out each bolt hole.

3.2.4.10. Upon completion of all inspections and work within opened tanks and voids, including work in other work items, close all opened tanks and voids with new gaskets.

3.2.4.11. Perform a 2.0 psig air test on each closed tank using a manometer to prevent tank over-pressurization. Hold the pressure for 10 minutes and check manhole covers for leaks using a soapy water solution.

3.2.4.12. Complete proper surface preparation to SSPC-11 and paint the three bilge pockets in the Domestic Equipment Room (3-29-0) in accordance with the Paint Schedule.

3.2.4.13. Prepare and accomplish ultrasonic testing (UT) on the following areas, in accordance with Reference 3.4.1.2, section 3.3, "Ultrasonic Tests (UT) for Thickness Gaging." Thickness gaugings shall not be taken before the hull has been water washed, and shall be completed before painting of the underwater body. For estimating purposes, assume a total of 1,000 thickness gaugings will be taken on hull plating, 500 gaugings on webs and flanges of frames, and 500 gaugings on decks, bulkheads, hatch covers, coamings, and other miscellaneous areas. Provide scaffolding or lifting arrangements for contractors and ABS Surveyor to prepare and survey exterior parts of hull and decks as required. If the total amount of gaugings is greater or less than 2,000, a contract modification shall be made to increase or decrease the total on a per-unit basis based on original proposal for 2,000 gaugings:

3.2.4.13.1. Three (3) transverse sections within the amidships 0.5L, as determined by Surveyor.

3.2.4.13.2. Internals in forepeak and after peak tanks.

3.2.4.13.3. All hatch covers and coamings (stiffeners and plating).

3.2.4.13.4. Wind-and-water strakes, port and starboard, full length.

3.2.4.13.5. All exposed main deck and superstructure deck plating.

3.2.4.13.6. Flat keel plating full length. Also, additional bottom plates in way of cofferdams, machinery spaces and aft end of tanks.

3.2.4.13.7. Plating of seachests and shell plating in way of overboard discharges.

3.2.4.13.8. Chain lockers.

3.2.4.14. Provide a 1st Class licensed electrician to complete ABS required electrical distribution cable testing. Coordinate testing with Ship's Force. For bidding purposes, estimate 10 hours of electrical testing shall be required.

3.2.4.15. Conduct a visual examination of interior and exterior of the ship's three air receivers with the COR and ABS surveyor. Follow all requirements of Reference 3.2.2.14 with preparation for the inspection of the tanks and for relief valve testing; however, no hydrostatic testing of the tanks will be accomplished.

3.2.4.15.1. Starting Air/Ship Service Air Receiver #1 (located in MMR, lower level, port side)

3.2.4.15.2. Starting Air/Ship Service Air Receiver #1 (located in MMR, lower level, port side)

3.2.4.15.3. Fuel Shut-Down Air Receiver (located in AMR, forward bulkhead)


Start/SS Air Receivers


Fuel Shutdown Air Receiver

3.2.4.16. Open the inspection ports on each air receiver and conduct a visual inspection of the interiors using lights, mirrors, and bore scope. Close upon completion of inspection.

3.2.4.17. Test and set all air receiver relief valves to the following pressures in accordance with Reference 3.16.2:

3.2.4.17.1. Starting Air/Ship Service Air Receiver #1 @ 948 kPA (137 psi)

3.2.4.17.2. Starting Air/Ship Service Air Receiver #1 @ 948 kPA (137 psi)

3.2.4.17.3. Fuel Shut-Down Air Receiver @ 660 kPA (97 psi)

3.2.4.17.4. Service Air Compressor #1 (located in MMR upper level, port side) @ 660 kPA (137 psi)

3.2.4.17.5. Service Air Compressor #2 (located in MMR upper level, port side) @ 660 kPA (137 psi)

3.2.4.18. Provide new stamped data plates for each relief valve, similar to existing, with test pressure and date.

A-Frame Inspection and Certification:

3.2.4.19. Remove the Side Station A-Frame. Side Station A-Frame weighs approximately 15,000 lbs. Procure the services of the OEM to inspect the A Frame after disassembly and again during the weight testing (2 trips total). OEM may be procured from below source:

Supreme Integrated Technology, Inc
915 Distributors Row
Harahan, LA 70123
POC: Jack Hano
Phone: 504-617-4620 / 504-464-0528
Email: jackh@sitech-us.com
www.supremeintegratedtechnology.com

3.2.4.20. Spot blast to SSPC-SP10 all damaged or rusted areas on the Side A-Frame and the Side A-Frame Foundation and sand sweep to SSPC-SP 7 all remaining areas of the A-Frame and A-Frame foundation. Inspect the blasted foundation with the OEM. Inspect the conditions of the pins and bushings and provide a CFR with any recommended repairs. Paint all blasted surfaces in accordance with the Paint Schedule. Top layer shall be painted black.

3.2.4.21. Reinstall the Side Station A-Frame and install six (QTY 6) new spacer rings (thrust washers) to replace the old removed thrust washers installed to restrict movement of the A-frame within the foundation.

3.2.4.22. Inspect the Aft and Starboard A-Frames and coordinate testing with Ship's Force. Weight test the Aft and Side Station A-Frames in the presence of ABS and add to the Lifting Appliance Certification. Weight test for the Side A-Frame is 3,800 lbs and weight test for the Aft A-Frame is 42,000 lbs. Static load shall be held for 5-minutes and dynamic load shall demonstrate movement of the respective A-Frame's full range of movement.

Main HPU Pump and Motor Inspection:

3.2.4.23. Provide a 1st Class licensed electrician to inspect each motor on the Main HPU Skid in the Oceanographic Winch Room. Provide a CFR detailing motor inspection results. Provide a CFR detailing removal and reinstallation routes for each of the seven (QTY 7) pumps and motors in the event of offsite repairs are required.

3.2.4.24. Provide all reports to COR.

3.2.4.25. Provide all labor and materials to correct all deficiencies identified by ABS. Additional ABS required repairs not identified in this specification will be the subject of additional work.

3.2.5. Quality Assurance

3.2.5.1. As required in reference 3.2.2.1.

3.2.5.2. Per Paragraph 2.2.12.2 and Reference 3.2.2.1, provide the ABS survey schedule within 10 days from the start of the contract performance period, clearly identifying loading conditions that correlate to initial tank boundary inspections. Update survey schedule at each weekly progress meeting.

3.2.5.3. Submit the reports required by Reference 3.2.2.1, section 3.3, "Ultrasonic Tests (UT) for Thickness Gaging."

3.2.5.4. Submit the ABS reports and new Load Line certification required by Reference 3.2.2.1, section 3.5, "ABS Documents."

3.2.6. Notes

3.2.6.1. A Drydocking Survey, which is part of Special Periodical Survey – Hull 6, shall be carried out under Item 3.3.

3.2.6.2. The ship carries approximately 107,000 gallons of diesel oil (with tanks at 95% full) and can be assumed to have approximately (50%) of her fuel on board upon arrival at the Contractor's facility.

3.2.6.3. Trim and Stability Booklet Tank Overview is provided below.

TANK CAPACITY SUMMARY

VTHM Job No: M282
VTHM Hull No: 1953

Trim 0 M Aft

Vessel: 63X15X8.65M FRV
Name: HENRY B. BIGELOW

Tank	Location	SP Vol M^3/MT	Capacity Liters	Capacity M Tonnes	VCG Meters	LCG Meters	TCG Meters	FSM M-MT	
BALLAST 4-1-0 FP	FR D-7 CTR	0.98	43,616	44.71	5.792	2.895	0.000	20.88	
BALLAST 4-34-0 DB#3	FR 34-39 CTR	0.98	35,489	36.38	2.040	22.315	-0.038	31.39	
BALLAST 4-29-1 DB#3	FR 29-39 STBD	0.98	33,944	34.79	2.341	21.041	3.974	23.73	
BALLAST 4-29-2 DB#3	FR 29-39 PORT	0.98	35,827	36.72	2.288	21.005	-3.959	23.95	
BALLAST 4-39-01 DB#4	FR 39-49 CTR	0.98	66,957	68.63	1.955	26.997	0.000	62.48	*
	Subtotal		213,567	218.910	2.877	19.40	-0.01		
FO 4-7-1 DT#1F	FR 7-13 STBD	1.18	31,288	26.54	3.752	6.602	0.971	3.88	
FO 4-7-2 DT#1F	FR 7-13 PORT	1.18	31,288	26.54	3.752	6.602	-0.971	3.92	
FO 4-13-1 DT#1A	FR 13-19 STBD	1.18	21,456	18.20	3.540	10.115	2.278	4.14	
FO 4-13-2 DT#1A	FR 13-19 PORT	1.18	21,456	18.20	3.540	10.115	-2.278	4.16	
FO 4-19-1 DT#2	FR 19-29 STBD	1.18	59,077	50.10	3.927	15.214	3.669	11.38	
FO 4-19-2 DT#2	FR 19-29 PORT	1.18	59,077	50.10	3.927	15.214	-3.669	11.40	
FO 4-19-0 DT#2	FR 19-23 CTR	1.18	25,631	21.74	2.159	13.007	0.000	20.78	
FO 4-39-1 DB#4	FR 39-49 STBD	1.18	43,025	36.49	2.241	26.609	4.436	33.18	*
FO 4-39-2 DB#4	FR 39-49 PORT	1.18	43,025	36.49	2.241	26.609	-4.436	32.50	*
FO 3-72-1 DT#5	FR 72-78 STBD	1.18	28,039	23.78	4.965	45.274	4.903	19.66	
FO 3-72-2 DT#5	FR 72-78 PORT	1.18	28,039	23.78	4.965	45.274	-4.903	19.66	
FO DAY TANK 3-39-1	FR 39-49 STBD	1.18	16,636	14.11	4.715	26.992	6.779	0.67	*
FO DAY TANK 3-39-2	FR 39-49 PORT	1.18	16,636	14.11	4.715	26.992	-6.779	0.67	*
	Subtotal		424,673	360.180	3.613	20.50	0.00		
FRESH WATER 3-19-1	FR 19-27 STBD	1.00	17,505	17.46	5.008	14.200	0.937	2.58	*
FRESH WATER 3-19-2	FR 19-27 PORT	1.00	17,505	17.46	5.008	14.200	-0.937	2.58	*
	Subtotal		35,010	34.920	5.008	14.20	0.00		
WASTE WATER 4-29-0	FR 29-34 CTR	1.00	34,965	34.88 (for FW) 35.84 (for SW)	2.060	19.309	0.000	31.39	*
ROLL STABILIZATION 2-22-0	FR 22-29 CTR	0.98	72,451	74.26	14.950	15.700	0.000	467.91	*
	Subtotal		107,416	109.140	10.831	16.85	0.00		
OILY WASTE 4-47-2	FR 47-49 PORT	0.98	5,350	5.48	2.035	29.201	-3.417	0.66	*
WASTE OIL 4-47-1	FR 47-49 STBD	1.09	5,350	4.92	2.035	29.201	3.417	0.59	*
LO 3-47-01	FR 47-49 PORT	1.09	3,549	3.26	4.111	29.150	-0.592	0.71	*
EMERG GEN DAY	FR 54-56 STBD	1.18	888	0.75	12.622	33.400	0.263	0.01	*
INCINERATOR	FR 69-70 PORT	1.18	296	0.25	11.207	42.100	-6.875	0.08	*
	Subtotal		15,433	14.660	3.200	29.65	-1.83		
HYRO LAB (12" OF WATER)	FR 38-45 STBD	0.98	5,073	5.20	8.804	25.300	5.500	22.62	*

END OF ITEM

3.3 ITEM 303: DRYDOCKING AND ROUTINE DRYDOCK WORK

3.3.1 Scope:

3.3.1.1 Drydock PISCES and accomplish routine and Regulatory Drydock work.

3.3.2 References

3.3.2.1 NOAA Standard Specification AMC-997-1A, "Drydocking and Routine Drydock Work"

3.3.2.2 Drawing 085 FA04, "Docking Drawing" (PISCES only)

3.3.2.3 Drawing HB-163 FP19, "Sea Chest Diagram"

3.3.2.4 Drawing HB-243 FM01, "Shafting Layout and Details"

3.3.2.5 Tech Manual HB-244 01 (FRV40-225-006-010), "Stern Tube Bearing (Thordon Compac) and Shaft Seal (Kobelco)"

3.3.2.6 Tech Manual HB-562 01 (FRV40-226-071-010), "High Performance Flap Rudder, Willi Becker"

3.3.3 Government-Furnished Material (GFM)

3.3.3.1 None

3.3.4 Requirements

3.3.4.1 Provide dry docking and routine dry dock work in accordance with Reference 3.3.2.1 and 3.3.2.2.

3.3.4.2 Use Reference 3.3.2.2 Blocking Position 3 at a minimum keel block height of four feet for access to transducers and centerboard.

Note: Keel Block #13 will need to be removed in order to accomplish steel repairs in way of Ballast Tank #3C (Item No. 318). Prior to removal of Keel Block #13, add additional keel block(s) as needed to compensate for the removal of block #13.

3.3.4.3 After positioning and before hauling the ship, conduct a diver's inspection of underwater keel block positions relative to hull mounted transducers and associated fairings to verify that keel blocks will not come in contact with these fixtures.

3.3.4.4 Immediately following the drydocking evolution, and before sand blasting, cleaning, or painting the hull, clean the faces of the transducers and then cover the transducers faces with ¼ inch of rubber sheeting, then 3/8 inch plywood. Plywood shall extend 2 inches beyond the transducer dimensions. Apply duct tape around edges to ensure a complete seal. Seal all openings to the interior of the transducer fairing to prevent contamination. When performing cleaning and maintenance on the existing transducers, extreme care must be taken to not move them. Do not remove any clamps or disturb any orientation.

3.3.4.5 Do not use cleaners, fuel, paint, sealants, and other products that may contain strong solvents such as acetone, which attack many plastics therefore greatly reduce their strength.

3.3.4.6 Do not use power tools or hydro-blast to clean any transducers. All cleaning and painting of transducers shall be done by hand.

3.3.4.7 The COR will appoint a Single Point of Contact from Ship's Force to oversee any work on or near the transducers. NOAA representatives will be inspecting/servicing some transducers. Coordinate with the NOAA Single Point of Contact to permit the maintenance and inspections on a not to interfere basis.

3.3.4.8 Inspect all shell plate openings listed on References 3.3.2.3 and 3.3.2.4 and sheet 6 of References 3.3.2.2. Provide results on a condition report.

3.3.4.9 Measure and record stern tube bearing wear down readings, specifically the shaft-to-Thordon stern tube bearing clearance in accordance with Reference 3.3.2.5 for bearing details.

3.3.4.10 Inspect rudder sections to the extent possible without removing rudder welded access plates in accordance with Reference 3.3.2.6. Remove bolted covers or obstructions, measure Neck Bearing, Rudder Hinge, Link System slide bolt to slide bushing clearance, completing the BEARING CLEARANCES table. Perform an inspection of the rudder with COR, providing for a man-lift or scaffolding to reach all rudder areas. Provide results on a condition report. Notify ABS surveyor of availability for inspection.

3.3.4.11 In addition to feeler gage measurements of bearing/shaft/pin clearances taken above, perform a test of the rudder and the rudder flap clearances by jacking the rudder forward, aft, port and starboard to determine amount of travel at a convenient location to attach dial indicator measuring travel of the rudder with respect to the hull. Measure and record travel and dial indicator location(s) on a condition report.

3.3.4.12 In the presence of the COR and ABS Surveyor, remove the rudder and rudder flap drain plugs and inspect for water leakage into the rudder and flap. Renew and reinstall plugs upon receipt of condition report response.

3.3.4.13 Remove void drain plugs listed below and inspect for water intrusion. Record results on a condition report. Fill and drain or float coat voids and rudder with rust preventive compound complying with MIL-C-16173, Grade 5, or Eureka Fluid Film Liquid A or equal. Reinstall void drain plugs using ABS approved thread anti-seize sealant on all plugs:

- Skeg drain plug frame 87-88 starboard
- Aft stern tube structure
- Port & starboard bilge keels
- Rudder and rudder blade/flap

3.3.4.14 Clean/polish the propeller blades.

3.3.4.15 After the propeller has been cleaned and polished, contact the COR to inspect the propeller. After COR inspection, protect the propeller with padding to prevent damage until just prior to undocking.

3.3.4.16 Provide a Docking Report form 2410 of Reference 3.3.2.1 as a CFR to the COR recording all hull inspection results.

3.3.4.17 Provide a Redlined Reference 3.3.2.2 Docking Drawing noting any variances in this new ship's blocking arrangement.

3.3.4.18 Ensure that all transducers have been completely covered prior to beginning any mechanical work around the hull (including blasting & painting). Contractor shall walk the hull to inspect each transducer with COR or the COR's designated representative. Ensure all transducer covers have been removed prior to undocking.

3.3.5 Quality Assurance

3.3.5.1 COR inspections in accordance with reference 3.3.2.1.

3.3.6 Notes:

3.3.6.1 None

END OF ITEM

3.4 ITEM 304: HULL ANODE RENEWALS

3.4.1 Scope

3.4.1.1 Replace aluminum anodes in various locations.

3.4.2 References

3.4.2.1 Drawing HB-085 FA04, “Docking Drawing”

3.4.2.2 Drawing HB-163 FP19, “Sea Chest Diagram”

3.4.3 Government Furnished Material

3.4.3.1 None

3.4.4 Requirements

3.4.4.1 Renew all fifty-six (56), existing hull-mounted aluminum anodes. Anodes are nominal 10 pound, bolted type, measuring 1-1/4 inch x 6 inch x 12 inch (AHC 10 or approved equal). Quantity and locations are as follows:

12 on Rudder
32 in Bow Thruster Tunnel
03 in Port Sea Chest
03 in Starboard Sea Chest
06 in the Centerboard Trunk (Anode Type ANC 10)

3.4.5 Quality Assurance

3.4.5.1 Inspect new anodes with COR after installation.

3.4.6 Notes

3.4.6.1 Another work item in this specification requires documenting the condition of the existing anodes in the docking report, prior to anode renewals.

END OF ITEM

3.5 ITEM 305: CATHODIC PROTECTION SYSTEM INSPECTION & ANODE REPLACEMENTS

3.5.1 Scope:

3.5.1.1 Inspect Cathodic Protection System and replace anodes as necessary.

3.5.2 References

3.5.2.1 Technical Manual FRV40-225-011-010 “Cathodic Protection System, Marimpress”

3.5.2.2 Technical Manual “Aquamatic 4 Impressed Current Cathodic Protection System”

3.5.2.3 Technical Manual FRV40-226-139-010 “Cathelco Antifouling System”

3.5.2.4 Drawing HB-163 FP19, “Sea Chests Diagram”

3.5.3 Government Furnished Equipment

Qty	Description	Cost	Ext Cost
18	Copper TZX27 Anodes	$1,900	$34,200

3.5.4 Requirements

3.5.4.1 Provide the services of a factory-authorized field service technician to supervise evaluation, service, and repair of ship’s existing Cathelco Cathodic Protection System. Arrangements for an approved technician may be made through contacting:

Wilson Walton International
3349 Rt. 138, BLDG C, Suite E
Wall, New Jersey 07719
POC: Cassie Corbett
Phone: (732) 681-0707
Email: cassie@wilsonwalton.com

3.5.4.2 Prior to any work on this item, and before ship is drydocked, conduct an operational test of ship’s Cathelco Anti-fouling System and the Cathodic Protection System in accordance with reference 3.5.2.1 through 3.5.2.3. Ship’s Force will operate equipment.

3.5.4.3 Inspect Cathodic Protection System controller, reference cells, and anodes in accordance with Reference 3.5.2.1 and 3.5.2.2. Locations are as follows:

3.5.4.3.1 Controller in Passage 1-7-01
3.5.4.3.2 Controller in EOS

3.5.4.3.3 Reference Cells at Frame 24-25
3.5.4.3.4 Anodes at Frame 81-82.

3.5.4.4 Using a megohmmeter, measure and record resistance readings between each anode and the hull and between the reference cell and the hull. Readings should be greater than 10 megohms.

3.5.4.5 Inspect each Reference Cell in the #2 Port and #2 Starboard Fuel Oil Tanks (4-19-2 and 4-19-1) in accordance with Reference 3.5.2.1 steps 4.1.2 and 4.2.2.3. Unbolt and remove covers and inspect Reference Cell cofferdams from inside the hull and inspect for signs of leakage or corrosion. Inspect external reference cell surfaces for signs of damage. Clean and re-establish coating inside the cofferdam.

3.5.4.6 Inspect anodes in Shaft Bossing (4-47-0) in accordance with Reference 3.5.2.1 steps 4.1.3, 4.2.2.1 and 4.2.2.1. Unbolt and remove covers and inspect Anode cofferdams from inside the hull and inspect for signs of leakage or corrosion. Check that anodes are securely fastened to the hull. Check that mounting stud hole filler is intact. Examine anode dielectric shield for any sigh of damage. Report any evidence of damage or leakage on a condition report. Check cable connections to the anodes for continuity. Clean and re-establish coating inside the cofferdam.

3.5.4.7 Reinstall reference cell and anode cofferdam covers with new gaskets.

3.5.4.8 In conjunction with Ship's force, follow ship's lockout / tagout procedures to secure all electrical power serving the anodes in the bow thruster machinery space and in the engine room main sea chests.

3.5.4.9 Disconnect the wiring to each of the anodes in the bow thruster machinery space (16 total) and in the engine room main sea chests (2 total). See Reference 3.5.2.4 as a guide for the location of the anodes.

3.5.4.10 Renew all anodes in the bow thruster machinery space and in the engine room main sea chests. Renew the flange gaskets. See Figures 3.5.1 and 3.5.2 in notes below. When assembling the new anodes in the flange sleeves, place the following over the stud in this order: Insulating washer, steel washer, brass full nut and brass half nut. Tighten each 27mm nut to 70 ft-lbs with a torque wrench. Do not over tighten as the nuts will strip.

3.5.4.11 Renew the junction boxes and terminal strips for all anodes in the bow thruster machinery space.

3.5.4.12 Rewire each of the anodes.

3.5.4.13 Upon completion of work clear lockout / tagouts.

3.5.4.14 Prior to undocking, request Ships Force power up the system and verify that each anode has the correct DC voltage to ground in accordance with Cathelco equipment instructions.

3.5.4.15 After all work has been completed, and after the ship is refloated, conduct operational tests for manufacturer's field service technician to adjust cathodic protection system parameters.
NOTE: Tech Representative will be required to make a minimum of 2 onsite inspections.

3.5.5 Quality Assurance

3.5.5.1 OEM shall provide a service report to the COR.

3.5.6 Notes

3.5.6.1 See Figures 3.5.1 and 3.5.2.

Figure 3.5.1 – Typical Copper Anode

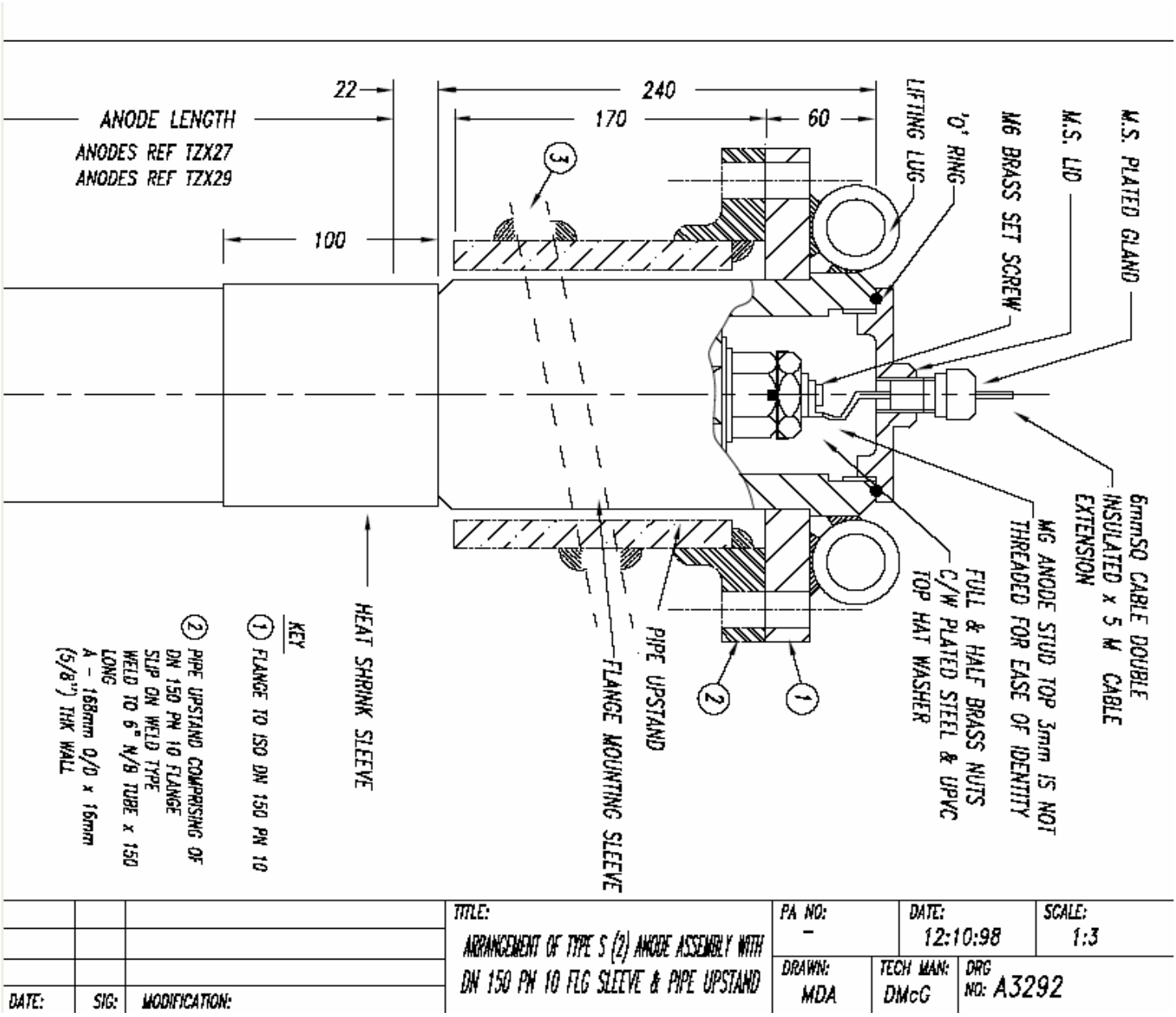


Figure 3.5.2 – Section view of installed anode. Gasket and flange fasteners are not shown.

END OF ITEM

3.6 ITEM 306: RUDDER AND TAIL SHAFT REMOVAL AND INSPECTION

3.6.1 Scope:

3.6.1.1 Remove and reinstall the rudder and tailshaft and accomplish ancillary work to complete the ABS Special Periodical Survey.

3.6.2 References

3.6.2.1 Tech Manual HB-562 (FRV40-226-071-010), “High Performance Flap Rudder, Model: Becker FKSR”

3.6.2.2 Drawing HB-562 FM02, “Rudder Arrangement”

3.6.2.3 Drawing HB-243 FM01, “Shafting Layout & Details”

3.6.2.4 NOAA Standard Specification AMC-240-1, “Propulsion Shaft and Propellers”

3.6.2.5 Tech Manual HB-244 (FRV40-225-006-010), “Stern Tube Bearing (Thordon Compac) and Shaft Seal (Kobelco)”

3.6.2.6 SKF Instruction File SKF C 3184 KM, “CARB Bearing Dismounting”

3.6.2.7 Tech Manual HB-633 (FRV40-225-011-010), “Cathodic Protection System, Marimpress Model: ICCP 50A”

3.6.2.8 Tech Manual HB-243 (FRV40-225-099-010), “Marine Shaft Braking System, Twiflex Model: T40-EN Caliper(s) with 20:1 Air/Hydraulic Intensifier”

3.6.2.9 SKF Instruction Number 81489, “The SKF OKV Coupling Mounting & Dismounting Instruction”

3.6.2.10 SKF Drawing 25616 Rev 9, “Ovako Couplings AB”

3.6.3 Government-Furnished Material (GFM)

3.6.3.1 Hydraulic Nut for Hydraulic Coupling (QTY 1) – estimated value: $2,500

3.6.3.2 Rudder Nut Turntable (QTY 1) – estimated value: $1,000

3.6.3.3 SKF Pumps and Injectors for lineshaft bearing (QTY 1) – estimated value: $1,000

3.6.3.4 Lineshaft bearing (QTY 1) – estimated value: $4,500

3.6.3.5 Taper Sleeve ($8,000)

3.6.3.6 Lineshaft Bearing Seals ($3,000)

3.6.4 Requirements

Rudder Removal

3.6.4.1 Prior to removing the rudder, operate the rudder from hard over to hard over and record the total travel (in degrees) to each side. Time the rudder from hard over on one side to hard over on the other side and record the results. Provide the COR with a report of all readings.

3.6.4.2 Attach temporary padeyes to the hull and the rudder. Remove the Becker high performance flap rudder in accordance with References 3.6.2.1 and 3.6.2.2. Record widening pressures and axial pressures on a condition report and provide the condition report to the COR.

3.6.4.3 Disassemble the joint link system and inspect the slide bar, bushing, the link pin and bushing for wear in accordance with Reference 3.6.2.1, drawing R-2.41573.

3.6.4.4 Disassemble the rudder hinge pins and inspect the hinge pins, bushing, wear rings and thrust rings for wear in accordance with Reference 3.6.2.1, drawing R-2.41576.

3.6.4.5 Remove the lower cover (PC 18) on Reference 3.6.2.1, drawing R-1.41572.

3.6.4.6 Support the rudder stock and disassemble the sealing assembly shown of Detail Z of Reference 3.6.2.1, drawing R-41572. Inspect the lip seal ring and O-rings for damage or wear.

3.6.4.7 Take bearing clearance measurements in accordance with reference 3.6.2.1 and fill in the Bearing Clearances table in Reference 3.6.2.1. Provide a copy of the Bearing Clearances table to the COR in a CFR.

3.6.4.8 Clean, preserve and lubricate all mechanical parts and areas that will be inaccessible after assembly in accordance with Reference 3.6.2.1 assembly drawing notes and lubricant table.

Tail Shaft Removal

3.6.4.9 Install temporary padeyes on the hull to allow for the propeller and tail shaft to be removed as an assembly. See Reference 3.6.2.3 for the dimensions and weights of the tail shaft and propeller assembly.

3.6.4.10 Remove the SKF bearing lower foundation. Lower housing for bearing must be lowered in order to remove the tail shaft.

3.6.4.11 Remove the tail shaft and propeller assembly, as one unit, from the ship in accordance with Reference 3.6.2.4 and as follows:

3.6.4.12 Remove the rope guard assembly and store until the tail shaft and propeller assembly are reinstalled.

3.6.4.13 Disconnect the water supply to the stern tube seal and bearing assembly to the extent that the tail shaft can be removed. Store all removed parts until the tail shaft and propeller assembly are reinstalled.

3.6.4.14 Disassemble the Kobelco shaft seal assembly in accordance with Reference 3.6.2.5. Disassemble the entire assembly to allow for replacement of mounting gasket, inflatable seal, seal ring and O-rings. Store all removed parts until the tail shaft and propeller assembly are reinstalled. Note position of body fit bolts, PC 4 of Reference 3.6.2.5, drawing KW-45001-0, for reinstallation in original position.

3.6.4.15 Disassemble / dismount the SKF CARB line shaft bearing assembly in accordance with Reference 3.6.2.6 to allow for shaft removal. Inspect the tapered sleeve and line shaft bearing seals and provide a CFR.

3.6.4.16 Within three (QTY 3) weeks of Contract Award, Contractor shall pick up the line shaft bearing at the NOAA Gulf Marine Support Facility and turn the SKF Bearing over to an SKF authorized overhaul and repair facility. Overhaul and refurbish the SKF lineshaft bearing and ship refurbished bearing to NOAA at the below address. For bidding purposes, Contractor shall estimate a Level 4 refurbishment.

NOAA Gulf Marine Support Facility
ATTN: NOAA Ship PISCES
151 Watts Avenue
Pascagoula, MS 39567

3.6.4.17 Turn the SKF Bearing removed from the lineshaft over to an SKF authorized overhaul and repair facility. Overhaul and refurbish the removed SKF lineshaft bearing and ship refurbished bearing to NOAA at the below address. Bearing shall be sealed for long-term storage. For bidding purposes, Contractor shall estimate a Level 4 refurbishment.

NOAA Gulf Marine Support Facility
ATTN: NOAA Ship PISCES
151 Watts Avenue
Pascagoula, MS 39567

3.6.4.18 SKF may be contacted at the following:

SKF USA, Inc
POC: Andrew Kennedy, Territory Manager
Phone: 205-441-9909
Email: Andrew.c.kennedy@skf.com

3.6.4.19 Disassemble the shaft slip ring assembly as needed to allow for shaft removal. See Reference 3.6.2.7, drawing P-C-2448. Store all removed parts until the tail shaft and propeller assembly are reinstalled.

3.6.4.20 Disassemble the shaft brake assembly in accordance with Reference 3.6.2.8 to the extent needed to allow for shaft removal. Store all removed parts until the tail shaft and propeller assembly are reinstalled.

3.6.4.21 Disassemble the hydraulic coupling (PC 11 of Reference 3.6.2.3) in accordance with References 3.6.2.9 and 3.6.2.10. Catch and properly dispose of all oil. Store and protect all parts until the tail shaft and propeller assembly are reinstalled. Prior to disassembly, record the existing "Pull Up" dimension, shown at 27mm in Reference 3.6.2.9. Provide a copy of the measurement to the COR.

Pull Up Dimension = _____ Recorded by: _____ Date: ____

3.6.4.22 Identify the position of the hydraulic coupling on the tail shaft so that this position can be restored at reassembly.

Tail Shaft Inspection

3.6.4.23 Remove the tail shaft and propeller assembly from the ship to a temporary storage location. Support the shaft on supports spaced no more than six feet apart on center.

3.6.4.24 Perform all measurements, inspections and tests on the tail shaft and propeller in accordance with Reference 3.6.2.4. All tests shall be performed in the presence of the local ABS Surveyor. Provide a condition report on shaft condition.

3.6.4.25 Clean and polish the forward and aft sleeves (Reference 3.6.2.3, sheet 3, PC's 2 & 3).

3.6.4.26 Apply two coats of anti-corrosive paint to the shaft surface where the seal assembly is to be installed and grease in accordance to Reference 3.6.2.5 Part II "Installation of the Seal Assembly".

3.6.4.27 After all measurements, inspections and tests have been performed on the tail shaft in accordance with Reference 3.6.2.4, reinstall the shaft and propeller assembly.

3.6.4.27.1 Contractor is responsible to properly install the shaft and verify shaft alignment. Obtain the services of a third party to verify shaft alignment. Submit a Condition Report containing final measurements and verifying shaft alignment.

Stern Tube Bearing Inspection

3.6.4.28 Cover the stern tube penetration to the ship and protect the stern tube bearing. Blast the stern tube water passages to SSPC-10 and paint in accordance with the Paint Schedule. Remove all marine growth from the bearing sliding surfaces.

3.6.4.29 Measure and record the inside diameter of the stern tube bearing at 12 locations vertical and 12 locations horizontal.

3.6.4.30 Provide the services of a Thordon Technical Representative to inspect the Thordon Compac stern tube bearing and provide a condition report.

Shaft Seal Machine Work and Assembly

3.6.4.31 Inspect the liner and carbon brush in accordance with Reference 3.6.2.5 Part II Paragraph D.3 “Replacement Schedule”

3.6.4.32 Provide and install the following Kobelco Eagle Marine, Inc. water lubricated shaft seal parts (5 year seal kit) for the Kobelco Model No. KW-450 shaft seal:

1. Sealing Rings size 450 for 458mm shaft size shaft (Item 1) – 2 total
2. Garter Spring size 450 (Item 2) – 2 total
3. Rubber Ring for mating ring o-ring (Item 11) – 1 total
4. Inflatable Sealing Ring (Item 10) – 1 total
5. O-ring for inflatable retainer (Item 19) – 1 total
6. Gasket for housing (Item 12) – 1 total
7. Spring Washer (Item 16) – 10 total
8. Spring Washer (Item 18) – 12 total

Note: All item numbers mentioned above are from Reference (e), drawing KW-45001-0 of Reference 3.6.2.5.

3.6.4.33 Ensure the stationary sliding liner (PC 3 of Reference 3.6.2.5, drawing KW-45001-0) can accommodate the 35mm wide EVK seal rings. Any machining will be the subject of additional work.

3.6.4.34 Align and install the shaft seal assembly in accordance with Reference 3.6.2.5. Provide a condition report to the COR with all alignment measurements.

3.6.4.35 Restore sealing water pipe and hose.

Shaft Brake Reassembly

3.6.4.36 Reassemble the brake discs and calipers in accordance with Reference 3.6.2.8.

Line Shaft Bearing Reassembly

3.6.4.37 Clean the SKF line shaft bearing oil sump and passages of all foreign material. Renew the lubricating oil during re-assembly of the bearing.

3.6.4.38 Install the refurbished line shaft bearing, taper sleeve, and line shaft bearing seals using provided GFM in coordination with the shaft reinstallation and in accordance with Reference 3.6.2.6. The bearing housing cap bolt torque is 630 ft-lbs. The bearing foundation bolt torque is 472 ft-lbs.

Hydraulic Coupling Reassembly

3.6.4.39 Reassemble the hydraulic coupling in accordance with References 3.6.2.9 and 3.6.2.10. Renew the Sealing, PC 4, of Reference 3.6.2.10.

3.6.4.40 Restore the hydraulic coupling to its original position, with pull- up reading the same as recorded in paragraph 3.6.4.18. Provide condition report to COR identifying Pull-up dimension, date recorded, person taking reading.

3.6.4.41 Reinstall the shaft grounding assembly, with new brushes, in accordance with Reference 3.6.2.7.

3.6.4.42 Reinstall the rope guards and all other removed interferences.

Rudder Installation

3.6.4.43 Reinstall the rudder in accordance with Reference 3.6.2.1, using all new gaskets, seals and O- rings.

3.6.4.44 Contact the local ABS surveyor and the COR to witness rudder pull- up on the rudder stock. Record pull up distance and widening and axial pressures on the table in Reference 3.6.2.1. Pull up pressures are provided on Reference 3.6.2.1, drawing R-1.41547: Nominal 4.7mm, Minimum 3.8mm, Maximum 5.6mm. Provide the COTR with a copy of the pressures and distances.

3.6.4.45 Weld the two access covers back on the rudder and perform MT or PT on all of the completed welds. Repair all deficiencies, if any.

3.6.4.46 Remove all temporary padeyes and preserve all disturbed steel areas.

3.6.4.47 Install new line cutters.

3.6.4.48 Provide all assistance to the ABS surveyor as required to complete the Special Periodical Surveys.

3.6.5 Quality Assurance

3.6.5.1 After the rudder has been re- installed, operate the rudder from hard over to hard over and record the total travel (in degrees) to each side. Time the rudder from hard over on one side to hard over on the other side and record the results. Time the rudder in each direction. Provide the COR with a report of all readings.

3.6.5.2 Verify shaft alignment and demonstrate full power ship operation (minimum 115 shaft RPM) during sea trails with no leakage through the shaft seal.

3.6.5.3 Upon completion of work, inspect all affected work areas and equipment with Ship's Force and COR and verify completion.

3.6.5.4 Demonstrate full power with 15 deg right rudder for one minute.

3.6.5.5 Demonstrate full power with 15 deg right rudder for one minute.

3.6.5.6 Demonstrate full power for 30 minutes with normal rudder usage.

3.6.5.7 Record rudder deflection readings with micrometer. Measure deflection atop of rudder stock.

3.6.6 Notes

3.6.6.1 Kobelco contact information:

Kobelco Eagle Marine, Inc.
366 Fifth Avenue, Suite 712
New York, NY 10001
Tel: 212-967-5575
Fax: 212-967-6966
www.kobelco-eagle.com

END OF ITEM

3.7 ITEM 307: PROPULSION SHAFT THRUST BEARING INSPECTION

3.7.1 Scope

3.7.1.1 Inspect thrust bearing.

3.7.2 References

3.7.2.1 Tech Manual HB-244 (FRV40-225-005-010), "Bearings, Lineshaft and Thrust; Model: SKF and Michell Bearing"

3.7.3 Government Furnished Material

3.7.3.1 None

3.7.4 Requirements

3.7.4.1 Disassemble the propulsion shaft thrust bearing in accordance with Reference 3.7.2.1 and in conjunction with the tail shaft removal. Provide the services of an authorized Michell Bearings factory representative to oversee disassembly, inspection and reassembly of the thrust bearing.

3.7.4.2 Clean and inspect all internal parts in accordance with Reference 3.7.2.1. Provide the COR with a condition report stating the condition of all internal parts.

3.7.4.3 Remove and clean trust bearing oil cooler. Pressure test after cleaning and prior to reinstallation.

3.7.4.4 Notify local ABS Surveyor once bearing is open and cleaned to allow for inspection.

3.7.4.5 After the local ABS Surveyor has inspected the bearing, reassemble the bearing in accordance with Reference 3.7.2.1. Provide and renew all disturbed gaskets, seals and O-rings.

3.7.4.6 Fill the bearing with contractor furnished oil in accordance with Reference 3.7.2.1. Filter the new oil through 10 micron (absolute) filters into a new, unused container prior to adding to bearing housing.

3.7.5 Quality Assurance

3.7.5.1 During trials, inspect bearing with shaft turning in accordance with Reference 3.7.2.1.

3.7.6 Notes

3.7.6.1 Below is the name plate data on the thrust bearing:

Manufacturer: Michell Bearings
Serial Number: 111745/1
Model Number: SB/0/217724
Order Number: SB/111745

END OF ITEM

3.8 ITEM 308: SEA VALVE OVERHAULS

3.8.1 Scope:

3.8.1.1 Overhaul or replace all sea water and shell isolation valves.

3.8.2 References

3.8.2.1 NOAA Standard Spec AMC-505-1B, “Valve Overhaul & Test”

3.8.2.2 Drawing 163- FP19, “Seachest Diagram” (1 sheet)

3.8.2.3 Drawing 256- FP08, “Main Seawater Cooling System”

3.8.2.4 Drawing 593-FP11 “Oily Waste & Waste Oil System Diagram”

3.8.2.5 Drawing 524- FP18, “Scientific Seawater Sys Diagram”

3.8.2.6 Drawing 524- FP21, “Egg Sampling System Diagram”

3.8.2.7 Drawing 524- FP23, “Auxiliary Seawater Cooling Sys”

3.8.2.8 Drawing 528- FP05, “Grey and Black Water System Dia”

3.8.2.9 Drawing 529- FP01, “Bilge & Ballast System Dia”

3.8.2.10 Drawing 551- FP07, “Compressed Air System Diagram”

3.8.2.11 NOAA Standard Specification MOC-000-1G

3.8.3 Government-Furnished Material (GFM)

3.8.3.1 None

3.8.4 Requirements

3.8.4.1 Remove, overhaul, test, and reinstall sea valves, listed in Table 3.8.1 below, in accordance with Reference 3.8.2.1. The term “overhaul” used in reference 3.8.2.1 shall be redefined for this work item to be the same as “rebuild” is defined in NOAA Standard Specification MOC-000-1G. In lieu of overhaul, the Contractor may renew any valves equal to or smaller than three inches. Replace the 10-inch sea-chest butterfly isolation valves (Items 12 – 19) with new butterfly isolation valves.

3.8.4.2 While valves are removed, perform inspection of Main & Auxiliary Seawater Piping in all removed valve locations using a flexible borescope (fiberscope) with video

capability. Inspection to be done in presence of COR and ship's force. Provide video results to COR. Any problem areas found will be topic of additional work.

3.8.4.3 Provide 24 hour notice in order for arrangements to be made for ship's crew and COR to be available for inspection.

3.8.4.4 After reassembly and prior to the shop hydro test of all steel valves and spool pieces, apply the first coat of paint system STL-11.

3.8.4.5 Prior to installing on the ship, apply the second coat of paint system STL-11 on the valves and spool pieces. Top coat color shall be same as found.

3.8.4.6 Replace all existing steel threaded fasteners with brass. Brass hardware shall be used for mating all connections.

3.8.4.7 All flanged shell valve gasket material shall be Garlock 5000 or similar ABS approved fire rated material.

3.8.4.8 Apply an anti-seize lubricant to fastener threads prior to installing and tightening.

3.8.4.9 Replace rubber seat gasket flappers in all scupper valves.

3.8.4.10 Inspect scupper valve pins for excessive wear or corrosion.

3.8.4.11 Perform the following work on all four sea chest strainers:

3.8.4.11.1 Remove to the shop.

3.8.4.11.2 Thoroughly clean interior housing to remove all growth and foreign matter.

3.8.4.11.3 Machine all mating and sealing surfaces, as necessary, to reestablish sealing capabilities. For estimating purposes, assume 50% of all mating and sealing surfaces require machining. See Reference 3.8.2.3 for all sea strainer connections and sealing surfaces.

3.8.4.11.4 Conduct visual inspection for evidence of damage or deterioration.

3.8.4.11.5 Prepare and preserve interior and exterior surfaces in accordance with General References 2.1.4.3 and 2.1.4.11. Apply paint system STL-11 to the prepared surfaces.

3.8.4.11.6 Reassemble strainers using a new gasket and new brass fasteners.

3.8.4.11.7 Power tool clean and preserve the tank top and exposed areas around sea chest strainers to an SSPC-SP 11 condition. Apply paint system STL-11. For bidding purposes, estimate painting 50 square feet.

3.8.4.11.8 Reinstall strainers on ship in original locations using new brass fasteners. Apply an anti-seize lubricant to fastener threads prior to installing and tightening.

3.8.4.11.9 The strainers are fitted with differential pressure gages. Reinstall gages using new tubing and new shut-off valves. The following information is provided for bidding purposes: Tubing and ball valve are ¼" 90/10 CUNI. Plan on a foot or less of tubing.

3.8.4.12 Flush the sea chest vent piping and firemain vent piping from weather deck vent fittings down through sea chests using water with 100 psig water pressure to remove all mud, slime, and loose rust particles.

3.8.4.13 Replace the reach rod assembly, including the deck box swivel, all U-joints, yokes, and valve connection for the Auxiliary Sea Water Overboard Discharge valve (524-VL-23). Reach rod is terminated in the Upper Level of the Engine Room and is a 300 series stainless steel reach rod.

3.8.5 Quality Assurance

3.8.5.1 After completion of all work and prior to preservation, perform a hydrostatic pressure test on strainers at a pressure of 60 psig. Hold the pressure for ten minutes.

3.8.6 Notes

3.8.6.1 Photos of some valves in their installed location are provided for information only.

3.8.6.2 The identification number for all sea valves contains a prefix that corresponds to the drawing number the valve is shown on. A few of the small valves are shown on more than one drawing and will have a number corresponding to the particular drawing.

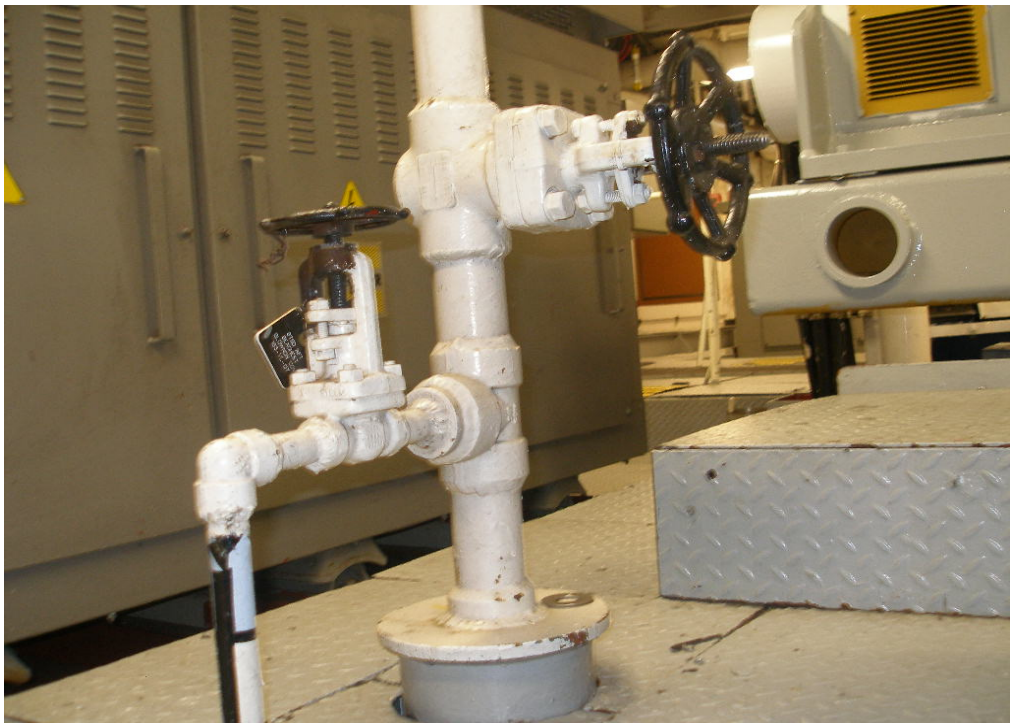


Fig. 3.8.1 Starboard side sea chest 2-inch vent and ¾-inch air blow down valves; Port side sea chest similar

Fig. 3.8.2 Upper Scientific SW ball valve, Fwd Sea Chest COV, 2-inch vent valve, ¾-inch air blow-down valve, in Bow Thruster Space

Table 3.8.1 List of Shell Valves

Main Sea Water Valves, Sea Chest Vents and Air Purge Valves in Engine Room

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
1	Sea Chest Inlet, Stbd, FR 61	163-VL-01	10-inch	Gate, bronze, flanged, reachrod	PIMA
2	Sea Chest Vent, Stbd	506-VL-50	2- inch	Gate, steel, welded	
3	Sea Chest Air Blowdown, Stbd	551-VL-70	3/4-inch	Gate, steel, welded	
4	Sea Chest Inlet, Port, FR61	163-VL-02	10-inch	Gate, bronze, flanged, reachrod	PIMA
5	Sea Chest Vent, Port	506-VL-49	2- inch	Gate, steel, welded	
6	Sea Chest Air Blowdown, Port	551-VL-69	3/4-inch	Gate, steel, welded	
7	Sea Chest Warm- Up, Stbd, FR62-63	163-VL-03	6- inch	Gate, bronze, flanged, reachrod	PIMA
8	Stbd Overboard, FR71	256-VL-23	6- inch	Bronze, flanged, Reachrod	PIMA
9	Port Overboard, FR71	256-VL-24	6- inch	Bronze, flanged, reachrod	PIMA
10	Oily Water Separator Ovbd., Port Side, FR49	593-VL-47	1- inch	Flanged, gate, welded	Williams Valve Co.
11	Stern Tube Supply	256-VL-48	1-1/2 in	Globe, bronze, welded	
12	Sea Water Strainer #1 Inlet, Port Side	256-VL-52	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
13	Sea Water Strainer #1 Outlet, Port Side	256-VL-26	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
14	Sea Water Strainer #2 Inlet, Port Side	256-VL-54	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
15	Sea Water Strainer #2 Outlet, Port Side	256-VL-56	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal

16	Sea Water Strainer #1 Inlet, Stbd Side	256-VL-53	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
17	Sea Water Strainer #1 Outlet, Stbd Side	256-VL-27	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
18	Sea Water Strainer #2 Inlet, Stbd Side	256-VL-55	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
19	Sea Water Strainer #2 Outlet, Stbd Side	256-VL-57	10-inch	Butterfly, lug, bronze, reachrod	Crane Flow Seal
20	Egg Pump Seachest, Stbd, FR53	524-VL-45	6- inch	Gate, bronze, flanged, reachrod	PIMA

Auxiliary Sea Water System Valves in Engine Room

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
21	Scupper Valve, Stbd Side	524-VL-23	5- inch	Scupper Gag Valve, bronze, reachrod	
22	Overboard Valve, Stbd Side	by 524-VL-23	5- inch	Butterfly, flanged,	
23	Overboard Scupper Valve, Stbd Side	524-VL-33	2- 1/2 in	Scupper Gag Valve, bronze	
24	Bilge & Ballast Overboard Discharge, Port Side	529-VL-19	3- inch	Scupper gag valve, bronze, reachrod	YC

Sea Water Valves in Bow Thruster Room

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
25	Forward Seachest Inlet (for firepump)	163-VL-05	4- inch	Gate, bronze, flanged, reachrod	
26	Forward Seachest Vent	506-VL-48	2- inch	Gate valve, steel, welded	
27	Forward Seachest Air Blowdown	551-VL-68	3/4-inch	Gate valve, steel, welded	
28	Scientific Sea Water System Sea Chest, Lower, FR12	524B-VL-60	2- inch	Butterfly, reachrod	

29	Scientific Sea Water System Sea Chest, Upper, FR12	524B-VL-61	2- inch	Butterfly, reachrod	

Seawater Valve in Domestic Equipment Room

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
30	MSD Overboard	524B-VL-12	2-inch	Gate, flanged, reachrod	

Seawater Valve in Transducer Void

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
31	Doppler Speed Log Hull Isolation Valve, Lower Level,	529-VL-61	8-inch	Gate, flanged, Reachrod	

Seawater Valve in Winch Room

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
32	Scientific Sea Water Overboard Discharge, Port	524B-VL-77	1- inch	Scupper gag valve, bronze, reachrod	

Seawater Valve in Cleaning Gear Locker in Exercise Room

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
33	Grey Water Overboard Discharge, FR21	528-VL-26	3- inch	Scupper gag valve	

END OF ITEM

3.9 ITEM 309: GROUND TACKLE INSPECTION AND PRESERVATION

3.9.1 Scope:

3.9.1.1 Replace the anchor chain, inspect the anchor windless, and preserve the anchor chain locker.

3.9.2 References

3.9.2.1 NOAA Standard Specification AMC-581-1A, “Inspection and Preservation of Ground Tackle”

3.9.2.2 Drawing OD-581-002, "R/V OSCAR DYSON Anchor Handling Modifications Key Plans" (2006) (use for below deck arrangement)

3.9.2.3 Drawing OD-581-03, R/V HENRY BIGELOW Anchor Handling Modifications Key Plans" (2009) (use for topside arrangement)

3.9.2.4 Drawing 582-FH20, "Anchor Storage and Handling Layout and Details", sheet 1 (use for painting and marking details)

3.9.2.5 Drawing 100-FH02, "Hull Forebody Scantlings FR0-FR18", sheets 3 and 4

3.9.2.6 Technical Manual FRV40-226-004-010 Rev 2 “Anchor Windlass”

3.9.3 Government Furnished Equipment (GFE)

3.9.3.1 None.

3.9.4 Requirements

3.9.4.1 Remove the existing port and starboard anchors and anchor chains. Scrap the old anchor chain.

3.9.4.2 Procure new ABS approved, 36mm, Grade 3 anchor chain for each anchor. Provide miscellaneous anchor chain attachments as specified below. Provide anchor chain and miscellaneous equipment ABS approval certificates to the COR. Anchor chain shots are as follows:

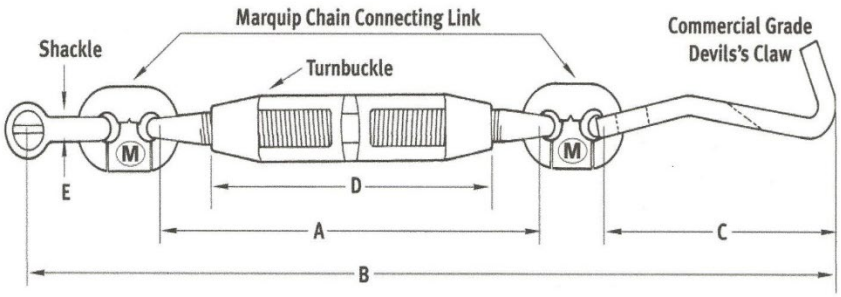
3.9.4.2.1 STBD Anchor Chain – 12 shots 36mm chain, with detachable links between each shot

3.9.4.2.2 Port Anchor Chain – 10 shots, 36mm chain, with detachable links between each shot

3.9.4.2.3 Anchor swivel assembly next to each anchor (QTY 2 total).

3.9.4.2.4 Six (QTY 6) detachable links

3.9.4.2.5 One (QTY 1) new devil's claw assembly. Devil's claw specifications highlighted in orange, below. See Note 3.9.6.2 for one source for anchor chain components.



Chain Size Inches	mm	A	B Min	B Max	C	D	E	Det Link Size	Proof Load Lbs
3/4	19	16	35-1/2	42-3/4	12	11	7/8	3/4	34,000
7/8	22	17-1/4	38-1/4	45-3/8	12	11	1	7/8	46,000
1 – 1-1/8 – 1-1/4	25-32	19-1/2	43-1/16	52-13/16	12-3/4	13	1-1/4	1-1/8	92,200
1-3/8 – 1-1/2 – 1-5/8	34- 42	23-3/4	50-1/4	60-3/4	13	16	1-1/2	1-3/8	153,000
1-3/4–2	44- 51	24-1/8	53-1/8	63-5/8	16	16	1 1/2	1-1/2	160,000
2-1/8–2-3/8	54- 60	26-1/4	56-1/4	66-3/4	19	16	1 5/8	1-1/2	170,000
2-1/2–2-5/8	64- 67	29-3/4	65	78-1/8	20	20	1-7/8	1-5/8	200,000
2-3/4	70	29-3/4	67-1/4	80-1/4	24	20	1-7/8	2-1/8	220,000
3	76	36	76-1/4	92-3/8	24	24	2-3/8	2-1/8	220,000

3.9.4.3 Complete surface preparation of the removed anchors by sand-blasting. Inspect, test, and paint the port and starboard anchors in accordance with Reference 3.9.2.1.

3.9.4.4 Perform surface preparation, painting, and marking of the new anchor chain in accordance with Reference 3.9.2.1.

3.9.4.5 Preparation and preservation of anchors and new anchor chain shall be accomplished by a QP-1 certified painting contractor.

3.9.4.6 Anchors, shackles, shackle pins, swivels, all other fittings shall be prepared for inspection and preservation by sand-blasting.

3.9.4.7 Sand-blasting shall be carried out to a minimum standard of SSPC-10 Near White Blast Cleaning.

3.9.4.8 Immediately prior to application of a mist coat (1- 2 mils) to the anchor, chain, or any links, the surfaces shall be tested and shall not exceed a chloride reading of 5 ug/cm^2 surface condition. Testing shall be accomplished by field analysis at one location on each shot of chain and one location on each anchor; location for test point shall be identified by COR. Testing shall be carried out by QP1 certified painting contractor in presence of COR. If reading is high, the entire shot of chain or anchor shall be re-cleaned and re-tested until chloride reading is equal to or less than 5 ug/cm^2.

3.9.4.9 Immediately after anchor and anchor chain surface contaminate readings are within limits, and prior to inspections, apply one mist coat of Ameron Dimetcote 302H.

3.9.4.10 Complete all ABS required inspections on the anchor and new anchor chain for the 5-year ground tackle certification.

3.9.4.11 Coat anchor and anchor chain as follows: In addition to the 1-2 mil mist coat to hold cleaning, apply one coat Ameron Dimetcote 302H, 3 mils DFT. Follow with one coat Ameron Amercoat 385, 5-6 mils DFT. Anchor chain and anchors shall be painted black. Detachable links, and chain on either side of detachable links, shall be painted in accordance with reference 3.9.2.3, "General Notes".

Chain Locker Preservation

3.9.4.12 Once anchors and chain have been removed, remove chain grating. Inspect, clean out, and preserve the drain line from chain lockers.

3.9.4.13 Clean both chain lockers to an SSPC-SP3 condition. For bidding purposes, estimate 100 square feet of miscellaneous locations within the chain lockers will require a “complete” system to an SSPC-SP11 condition.

3.9.4.14 Surface preparation to include feathering back edges to remaining paint in all areas where water jetting or power tool cleaning is used.

3.9.4.15 Rewash the chain lockers with a 3000 psi fresh water wash after all surface preparation has been carried out and prior to any painting.

3.9.4.16 Test for chlorides in three locations in each chain locker; locations to be identified by COR. Chloride readings shall be 5 ug/cm^2 or less before proceeding with surface preparation and painting.

3.9.4.17 Paint both chain lockers.

3.9.4.17.1 A “complete” system consists of the coating system called out in Reference 2.1.4.11, “Chain Locker and Sump”.

3.9.4.17.2 Coat the rest of the chain lockers with a “maintenance system”, consisting of one coat Ameron Amercoat 385 (red), 4-5 mils DFT.

3.9.4.18 If a combined area of both chain lockers requiring a “complete system” is greater than 100 square feet, it will be the subject of additional work.

3.9.4.19 Reinstall grating using new fasteners after other work is accomplished.

Anchor Windlass Inspection

3.9.4.20 After anchor and anchor chains have been removed, disconnect and remove the anchor windlass from ship to shore facility.

3.9.4.21 Disassemble the anchor windlass. Complete NDT (dye penetrant) testing as required by ABS. Blast and paint all components in accordance with References 3.9.2.1 and 3.9.2.6. Inspect disassembled anchor windlass with COR. Inspect and rebuild the brake using a new 460VAC solenoid valve and actuator. Reassemble the anchor windlass using new seals and bearings and reinstall using new fasteners. Reinstall the anchor windlass and fill with new contractor furnished oil.

3.9.4.22 Remove the anchor windlass motor and transport to an authorized overhaul and repair facility. Rewind the motor. Replace the solenoid, bearings, hardware, and any other consumables. Paint the overhauled motor. Test, balance, and reinstall motor upon completion of overhaul.

3.9.4.23 After completion of all other work, reassemble the chain and anchors and reinstall on the ship. Coordinate the reinstallation of the anchors and chains with the Ship’s deck department.

3.9.4.24 After the anchors and anchor chains have been installed, test the windlass and verify windlass and brake operation in the presence of ABS.

3.9.5 Quality Assurance

3.9.5.1 COR inspection in accordance with Reference 3.9.2.1.

3.9.5.2 Operational test of the anchor windlass in the presence of ABS, COR, and Chief Bosun Mate.

3.9.5.3 Provide ABS certifications for new anchor chain, detachable links and devil’s claw.

3.9.6 Notes

3.9.6.1 One possible source for anchor chain components is provided below (chain, Devil's claw, detachable links, etc.):

Washington Chain & Supply
2910 Utah Ave. S.
Seattle, WA 98134
Tel: (206) 623-8500

END OF ITEM

3.10 ITEM 310: UNDERWATER HULL COATING

3.10.1 Scope:

3.10.1.1 Blast and paint the entire underwater hull.

3.10.2 References

3.10.2.1 NOAA Standard Specification AMC-631-1B, "Epoxy-Polyamide/Vinyl Underwater Body Coating System"

3.10.2.2 Drawing HB-631 FF04, "Painting Schedule"

3.10.2.3 Drawing HB-085 FA01, "Outboard Profile"

3.10.3 Government-Furnished Material

3.10.3.1 None

3.10.4 Requirements

3.10.4.1 All surface preparation and painting shall be done by a QP-1 certified contractor.

3.10.4.2 Prior to applying hull the coating systems, complete all potential structural steel repairs, and all access cuts, NDT testing, and hull plate inserts below the waterline that have been called out in other items of these specifications.

3.10.4.3 The existing hull coating system is an International System applied during the last Intermediate Drydock in February 2017 (Primer Coats: International 262 Red, 262 Gray; Anti-Fouling Coats: International 640 Red, 640 Black). Except for paint brand name, Contractor shall adhere to the ship's Paint Schedule.

3.10.4.4 All preparations and painting shall be accomplished in accordance with the paragraphs for "General Requirements" and "Quality Assurance" of Section 2 of this specification. References 3.10.2.1. Reference 3.10.2.2 shall be used for guidance on hull coating details such as hull coating areas, number of coats and DFT, but the Contractor may substitute the "Ameron" product name for "International" for underwater hull coatings. Use reference 3.10.2.3 as an aid in determining approximate area to be coated. Area to be coated includes the Centerboard Trunk to the waterline.

3.10.4.5 Protect all transducers per the Drydocking Item prior to beginning the work of this Item.

3.10.4.6 Prepare the entire underwater hull, from the bottom of the keel to the top of the boottop to a near-white metal standard in accordance with SSPC-SP10.

3.10.4.7 Prior to blasting and painting the sea chests, remove and dispose of all sound-dampening material within the sea chests, as well as the stainless screens holding it in position. The screens are fastened in place with studs. For bidding purposes, assume renewal of 12 studs. After sea chest painting is complete, install all new sound-dampening material and new 316 stainless steel screens.

3.10.4.8 After surface preparation and immediately prior to application of paint, accomplish chloride checks at a total of ten (10) different locations on the underwater hull. Locations to be selected by COR. Maximum chloride readings shall not exceed 5 ug/cm^2. If chloride readings exceed this level, the areas shall be recleaned and retested until the chloride readings do not exceed 5 ug/cm^2.

3.10.4.9 Apply the following (or equal) coating to the prepared surfaces

3.10.4.9.1 Full coat of Amercoat 385 (red) at 5 mils DFT;

3.10.4.9.2 Full coat of Amercoat 385 (gray) at 5 mils DFT;

3.10.4.9.3 Full coat of ABC#4 (red) at 5 mils DFT;

3.10.4.9.4 Full coat of ABC#4 (black) at 5 mils DFT;

3.10.4.10 Apply two full coats of Amerlock 400 GFK (red/black) at 5 mils DFT to sea chests and other high turbulence areas over the two Amercoat 385 primer coats specified in Paragraph 3.10.4.9 above.

3.10.4.11 Apply another full coat of ABC#4 (black) to the boottop at 5 mils DFT (for a total boottop A/F coating of 3 coats of ABC #4 with the two top coats being black).

3.10.4.12 Apply one coat of Amercoat 229C (white) to all hull markings (frame numbers, draft marks, Plimsoll marks, etc.) within the underwater hull area.

3.10.5 Quality Assurance

3.10.5.1 Conduct joint inspection of hull with Paint Company representative and COR after hull has been sand blasted. Provide detailed “Paint Plan” to COR, in accordance with Reference 3.10.2.1, prior to start of surface preparation.

3.10.5.2 Conduct joint temperature and humidity readings with Paint Company representative prior to each coat of paint applied.

3.10.5.3 Verify all transducers are protected prior to surface preparation and painting.

3.10.5.4 Conduct joint inspection of Dry Film Thickness gaging with Paint Company representative after each coat of paint is applied.

3.10.5.5 Provide all additional documentation identified in Reference 3.10.1.1, section 4, "Quality Assurance."

3.10.6 Notes

3.10.6.1 "Underwater hull" includes from the bottom of the keel to the top of the boottop, including the rudder, sea chests, and the centerboard trunk to the waterline.

END OF ITEM

3.11 ITEM 311: FREEBOARD COATING

3.11.1 Scope:

3.11.1.1 Blast and paint the Freeboard.

3.11.2 References

3.11.2.1 NOAA Standard Specification MOC-631-2D, "Coating Systems for Steel Surfaces"

3.11.2.2 Drawing HB-631 FF04, "Painting Schedule"

3.11.2.3 Drawing HB-085 FA01, "Outboard Profile"

3.11.3 Government-Furnished Material

3.11.3.1 None

3.11.4 Requirements

3.11.4.1 All surface preparation and painting shall be done by a QP-1 certified contractor.

3.11.4.2 Prior to surface preparation, Contractor shall ensure that all transducers and hull, shell, ventilation, drains, and ship accesses are properly covered or secured to prevent intrusion of blast material. Cover all port hole windows in the shell to prevent damage.

3.11.4.3 All preparations and painting shall be accomplished in accordance with the paragraphs for "General Requirements" and "Quality Assurance" of this specification. References 3.11.2.1. Reference 3.11.2.2 shall be used for guidance on shell coating details such as shell coating areas, number of coats and DFT, but the Contractor shall substitute the "Ameron" product name for "International". Use reference 3.11.2.3 as an aid in determining approximate area to be coated.

3.11.4.4 Spot blast to SSPC-SP10 all damaged or rusted areas within the freeboard and sand sweep to SSPC-SP 7 all remaining areas of the freeboard to remove all contamination.

3.11.4.4.1 The Freeboard consists of all areas of the hull from the top of the boottop to the intersection of the hull with the Main and 01 Decks, to include the bulwarks in the bow area and aft deck. On the port side, the freeboard extends to the 01 Deck from the bow to FR82, and to Main Deck from FR 82 to the transom. On the starboard side the freeboard extends to the 01 Deck from the bow to FR 47, and to Main Deck from FR 47 to transom.

3.11.4.5 After surface preparation and immediately prior to application of paint, accomplish chloride checks at a total of 10 different locations on the freeboard. Locations will be selected by the COR. Maximum chloride measurements shall not exceed 5 ug/cm2. If chloride measurements exceed this level, the areas shall be re-cleaned, then re-tested until the chloride measurement does not exceed 5 ug/cm2.

3.11.4.6 Apply the following coating system, or equal, to all SP10 blasted areas:

3.11.4.6.1 Dimetcote 302H (green) at 3 mils DFT.

3.11.4.6.2 Amercoat 385 (red) at 5 mils DFT.

3.11.4.7 Apply a full coat of Amercoat 229T (white), or equal, at 2 mils DFT to the entire freeboard

3.11.4.8 Repaint markings within the freeboard area (i.e., ship's name, IMO numbers, NOAA logo, draft marks, frame numbers, thruster symbols, anchor pocket etc.) with 2-3 mils of Amercoat 229T of the appropriate color (black or NOAA Reflex or Process blue).

3.11.4.9 Upon completion of work and all work associated with Items 310 and 312 Underwater Hull Coating and Superstructure Coating, remove all temporary coverings. Verify drain and scuttle operation.

3.11.5 Quality Assurance

3.11.5.1 Conduct joint inspection of the Freeboard with Paint Company representative and COR after surface preparation has been completed. Provide detailed "Paint Plan" to COR, in accordance with Reference 3.11.2.1, prior to start of surface preparation.

3.11.5.2 Conduct joint temperature and humidity readings with Paint Company representative prior to each coat of paint applied.

3.11.5.3 Conduct joint inspection of Dry Film Thickness gaging with Paint Company representative after each coat of paint is applied.

3.11.5.4 Provide all additional documentation identified in Reference 3.11.1.1, section 4, "Quality Assurance.

3.11.6 Notes

3.11.6.1 None

END OF ITEM

3.12 ITEM 312: SUPERSTRUCTURE COATING

3.12.1 Scope:

3.12.1.1 Paint and preserve the ship's superstructure.

3.12.2 References

3.12.2.1 NOAA Standard Specification AMC-631-4, "Coating Systems for Aluminum Surfaces"

3.12.2.2 Drawing HB-631 FF04, "Painting Schedule"

3.12.2.3 Drawing HB-085 FA01, "Outboard Profile"

3.12.3 Government-Furnished Material

3.12.3.1 None

3.12.4 Requirements

3.12.4.1 All surface preparation and painting shall be done by a QP-1 certified contractor.

3.12.4.2 Prior to surface preparation, Contractor shall ensure that all transducers and hull, shell, ventilation, and ship accesses are properly covered or secured to prevent intrusion of blast material.

3.12.4.3 Plug or cover all scupper drains to prevent intrusion of paint debris. Cover all bulkhead windows in the areas to be worked to prevent damage.

3.12.4.4 Prior to applying the coating system, complete all potential structural steel repairs and all anticipated access cuts.

3.12.4.5 All preparations and painting to be accomplished in accordance with the paragraphs for "General Requirements" and "Quality Assurance" of this specification. References 3.12.2.1. Reference 3.12.2.2 shall be used for guidance on shell coating details such as shell coating areas, number of coats and DFT, but the Contractor shall substitute the "Ameron" product name for "International".

3.12.4.6 Provide a man-lift or staging as necessary to reach all areas of this work item.

3.12.4.7 Power tool clean to SSPC-11 all areas having loose paint or surface corrosion as designated by the COR. Apply a "complete" coating system to these areas. For bidding purposes, estimate 1000 non-contiguous square feet of miscellaneous

superstructure locations will require a “complete system”. If locations requiring a “complete system” exceed these amounts, it will be the topic of additional work.

3.12.4.8 After surface preparation and immediately prior to application of paint, accomplish chloride checks at a total of 10 different locations. Locations will be selected by the COR. Maximum chloride measurements shall not exceed 5 ug/cm2. If chloride measurements exceed this level, the areas shall be re-cleaned, then re-tested until the chloride measurement does not exceed 5 ug/cm2.

3.12.4.9 A “complete system” for the Superstructure consists of two coats Amerocat 385 primer and one top coat of Amercoat 229T (white) at 2 mils DFT.

3.12.4.10 Upon completion of all coatings in this item and removal of all covering materials, perform a low pressure, fresh water washing of the entire hull and all other weather areas of the ship. Co-ordinate this work with Item 310 “Underwater Hull Coating” and Item 311 “Freeboard Coating”. Cover all deck drain openings and strainer plates to prevent debris from clogging the ship’s deck drainage system. After all coatings and clean ups are complete, flush ship’s deck drainage system to ensure all debris has been removed.

3.12.5 Quality Assurance

3.12.5.1 Conduct joint inspection of all areas to be painted with Paint Company representative and COR after surface preparation has been completed. Provide detailed “Paint Plan” to COR, in accordance with Reference 3.12.2.1, prior to start of surface preparation.

3.12.5.2 Conduct joint temperature and humidity readings with Paint Company representative prior to each coat of paint applied.

3.12.5.3 Conduct joint inspection of Dry Film Thickness gaging with Paint Company representative after each coat of paint is applied.

3.12.5.4 Provide all additional documentation identified in Reference 3.12.1.1, section 4, “Quality Assurance.

3.12.6 Notes

3.12.6.1 The superstructure, including the entire stack, from the 01 level and above is aluminum.

END OF ITEM

3.13 ITEM 313: MAST AND JACK STAFF PAINTING AND PRESERVATION

3.13.1 Scope:

3.13.1.1 Blast and paint the masts on the Flying Bridge (04 Level) and the Jack Staff on the Foc'sle deck.

3.13.2 References

3.13.2.1 NOAA Standard Specification AMC-631-4, "Coating Systems for Aluminum Surfaces"

3.13.2.2 Drawing HB-631 FF04, "Painting Schedule"

3.13.2.3 Drawing HB-085 FA01, "Outboard Profile"

3.13.3 Government-Furnished Material

3.13.3.1 None

3.13.4 Requirements

3.13.4.1 All surface preparation and painting shall be done by a QP-1 certified contractor.

3.13.4.2 This item contains the requirements for blasting and painting the masts on the flying bridge (04 Level) and the Jack Staff on the Foc'sle. Note: Masts are constructed of aluminum. Photos of the masts follow:


Fishing Mast


Inmarsat B Mast

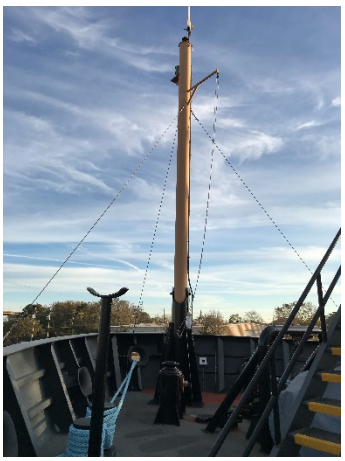
Ku-Band Antenna Mast


S-Band Radar Mast


X-Band Radar Mast


Main Mast (looking aft)


Main Mast (looking fwd)


Jackstaff

3.13.4.3 Conduct an operational test, in the presence of the COR and his/her designated representatives of navigation lights, flood lights, antenna driven components, radars, and anemometers on the mast and Jack Staff prior to accomplishing any other work on this item.

3.13.4.4 In conjunction with the ship's force, follow lock out and tag out procedures on all powered equipment to be removed from the Jack Staff and mast.

3.13.4.5 Disconnect and remove all electronic and electrical items from the Jack Staff. Remove the Jack Staff from the ship.

3.13.4.6 Label and remove the following from the masts: all existing wiring, lights, anemometers, radars, antennas, halyards, and the notched vertical bars which are clamped to the ladder for the climber's safety harness. Cover cable connectors to prevent damage from dust and moisture. Wrap each antenna and store in an enclosed space until the mast repair work is completed. Wrap and protect all fixed navigational and communications equipment remaining in place such as domes, prior to start of

work. Contractor shall inspect all coverings with COR and Ship's Force Representative prior to start of work to verify protective coverings are in place.

3.13.4.7 Construct scaffolding around and completely enclose the masts in plastic sheeting. Plastic sheeting around scaffolding shall form a tent such that all sandblast material and paint spray are confined within the tent structures. Staging shall be inspected and certified daily.

3.13.4.8 Crop off/grind off all existing cable standoffs. Weld new 316L stainless steel standoffs in same locations as existing. Install new 316L stainless steel cable wraps (same type as existing) on standoffs.

3.13.4.9 Perform a thorough visual inspection of the jack staff and the mast and provide the COR a condition report identifying the location and extent of all recommended repairs Areas found in need of repair/renewal as part of the inspection will be handled as growth work.

3.13.4.10 Sandblast the entirety of the mast structures with garnet or Starblast to an SSPC-SP17 standard in accordance with Reference 3.13.2.1. Use dust collectors, heaters, and dehumidification equipment to remove blast materials and maintain temperatures and environmental conditions conducive to painting. Sandblasted surfaces shall be inspected and approved by the paint manufacturer prior to coating.

3.13.4.11 After blasting, perform chloride tests in six different locations on each mast, using a Chlor*Rid test kit (or equal). Exact locations to be determined by the COR. If chloride contamination above 5 ug/cm^2 is detected, pressure wash the entire surface until chlorides are below 5 ug/cm^2, then repeat blasting as necessary to achieve surface prep in accordance with SSPC-SP17.

3.13.4.12 All preparations and painting to be accomplished in accordance with the paragraphs for "General Requirements" and "Quality Assurance" of this specification. References 3.13.2.1. Reference 3.13.2.2 shall be used for guidance on coating systems such as the number of coats and DFT, but the Contractor may substitute the "Ameron" product name for "International".

3.13.4.13 After surface preparation is approved, apply the following (or equal) coating system to the masts. Submit environmental and DFT readings for each coat to the COR in a condition report.

3.13.4.13.1 Full coat: Dimetcote 302H (green), 3 mils DFT.

3.13.4.13.2 Stripe-coat all cut-outs, hidden welds, backsides of angles, edges, wire clips, ladder rungs, and other hard to reach areas with PPG Amercoat 385 (red).

3.13.4.13.3 Full coat: PPG Amercoat 385 (red), 5 mils DFT.

3.13.4.13.4 Full coat: PPG Amercoat 229T (buff or spar), 2 mils DFT.

3.13.4.14 Reinstall all items removed per paragraph 3.13.4.5.

3.13.4.15 Reinstall the Jack Staff on the foundation on the Foc'sle Deck. Test the installed air tugger winch and submit a CFR with recommendations for repair or replacement of the air tugger winch for the Jack Staff.

3.13.4.16 Restore all existing coating systems which are damaged during performance of work. The new coating system shall be same as existing.

3.13.4.17 Conduct an operational test, in the presence of the COR and his/her designated representatives of navigation lights, radars, flood lights, and antenna driven equipment after accomplishing all other work on this item.

3.13.5 Quality Assurance

3.13.5.1 Verify all Pilot House Deck and Mast equipment is covered and protected prior to surface preparation and painting as identified in Reference 3.13.2.2.

3.13.5.2 Prior to applying any paint or coatings, and prior to each subsequent coat of paint, verify to the COR that all surfaces have been properly prepared and that weather conditions are suitable for painting.

3.13.5.3 Paint shall be applied only when the following conditions exist and can be maintained until the paint has cured:

3.13.5.3.1 Apply paint only to dry surfaces and when there is no chance of precipitation until after the paint has cured. The temperature of the surface to be painted shall be at least 5 degrees Fahrenheit above the dew point. The dew point can be presumed to be satisfactory if a thin, clearly defined film of water applied to the cleaned surface with a damp cloth evaporates within 15 minutes. Otherwise, the dew point shall be measured prior to painting by taking the dry-bulb temperature of the surface and the wet-bulb temperature at the jobsite.

3.13.5.3.2 The air temperature and surface temperature must both be a minimum of 45 degrees Fahrenheit at all times, unless a lower temperature is specifically authorized by the paint manufacturer's printed instructions.

3.13.5.3.3 Painting is permitted only when the humidity is less than 95 percent.

3.13.5.3.4 In the event the Contractor desires or must proceed with painting when the existing weather conditions do not meet the above specified conditions, the Contractor shall erect a cover over the surfaces to be painted and shall heat the

surfaces and the surrounding air to establish the required conditions. The conditions shall be maintained until the paint has fully cured.

3.13.5.4 Conduct joint temperature and humidity readings with paint coatings representative prior to each coat of paint applied.

3.13.5.5 Conduct joint inspection of Dry Film Thickness gaging with Paint coatings representative after each coat of paint is applied.

3.13.6 Notes

3.13.6.1 The forward- facing and aft- facing areas of the superstructure bulwark and handrails are not included in this Item.

END OF ITEM

3.14 ITEM 314: ROLL STABILIZATION TANK PRESERVATION AND REPAIRS

3.14.1 Scope:

3.14.1.1 Preserve, blast, paint, and accomplish repairs within the Roll Stabilization Tank.

3.14.2 References

3.14.2.1 NOAA Standard Specification AMC-631-4, “Coating Systems for Aluminum Surfaces”

3.14.2.2 Drawing HB-631 FF04, “Painting Schedule”

3.14.2.3 Drawing No. M282 085-FA02 “General Arrangements”

3.14.2.4 Drawing No. M282 801-FC05, “Tank Capacity Curves”

3.14.3 Government-Furnished Material

3.14.3.1 None

3.14.4 Requirements

3.14.4.1 All surface preparation and painting shall be done by a QP-1 certified contractor.

3.14.4.2 Accomplish up to 5 linear feet of aluminum weld repair in non-contiguous areas within the Roll Stabilization Tank (02-22-0).

3.14.4.3 Insert a 4-foot by 4-foot section of the bulkhead in the lower aft portion of the Roll Stabilization Tank, to include the dump valve.

3.14.4.3.1 The overhead aluminum of Staterooms 01-19-2 and 01-24-4 will have to be exposed in the area of the weld. Cover the mattresses with plastic sheeting prior to start of work and remove overhead panels and insulation as necessary. Replace all disturbed insulation upon completion of work. Reinstall the false overhead panels removed and clean the space to “as-found” conditions.

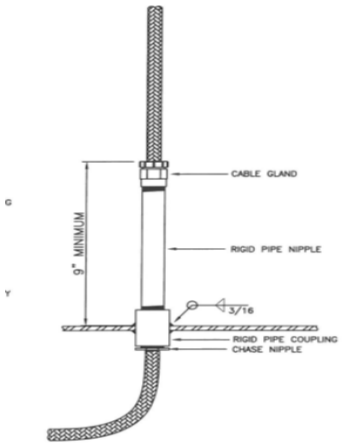
3.14.4.3.2 Expose the forward bulkhead in the Chief Engineer’s Stateroom (02-29-2) in the area of the weld. Note that there is an access cover to the forward bulkhead installed below the chief engineer’s desk. Cover the mattresses with plastic sheeting prior to start of work. Remove insulation as necessary and replace upon completion of work. Reinstall the access panel and clean the space to “as-found” conditions upon completion of work.

3.14.4.3.3 Paint the weather side insert and all disturbed surfaces to match the surrounding surfaces.

3.14.4.3.4 Bulkhead insert shall have structural support for the dump valve. Construct a foundation for the dump valve of 2x2x1/4-inch aluminum angle iron to properly support and distribute the weight of the dump valve to the bulkhead plate.

3.14.4.4 Crop off the sounding tubes for the two (QTY 2) Tank Level Indicators (TLIs) just below the tank overhead penetration; remove and scrap the existing TLIs.

3.14.4.5 Fabricate an aluminum TLI enclosure with a cable penetration for each new TLI and a bolted, gasketed cover for each of the two TLIs. Install a kick pipe in the top or side of the box for the TLI cable. See kick pipe drawing below (kick pipe may be shorter than shown). Weld the enclosures/boxes to the weatherdeck in way of the two TLIs such that the TLIs will be in watertight enclosures. Each TLI enclosure shall have a minimum of 6-inch clearance on each side of the TLI for proper preservation within the TLI enclosure. Each enclosure shall be fitted with one (QTY 1) 1-inch threaded drain plug located no higher than ½ inch above the deck. NDT welds and hose test the MCT as required by ABS surveyor.



3.14.4.6 Install the two (QTY 2) TLIs procured on the "TLI System Replacement" Work Item 322. Modify the deck penetrations to include installing stainless steel 2-inch flanges and a 2" x ¾" reducer as shown below to accommodate the new TLIs.

3.14.4.7 Spot blast all damaged or rusted areas on the interior of the Roll Stabilization tank to an SSPC SP17 standard. Sand sweep all remaining surfaces to an SSPC-7 standard to remove all contamination. For bidding purposes, estimate complete blasting to SSPC-17 to be 250 square feet. Submit a CFR if additional surfaces require blasting to bare metal.

3.14.4.8 After surface preparation and immediately prior to application of paint, accomplish chloride checks at a total of 5 different locations. Locations will be selected by the COR. Maximum chloride measurements shall not exceed 5 ug/cm2. If chloride measurements exceed this level, the areas shall be re-cleaned, then re-tested until the chloride measurement does not exceed 5 ug/cm2.

3.14.4.9 Apply the following system to the tank interior in accordance with Reference 3.14.1.2:

3.14.4.9.1 Full coat of Amercoat 385 (red) at 5 mils DFT;

3.14.4.9.2 Stripe coat of Amercoat 385 (off-white);

3.14.4.9.3 Full coat of Amercoat 385 (off-white) at 5 mis DFT.

3.14.4.10 Fill the Roll Stabilization Tank with fresh potable water to accomplish ABS Surveys and leave tank filled to the normal operating level (0.80 meters).

3.14.4.11 Inspect the FLUM system on the bridge and verify the FLUM system shows proper tank operating level. Provide a CFR with recommended repairs.

3.14.5 Quality Assurance:

3.14.5.1 Conduct joint inspection of the Roll Stabilization Tank with the Paint Company representative and COR after surface preparation has been completed.

3.14.5.2 Conduct joint temperature and humidity readings with Paint Company representative prior to each coat of paint applied.

3.14.5.3 Conduct joint inspection of Dry Film Thickness gaging with Paint Company representative after each coat of paint is applied.

3.14.5.4 Provide all additional documentation identified in Reference 3.14.2.1, section 4, "Quality Assurance.

3.14.6 Notes:

3.14.6.1 There is normally 0.8 meters (2.62 feet) of fresh water in the tank.

END OF ITEM

3.15 ITEM 315: MARINE SANITATION DEVICE (MSD) SYSTEM MAINTENANCE

3.15.1 Scope:

3.15.1.1 Complete inspection and repairs to the MSD.

3.15.2 References

3.15.2.1 Technical manual FRV40-226-059-010, “Marine Sanitation Device Unit (MSD) Model: MX-5”

3.15.2.2 Drawing M282-528-FP05, “Gray and Black Water System Diagram”

3.15.2.3 NOAA Standard Specification AMC-300-1, "Overhaul of Electrical Rotating Machinery”

3.15.3 Government-Furnished Material

3.15.3.1 None

3.15.4 Requirements

3.15.4.1 As specified in Work Item 3.1, provide temporary toilet facilities and hand washing stations for ships force (separate facilities for male and female) for the entire time the ship’s sanitary waste system is secured. Temporary toilet and hand washing facilities shall be thoroughly cleaned and sanitized at intervals of no more than 7 days.

3.15.4.2 Provide ship’s Chief Engineer with 48 hours’ notice prior to commencing work on the MSD system. Ship’s force will witness system pumpout and refilling evolutions.

3.15.4.3 Prior to tagging out the Vacuum Sewage System, procure the services of an authorized Rydlyme distributor and flush the Vacuum Sewage and CHT system piping with Rydlyme (or approved equivalent). Skid for flushing the piping systems may be located on the aft deck. Piping shall be thoroughly cleaned and sanitized.

3.15.4.4 Follow ship’s Lockout/Tagout procedures for the MSD and Vacuum System with ship’s force prior to working on MSD.

3.15.4.5 Secure the MSD system in accordance with the procedures in Reference 3.15.2.1, then accomplish the pumpout and refilling procedure for the media tank and wet well as described in section 8 of Reference 3.15.2.1 with the Chief Engineer. Drain media tank and wet well into the Waste Water Tank (4-29-0), located immediately below the MSD.

3.15.4.6 After air scouring operation is complete, remove the manhole cover from the top of the media tank. Carry out a visual inspection of the tank including operation of the level sensors.

3.15.4.7 Remove blower, inlet filter, vent, and other components from the top cover. Remove the top cover and stow away from the tank opening (top cover is approximately 6 feet by 6 feet). Install lifting eyes on the cover and overhead, as needed, for cover removal and reinstallation. Lifting eyes shall be painted and kept in place upon completion of work.

3.15.4.8 Remove and dispose of the existing media blocks.

3.15.4.9 Thoroughly clean the inside of the tank to include pumping out sludge in the bottom of the tank, cleaning air scouring tubes, air lifts, a complete washing of the inside of the tank and tank cover, and wet well, and disinfecting the tank and internal components to make the tank safe for entry and inspection.

3.15.4.10 Inspect the tank interior with the COR or his/her designated representative. Submit findings on a Condition Report. Any required repairs will be the subject of Additional Work. Any parts requiring replacement will be subject of Additional Work. See Note 3.15.6.4 for a source of parts for this equipment.

3.15.4.11 Power tool clean the interior of the MSD Unit and wet well to SSPC SP11.

3.15.4.12 Apply the following coating system (or equal) to all new and disturbed surfaces within the tank:

3.15.4.12.1 Full coat of PPG Amercoat 240 (buff), 6 mils DFT;
3.15.4.12.2 Stripe coat of PPG Amercoat 240 (oxide red);
3.15.4.12.3 Full coat of PPG Amercoat 240 (oxide red), 6 mils DFT.

3.15.4.13 After cleaning, inspection, repairs and painting are complete, install new polycarbonate sheet media under the direction of a Scienco/FAST technical representative. See Notes 3.15.6.4 and 3.15.6.5 for sources of parts and technical support.

3.15.4.14 Remove, overhaul, test, align, and reinstall each of the two sewage pumps to include new mechanical seals, o-rings, bearings, and impellers. Rewind both electrical motors in accordance with Reference 3.15.2.3. Submit a CFR documenting all completed repairs and test reports.

3.15.4.15 Replace the non-return check valve for each ejector and demonstrate operation to COR. Check valves are welded 4-inch valves. For bidding purposes, estimate the check valves to be $500 each. Valves must be identified locally. Submit a CFR if valve costs exceed estimated costs.

3.15.4.16 Crop out and remove the 4-inch collection manifold piping (see Reference 3.15.2.2) to include all piping from the Eductor to and including the collection manifold isolation ball valves (528-VL-06, 528-VL-07, 528-VL-08, 528-VL-9, 528-VL-10, and 528-VL-11). Replace all ball valves with new valves. Replace the Collection Manifold pipe. Flexible joints may be reused. For bidding purposes, estimate replacing ten (QTY 10) feet of 4-inch schedule 40 steel pipe, five (QTY 5) 4"x4"x2" schedule 40 Tee fittings, five (QTY 5) feet of 2-inch schedule 40 steel pipe, and the six (QTY 6) listed isolation 150 lb welded ball valves. Submit a CFR for additional pipe work.

3.15.4.17 Replace the 4-inch flexible stainless steel sheathed braided vibration isolation hoses on the outboard ejector pump suction and discharge (2 hoses on each pump).

3.15.4.18 Reinstall all removed components and covers using new gaskets and fasteners. FAST Model MX-5 technical representative shall be onsite to validate final assembly and witness/direct restarting the MSD and ensuring normal operation in accordance with Reference 3.15.2.1.

3.15.4.19 Repair all damaged painted surfaces and insulation to match surrounding surfaces.

3.15.5 Quality Assurance

3.15.5.1 In accordance with Reference 3.15.1.1.

3.15.6 Notes

3.15.6.1 The Waste Water Tank (4-29-0) will have been pumped down to low suction by ships force prior to commencement of work on the MSD.

3.15.6.2 The Waste Water Tank will be blasted and painted under Work Item 316. Portions of the aft bulkhead of the Waste Water Tank will also be renewed under Work Item 316. The work in the Waste Water Tank may not be started until the MSD Unit is opened for preservation.

3.15.6.3 All surface preparation and painting shall be accomplished by a QP1-certified painting contractor.

3.15.6.4 One known source for FAST MSD parts:
Green Marine & Industrial Equipment Co., Inc.
1111 Central Ave.
Metairie, LA 70001
Tel: (504) 833-7386

3.15.6.5 Technical support for FAST MSD system

Alan Fleischer
Scienco/FAST Division of Bio-Microbics, Inc.
12977 Maurer Industrial Dr.
Sunset Hills, MO 63127
Tel: (314) 756-9300

END OF ITEM

3.16 ITEM 316: WASTE WATER TANK (4-29-0) PRESERVATION

3.16.1 Scope:

3.16.1.1 Blast and paint the Waste Water Tank.

3.16.2 References:

3.16.2.1 NOAA Standard Specification MOC-631-2D, "Coating Systems for Steel Surfaces"

3.16.2.2 Drawing M282 085 FA02 General Arrangements

3.16.2.3 Drawing SH-110-FH03 Hull Midbody Scantlings FR 19 – 49

3.16.2.4 Drawing M282 801 FC05 Tank Capacity Curves

3.16.2.5 Drawing M282 631 FF04 Paint Schedule

3.16.3 Government Furnished Material

3.16.3.1 None.

3.16.4 Requirements

3.16.4.1 All surface preparation and painting shall be accomplished by a QP-1 certified painting contractor.

3.16.4.2 After completion of the pump out procedures for the MSD and the MSD has been opened for inspection per the work of Item 3.15 "Marine Sanitization Device (MSD) System Maintenance, Contractor shall blast the interior of the tank to near-white metal in accordance with NACE 2/SSPC-SP10. Use caution to prevent sandblast material from entering ship. Such protective measures shall include double hose integrity (wherein the sandblast hose is routed inside a second hose such that a rupture of the sandblast hose will be contained within the outer hose) and dust collectors creating negative air flow in the tank with ducting run to the exterior of the ship.

3.16.4.3 Use dehumidification (DH) equipment and maintain temperature and humidity within the tanks to the paint manufacturer's specifications throughout the entire surface preparation and painting process.

3.16.4.4 After surface preparation and immediately prior to application of paint, accomplish chloride checks at a total of 5 different locations. Locations will be selected by the COR. Maximum chloride measurements shall not exceed 5 ug/cm2. If chloride

measurements exceed this level, the areas shall be re-cleaned, then re-tested until the chloride measurement does not exceed 5 ug/cm2.

3.16.4.5 Apply the following coating system (or equal) to all new and disturbed surfaces within the tank:

3.16.4.5.1 Full coat of PPG Amercoat 240 (buff), 6 mils DFT;

3.16.4.5.2 Stripe coat of PPG Amercoat 240 (oxide red);

3.16.4.5.3 Full coat of PPG Amercoat 240 (oxide red), 6 mils DFT.

3.16.4.6 Inspect the Waste Water Tank with COR and close the tank with a new gasket.

3.16.4.7 Following closure of the tank, conduct the 2 psi air test for 10 minutes with a manometer installed to protect the tank from over-pressurization.

3.16.5 Quality Assurance

3.16.5.1 As required by Reference 3.16.2.1.

3.16.6 Notes

3.16.6.1 The aft bulkhead of the Waste Water Tank is common with the No. 3 Center Ballast Tank. Portions of that bulkhead will be renewed under Item 318.

END OF ITEM

3.17 ITEM 317: BALLAST TANK REPAIRS & MODIFICATIONS

3.17.1. Scope

3.17.1.1. Complete repairs within the identified Ballast Tanks.

3.17.2. References

3.17.2.1. Drawing No. SH-100-FH02, “Hull Forebody Scantlings Frame 0-18”

3.17.2.2. Drawing No. SH-110-FH03, “Hull Midbody Scantlings Frame 19-49”

3.17.2.3. Drawing No. SH-100-FH04, “Hull Sternbody Scantlings Frame 49-82”

3.17.2.4. Drawing M282-529-FP01 “Bilge & Ballast System Diagram”

3.17.2.5. Drawing M284-256-PZ57 “Damage Control Diagram Bilge, Ballast, and SW Systems”

3.17.3. Government-Furnished Material (GFM)

3.17.3.1. 6-inch bronze gate valve (estimated value: $6,500)

3.17.4. Requirements

3.17.4.1. Provide and install new type ZHC-23 zinc anodes conforming to MIL-A-18001K in the ship’s ballast tanks as follows (total of 50 zinc anodes):

3.17.4.1.1. Forepeak Ballast Tank (4-1-0) 10 zincs

3.17.4.1.2. #3 Port Ballast Tank (4-29-2) 8 zincs

3.17.4.1.3. #3 Stbd Ballast Tank (4-29-1) 8 zincs

3.17.4.1.4. #3 Center Ballast Tank (4-34-0) 8 zincs

3.17.4.1.5. #4 Center Ballast Tank (4-39-01) 16 zincs

3.17.4.2. The new finished zinc plates shall weigh twenty three (23) pounds each. Provide certification to the COR that the new zinc anodes are in conformance with MIL-A-18001K. Type ZHC-23 zincs are the bolt-on type, requiring 2 studs per zinc anode to be welded (or stud-gunned) to frames in the ballast tanks. COR will designate exact locations.

3.17.4.3. The underside of the zinc shall not contact the steel frame on which it is bolted.

3.17.4.4. Prepare and paint the new zinc attachment points and all other disturbed paint within the tanks in accordance with the Paint Schedule. No paint or other permanent coatings are to be applied to the exposed zinc surfaces, which shall be clean bare metal.

3.17.4.5. Insert the old TLI penetration on the #3 Port (3-29-2) Ballast Tank located on the aft bulkhead at Frame 38. Paint all new and disturbed surfaces in accordance with the Paint Schedule. Note that this insert is with 12-inches of the aft bulkhead to the MMR lower level.

3.17.4.6. Inspect the deformed overhead stiffeners in the #3 Port (4-29-2) with ABS Surveyor tank and provide a CFR.

3.17.4.7. Replace the crossover valve (529-VL-61) in the #3 Center Ballast Tank (4-34-0) with the GFM furnished bronze valve. Install using new stainless steel hardware and new gaskets. Modify the Teleflex cable attachments to mate the remote actuation cable with the valve.

3.17.4.7.1. Renew approximately 5 feet of Schedule 80 6-inch pipe (and flange) on the port side of valve 529-VL-61 and 10 feet (and flange) on the starboard side of the valve in the #3 Center Ballast Tank.

3.17.4.7.2. NDT welds as required by ABS surveyor. Demonstrate operation of the valve and reach rod to the ABS surveyor

3.17.4.8. Replace the 3-inch gate isolation valve (529-VL-50) in the Forepeak Ballast Tank (4-1-0) with a new Contractor furnished bronze valve. Install using new stainless steel hardware and new gaskets. Modify the Teleflex cable attachments to mate the remote actuation cable with the valve. Test valve remote actuation in presence of COR. Touch up all disturbed painting.

3.17.4.9. Replace the Teleflex cable to isolation valves in the Forepeak and #3C Ballast Tanks. Replace all rubber chaffing protection at each hanger with new. Paint all disturbed surfaces. Approximate length of cable runs are as follows:

- Forepeak Ballast Tank Cable: 30 feet
- #3 Center Ballast Tank Cable: 10 feet

One possible source for the replacement cables is provided below:
http://www.bfgmarine.com/products/flexible_reach_rod_assemblies.html

3.17.4.10. Paint all new and disturbed surfaces.

3.17.5. Quality Assurance

3.17.5.1. Inspect operation of new valves with ABS.

3.17.5.2. Inspect all work areas for disturbed paint.

3.17.6. Notes

3.17.6.1. None

END OF ITEM

3.18 ITEM 318: BALLAST TANK #3 CENTER (4-34-0) REPAIRS

3.18.1. Scope

3.18.1.1. Complete repairs to Ballast Tank #3 Center (4-34-0).

3.18.2. References

3.18.2.1. NOAA Standard Specification MOC-100-1A, "ABS Load Line Survey"

3.18.2.2. NOAA Standard Specification MOC-631-2D, "Coating Systems for Steel Surfaces"

3.18.2.3. Drawing M282 085 FA02 General Arrangements

3.18.2.4. Drawing SH-110-FH03 Hull Midbody Scantlings FR 19 – 49

3.18.2.5. Drawing M282 801 FC05 Tank Capacity Curves

3.18.2.6. Drawing M282 631 FF04 Paint Schedule

3.18.2.7. Drawing M283-191-FZ16 "Permanent Ballast Installation"

3.18.3. Government-Furnished Material (GFM)

3.18.3.1. None

3.18.4. Requirements

3.18.4.1. Background: The purpose of this item is to repair areas of severe pitting that were found and temporarily repaired during the ship's FY21 Dockside Repairs.

3.18.4.2. There are 192 lead pigs weighing 60 pounds each installed in the center of the tank as permanent ballast. Remove the lead pigs from the tank; reinstall them as original upon the completion of all other tank work. After lead ballast reinstallation, thoroughly paint all disturbed surfaces and inspect with COR.

3.18.4.3. With approval from the ABS surveyor, crop out and renew the bottom of the tank (to include hull plating and transverse frames extending from approximately 6 inches aft of Frame 34 to approximately 6 inches forward of Frame 39 and extending approximately 6 feet port and stbd of Centerline. See Reference 3.18.2.4 for plate sizes. Note: each of the 4 transverse frames has a steel ½" x 10" x 6' doubler plate welded on both sides of Centerline as part of the temporary repairs.

3.18.4.4. Renew approximately 20 square feet in non-contiguous areas of the forward bulkhead of the tank. The Waste Water Tank (4-29-0) is on the other side of this bulkhead. This tank will be opened and gas-freed and made safe for hot work as part of Work Item 316.

3.18.4.5. Fabricate and install a new docking plug, same as existing in other ballast tanks, between frames 38 and 39, one foot to starboard from centerline.

3.18.4.6. Weld new 20.4# fore/aft oriented plates between each of the frames port/stbd to retain the lead pigs, same as existing. After pigs are reinstalled, fabricate bolt-on straps (2 per bay) to hold the pigs in place vertically.

3.18.4.7. Spot blast to SSPC-SP10 all new or rusted areas within the tank and sand sweep to SSPC-SP 7 all remaining interior surfaces of the tank to remove all contamination. Use caution to prevent sandblast material from entering ship. Such protective measures shall include double hose integrity (wherein the sandblast hose is routed inside a second hose such that a rupture of the sandblast hose will be contained within the outer hose) and dust collectors creating negative air flow in the tank with ducting run to the exterior of the ship. All surface preparation and painting shall be accomplished by a QP-1 certified painting contractor. For bidding purposes, estimate complete blasting to SSPC-10 to be 250 square feet. Submit a CFR if additional surfaces require blasting to bare metal.

3.18.4.8. Use dehumidification (DH) equipment and maintain temperature and humidity within the tanks to the paint manufacturer's specifications throughout the entire surface preparation and painting process.

3.18.4.9. Apply the following coating system (or equal) to all prepared surfaces within the tank:

3.18.4.9.1. Full coat of Amercoat 385 (red), 5 mils DFT;

3.18.4.9.2. Stripe coat of Amercoat 385 (off-white);

3.18.4.9.3. Full coat of Amercoat 385 (off-white), 5 mils DFT.

3.18.4.10. Install zincs anodes of Work Item 317 and lead pigs after all surface preparation and painting is complete.

3.18.4.11. Following closure of the tank, conduct the 2 psi air test per para.3.4.8 of Reference 3.18.2.1 with a manometer installed to protect the tank from over-pressurization.

3.18.5. Quality Assurance

3.18.5.1. Complete fit-up and final NDT inspections with ABS Surveyor.

3.18.6. Notes

3.18.6.1. This item shall be completed prior to or in conjunction with the Underwater Hull Preservation item.

3.18.6.2. Keel Block #13 will have been removed and additional supporting block(s) installed prior to beginning this work.

END OF ITEM

3.19 ITEM 319: POTABLE WATER SYSTEM MODIFICATIONS AND TANK PRESERVATION

3.19.1. Scope

3.19.1.1. Complete repairs to Potable Water System and preserve the Potable Water Tanks (3-19-1 and 3-19-2).

3.19.2. References

3.19.2.1. NOAA Standard Specification MOC-631-2D, "Coating Systems for Steel Surfaces"

3.19.2.2. NOAA Standard Specification AMC-533-1, "Potable Water Tank Disinfection."

3.19.2.3. Drawing FC05-001-01, "Tank Capacity Curves."

3.19.2.4. Drawing M282 631 FF04 Paint Schedule

3.19.3. Government-Furnished Material (GFM)

3.19.3.1. None

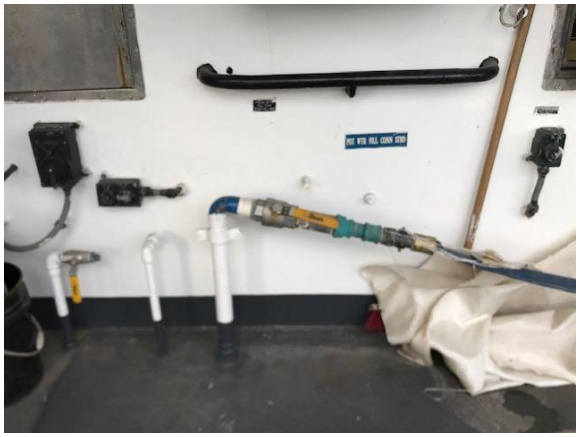
3.19.4. Requirements

3.19.4.1. All surface preparation and painting work required by this specification shall be done in accordance with Reference 3.19.2.1 and shall be performed by a QP-1 certified paint contractor.

3.19.4.2. Potable Water System Valves: Replace two (QTY 2) 1-1/2" welded globe stop-check valves in the potable water system. Replacement valves may be welded or flanged using potable water system approved gasket materials. Valves are located in the Domestic Equipment/MSD Room (3-29-0). Coordinate work with Ship's Force to secure water prior to work.

3.19.4.3. Potable Water Recirculation System: Install two (QTY 2) new 1" gate valves as marked on the piping below. Location is 3-29-0 on the aft side of the space. Welded valves are acceptable. Paint all new and disturbed surfaces.

3.19.4.4. Potable Water System Shore Connection STBD Side Station: Replace the failed elbow on the shore connection and install a new hanger to support the shore connection. Paint all new and disturbed surfaces.



Potable Water Tank Preservation

3.19.4.5. Drain the water from the two potable water tanks (3-19-1 and 3-19-2), located above the Transducer Room, between Frames 19-27 port/stbd. See Note 3.19.6.1. Open and certify the tanks safe for entry. Access manholes are located at the aft end of each tank at Frame 27.

3.19.4.6. Use dehumidification (DH) equipment and maintain temperature and humidity within the tanks to the paint manufacturer's specifications throughout the entire surface preparation and painting process.

3.19.4.7. Spot blast to SSPC-SP10 all damaged or rusted areas within the two potable water tanks and sand sweep to SSPC-SP 7 all remaining surfaces within the tanks to remove all contamination. Use caution to prevent sandblast material from entering ship. Such protective measures shall include double hose integrity (wherein the sandblast hose is routed inside a second hose such that a rupture of the sandblast hose will be contained within the outer hose) and dust collectors creating negative air flow in the tank with ducting run to the exterior of the ship. For bidding purposes, estimate complete blasting to SSPC-10 to be 250 square feet. Submit a CFR if additional surfaces require blasting to bare metal.

3.19.4.8. Tank Surface preparation shall include cleaning the tank man-hole foundations to SSPC-11 and blasting man-hole covers to SSPC-10.

3.19.4.9. Rod out the entire length of vent piping from each tank.

3.19.4.10. Clean the tanks of all traces of blast products and dust.

3.19.4.11. Perform surface chloride checks in 8 locations in each tank, actual locations to be selected by COR. Maximum chloride measurements shall not exceed 3 ug/cm2. If chloride measurements exceed this level, repeat surface cleaning and testing until that level is achieved. Results of chloride tests shall be included in documentation submitted with the paint plan.

3.19.4.12. Coat the tanks (including man-hole covers and foundations) with the following system (or equal) in accordance with Reference 3.19.2.1:

3.19.4.12.1. Full coat of Amerlock 400 (grey), 5 mils DFT.

3.19.4.12.2. Stripe coat of, Amerlock 400 (off-white).

3.19.4.12.3. Full coat of Amerlock 400 (off-white), 5 mils DFT.

3.19.4.13. Allow 7 days minimum with forced air circulation after complete system is applied prior to flushing and filling tanks.

3.19.4.14. Following the manufacturer's recommended cure time, close up the tanks using new rubber gaskets for manholes, same thickness as existing. Conduct a 2 psi air test (with a manometer) of each tank to ensure air tight seal of manhole covers.

3.19.4.15. Disinfect the tanks in accordance with Reference 3.19.2.2 and the following (from U.S. Public Health Service Vessel Sanitation Program (VSP) 2018 Construction Guidelines):

3.19.4.16. Provide written documentation showing that representative sampling was conducted at plumbing fixtures on each deck throughout the vessel (forward, aft, port, and starboard) to ensure the 100-MG/L (ppm) free chlorine residual circulated throughout the distribution system including distant sampling point(s).

3.19.5. Quality Assurance

3.19.5.1. In accordance with the requirements of References 3.19.2.1, 3.19.2.2, and 3.19.2.4.

3.19.6. Notes

3.19.6.1. The following information is taken from Reference 3.19.2.3 and applies to each tank:

- Tank 100% Capacity (above Petcock #12) = 17,505 liters
- At lowest point of suction, the remaining volume is 661 liters
- Lowest Point of the tank @ 4.015 meters Above Base Line
- Petcock #1 is @ 4.16 meters Above Base Line
- Petcocks are spaced at .015 meter height intervals

3.19.6.2. Each potable water tank has a 1-1/2 inch drain with a ball valve in the bottom (overhead of the Transducer Room).

END OF ITEM

3.20 ITEM 320: BOW THRUSTER MAINTENANCE

3.20.1. Scope:

3.20.1.1. Provide all labor, materials, and equipment to overhaul the Bow Thruster.

3.20.2. References

3.20.2.1. Tech Manual HB-568 (FRV40-225-008-010), “Bow Thruster Model: 40 T3S”

3.20.2.2. NOAA Standard Specification AMC-300-1, "Overhaul of Electrical Rotating Machinery”

3.20.2.3. Bow Thruster Overhaul Parts Ship Set for NOAA Ship PISCES Enquiry No. 23196

3.20.3. Government-Furnished Material (GFM)

3.20.3.1. None

3.20.4. Requirements

3.20.4.1. ***Order all replacement parts and tooling listed on Reference 3.20.2.3 within seven (QTY 7) days of Contract award. Reference 3.20.2.3 is a complete overhaul kit for the Bow Thruster Assembly. Replacement Bow Thruster parts must be furnished by the OEM (Tees White Gill) to ensure proper thruster operation after overhaul.***

3.20.4.2. In conjunction with Ship’s Force, follow ship’s Lockout and Tagout Procedures to secure/de-energize the bow thruster motor.

Bow Thruster Motor Inspection and Cleaning:

3.20.4.3. Inspect and clean the bow thruster motor and provide a condition report. Procure the services of an experienced motor overhaul and repair shop, certified for GE 5JEB20 motors to perform the following work.

3.20.4.3.1. Inspect:

a) Coupling for cracks, broken segments, wear, and misalignment.

b) Motor foundations, bolts, chocks, shims, shock mounts, and other accessories associated with the machine for tightness, cracks,

corrosion, distortion, and excessive deterioration.

c) Perform a polarization index test on the bow thruster motor winding with a 500 V megger. Caution! All motor field connections shall be removed and isolated from the motor drive during test to prevent damage to drive. Record reading and submit to COR.

3.20.4.3.2. Cleaning:

a) Do not use liquid solvents of any kind. Solvents will not remove carbon dust accumulations but will spread them and wash them into critical areas.

b) Initial cleaning is to be conducted using a vacuum cleaner and if required, a soft fiber or bristle brush.
Note: Under no circumstances is a metallic wire bristle brush to be used.

c) Use clean dry compressed air (maximum air pressure is 30 PSI) and a vacuum to blow contaminants from top end of the motor to the lower end for collection. The direction of the air shall be controlled to prevent re-depositing the contaminants in an even more inaccessible part of the motor.

d) Use vacuum cleaner for the removal of loose dust and debris dislodged from blowing with compressed air.

e) Wipe down all accessible area with lint-free cloths.

Bow Thruster Overhaul

3.20.4.4. Remove the port and starboard bow thruster intake gratings on the hull to facilitate inspection. Provide staging to allow inspection.

3.20.4.5. Provide the services of an authorized Tees White Gill Thrusters technical representative. The technical representative shall be on site for disassembly, inspection, reassembly, and calibration of the bow thruster. Disassembly and inspection of the bow thruster is to be completed within the first 25% of the contract performance period. Notify the COR if the Tees White Gill OEM representative is unavailable due to COVID travel restrictions. See Note 3.20.6.1. Source for Tees White Gill Thrusters OEM technical representative is below:

Tees White Gill Thrusters

North Skelton, Saltburn-by-the-Sea
Cleveland, TS12 2AP
United Kingdom
POC: Adam Robson
Phone: +44 (0)1287650621
Email: Adam.robson@teescomponents.co.uk

Note: The OEM will be required to complete two trips for onsite work: one for the thruster overhaul and the second for the Bow Thruster Operational Inspections and Testing.

3.20.4.6. Accomplish the following inspections and checks prior to disassembly of the bow thruster and provide in the inspection report:

3.20.4.6.1. Check the steering gear instrumentation transmitter drive for wear, backlash, or sheared pins.

3.20.4.6.2. Measure and record the rotor tip/liner radial clearance.

3.20.4.6.3. Measure and record the rotor/guide vane hub clearance.

3.20.4.6.4. Measure and record the discharge deflector/guide vane shell chamfer clearance.

3.20.4.6.5. Measure and record the steering pinion to deflector gear wheel tooth clearance.

3.20.4.7. Remove and dispose of the oil from the upper bearing oil system housing and reservoir.

3.20.4.8. Remove from ship to shop and completely disassemble the following components in accordance with Reference 3.20.2.1:

3.20.4.8.1. The rotating thrust deflector assembly from the bottom of the thruster.

3.20.4.8.2. The static guide vane assembly.

3.20.4.8.3. The floating shaft assembly between the electric motor drive and the bow thruster shaft. The floating shaft has two each external tooth couplings.

3.20.4.8.4. The radial/thrust bearing housing.

3.20.4.8.5. The Packing gland assembly.

3.20.4.8.6. The rotor shaft assembly and perform the following work:

a) Remove the fiberglass sheathing and renew. Conduct spark testing of the new sheathing in the presence of ABS and the COR.

b) Upon reassembly of the rotor shaft, statically balance the rotor shaft in accordance with the tech rep's recommendation in the presence of the COR and ABS.

c) Inspect and polish the shaft in way of the gland sleeve sealing area.

d) Apply two coats of marine epoxy on the rotor shaft in the area directly above the gland sleeve.

Note that in order to rig the rotor shaft through the bottom of the vessel, the contractor will need to disconnect the bow thruster DC motor and associated ducting and piping and raise the motor. This will provide access for rigging of the shaft. Upon completion of bow thruster work, contractor is to realign motor to the shaft, install new chock fast, and restore all ducting, piping, and interferences.

3.20.4.8.7. The steering shaft assembly and perform the following work:

a) Remove the fiberglass sheathing and renew. Conduct spark testing of the new sheathing in the presence of ABS and the COR.

b) Overhaul and test the steering gear box assembly. Gearbox overhaul includes inspection of all gears and teeth, replacement of all bearings, seals, and consumables.

c) Remove and overhaul the bow thruster steering gear motor and the attached bow thruster steering gear blower motor and blower. Overhaul the steering gear motor and steering gear blower motor in accordance with Reference 3.20.2.2. Replace all bearings and consumables. Preserve and paint the motors. Overhaul, preserve, and paint the blower assembly including replacement of all bearings.

d) Procure one (QTY 1) spare Bow Thruster Steering Gear Motor. Steering Gear Motor technical details are provided below:
Make: Bauer
Model: GBv1052093/001
Type: BK60-32HM/011MG4-TF-FV-5
480 Volts

e) Reinstall the steering gear motor, steering gear motor blower and blower motor, and the gearbox upon completion of work.

3.20.4.9. Inspect all components removed in Paragraph 3.20.4.8 and submit an as found condition report with recommendations to restore to as-new conditions. Provide the local ABS surveyor and the COR the opportunity to inspect all disassembled components.

3.20.4.10. Prepare and preserve the bow thruster hull cavity and components by accomplishing the following:

3.20.4.10.1. Prepare the entire bow thruster sea chest area inside the gratings and thrust deflector, the removed gratings, the thrust deflector, the static guide vanes, and the bow thruster internals to 100% bare steel with 3 to 5 mil surface profile (SSPC-SP6 or equal).

3.20.4.10.2. Prior to surface preparation, install a gasketed plate in way of the removed rotor shaft at the packing gland. The inside surfaces of the packing gland are to be prepared and coated as well.

3.20.4.10.3. Apply the same coating system that is being applied to the underwater hull in Work Item 310 “Underwater Hull Coating”.

3.20.4.10.4. Remove all corrosion within the bow thruster pedestal foundation, including the steering shaft pedestal foundation and preserve in accordance with the Paint Schedule. Surface preparation within the pedestal housing shall be to SSPC-11.

3.20.4.10.5. Complete surface preparation within the bilge box in the Bow Thruster Room to SSPC-11. Take ten (QTY 10) UT readings of the steel in the bilge box and submit a CFR to the COR. Paint the bilge box in accordance with Paint Schedule.

3.20.4.11. Upon completion of bow thruster sea chest preservation, assemble and install the bow thrust components using the new OEM procured components of Paragraph 3.20.4.1 in accordance with Reference 3.20.2.1 and as follows:

3.20.4.11.1. The contractor is to provide all sealing compounds as necessary and recommended by the technical representative.

3.20.4.11.2. Lubricate and grease all components and bearings as recommended by the technical representative and outlined in the tech manual. Install oil in the upper rotor shaft bearing housing and reservoir as recommended by tech rep. Install oil in the steering gear assembly.

3.20.4.11.3. Provide an Environmentally Acceptable Lubricant (EAL) per the Environmental Protection Agency's (EPA) Vessel General Permit (VGP), water resistant grease with a NLGI of 2. One possible type of acceptable EAL grease is RCS Evirologic ® Grease 2 WREP.

3.20.4.11.4. Clean the floating shaft couplings of all grease. Inspect coupling gear teeth and the coupling hub gear teeth. Submit as found condition report. Lightly grease coupling interiors, reassemble with new flange gaskets. Remove lube plugs and fill with EAL water resistant grease with a NLGI rating of 2. Approximately 1.5 quarts required for each coupling.

3.20.4.11.5. The contractor shall tack weld fasteners on sealing plates/torque plates/retaining plates and install lock wire on fasteners as directed by the technical representative.

3.20.4.12. Inspect Bow Thruster assembly using "Check List Three" of Reference 3.20.2.1 (starting Page 50 of 559). Provide a printed copy of completed "Check List Three" in a Condition Report.

3.20.4.13. After completion of assembling all the bow thruster components, accomplish calibration and alignment checks to ensure the steering transmitter unit and the proximity switch are operating properly.

3.20.4.7. Operate Bow Thruster during Dock and Sea Trials:

Dock Trials:

3.20.4.7.1. Verify operation and calibration of the proximity sensor. Verify calibration of the potentiometers.

3.20.4.7.2. Place thruster steering in continuous CW rotation for 15 minutes. Take steering motor and gear box temperature with IR thermometer every 5 minutes.

3.20.4.7.3. Place thruster steering in continuous CCW rotation for 15 minutes. Take steering motor and gear box temperature with IR thermometer every 5 minutes.

3.20.4.7.4. With thruster directed toward dock, gradually raise thrust to 50% and hold for 15 minutes. Record motor winding, motor bearing, thruster bearing, and packing gland temperatures every 5 minutes. Note – Check adequacy of fendering system and mooring lines and secure the gangway until ship's response to bow thruster is known.

Sea Trials:

3.20.4.7.5. From a dead in the water and heading into the wind, operate the bow thruster at full thrust for the time it takes to change the ship's heading 90 degrees to the left of the original heading.

3.20.4.7.6. From a dead in the water and heading into the wind, operate the bow thruster at full thrust for the time it takes to change the ship's heading 90 degrees to the right of the original heading.

3.20.4.7.7. From a dead in the water heading and into the wind, operate the thruster in the ahead direction for 30 minutes. Record motor winding, motor bearing, thruster bearing, and packing gland temperatures every 5 minutes.

3.20.4.8. OEM shall provide a service report. Contractor shall submit OEM service report to COR in a condition report.

3.20.5. Quality Assurance

3.20.5.1. Provide Condition Reports detailing Dimensional Checks of the Technical Manual Reference 3.20.2.1 "Check List Two" and "Check List Three".

3.20.5.2. OEM Service Report

3.20.5.3. Once the ship is floated and out of the dry dock, the OEM technical representative is to return to the ship to accomplish final calibration and operational testing of the bow thruster unit in accordance with Section A5 of Reference 3.20.2.1.

3.20.6. Notes

3.20.6.1. As of this version of the specification, due to COVID travel restrictions, there are currently four presidential proclamations that suspend entry into the United States of all non-citizens who were physically present in any of 33 countries (including the United Kingdom) during the 14 day period proceeding their entry or attempted entry into the United States.

3.20.6.2. Bow Thruster Technical Details:

Manufacturer: Tees White Gill
Thruster: G679T 40T3S

END OF ITEM

3.21 ITEM 321: ANNUAL FIRE INSPECTION

3.21.1. Scope:

3.21.1.1. Conduct an annual inspection of ship's fixed and portable fire-fighting equipment.

3.21.2. References

3.21.2.1. Drawing FA05-001-07 "Fire Control Plan"

3.21.2.2. NFPA 1962 " Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances"

3.21.2.3. IMO MSC/Circ.1114 "Guidelines for Periodic Testing of Immersion Suit and Anti-Exposure Suit Seams and Closures"

3.21.2.4. Drawing M283-555-FP15 "CO2 Fire Suppression Systems"

3.21.2.5. Drawing M282-330-FE22 "Fire Alarm System BOM, Legend, and Notes"

3.21.2.6. Drawing M282-300-FE01 "Power One Line"

3.21.3. Government Furnished Material

3.21.3.1. None

3.21.4. Requirements

3.21.4.1. Perform the annual fire inspection to include:

3.21.4.1.1. Inspection of all fixed CO2 extinguishing systems.

3.21.4.1.2. Inspect and certify all 21 CO2 cylinders on the ship (19 cylinders in the CO2 Room and 2 cylinders in Engine Room lower level).

3.21.4.1.3. Inspection of all (90) portable fire extinguishers. See Paragraph 3.4.4.1.11.

3.21.4.1.4. Inspection and test of the fire alarm system.

3.21.4.1.5. Inspection and test of all (36) fire alarm heat sensors.

3.21.4.1.6. Inspect and Hydrostatic testing of 17 SCBA cylinders.

3.21.4.1.7. Flow testing of 8 SCBA respirators.

3.21.4.1.8. Calibration of 1 H2S Gas Detection Control Panel. Two H2S gas sensors are manufactured by Crowcon.

3.21.4.1.9. Inspection and test of the Galley Gaylord Hood including replacement of fusible links.

3.21.4.1.10. Complete an inspection and operational test of each roller door in the Galley and Scullery.

3.21.4.1.11. Recharge portable fire extinguishers that are found to be under charged. For estimating purposes, estimate 20 dry chemical extinguishers require recharging and 20 CO2 extinguishers require recharging. Estimate 2 dry chemical and 2 CO2 extinguishers require replacement (15 lb cylinders).

3.21.4.1.12. Hydrostatic testing of all portable fire extinguishers requiring recertification. For bidding purposes, estimate 20 fire extinguishers require hydrostatic testing.

3.21.4.2. Provide a report to the COR documenting all items inspected and tested, the SCBA Test Certificates, and a completed inspection list of all SCBA cylinders. Label all SCBA Cylinders with inspection and hydrostatic testing.

3.21.4.3. Hydrostatic test and stamp all fire hoses on board the ship in accordance with Reference 3.21.2.2. For bidding purposes, estimate testing fifty (QTY 50) 1-3/4" fire hoses (50 foot length each). Stamping shall be accomplished on the hose jacketing.

3.21.4.4. Complete the annual inspection of all 75 survival suits on board the ship in accordance with Reference 3.21.2.3 and provide an inspection report to COR.

3.21.5. Quality Assurance

3.21.5.1. Conduct a sample inspection with the COR to ensure all retested cylinders have been stamped with the hydrostatic test date, fire extinguishers are tagged with the proper inspection data, and CO2 System is properly tagged.

3.21.5.2. Provide service report from Ansul representative upon reinstallation of CO2 system, to include results of all testing and inspections accomplished.

3.21.6. Notes

3.21.6.1. None

END OF ITEM

3.22 ITEM 322 ANNUAL LIFE RAFT INSPECTION

3.22.1. Scope

3.22.1.1. Complete regulatory inspection and certification of life rafts and FRB Life Vests.

3.22.2. References

3.22.2.1. NOAA Standard Specification AMC-583-1B, General Requirements for Life Raft Inspections

3.22.3. Government Furnished Equipment

3.22.3.1. None

3.22.4. Requirements:

3.22.4.1. Remove six (6) Elliot 25 person SOLAS style MK 3 life rafts and three Viking FRB life vests (Product No. PV9274) from the ship to shop for annual inspections and certification.

3.22.4.2. Inspect and service life rafts in accordance with Reference 3.22.2.1 using an ABS approved service provider. The inspection shall include the following:

3.22.4.2.1. Accomplish floor seam test and raft pressure tests as required by 46 CFR 160.151-57.

3.22.4.2.2. Replacing all consumables and pyrotechnic signaling devices (including aerial flares and hand held signals) that will expire within 12 months of the date of inspection. For bidding purposes, Contractor shall assume all consumables required for one (QTY 1) life raft shall be required to be replaced in its entirety

3.22.4.3. Affix a weatherproof label that reads as, “Radar Reflector Not Included” on life rafts that do not have radar reflectors.

3.22.4.4. Provide a condition report to identify deficiencies any additional discrepancies.

3.22.4.5. Replace the Hydrostatic releases for each life raft (QTY 6 total).

3.22.4.6. Perform annual inspection and certification of the 3 (QTY 3) Viking FRB life vests.

3.22.4.7. Reinstall recertified life rafts and life vests a minimum of seven (QTY 7) days before sea trials and provide certificates of annual inspection for all lifesaving equipment inspected.

3.22.5. Quality Assurance

3.22.5.1. In accordance with Reference 3.22.2.1

3.22.6. Notes

3.22.6.1. None

END OF ITEM

3.23 ITEM 323: RESCUE BOAT DAVIT ANNUAL INSPECTION

3.23.1. Scope

3.23.1.1. Complete the annual inspection of the Fast Rescue Boat Davit.

3.23.2. References

3.23.2.1. Technical Manual FRV40-226-093-010 “Rescue Boat Handling System, Rev 1”

3.23.2.2. Technical Manual FRV40-226-027-010 “Encapsulated Liferafts and Davits Model: Davit SRR 360/3,65/21 Winch: 08-02 HVStop”

3.23.2.3. NOAA Procedure 0606-01, “Shipboard Lifting Appliance Certification and Inspections”

3.23.3. Government Furnished Equipment

3.23.3.1. None

3.23.4. Requirements:

3.23.4.1. Coordinate removal of the Fast Rescue Boat with Ship’s Force.

3.23.4.2. Arrange for an annual inspection of the rescue boat davit on NOAA Ship PISCES. The OEM Inspection shall be carried out by a technician from Palfinger.

3.23.4.3. Provide a three (3) day notice (minimum) to the COR so that arrangements can be made for the Ship’s Bosun to attend the davit inspection.

3.23.4.4. Inspection shall include visual and operational actions encompassing the davit and davit operating system. Visual inspections shall include structural integrity of davit and davit foundation, winch, brake, lifting hook and end link, and cable. Operational tests shall demonstrate the performance of all davit-controlled operating features including launching, braking, retrieval, and stowage of the rescue boat.

3.23.4.5. Submit a condition report detailing the scope of the inspections and testing accomplished as well as an itemized list of any required parts or other work that should be performed to keep davit fully SOLAS compliant.

3.23.4.6. Purchase and installation of new parts, or other davit work shall be the topic of additional work.

3.23.5. Quality Assurance

3.23.5.1. Condition report to be on standard forms provided by Palfinger.

3.23.6. Notes

3.23.6.1. Palfinger OEM Contract information is below:

Palfinger Marine USA Inc (LA)
912 Highway 90 East
New Iberia, LA 70560
POC: Mike Resweber
Phone: 337-551-6230
Email: mike.resweber@palfingermarine.com

END OF ITEM

3.24 ITEM 324: CENTERBOARD ANNUAL MAINTENANCE

3.24.1. Scope:

3.24.1.1. Complete required Centerboard annual maintenance to ensure it is in good working order.

3.24.2. References

3.24.2.1. Technical Manual FRV40-226-012-010, "Centerboard, Retractable and HPU"

3.24.3. Government-Furnished Material (GFM)

3.24.3.1. Safety Tripod and harnesses - $3,500

3.24.3.2. Centerboard Hoses (QTY 18) – total cost $10,000

3.24.4. Requirements

3.24.4.1. Remove man-hole covers in Pilot House, and open doors on 2nd Deck to allow access to the centerboard from both locations. Key for door access is kept with ship's force. Ensure that work areas with an open man-hole cover are isolated from normal foot-traffic and protect work area.

3.24.4.2. Gas-free the Centerboard trunk and ensure the area is safe for entry and hot-work. Maintain the gas-free certificate, including all required ventilation runs to/from the Centerboard for the duration of the work. Work with the COR to stage the ship’s rescue & safety tripod on the Bridge.

3.24.4.3. All personnel working within the Centerboard Trunk shall be harnessed, unless certified staging is provided.

3.24.4.4. Provide an OEM technician to inspect and groom the centerboard for a minimum of 40 hours onsite. Travel time is not included in the 40 hours. Technician shall submit a condition report detailing all discrepancies and any required repairs.

3.24.4.5. Based on results of grooming, technicians will accomplish maintenance items up to the 40 hours covered by this work item and recommend additional maintenance, if needed. Maintenance and grooming shall be accomplished in accordance with Reference 3.24.2.1.

3.24.4.6. Open, gas-free, and inspect the Centerboard Dry Void. OEM inspection shall include the dry well to verify watertight integrity and corrosion control. Submit a condition report identifying any discrepancies.

3.24.4.7. Complete painting and corrosion preservation of miscellaneous areas within the Centerboard. Complete surface preparation to SSPC-3 and paint to match surrounding surfaces. For bidding purposes, Contractor shall estimate painting 100 square feet of corrosion. Contractor shall submit a CFR if additional surfaces require preservation.

3.24.4.7.1. Iinstall staging as necessary to support painting evolutions and ensure all personnel are properly supported and/or harnessed to prevent any slip, trips, and falls injuries.

3.24.4.8. Replace all hoses on the Centerboard with the GFM furnished hoses prior to the Centerboard OEM inspection.

3.24.4.9. The OEM Inspection and Maintenance includes the following:

3.24.4.9.1. Procure one (QTY 1) spare Encoder and turnover to Ship's Force.

3.24.4.9.2. Inspect the Trunk guide rails for damage, distortion, cracks, corrosion, and loose or missing parts.

3.24.4.9.3. Inspect all eight wear pads and shim as needed to meet specification.

3.24.4.9.4. Inspect Centerboard drive equipment for damage, distortion, cracks, corrosion, and loose or missing parts.

3.24.4.9.5. Inspect Structural members and welds for damage, distortion, cracks, corrosion, and loose or missing parts.

3.24.4.9.6. Inspect Foundations and supports for continued ability to support the imposed loads.

3.24.4.9.7. Inspect Handrails, stairs, ladders, walkways, and safety guards for damage, distortion, cracks, corrosion, and loose or missing parts.

3.24.4.9.8. Inspect Fasteners for tightness, corrosion, etc.

3.24.4.9.9. Verify that interior centerboard drain lines are free and unplugged.

3.24.4.9.10. Inspect Pins, bearings, shafts, gears, couplings, rollers, locking and clamping devices (spud, wear pads) for wear, cracks, and distortion, and for excessive noise and vibration.

3.24.4.9.11. Clean Safety labels (see drawing 1568521 of Reference 3.24.2.1 for label locations) for good legibility. Replace all damaged or missing safety labels.

3.24.4.9.12. Inspect the Hydraulic power plant for proper performance, leaks, hose condition, and compliance with applicable safety requirements.

3.24.4.9.13. Inspect Electrical equipment (control contactors, encoder, limit switches, control panels, etc.) for contact pitting or any deterioration.

3.24.4.9.14. Inspect all hydraulic hoses, fittings, and tubing for: leaks, wear, abrasion, or chaffing. Repair leaks by standard tightening or repair procedures, if possible, before recommending replacement.

3.24.4.9.15. Inspect Hydraulic pump and motor for: loose fasteners, leaks at joints between sections, shaft seal leaks, unusual noises or vibration, loss of operating speed, excessive heating of the fluid, loss of pressure

3.24.4.9.16. Inspect Hydraulic valves for: cracks in valve housing, improper return of spool to neutral position, leaks at spools or joints, sticking spools, failure of relief valves to attain correct pressure setting

3.24.4.9.17. Inspect relief valve pressures as specified on hydraulic drawings

3.24.4.9.18. Inspect Hydraulic cylinders for: drifting caused by fluid leaking across the piston, rod seal(s) leakage, leaks at welded joints, scored, nicked, or dented cylinder rods, dented cylinder barrel, loose or deformed rod eyes or connecting joints

3.24.4.9.19. Inspect all accessible spud pockets and verify spud position limit switch operation and calibration. Adjust as needed to obtain magnetic pick-up. Clean, preserve, and lubricate the spud pockets as needed.

3.24.4.9.20. Inspect the Flexible Hose Tray and verify the structural integrity of all attachment points, cables, and hoses. Verify that all cables and hoses are properly positioned within the hose tray with sufficient clearance and not snagged or caught on any obstructions. Inspect condition of cables and hoses. Replace all deteriorated C-Clamps. For bidding purposes, Contractor shall estimate replacing 50 (QTY 50) stainless steel C-Clips retaining rings to secure the hose tray plate pins (recommend Gleason

Part Number GR047791 for the Gleason PT80E-HN-10.5-8-316SS PowerTrak Flexible Hose Tray, or approved equal).

3.24.4.9.21. Inspect PLC program and operation for proper function. Inspect the encoder and all pressure switches for proper function and condition.

3.24.4.9.22. Inspect all electrical cabling and penetrations for wear, rubbing, chaffing and ensure all cable penetrations are properly sealed.

3.24.4.9.23. Provide and install grease on centerboard rack and pinion gears.

3.24.4.9.24. Inspect the Centerboard and all Centerboard components for any signs of corrosion and submit a Condition Report listing any discrepancies. Repair any corroded area in accordance with the Paint Specification. Corrosion repairs will be the topic of additional work.

3.24.5. Quality Assurance:

3.24.5.1. Test the Centerboard under the guidance of the Centerboard Technician and verify operation and calibration in the Maintenance and Retracted positions. If further Centerboard testing at sea is required by the OEM, it will be the topic of additional work.

3.24.5.2. Demonstrate operation of the Centerboard from both “Auto” mode from the Pilot House and locally. All Centerboard position indicator lamps shall indicate same centerboard positions.

3.24.5.3. Technicians shall provide a service report.

3.24.6. Notes

3.24.6.1. Centerboard is AmClyde Model CB-32, Serial Number SO5325.

3.24.6.2. Possible source of technical support for service

Global Technical Services (GTS)
Field Service Engineer: Mark Connor
414.232.0412
mconnor@gts-mc-com

END OF ITEM

3.25 ITEM 325: PROPULSION MOTOR ANNUAL INSPECTION

3.25.1. Scope

3.25.1.1. Complete the annual inspection on the Main Propulsion Motors.

3.25.2. References

3.25.2.1. Technical Manual FRV40-226-058-010 "Motor, Propulsion DC, Models: 2795AA, 2x1125 KW (2x1508 HP), 750VDC, 134 RPM"

3.25.3. Government Furnished Equipment

3.25.3.1. None

3.25.4. Requirements:

3.25.4.1. Procure the services of an OEM Technician to complete the annual inspection, cleaning, and system maintenance on the Teco-Westinghouse Main Propulsion Motors (Motor Serial Numbers: 2795AA-01 and 2795AA-02).

3.25.4.2. OEM shall recommend any additional maintenance or repairs that are not already called out by these specifications. Contractor shall provide required labor and assistance to enable the OEM technician to complete the required work. Contractor shall assign two mechanics to accompany the OEM technician to remove and reinstall motor access covers and complete any other tasks as assigned by the OEM technician.

3.25.4.3. Provide the services of an on-site, Teco-Westinghouse representative to complete all work required by this specification. For bidding proposes, estimate the OEM technician will be onsite a total of 30 hours (3-10 hour days onsite). Travel time is not included as part of the 30 hours of on-scene time. Arrangements for obtaining a Teco-Westinghouse technician can be made by contacting:

Teco Westinghouse
5100 N. IH-35
Round Rock, Texas 78681
POC: Rosa Segura / Rebecca Skrhak
Phone: 512-218-7313 / 1-800-451-8798 / 512-218-7243
Email: segurar@tecowestinghouse.com
Email for Parts: skrhakr@tecowestinghouse.com
Website: www.tecowestinghouse.com

3.25.4.4. OEM shall complete a thorough inspection and annual cleaning of the armature, field windings, commutator, brushes, and other OEM recommended annual inspections in accordance with OEM procedures

3.25.4.5. OEM shall test the motor insulation resistance for each motor to include the armature windings, C+C windings (with both positive and negative main power cables disconnected), shunt field, and both the Positive and Negative Cross Over ring resistance.

3.25.4.6. Conduct an operational test of the motors with the Teco-Westinghouse Representative to witness and validate motor operation. Ship's Force will be available to operate SSDGs and transfer power to the ship for testing main motors.

3.25.5. Quality Assurance

3.25.5.1. OEM shall provide a service report.

3.25.6. Notes

3.25.6.1. None

END OF ITEM

3.26 ITEM 326: SHIP'S CRANES ANNUAL MAINTENANCE

3.26.1. Scope:

3.26.1.1. Inspect and complete maintenance on the three ship's cranes, as specified.

3.26.2. References

3.26.2.1. Tech Manual FRV40-226-134-010 "Knuckle Boom Crane"

3.26.2.2. Tech Manual FRV40-226-111-010 "Telescoping Boom Crane"

3.26.2.3. Tech Manual FRV40-226-105-010 "Stores Handling System"

3.26.2.4. ABS Guide for Certification of Lifting Appliances

3.26.3. Government Furnished Material

3.26.3.1. Knuckleboom Crane Jib Angle Sensor Appleton Part Number TMD-8902 (estimated value: $5,000).

3.26.4. Requirements

3.26.4.1. Procure and replace one (QTY 1) load pin for the Telescoping Crane (Appleton Part Number YMD-8890). See Drawing AMD-1503 of Reference 3.26.2.2 for reference. OEM shall calibrate the Load Pin and chest pack after installation while OEM is onsite.

NOTE:This is a long lead time item. Load Pin may be procured from the below provided source:

Appleton Marine
3030 E. Pershing St.
Appleton, WI 54911
POC: Steve Zahringer
Email: steve.zahringer@appletonmarine.com
Phone: 920-738-5432 (EXT 126) / 920-738-1390

3.26.4.2. Tag-out all electrical services and hydraulics to the Telescoping, Knuckleboom, and Stores Handling Cranes as needed.

3.26.4.3. Procure the services of the OEM to complete an inspection and system maintenance on each crane. An Appleton OEM Technician may be obtained from below contact information. OEM Technician shall complete an annual inspection and operation of each crane according to OEM recommendations.

For bidding purposes, the OEM shall be onsite for a minimum of 24 hours. Travel hours do not constitute time required to be on-site.

Appleton Marine
3030 E. Pershing St.
Appleton, WI 54911
POC: Steve Zahringer
Email: steve.zahringer@appletonmarine.com
Phone: 920-738-5432 (EXT 126) / 920-738-1390

3.26.4.4. The OEM shall perform a detailed inspection of each crane. Inspection includes inspection and operation of all electrical, hydraulic, mechanical, and structural components of the Knuckleboom, Telescoping, and Ship's Stores Cranes. All repairs shall be completed by the Contractor (or OEM) in accordance with the OEM Technician recommendations.

3.26.4.4.1. On the Knuckleboom, disconnect the boot bellows (covers) on the luff and jib boom cylinders and inspect for leakage and cylinder rod condition with the OEM. NOTE: a man-lift is required for this work.

3.26.4.4.2. Inspect all hydraulic hoses on the cranes for wear, abrasion, and chaffing.

3.26.4.4.3. Inspect all piping, joints, welds, structure, wiring and electrical connections for deterioration or damage.

3.26.4.4.4. Lubricate all lubrication joints on all three cranes.

3.26.4.4.5. Replace and calibrate the GFM furnished Jib Angle Sensor on the Knuckleboom Crane. Note: Man-lift is required to access the angle sensor.

3.26.4.5. Provide an inspection report for each crane detailing inspection results and all recommended repairs that are not already directed by this specification.

3.26.4.6. Procure the services of a QP1 certified contractor to touch-up paint and remove all rust and corrosion on each of the three cranes, including the foundations and mounting pedestals on the ship. Conduct proper surface preparation to SSPC-11 and paint any affected areas in accordance with the Paint Schedule. For bidding purposes, estimate required painting on all cranes to be a total of 25 square feet. Note: a man-lift will be required for painting services.

3.26.4.7. Perform the annual inspection of all three ship's cranes in accordance Reference 3.26.2.4 to maintain the ABS Lifting Gear Appliances Certification.

Testing shall include a rock / tilt test and operational testing to the satisfaction of ABS. Coordinate testing with ABS to maintain the annual ABS certification.

3.26.5. Quality Assurance

3.26.5.1. OEM shall inspect and operate each crane.

3.26.5.2. Cranes shall pass the annual ABS Lifting Appliances Certification which shall be demonstrated by ABS signing the ship's Lifting Appliances Certificate.

3.26.5.3. Provide 24 hour notice so ship's crew and ABS Surveyor can be available to operate/witness crane testing.

3.26.6. Notes

3.26.6.1. Ship's force will be available to operate Ship's Cranes for crane testing. Contractor and OEM will be allowed to operate ship's cranes after permission from the Ship CO or the Chief Bosun.

END OF ITEM

3.27 ITEM 327: REFRIGERATION SYSTEM ANNUAL MAINTENANCE

3.27.1. Scope:

3.27.1.1. Inspect the Chilled Water (HVAC) Plant, Domestic Stores, Scientific, and Environmental Refrigeration Systems on NOAA Ship PISCES.

3.27.2. References

3.27.2.1. Technical Manual FRV40-226-015-010 “Chill Water Plant Model 30HXS086R-140”

3.27.2.2. Technical Manual FRV40-226-090-010 “Refrigeration System, Galley Model 90YR28MSF3ND1K9R”

3.27.2.3. Technical Manual FRV40-225-091-010 “Refrigeration System, Scientific Freezer Model 90YR16MSD3ND1K9R”

3.27.2.4. Technical Manual FRV40-226-089-010 “Refrigeration System, Controlled Environment Room Model: 90YK12NBD3CA1Z9Z”

3.27.3. Government Furnished Material

3.27.3.1. None

3.27.4. Requirements

3.27.4.1. The Contractor is responsible for providing all labor, materials, services, tools, supervision, technical manuals, and technical expertise required to accomplish all work in this specification. Contractors shall be Carrier approved factory trained service technicians.

3.27.4.2. Tag out and recover refrigerant from each system as necessary to accomplish inspections and repairs. All recovered refrigerant shall be stored in EPA approved recovery cylinders. All recovered refrigerant shall be weighed, reused, and reinstalled upon completion of work.

Chilled Water HVAC Plants

3.27.4.3. Maintenance on the Chill Water Plant requires securing HVAC service throughout the ship directly affecting habitability. During the time the system is taken off line, the ship will be deemed "uninhabitable". Contractor shall schedule work to minimize ship “uninhabitable” conditions.

3.27.4.4. All work on the chilled water plants will be done in accordance with applicable sections of Reference 3.27.2.1. Work described below is applicable to both chilled water plants.

3.27.4.5. Check, test, and inspect the following:

3.27.4.5.1. Check all electrical connections in the Carrier Chiller System and tighten all loose connections.

3.27.4.5.2. Check starter wiring and contacts

3.27.4.5.3. Inspect the compressor motor power/starting contactors

3.27.4.5.4. Check gauges and indicator lights

3.27.4.5.5. Check accuracy of all transducers for each circuit, replace as necessary.

3.27.4.5.6. Inspect the entering and leaving thermistors on all heat exchangers for signs of corrosion or scale. Procure and install replacement thermistors for any corroded thermistors or remove any scale (if found).

3.27.4.5.7. Check accuracy of thermistors. Replace any thermistors if greater than plus or minus 2 degrees Fahrenheit variance from calibrated thermometer, per Reference 3.27.2.1.

3.27.4.5.8. Test all safety and relief devices per Reference 3.27.2.1, including, but not limited to: Compressor motor overload, cooler low water temperature, and pressure relief valves.

3.27.4.5.9. Check and clean all refrigeration strainers.

3.27.4.5.10. Calibrate operating controls and flow switches/devices per Reference 3.27.2.1.

3.27.4.5.11. Replace all internal oil filters and in-line external oil filters.

3.27.4.5.12. Replace the drier cores.

3.27.4.5.13. Inspect the condition and operation of the Metrex Water Regulating Valves.

3.27.4.5.14. Review and evaluate the log readings. Provide recommendations in the service report.

3.27.4.5.15. Take an oil sample, test, and provide analysis. If required per the oil sample recommendations, replace oil in the compressors with new oil of the type specified in Reference 3.27.2.1. Government will provide replacement oil.

3.27.4.6. Remove the Condenser tube sheet heads and other interferences as necessary for cleaning Condenser tubes.

3.27.4.6.1. Clean the Condenser coils and tube heads per Reference 3.27.2.1

3.27.4.6.2. Using eddy current testing as recommended every two years, inspect the condenser tubes. If scaling is present, clean tubes with a rotary-type tube cleaning system per Reference 3.27.2.1

3.27.4.6.3. Restore heads with new seals and torque heads per Reference 3.27.2.1.

3.27.4.7. Provide a written report to the COR within two weeks of the completed inspections. The report shall include a general description of the system's conditions, any recommendations made by the technician, as well as the following information:

3.27.4.7.1. Results from the inspection of the compressor motor power/starting contactors.

3.27.4.7.2. List any items that were damaged and replaced, such as gauges, etc.

3.27.4.7.3. Oil sample analysis report: All oil samples must be reviewed and recommendations based on oil samples must be provided to COR.

3.27.4.8. Additional Work: Renewal of parts above and beyond those stated shall be negotiated as additional work. Provide a condition found report to identify replacement items for quote that may not have been covered or exceed these requirements.

3.27.4.9. Demonstrate satisfactory operation of both chilled water plants to COR for a minimum of 72 hours operation on each plant.

Refrigeration Systems Inspection

3.27.4.10. Inspect the Scientific Refrigeration System and verify system operation. Submit a condition report of any discrepancies.

3.27.4.11. Inspect the Environmental Refrigeration System and verify system operation. Submit a condition report of any discrepancies.

3.27.4.12. Inspect the Domestic Refrigeration System and verify system operation. Submit a condition report of any discrepancies.

3.27.4.13. Recharge all refrigeration systems to proper levels upon completion of service. Contractor is responsible for procuring and installing necessary refrigerant and using OEM parts. For estimating purposes, estimate three (3) cylinders of Refrigerant R-134a. Turn over unused Refrigerant to the ship. Submit a CFR if additional Refrigerant is required.

3.27.4.14. Repair all disturbed insulation upon completion of work. Touch up paint all new and disturbed surfaces.

3.27.5. Quality Assurance

3.27.5.1. Operate the Chilled Water and three Refrigeration Systems and check for leaks. Repairs and system shall be leak free.

3.27.5.2. Witness the box pull-down temperatures to ensure systems are functioning properly for a minimum of 24 hours.

3.27.5.3. Technician shall provide a service report.

3.27.6. Notes

3.27.6.1. None

END OF ITEM

3.28 ITEM 328: AIR COMPRESSOR ANNUAL SYSTEM MAINTENANCE

3.28.1. Scope:

3.28.1.1. Provide an OEM Technical Representative to complete system the annual system maintenance and certifications for the two Ship's Service Air Compressors and the Dive Locker Air Compressor.

3.28.2. References

3.28.2.1. None

3.28.3. Government-Furnished Material (GFM)

3.28.3.1. None

3.28.4. Requirements

Ship's Service Air Compressors

3.28.4.1. Procure the services of a Kaeser certified technician to perform a full system maintenance on the two Ship's Service Low Pressure Air Compressors located in the Upper level of the Engine Room. Low Pressure Ship's Service Air Compressors technical specifications:

Make:	Kaeser
Model:	SM15
Air Compressor #1 Part Number:	100758.1
Air Compressor #1 Serial Number:	1070
Air Compressor #2 Part Number:	100758.1
Air Compressor #2 Serial Number:	1074

3.28.4.2. Tag out the low pressure Ship's Service Air Compressors.

3.28.4.3. Perform a full SM15 air compressor service including changing all filters, oil, and belts.

3.28.4.4. Restore system operation upon completion of maintenance.

Dive Locker Air Compressor

3.28.4.5. Procure the services of a Mako certified technician to perform a full system maintenance on the Ship's Dive Locker Air Compressor located in the Dive Locker (01-10-1). Dive Locker Air Compressor technical specifications are as follows:

Make:	Mako

Model: MKBCI051N3236
Air Compressor Serial Number: 5405H1030094

6.28.4.2. Tag out the Dive Locker Air Compressor.

6.28.4.3. Perform a full SM15 air compressor service including changing all filters, oil, and belts.

6.28.4.4. Restore system operation upon completion of maintenance.

6.28.4.5. Provide a service report detailing all completed repairs and recommended additional maintenance / modifications.

6.28.4.6. Test the Ship's Service and Dive Locker Air Compressors with the Ship's Chief Engineer in attendance.

3.28.5. Quality Assurance

3.28.5.1. Submit a trip report detailing all effected repairs and any recommended additional maintenance / repairs.

3.28.6. Notes

3.28.6.1. One possible source for OEM service is provided below:

Air Power Services
530 North New Warrington Road
Pensacola, FL 32505
Phone: 850-469-0704
POC: Brad Wartman
Email: bwartman@airpowerservicesinc.com

END OF ITEM

3.29 ITEM 329: HYDRAULIC HOSE RENEWALS

3.29.1. Scope

3.29.1.1. Replace the identified hydraulic hoses on the following systems:

3.29.1.1.1. Oceanographic Winch (6 total)

3.29.1.1.2. Traction Winch (14 total)

3.29.1.1.3. Hydrographic Winch, Forward (15 total)

3.29.1.1.4. Hydrographic Winch, Aft (15 total)

3.29.1.1.5. Gallows Out Rigger Rams (4 total)

3.29.1.1.6. Gray Water MSD (1 total)

3.29.1.1.7. Wash Down System (4 total)

3.29.2. References

3.29.2.1. Drawing M283-502-3010 “Hose Booklet Piping Assembly 3010”

3.29.2.2. Drawing M283-502-3020 “Hose Booklet Piping Assembly 3020”

3.29.2.3. Drawing M283-502-4020 “Hose Booklet Piping Assembly 4020”

3.29.2.4. Drawing M283-502-4030 “Hose Booklet Piping Assembly 4030”

3.29.2.5. Reference NOAA PISCES Hose Survey

3.29.3. Government Furnished Material

3.29.3.1. None

3.29.4. Requirements

3.29.4.1. Replace all oil required to be drained, removed, or disposed during the accomplishment of this work. Dispose of all used oil in accordance with all local, state, and federal regulations.

3.29.4.2. Conduct a ship visit to verify hose dimensions, type, and hose fittings prior to fabrication. Note that all lengths provided in References 3.29.2.5 are approximations and shall be verified by the Contractor.

3.29.4.3. Work with ship's engineers to lock out/tag out hydraulic and electrical systems.

3.29.4.4. Cap all openings after hoses are removed.

3.29.4.5. All hose installations shall be in accordance with standard hydraulic hose manufacturer installation instructions.

3.29.4.6. Replace the 6 hoses on the Oceanographic Winch. All new hoses shall be made and installed with all new 316 stainless steel fittings. Add installation tags onto new hoses, identifying hydraulic company providing hoses, hose number, date of installation, date of hose hydrostatic test date, and test pressure.

3.29.4.7. Replace the 14 hoses on the Traction Winch. All new hoses shall be made and installed with all new 316 stainless steel fittings. Add installation tags onto new hoses, identifying hydraulic company providing hoses, hose number, date of installation, date of hose hydrostatic test date, and test pressure.

3.29.4.8. Replace the 15 hoses on the Forward Hydrographic Winch and the 15 hoses on the Aft Hydrographic Winch. All new hoses shall be made and installed with all new 316 stainless steel fittings. Add installation tags onto new hoses, identifying hydraulic company providing hoses, hose number, date of installation, date of hose hydrostatic test date, and test pressure.

3.29.4.9. Replace the 4 hoses (total) on the Port and Starboard Outriggers. All new hoses shall be made and installed with all new 316 stainless steel fittings. Add installation tags onto new hoses, identifying hydraulic company providing hoses, hose number, date of installation, date of hose hydrostatic test date, and test pressure.

3.29.4.10. Replace the one (QTY 1) hose on the Gray Water MSD system on the MSD unit. The new hose shall be made and installed with all new 316 stainless steel fittings. Add installation tags onto the new hose, identifying hydraulic company providing hose, hose number, date of installation, date of hose hydrostatic test date, and test pressure.

3.29.4.11. Wrap all the exterior hydraulic hose end fittings with cloth impregnated anti-corrosion grease tape (i.e., Densyl tape), achieving 100% coverage and 50% overlap per wrap and extend wrap 4 inches onto hose.

3.29.4.12. All hose tags shall be stainless steel with deburred edges, clearly visible, legible, and be permanently affixed to their respective hoses using stainless steel wire or bands. The tag data shall be etched into each tag.

3.29.4.13. Provide an excel spreadsheet detailing as-built hose fabrication details to the COR. At a minimum, the spreadsheet shall contain the following details: Hose identification and system, length, diameter, material, end fittings, and working pressure.

3.29.5. Quality Assurance

3.29.5.1. Conduct operational test (and ABS approved hydrostatic testing, if required by ABS) on all systems where hoses were replaced. Check all hoses and hose fittings for leaks.

3.29.5.2. Provide new hose fabrication and test dates in a CFR to port engineer.

3.29.5.3. Ensure the newly installed hoses meet the minimum bend radius specified by the hose OEM, are properly secured, and are not twisted, worn, or have undue stress placed on the hose.

3.29.5.4. Ensure all oil/hydraulic fluid drained, removed, or consumed to accomplish hose replacement have been properly removed from the ship and been replenished by identical oil / hydraulic fluid. Work with the COR and Chief Engineer to identify the hydraulic oil in each system.

3.29.6. Notes

3.29.6.1. Hose lengths and diameters provided shall be verified by actual ship measurements. Dimensions provided in Reference 3.29.2.5 are approximations.

END OF ITEM

3.30 ITEM 330: MISCELLANEOUS PIPE AND HABITABILITY REPAIRS

3.30.1. Scope

3.30.1.1. Complete identified piping, habitability, and electrical penetration repairs.

3.30.2. References

3.30.2.1. Drawing M282-521-FP20 “Firemain System Diagram”

3.30.2.2. Drawing M282-256-FP08 “Main Sea Water Cooling System Diagram”

3.30.2.3. NOAA Standard Specification AMC-634-1B, "Deck Coverings”

3.30.2.4. PPI NBR 63421-006H (Rev 04), Preservation Process Instruction (PPI) for Cosmetic Polymeric Deck Coverings Type II, Classes 1 & 2 for Wet and Dry Interior Spaces

3.30.2.5. Navy MIL-D-3134J, Deck Covering Materials

3.30.2.6. Drawing SH-100-FH04, “Hull Sternbody Scantlings FR 49-82”

3.30.2.7. NOAA Standard Specification MOC-631-2D, “Coating Systems for Steel Surfaces”

3.30.3. Government-Furnished Material (GFM)

3.30.3.1. None

3.30.4. Requirements

3.30.4.1. Tag-out, isolate, and drain all piping affected by this work item.

Shower Deck Preservation

3.30.4.2. Replace the shower and deck drains and replace the deck material in the following T & S Modules:

3.30.4.2.1. SH&T 2-29-1 (Chief Bosun Stateroom)
3.30.4.2.2. SH&T 2-31-1 (Lead Fisherman Stateroom)
3.30.4.2.3. SH&T 2-26-2 (Assistant Cook Stateroom)
3.30.4.2.4. SH&T 2-26-1 (Chief Steward Stateroom)
3.30.4.2.5. SH&T 02-35-2 (Chief Engineer Stateroom)

3.30.4.3. Cover the mattresses in each stateroom to protect them from any debris. Cover all surfaces in the stateroom or isolate the work area to prevent any

debris from contaminating the stateroom. Provide ventilation to outside for each work area.

3.30.4.4. Remove and stow all deck mounted items and equipment from the SH&T spaces, including toilets, if needed.

3.30.4.5. Remove and dispose of the existing deck tiles and underlayment down to the steel or aluminum decks.

3.30.4.6. Power tool clean the entire deck in each SH & T listed in Paragraph 3.30.4.2 to an SSPC-SP3 surface condition. Inspect surface preparation with COR.

3.30.4.7. Crop out each deck and shower drain. Note that the drains are installed in a module and may require custom made drain boxes for reinstallation. Contactor may elect to fabricate replacement shower and deck drains out of stainless steel. Construction shall be similar to removed drain boxes. Provide and install all new required plumbing and fittings. All repairs shall be leak free.

3.30.4.8. Install the new shower and deck drain boxes and ensure the deck is properly supported and sealed.

3.30.4.9. All decking material replacement shall be accomplished in accordance with the general requirements of Reference 3.30.2.3 – 3.30.2.5, supplemented with the following, detailed requirements. Engage the services of a deck coating specialist certified to apply the specified decking systems.

3.30.4.10. Match existing passageway deck color scheme for all new decking materials.

3.30.4.11. Apply a complete decking system in each SH & T listed in Paragraph 3.30.4.2, to include lightweight epoxy underlayment and a polymeric deck covering system. Complete system shall be IMO and USCG approved, Dex-O-Tex Colorflake VP, or equal (PRC or Spectrum Terrazzo). Contractor shall slope the underlayment and deck coverings to the deck drains. Final coat shall be slip-resistant.

3.30.4.11.1. Strip and reseal the deck in the First Engineer's Stateroom T & S (02-44-4).

3.30.4.12. Caulk and seal all seams to make the shower watertight.

3.30.4.13. Replace all shower curtains and curtain rods with new.

3.30.4.14. Replace the cove base with a 4" red cove to match existing cove base on 01 Level, as applicable.

3.30.4.15. Upon completion of work, reinstall all removed items. Test all reinstalled toilets with Ship's Force. Remove protective coverings, vacuum and wipe down all bulkheads, overhead, and decks to remove all dust and debris.

Main Sea Water Piping Modifications

3.30.4.16. Replace the SW inlet pipe at the Aft Main Propulsion Motor Heat Exchanger above the isolation valve. Pipe has a patch over the hole.

3.30.4.17. Paint all new and disturbed surfaces in accordance with the Paint Schedule.

Pipe Removal in Voids 3-78-1 and 3-78-2

3.30.4.18. All surface preparation and painting in Voids 3-78-1 and 3-78-2 shall be accomplished by a QP-1 certified paint contractor.

3.30.4.19. Crop out the 4" Salt Water Washdown piping in it's entirety from the through hull connection in the port void, the butterfly and check valves, through the inboard bulkhead of the 3-78-2 tank, through the inboard bulkhead of the 3-78-1 tank, and through the deck into the Oceanographic Winch Room (see photos to follow):


Inside Void 3-78-2, looking outboard


Continuation of piping in Void 3-78-2

Pipe penetration inboard bulkhead of Void 3-78-2

Pipe entering through inboard bulkhead of Void 3-78-1

Pipe penetrating deck into Oceo Winch Room

3.30.4.20. Overhaul the removed valves in accordance with the requirements of the Sea Valve Item (Item 308). Turn valves over to the ship as spares.

3.30.4.21. Crop out the deck box for the reach rod assembly.

3.30.4.22. Make the following inserts:

3.30.4.22.1. Hull penetration into the 3-78-2 void

3.30.4.22.2. Oceo Winch Room deck in way of cropped out deck box

3.30.4.22.3. Inboard bulkhead of 3-78-2 void

3.30.4.22.4. Inboard bulkhead of 3-78-1 void

3.30.4.22.5. Deck penetration from 3-78-1 Void into Oceo Winch Room

3.30.4.23. Insert fit up and final NDT inspections shall be to the satisfaction of the attending ABS Surveyor.

3.30.4.24. Apply the following system (or equal) to new and disturbed surfaces within the voids:

3.30.4.24.1. Full coat of Amercoat 385 (red), 5 mils DFT;

3.30.4.24.2. Stripe coat of Amercoat 385 (off-white);

3.30.4.24.3. Full coat of Amercoat 385 (off-white), 5 mils DFT.

3.30.4.25. Apply the following system to the upper sides of the 2 deck inserts in the Oceo Winch Room:

3.30.4.25.1. Full coat of Amercoat 385 (red), 6 mils DFT.

3.30.4.25.2. Full coat of Amercoat 385 (dark grey), 6 mils DFT;

3.30.4.26. Paint the external side of the hull insert in accordance with the Paint Schedule and Hull Painting Item (Item 310).

General Piping Replacement

3.30.4.27. Replace degraded sections of the piping as specified by COR. For bidding, purposes, Contractor shall estimate replacing 25 feet of miscellaneous exposed, un-insulated 3-inch schedule 40 steel piping in the following accessible locations. Contractor shall also estimate replacement of one (QTY 1) 3-inch bronze gate valve, three (QTY 3) 3-inch Tees, three (QTY 3) 3-inch 90-degree elbows, and three (QTY 3) 3-inch pipe unions to supplement piping length replacement.

3.30.4.27.1. Main Deck Passageway
3.30.4.27.2. Upper Level Engine Room
3.30.4.27.3. Trawl Winch Room
3.30.4.27.4. Oceanographic Winch Room
3.30.4.27.5. Miscellaneous Spaces
3.30.4.27.6. Replace the 2-inch digital fuel flow meter in the AMR with a 2-inch mechanical flow meter. Replacement digital flow meter shall be flanged, aluminum, calibrated, and rated for metering fuel oil at 8-120 GPM. One such acceptable model is the Flomec Oval Gear Model 050 for 2-inches, M Series.

3.30.4.28. Conduct a pressure test of replaced piping in the presence of ABS.

3.30.4.29. Paint all new and disturbed surfaces.

Kick Pipe Replacement

3.30.4.30. Replace the following kick-pipe penetrations:

3.30.4.30.1. 01 Level F'SCL Deck (QTY 3)

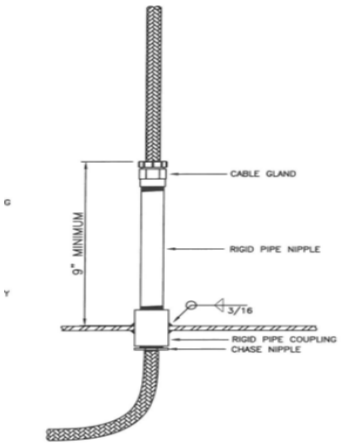
3.30.4.30.2. 01 Level Aft Deck (QTY 3)

3.30.4.30.3. Main Deck Aft Deck (QTY 3)

3.30.4.31. Prior to the start of work, contact the Chief Engineer to coordinate the implementation of the ship's Lock Out/Tag Out Program for each affected system.

3.30.4.31.1. For each kick pipe identified, disconnect the cable from the affected system and pull the cable through the existing kick pipe. Ensure the cable is identified for reinstallation.

3.30.4.31.2. Provide and install new kick pipes as shown in the detail below. Welder shall be ABS certified. Notify ABS surveyor to inspect fit up, NDT and testing as required by local ABS office.



3.30.4.32. Paint all new and disturbed piping and surfaces in accordance with the Paint Schedule.

3.30.4.33. Re-install the cables in their respective kick pipe. Provide and install replacement seal tight flex conduit for all cables. Reconnect each cable to its respective system as original.

3.30.4.34. Complete a soap & blow test and validate the functioning of lights and equipment after stuffing tube replacement to verify cable integrity and installation.

3.30.5. Quality Assurance

3.30.5.1. As specified above.

3.30.6. Notes:

3.30.6.1. None

END OF ITEM

3.31 ITEM 331: MISCELLANEOUS CORROSION MITIGATION REPAIRS

3.31.1. Scope

3.31.1.1. Provide the personnel, tools, equipment, and materials needed to identify and correct miscellaneous areas of corrosion onboard the NOAA Ship PISCES.

3.31.2. References

3.31.2.1. Drawing M282-100-FH13 “Bimetallic Details”

3.31.3. Government Furnished Material

3.31.3.1. Bi-metallic data coupling, 30 linear feet (estimated value: $1,500)

3.31.4. Requirements

3.31.4.1. Contractor shall provide all labor, materials, and equipment necessary to complete the corrosion mitigation tasks outlined in this work item. All paint work of this specification shall be completed by a QP-1 Certified Contractor.

Data Coupling Replacement

3.31.4.2. Using the GFM furnished material, replace ten (QTY 10) linear feet each of Data Coupling behind the Port and Starboard vent pipes on the F’scl Deck at Frame 10. The Data Coupling is the base of the Forward bulkhead foundation and is the transition joint between the steel structure below 01 Level and the aluminum of 01 Level and above. Inspect the data coupling with COR and ABS and mark out areas for replacement. Submit a CFR if additional repairs are required.

3.31.4.2.1. Empty the Dive Locker of all equipment, disassemble the dive locker shelf, remove and dispose of the false forward bulkhead. Expose the steel plating. Cover and protect the Dive Locker Compressor from any debris and damage.

3.31.4.2.2. Procure the services of a Carrier approved service technician to tag-out, disconnect, and secure the two Domestic Refrigeration System Compressors. Remove all refrigeration from the system into approved cylinders.

3.31.4.2.3. Disconnect and remove both Domestic Refrigeration Compressors from the Forward bulkhead in the Refrigeration Machinery Room (01-10-2). Remove insulation and expose the data coupling. Cover and protect the compressors from any debris and damage.

3.31.4.3. Using the GFM furnished material, replace ten (QTY 10) linear feet of Data Coupling on the Starboard 01 Level along the Lounge (01-19-1) in the area of Frame 22-23.

3.31.4.3.1. Remove the interferences and the bolted access plates in the Lounge bulkhead to expose the steel bulkhead along the Data Coupling. Submit a CFR if additional removals are required. Isolate the work area in the Lounge or cover all furnishings to protect from dust, damage, or debris.

3.31.4.4. Mark out the areas to be cropped out and inspect with ABS.

3.31.4.5. Crop out and insert indicated areas. Except for the GFM provided data coupling, Contractor shall provide all aluminum and steel materials required for ABS approved inserts.

3.31.4.6. Test all inserts with ABS. At a minimum, all welds shall be NDT by soap & blow in the presence of ABS.

3.31.4.7. Paint all new and disturbed surfaces in accordance with the Paint Schedule.

3.31.4.8. Replace all removed insulation.

3.31.4.9. Reinstall the bulkhead access panels in the Lounge. Replace all removed interferences. Clean the Lounge.

3.31.4.10. Replace and paint the false bulkhead panel in the Dive Locker with stainless steel sheet metal.

3.31.4.11. Reinstall the Dive Locker shelving and reinstall all removed equipment. Clean the space and turnover to Ship’s Force.

3.31.4.12. Reinstall both Domestic Refrigeration Compressor skids. Using the services of the OEM, reinstall all piping and wiring. OEM shall restore proper system refrigeration and restore system operation.

Miscellaneous Corrosion Repairs

3.31.4.13. Complete the areas of miscellaneous corrosion and repairs detailed below.

3.31.4.13.1. Replace the Port Bridge wing overhang with new stainless steel flashing covering. Replace all insulation with new. Seal and make

flashing watertight. Replace all dissimilar metals with stainless steel hardware. Paint all new and disturbed surfaces.

3.31.4.13.2. Install a new 1-inch aluminum pipe drain on the stack hatch and tie the new stack hatch drain in to the existing stack drain line. Approximate pipe run length is 4 (QTY 4) feet. Paint all new and disturbed surfaces. Complete a water test to verify flow and ensure repairs are leak free.

3.31.4.13.3. Replace deteriorated cable tray hanger arms and vertical support brackets in miscellaneous spaces throughout the ship. For estimating purposes, Contractor shall estimate replacing 250 cable hangers and 30 vertical support brackets. Contractor shall cover all electrical cables prior to any cutting or welding operations of the vertical support brackets. Replace any removed or missing cable tray cable banding with ABS approved banding, and any missing or corroded hardware with new stainless steel hardware.

3.31.4.13.4. Replace the Zurn Z1183 Size 500 Solid Interceptor and Grease Trap containments located in the Domestic Stores Room. Replacement Interceptor and Grease Traps shall be new and of the same material and construction as removed containments. Paint the existing foundation and all disturbed surfaces.

3.31.5. Quality Assurance

3.31.5.1. All coatings and lubricants shall be applied IAW the manufacturers' instructions.

3.31.6. Notes

3.31.6.1. None

END OF ITEM

3.32 ITEM 332: TLI SYSTEM REPLACEMENT

3.32.1. Scope:

3.32.1.1. Replace miscellaneous Tank TLIs.

3.32.2. 3.12.1 References

3.32.2.1. Tech Manual FRV40-226-014-010 “Control and Monitoring System, Model: NOAA 3 and NOAA 4”

3.32.2.2. Drawing M283-801-FC05 “Tank Capacity Curves”

3.32.2.3. RAACI Drawing 2002-02S6003 “Schematic - Aux Machinery Room”

3.32.2.4. RAACI Drawing 2002-02S6004 “Schematic - Transducer Room”

3.32.3. Government Furnished Material

3.32.3.1. None

3.32.4. Requirements

3.32.4.1. Contractor is responsible for providing all technical expertise, labor, materials, and support for completion of all work in this item. Contractor is responsible to ensure tank gas-free certification is maintained throughout the completion of this work.

3.32.4.2. Procure and replace the Tank Level Indication (TLI) sensors in the following tanks:

Ballast Tanks:

3.32.4.2.1. QTY 2 - Roll Stabilization Tank (02-22-0)

Fuel Oil Tanks:

3.32.4.2.2. #2 Port Fuel Oil Tank (4-19-2)
3.32.4.2.3. #2 Starboard Fuel Oil Tank (4-39-1)
3.32.4.2.4. #4 Port Fuel Oil Tank (4-39-2)
3.32.4.2.5. #4 Starboard Fuel Oil Tank (4-39-1)

Miscellaneous Tanks:

3.32.4.2.6. Oil Residue / Waste Oil Tank (4-47-2)
3.32.4.2.7. Bilge Holding / Oily Waste Tank (4-47-1)
3.32.4.2.8. Waste Water Tank (4-29-0)
3.32.4.2.9. Incinerator Tank (in Trash Room 1-65-2)

3.32.4.2.10. Mission Trawl Winch HPU Tank (Oceographic Winch Room STBD at FR 75)

3.32.4.3. Crop off the existing tank level indication pipe flush with the deck and remove from each tank.

3.32.4.4. Contractor shall install new radar type Tank Level Indicators for each of the tanks listed in Paragraph 3.32.4.2. Replacement Tank Level Indicating system shall be compatible with the installed Data Acquisition Units and tie into the existing installed panels. New TLIs shall have both a local and remote tank capacity display. One possible source is the Vegapuls 64 (http://www.nagmarine.com/puls-64.html) or similar approved unit. New TLIs shall be compatible and interchangeable with the new TLIs installed on the Ballast Tanks in January of 2021 where the Vegapuls 64 TLIs were installed. Contractor is responsible for replacing the tank sensor, deck fitting adapter, and completing all electrical and wiring installations. For bidding purposes, assume that existing wiring may be used. Submit a CFR if wiring or deck modifications/inserts are required.

3.32.4.5. Tank level indicator housing shall be plastic, single chamber IP66/IP67 with a 316L 3/4-inch NPT process fitting.

3.32.4.6. Each TLI head shall contain a connection port for local troubleshooting and repairs (ability to be connected to a laptop computer device). Wireless connections are not allowed.

3.32.4.7. Procure the services of an OEM authorized distributor to oversee the installation, calibration, and commissioning of each tank sensor.

3.32.4.8. Contractor shall also procure the services of the Machinery Control System (MCS) OEM to be on-site and assist with the installation / commissioning of the new Tank Level Indicators as required by the new Tank Level Indicator OEM. For bidding purposes, estimate the MCS OEM to be onsite for a total of 40 hours to assist with installation and commissioning of the new Tank Level Indicators. MCS OEM Contact information is below:

Trident Maritime Systems, RAACI Division
Attn: Adam Solino
2840 Lausat Street
Metairie, LA 70001
Email: adam.solino@tridentllc.com
Phone: 504-313-0850

3.32.4.9. Machinery Control System OEM shall also inspect each Tank Level Indicator Panel and ensure calibration of the new TLIs with the MCS.

3.32.5. Quality Assurance

3.32.5.1. Demonstrate the calibration and operation of the new tank sensors to COR.

3.32.5.1.1. Demonstrate calibration of the TLIs locally.

3.32.5.1.2. Demonstrate operation of the tanks at 25%, 50%, and 75% filled. Local and remote displays shall display similar readouts.

3.32.6. Notes

3.32.6.1. One possible source for tank level sensors and commissioning is below:

NAG Marine
2511 Walmer Avenue
Norfolk, VA 23513
POC: Christin Evans
Phone: 757-708-0966
Email: cevans@nagmarine.com
www.nagmarine.com
Reference: Quote No. M527595

END OF ITEM

3.33 ITEM 333: GAUGE CALIBRATION

3.33.1. Scope:

3.33.1.1. Calibrate all gauges on the ship.

3.33.2. 3.12.1 References

3.33.2.1. NOAA Ship PISCES Gauge Calibration Spreadsheet

3.33.2.2. Drawing M282-500-FL05 “Gauge & MISC Instrument List”

3.33.3. Government Furnished Material

3.33.3.1. None

3.33.4. Requirements

3.33.4.1. Calibrate the 269 pressure, temperature, and electrical monitoring gauges listed on Reference 3.33.2.1.

3.33.4.2. Secure the system and gauges as necessary, remove the gauges, and protect system from entry of foreign debris. Calibrate and label each gauge. Calibration may be completed onsite or at a certified calibration facility.

3.33.4.3. Label each calibrated gauge with date of calibration.

3.33.4.4. Inspect, calibrate, and label the 23 pressure switches, flow alarms, transducers, and level alarms given on Sheet 2 of Reference 3.33.2.1 labeled “Switches and Transducers”.

3.33.4.5. Upon completion of work, update Reference 3.33.2.1 listing each gauge, service, system served, range/setting, remarks, test date, and next calibration due date.

3.33.5. Quality Assurance

3.33.5.1. Calibrate the gauges, meters, thermometers, and all other instrumentation using a transfer measurement standard traceable to the National Institute of Standards and Technology (NIST) and in accordance with the manufacturer’s specifications. Use standards which have an accuracy at least four times that of the instrument being calibrated.

3.33.5.2. Affix a tamper-proof calibration label denoting the name of the calibrating facility and the date of the calibration to the face of each device. Place labels over calibration adjusting screws, where applicable.

3.33.6. Notes

3.33.6.1. None

END OF ITEM

3.34 ITEM 334: MAIN SWITCHBOARD AND TRANSFORMER CLEANING

3.34.1. Scope

3.34.1.1. Inspect and clean the Main and Emergency Switchboards and Transformers.

3.34.2. References

3.34.2.1. US Standard Bus Connection Bolt Torque Values

3.34.2.2. Drawing FA03 “Machinery Arrangement”

3.34.2.3. Drawing M282-300-FE01 “Power One Line”

3.34.3. Government-Furnished Material (GFM)

3.34.3.1. None

3.34.4. Requirements

3.34.4.1. Comply with all requirements of the ship’s Lockout/TagOut Program. The ship’s Chief Engineer is to administer the Tag-Out Program. Prior to the start of work, contact the Chief Engineer to coordinate the implementation of the Tag-Out Program for the entire performance period of this item.

3.34.4.2. Coordinate scheduling with Ship’s Force to assist in securing power throughout ship. Work hours on this item shall be limited to 0700-1700 daily. By 1900 each day, switchboards and transformers necessary for overnight service shall be placed back on line and shore power shall be restored.

3.34.4.3. Provide all labor and material to clean the voltage transformers and switchboards listed below, and tighten all electrical connections; torque values for fasteners shall be in accordance with reference 3.34.2.1.

3.34.4.3.1. 600/660V 4x419 KVA Propulsion Transformer No. 1 (located in MMR Lower Level FR 65)

3.34.4.3.2. 600/660V 4x419 KVA Propulsion Transformer No. 2 (located in MMR Lower Level FR 65)

3.34.4.3.3. 600/480 VAC Ship Service Transformer No. 1 (located in MMR tanktop behind Propulsion Transformer 1)

3.34.4.3.4. 600/480 VAC Ship Service Transformer No. 2 (located in MMR tanktop behind Propulsion Transformer 2)

3.34.4.3.5. 480/120 VAC Emergency Transformer No. 1 (located in Emergency Generator Room)

3.34.4.3.6. 480/120 VAC Emergency Transformer No. 2 (located in Emergency Generator Room)

3.34.4.3.7. 600 VAC Main Switchboard (located in EOS, 2nd Deck)

3.34.4.3.8. 480 VAC Ship Service Switchboard (located in EOS, 2nd Deck)

3.34.4.3.9. 480 VAC Emergency Generator Switchboard (located in Emergency Generator Room)

3.34.4.4. Remove all dust and debris from inside switchboards and transformers. Use hand tools that will not scratch/gouge finish, brushes, rags, and vacuum cleaners. Use dry filtered compressed air only when necessary, being careful to minimize blowing dust. Use ZEP #424035 cleaner to remove dirt and gummy/sticky contaminates not able to be cleaned with brushes, rags, or vacuum cleaners alone.

3.34.4.5. Clean, inspect, and lubricate 600 and 480 VAC power breakers.

3.34.4.6. Tighten all electrical connections using torque wrenches to match rated torque values for various sized bolts, screws, and other fittings. Use extraordinary care and do not over-tighten connections.

3.34.4.7. Devise a color coding scheme and use paint markers to identify each connection as cleaned and tightened before moving on to next connection. Do not use paper or plastic tags.

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3.34.5. <u>Quality Assurance</u>

3.34.5.1. All work and testing shall be in accordance with the latest US Coast Guard Regulation in 46 CFR Subpart J and ABS Rules and Regulations for Building and Classing Steel Vessels under 90 meters in length.

3.34.5.2. COR will inspect the cleanliness of transformers after cleaning and prior to closing.

3.34.5.3. Provide documentation showing each torque wrench used has been calibrated.

3.34.5.4. COR, ABS, and a Contractor-provided 1st class licensed electrician shall accomplish random checking of torque readings of various fasteners prior to closing switchboards and transformers.

3.34.6. Notes

3.34.6.1. This work shall be scheduled toward the end of the repair period, after all blasting, painting, and other yardwork which would risk dirtying the switchboards and transformers is complete.

END OF ITEM

3.35 ITEM 335: CAPSTAN OVERHAUL

3.35.1. Scope

3.35.1.1. Overhaul the two (QTY 2) Ship's Capstans.

3.35.2. References

3.35.2.1. Technical Manual FRV40-226-010-010 "Capstan"

3.35.2.2. NOAA Standard Specification AMC-300-1, "Overhaul of Electrical Rotating Machinery"

3.35.3. Government-Furnished Material (GFM)

3.35.3.1. None

3.35.4. Requirements

3.35.4.1. Tag out all equipment prior to start of work.

3.35.4.2. Work with the Ship's Chief Bosun to secure the ship while work on the Capstans is ongoing.

3.35.4.3. Disassemble and remove the two (QTY 2) aft Capstans from the ship to include the 15 HP 575VAC electric motor, brake, and planetary gear reducer. Transport the Capstan assemblies to an authorized overhaul and repair facility. Accomplish a complete overhaul on the motors, brakes, and gear reducers, including replacing all bearings in accordance with Reference 3.35.2.2.

3.35.4.4. Rewind each electric motor.

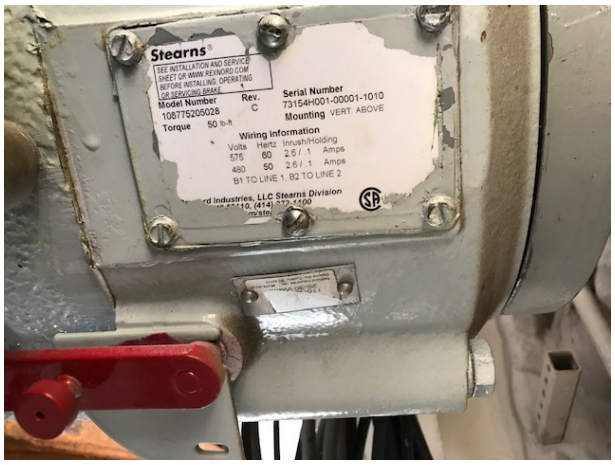
3.35.4.5. Replace all seals, bearings, brake discs, and other consumables on each brake and gear reducer. Technical data for each component is provided below:

Planetary Gearbox
Make: RR USA
Type: 810 TMC
NC: 050569, Ratio: 154, 80:1
C: 154 B3895M956

Electric Brake:
Make: Stearns
Model: 108775205028, Rev C
Serial Number (for port aft capstan): 73154H001-00001-1010

Details: Torque: 50 lb-ft, Mounting: Vent above, 575VAC, 60Hz

Electric Motor:
575VAC, 60Hz, See Reference 3.35.2.2



3.35.4.6. Preserve and paint each item in accordance with the Paint Schedule.

3.35.4.7. Reinstall all removed components. Lubricate all joints and touch up paint any disturbed surfaces. Fill the gearbox with new EAL oil.

3.35.4.8. Test and operate each Capstan.

3.35.4.9. Provide a CFR detailing completed repairs and any other recommended maintenance.

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3.35.5. Quality Assurance

3.35.5.1. Test the reinstalled Capstans with the COR and Chief Bosun.

3.35.6. Notes

3.35.6.1. Note: Do not lift the Capstan equipment by the gearbox.

END OF ITEM

3.36 ITEM 336: SSDG ABS ANNUAL INSPECTION

3.36.7. Scope

3.36.7.1. OEM shall complete the annual SSDG inspection and testing with ABS.

3.36.8. References

3.36.8.1. Technical Manual FRV40-226-029-010 “Diesel Engine Caterpillar 3512B”

3.36.8.2. Technical Manual FRV40-226-028-010 “Diesel Engine Caterpillar 3508B”

3.36.8.3. Technical Manual FRV40-226-030-010 “Diesel Engine, Parts Manual Model: 3508B”, Volumes 1 and 2

3.36.8.4. Technical Manual FRV40-226-041-010 “Kato Generator, 3 Phase Synchronous”

3.36.9. Government-Furnished Material (GFM)

3.36.9.1. None

3.36.10. Requirements

3.36.10.1. In preparation for dock trials, Contractor shall coordinate annual ABS testing of the SSDGs with Ship’s Force. **Schedule SSDG testing to be completed on the day prior to dock trials.**

3.36.10.2. Procure the services of a Caterpillar authorized technical representative to complete the ABS annual system testing on the four (QTY 4) SSDGs and EDG. Serial Numbers are below:

Engine #1: 8EM00549, Model 3512
Engine #2: 8EM00550, Model 3512
Engine #3: 3DM00508, Model 3508
Engine #4: 3DM00509, Model 3508
EDG: 6DG01939, Model 3306

3.36.10.3. Provide a CFR detailing any outstanding issues or recommended additional maintenance.

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3.36.11. Quality Assurance

3.36.11.1. Complete ABS annual testing.

3.36.12. Notes

3.36.12.1. Contractor shall coordinate OEM onsite maintenance and inspections in preparation for dock trials.

3.36.12.2. Arrangements for obtaining a Caterpillar Technician can be made by contacting:

Puckett Machinery
ATTN: Seth Hester
14028 Highway 49 North
Gulfport, MS 39503
(601) 520--5083

END OF ITEM

3.37 ITEM 337: DOCK AND SEA TRIALS

3.37.1. Scope

3.37.1.1. The following requirements are for dock and sea trials for the NOAA Ship PISCES.

3.37.2. References:

3.37.2.1. None.

3.37.3. Government Furnished Materials

3.37.3.1. None.

3.37.4. Requirements

DOCK TRIAL

3.37.4.1. Conduct a Dock Trial after all work on the ship has been accomplished. Schedule one working day for the dock trials to test and evaluate work. Dockside trial shall be preliminary testing under reduced power prior to the sea trial. The date for the dock trials must be approved by the COR.

3.37.4.2. Provide a written test procedure to the COR for review one week prior to each trial. Testing shall include engine operation for slow-speed turning of the main propulsion shaft and propeller and to cycle the rudder. Provide services of qualified personnel, including manufacturer's representatives if necessary, for the duration of the dock trial.

3.37.4.3. Submit a schedule to the COR at least 48 hours before dock trials for testing all equipment and systems on which the Contractor has performed work.

3.37.4.4. In addition to the contractor equipment testing the Government will provide a list of systems on which it intends to perform functional testing.

3.37.4.5. All equipment will be operated by ship's force personnel.

3.37.4.6. During the dock trials, all utilities, except telephone service, will be transferred to the ship.

3.37.4.7. Schedule testing during normal working hours.

3.37.4.8. No Contractor work shall be performed during dock trials without the prior approval of the COR.

3.37.4.9. Provide a supervisor with access to Contractor personnel in all trades to oversee the repair/adjustment of equipment repaired by the Contractor.

3.37.4.10. Provide a dock trial report including all deficiencies and their resolutions.

3.37.4.11. All deficiencies identified during the dock trial shall be corrected prior to the sea trial.

SEA TRIAL

3.37.4.12. Following satisfactory completion of dock trials, schedule and participate in a one-day sea trial to witness testing of all repaired or newly installed equipment and machinery. Coordinate the sea trial date with manufacturers' technical representatives as required, and provide at least 72 hours' notice to all required attendees.

3.37.4.13. Provide support to ship's force to operate all individual equipment and systems, to the satisfaction of the chief engineer and the COR. Contractor support shall include supervision and trades associated with the major equipment/ systems worked during the contract

3.37.4.14. In addition to the contractor equipment testing the Government will provide a list of systems on which it intends to perform functional testing.

3.37.4.15. The date for the sea trial must be approved by the COR. The sea trial agenda shall be set for no less than eight hours and no more than 24 hours. Prior to departure, submit a list of Contractor's/subcontractor's personnel who will ride the ship for sea trials and include Name, Citizenship, Address and telephone number of person to be notified in case of an emergency.

3.37.4.16. The ship shall be in an underway at sea condition for at least eight hours, departing from and returning to NOAA's Home Port piers in Pascagoula, MS. Transits in a river shall not constitute an underway at sea condition. The COR may elect to shorten the duration of the sea trial in consultation with the ship's command, dependent on the performance of all ship's equipment and systems to be operated and tested.

3.37.4.17. All equipment will be operated by ship's force.

3.37.4.18. No Contractor work will be allowed during the sea trial without the prior approval of the COR.

3.37.4.19. Provide a sea trial report including all deficiencies and their resolutions.

3.37.4.20. All identified deficiencies on equipment/ systems worked on by the Contractor to be corrected prior to ship's departure at no additional cost to the Government.

3.37.4.21. Ensure ABS is scheduled to attend sea trial and provide the Surveyor with prior notice and the opportunity to inspect any or all portions of ongoing work during the dock trials or the sea trials.

3.37.5. Quality Assurance

3.37.5.1. Tests, inspections, and reports shall be in accordance with the approved schedule and agenda.

3.37.6. Notes

3.37.6.1. This work item is in addition to any inspection requirements identified in the individual work items of this specification

3.37.6.2. Mooring of the vessel shall be to the satisfaction of the ship's Commanding Officer and COR prior to conducting dock trials.

3.37.6.3. Provide extra line handlers pierside to assist ship's force for passing extra lines for securing vessel during turning of propeller.

END OF ITEM

4. ITEM 40000 ADDITIONAL WORK (LABOR AND MATERIAL)

4.1.1. References

4.1.1.1. None

4.1.2. Government Furnished Equipment (GFE)

4.1.2.1. None

4.1.3. Requirements

4.1.3.1. The rate for all man-hours of labor, to be used for emergent work if ordered by the Contracting Officer pursuant to the "Changes – Ship Repair" clause or mutually agreed upon by the parties by supplemental agreement to accomplish additional work not required elsewhere in the work items, shall be established using this item. For bidding purposes estimate 1000 man-hours worth of emergent work for this item.

4.1.3.2. Indicate in the "Bid Schedule" the total man-hour rate to be used in evaluation of the proposal and also to be used for negotiating changes as required by the "Changes – Ship Repair" clause. This rate shall be a flat rate to cover the entire effort and shall be burdened to include:

4.1.3.3. Production man-hours shall be for skilled labor at the journeyman level expended in direct production as exemplified by the following functions: Abrasive Cleaning/Blasting, Blacksmithing, Boilermaking, Carpentry, Crane Operation, Electrical/Electronics Work, Engineering (Production), Insulating/Lagging, Machining (inside and outside), Painting, Pipe Fitting, Rigging, Sheet-metal Work, Shipfitting, Shipwrights, Staging/Scaffolding, Tank Cleaning, and Welding/Burning/Brazing.

4.1.3.4. Non-production man-hours (whether charged as direct labor or indirect labor by the contractors accounting system) shall be for labor in support of production functions. Necessary support functions should be priced into the burdened rate for production man-hours. Examples of support functions include: Engineering (support), Estimating, General Labor, Firewatch, Material Handling, Planning, Quality Assurance, Security (General), Supervision, Surveying, Testing, and Transportation.

4.1.3.5. Other indirect charges including but not limited to the following: overhead, general and administrative, support functions, facilities, and capital cost of money and profit for the contractor and any subcontractors selected by the prime contractor. The hourly rate will not be used to price work which may be directed to a subcontractor by name in the work specifications.

4.1.3.6. All material costs shall be paid based on the contractor's return cost plus the markup identified in the "Bid Schedule". For bidding purposes estimate $150,000.00 worth of additional material for this item.

4.1.3.7. Take into account full award of this item during the development of the Production Schedule. Award of any portion of this item does not in itself justify an extension to the original contract completion date.

4.1.3.8. The man-hours and material cost estimates specified herein are for evaluation of proposals only. The provided burdened man-hour rates and material cost rates shall remain in effect for the entire life of the contract. Pursuant to the "Changes – Ship Repair" clause, the Government reserves the right to award or not award any portion up to or beyond the estimates set forth herein.

4.1.4. Quality Assurance

4.1.4.1. No additional requirements.

4.1.5. Notes

4.1.5.1. The man-hours of labor contained within this item are in addition to those required to accomplish work specified within the remaining specifications.

4.1.5.2. By definition, there are 8 hours in a man-day. Therefore, the estimated 1000 man-hours equates to 125 man-days.

END OF ITEM

OPTION ITEMS

5.1 ITEM 501: MAIN SEA WATER PUMP REPLACEMENT

5.1.1. Scope:

5.1.1.1. Replace the two Main Sea Water Pumps.

5.1.2. References

5.1.2.1. Technical Manual FRV40-226-070-010 “Pumps Manual, Model: Various”

5.1.3. Government Furnished Material

5.1.3.1. Two (QTY 2) Aurora Main Sea Water Pumps and Motors (Estimated value: $50,000)

5.1.4. Requirements

5.1.4.1. Install the two GFM furnished replacement Main Sea Water Pump and motor assemblies. Remove the old pumps and turnover to the COR for fleet spares.

5.1.4.2. The new pumps are slightly larger than the original pump and motor size and may require the piping and Main Sea Water Pump Foundation to be slightly modified. Submit a CFR for any piping or foundation modifications.

5.1.4.3. Preserve and paint the pump and motor foundations prior to replacement with new units.

5.1.4.4. Commission and test the pumps in accordance with OEM recommendations to maintain OEM warranty.

5.1.4.5. Conduct proper surface preparation and paint the main and auxiliary sea water pump skid, including the new pumps and motors. Replace all disturbed insulation and paint all replaced insulation.

5.1.5. Quality Assurance

5.1.5.1. Demonstrate pump operation to the satisfaction of ABS Surveyor after commissioning of the new pumps.

5.1.6. Notes

None

END OF ITEM

5.2 ITEM 502: STEERING SYSTEM MAINTENANCE AND CALIBRATION

5.2.1. Scope:

5.2.1.1. Upgrade and calibrate the Steering System.

5.2.2. References

5.2.2.1. Technical Manual FRV40-226-104-010 Steering System, Rudder Control

5.2.2.2. Technical Manual FRV40-226-128-010 Steering Gear, Model 1xSR662

5.2.3. Government-Furnished Material (GFM)

5.2.3.1. None

5.2.4. Requirements

5.2.4.1. The Contractor is responsible for providing all labor, services, tools, supervision, and technical expertise required to accomplish all work in this specification. Contractor shall be an OEM approved technician authorized to work on OEM equipment.

5.2.4.2. Replace the feedback component of the steering system. Replace the PLC and calibrate the steering system.

5.2.4.3. Inspect and test steering system operation. Submit a CFR with any additional recommended repairs / upgrades.

5.2.4.4. Submit a trip report detailing all effected repairs and all recommended maintenance / repairs

5.2.5. Quality Assurance

5.2.5.1. Perform pre-departure steering checks, to include swinging the rudder 35 degrees each direction to verify calibration.

5.2.5.2. Demonstrate steering system operation pierside to the satisfaction of COR and Ship’s Force.

5.2.6. Notes

5.2.6.1. Rudder Controls and Steering Gear System Original Equipment Manufacturer is Rolls-Royce. Contact information is below:

Kongsberg Maritime, Inc (for Rolls-Royce Marine North America)
St. Rose, Louisiana 70087
Phone: 504-432-8383 / 504-303-5244
POC: Ed Ramsey
Email: ed.ramsey@km.kongsberg.com

END OF ITEM

5.3 ITEM 503: RO PLANT MODIFICATIONS

5.3.1. Scope:

5.3.1.1. Relocate the RO Plant from the Engine Room Upper Level to the Engine Room Lower Level and provide an OEM Technical Technician to complete system maintenance.

5.3.2. References

5.3.2.1. None

5.3.3. Government-Furnished Material (GFM)

5.3.3.1. None

5.3.4. Requirements

5.3.4.1. The Contractor is responsible for providing all labor, services, tools, supervision, and technical expertise required to accomplish all work in this specification. Relocation and unit assembly shall be the responsibility of the Contractor. Start-up and annual system maintenance shall be accomplished by an OEM approved technician authorized to work on OEM equipment.

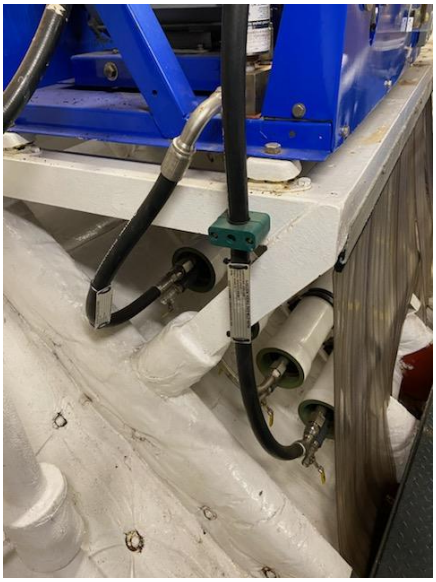
5.3.4.2. Relocate the Reverse Osmosis (RO) Plant from the Engine Room Upper Level to the Engine Room Lower Level, specifically Lower Level Starboard, Aft outboard, as shown in the photograph below.

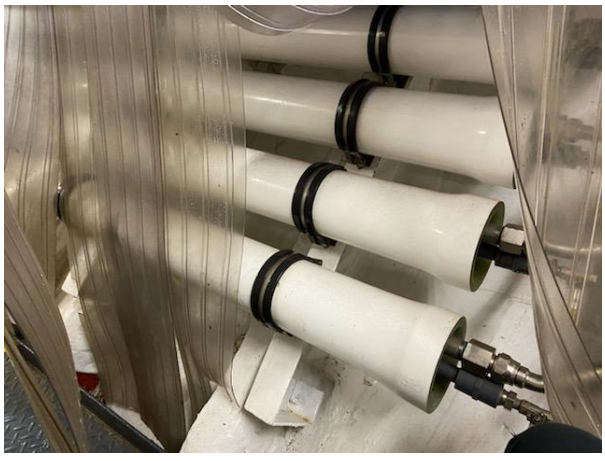
5.3.4.3. Complete all piping, electrical, and structural modifications required to complete the relocation. Fabricate and install a bulkhead mounted steel foundation to contain and hold the RO Plant.

5.3.4.4. Mount the RO on new contractor furnished vibration mounts.

5.3.4.5. Paint the steel foundation in accordance with the Paint Schedule. Replace disturbed bulkhead insulation with new and paint insulation. For bidding purposes, estimate replacement of 25 square feet of 2-inch thick insulation and painting of 100 square feet of bulkhead mounted insulation. Label all bulkhead markings that were disturbed.

5.3.4.6. Mount the four (QTY 4) RO membranes beneath the steel foundation. Photographs are provided below for reference from a similar installation.





5.3.4.7. Provide and install a vapor barrier for the RO membranes as shown in the photographs above to prevent water leaks from spraying on any electrical equipment.

5.3.4.8. Procure the services of an OEM to inspect the relocated RO unit and complete the annual system inspection. Submit a trip report detailing all effected repairs and any recommended maintenance / repairs

5.3.5. Quality Assurance

5.3.5.1. Coordinate with Ship's Force to test RO Plant operation during Sea Trials to validate system operation.

5.3.6. Notes

5.3.6.1. OEM for the RO units is provided below::

Lifestream Watersystems
16611 Gemini Lane
Huntington Beach, CA 92647
Phone: 714-375-6583
POC: Gina Myers
Email: gina@lifestreamwater.com

END OF ITEM

5.4 ITEM 504: COMPUTER LAB STAND-ALONE HVAC SYSTEM

5.4.1. Scope:

5.4.1.1. Install a new split unit AC for service to Acoustics Lab.

5.4.2. References

5.4.2.1. NOAA Ship BELL M. SHIMADA R227 A/C Additions on 04 Level

5.4.2.2. NOAA Ship *Bell M. Shimada* drawing SH-100-FH14, "Pilothouse Scantlings, 03 – 04 levels"

5.4.3. Government Furnished Material

5.4.3.1. None

5.4.4. Requirements

5.4.4.1. Provide all labor, materials, supervision, rigging, lifting, and technical expertise to accomplish the work of this specification.

5.4.4.2. Procure a new Split type AC System as a standalone system for the Acoustics/Computer Lab (1-38-2). Condenser and Evaporator shall be rated for 96,000 BTU & 4,000 CFM. One possible type of Split Type AC System is provided below:

Ocean Breeze Marine Split System
Compressor condenser Model RR96
Evaporator Model EV96

5.4.4.3. Using Reference 5.4.2.1 as a guide, fabricate and install a new foundation to mount and install a new compressor and condenser unit on the 04 Level deck, port of the main mast.

5.4.4.4. Mark-up Reference 5.4.2.1 foundation and structural details to fit the contractor furnished split plant A/C unit on the 04 Level Deck. Provide as CFR.

5.4.4.5. Fabricate and install the foundation on 04 Deck for the Compressor and condenser unit.

5.4.4.6. Provide and install rubber resilient mounts for condenser.

5.4.4.7. Provide all mounting hardware for AC unit. All hardware shall be stainless steel.

5.4.4.8. Install compressor and condenser unit on foundation.

5.4.4.9. Provide and install soft seamless annealed copper tube for refrigerant supply and return. Provide and install pipe hangers to properly support the pipe. All penetrations shall be ABS approved.

5.4.4.9.1. Size 1.25 inch and .75 inch.
5.4.4.9.2. Approximately 150 feet run, supply and return each.

5.4.4.10. Remove and reinstall joiner panel, insulation, heat blankets, electrical enclosure, and work bench in Radio Chart area on the 03 Level.

5.4.4.11. Do not run refrigerant lines through DC locker 02-53-2.

5.4.4.12. Remove and reinstall joiner panel, insulation, heat blankets, and bunk in Stateroom 02-46-2.

5.4.4.13. Remove and reinstall joiner panel, insulation, heat blankets, and work bench and Vidmar cabinets in ET Shop 01-47-2.

5.4.4.14. Install the fan coil unit in the Acoustic/Computer Lab (1-38-2).

5.4.4.15. Provide and install drain piping from Condenser unit to nearby fan coil unit drain piping. 15 feet run.

5.4.4.15.1. Size 1 inch

5.4.4.16. Provide and install drain piping from evaporator unit to existing drain at foundation. 10 feet run.

5.4.4.16.1. Size 1 inch

5.4.4.17. Provide and install metal expansion joints to make tubing connection to evaporator and condenser.

5.4.4.18. Provide and install deck penetration at 04 Deck for three electrical connection and three pipe penetrations.

5.4.4.19. Provide and install two pipe deck penetrations at 03 deck, 02 deck, and 01 Deck.

5.4.4.20. Provide and install one (QTY 1) two conductor shipboard cable rated for 2 amp 24 volt AC circuit. From Evaporator unit to condenser unit approximately 75 feet run.

5.4.4.21. Install control unit in acoustic lab on inboard bulkhead at frame 45. Provide and install a recessed junction box in the joiner panel for mounting the control unit.

5.4.4.22. Provide and install CRES cable labels and stainless steel cable banding.

5.4.4.23. Provide and install one three conductor shipboard cable rated for 2 amp 24 volt AC. From control unit to condenser unit approximately 75 feet run.

5.4.4.24. Provide and install foundation for evaporator coil in the overhead of the acoustics lab (in the location of the disused fan coil unit foundation).

5.4.4.25. Provide Nitrogen charge to test all piping connections.

5.4.4.26. Provide a licensed Air conditioning service representative to charge and commission air conditioning unit.

5.4.5. Quality Assurance

5.4.5.1. All deck penetrations shall be tested and approved by ABS.

5.4.6. Notes

5.4.6.1. One possible source for the Ocean Breeze Marine Split System is provided below:

Quorum Marine & Electronics, Inc
295 SW Dominica Terrance
Stuart, FL 34997
Phone: 772-220-0038
Email: obr@oceanbreeze.com
Web: www.oceanbreeze.com/split_systems.php

END OF ITEM

5.5 ITEM 505: DECK COATING REPLACEMENT

5.5.1. Scope:

5.5.1.1. Recoat the ship's PRC decking and install a new decking system in the Chemistry Lab (1-31-1).

5.5.2. References

5.5.2.1. NOAA Standard Specification AMC-634-1B, "Deck Coverings"

5.5.2.2. Marine Operations Center – Atlantic Standard Specification MOC-631-2D, "Coating Systems for Steel Surfaces."

5.5.2.3. Drawing M282-631-FF04 "Paint Schedule"

5.5.3. Government-Furnished Material (GFM)

5.5.3.1. None

5.5.4. Requirements

5.5.4.1. All work to be accomplished in accordance with the general requirements of Reference 5.5.2.1, supplemented with the following, detailed requirements.

5.5.4.2. Remove and stow all deck mounted items and equipment from the passageways and ladderwells.

5.5.4.3. On 2nd Deck, carefully the wrap and seal the SIMRAD unit in Passage 2-24-0, including all cables leading to/from the equipment. Prior to work on 2nd Deck, COR shall inspect sealing to ensure equipment is protected against any dust intrusion.

5.5.4.4. For all dust generating work, install protective coverings to seal off all access points and completely cover the overhead, except lights can be exposed. All items and equipment remaining in the passageways shall be completely wrapped and sealed.

5.5.4.5. Reseal the following PRC decks:

5.5.4.5.1. 2nd Deck Passageways and ladderwell landings
5.5.4.5.2. Main Deck Passageways and ladderwell landings, as well as the Mess
5.5.4.5.3. 01 Level Passageways and ladderwell landings
5.5.4.5.4. 02 Level Passageways and ladderwell landings

5.5.4.5.5. Main Deck Toilet 1-43-2
5.5.4.5.6. Main Deck Toilet 1-63-2
5.5.4.5.7. 02 Level Toilet 02-50-0

5.5.4.6. Repair the damaged PRC decking material at the Side Station Door at Frame 46 Starboard. For bidding purposes, estimate ten (QTY 10) square feet of material will have to be exposed to bare steel and replaced with a complete new PRC decking system.

5.5.4.6.1. Remove the expanded metal flashing covering the insulation around the side station door at Frame 46.

5.5.4.6.2. Remove and dispose of the damaged PRC and underlayment in accordance with best commercial practices. Complete deck surface preparation for installation of new underlayment and decking material.

5.5.4.6.3. Apply a complete decking system, to include lightweight epoxy underlayment and a polymeric deck covering system. Complete system shall be IMO and USCG approved, Dex-O-Tex Colorflake VP, or equal.

5.5.4.6.4. Replace the cove base with a 4” red cove to match existing cove base on 01 Level.

5.5.4.6.5. Replaced the removed expanded metal flashing around the side station door with new solid stainless steel flashing. Flashing shall be painted white to match surrounded bulkhead surfaces.

Chemistry Lab (1-31-1) Deck Replacement

5.5.4.7. Apply protective coverings to all surfaces and overhead in the Chemistry Lab (1-31-1). Overhead lights may be left exposed. Secure all ventilation to and from the space. Secure all electronics in the space. Particular attention shall be made to ensure the deep freezer and all scientific monitoring equipment is carefully covered to prevent any damage. Inspect with COR.

5.5.4.8. Seal off all accesses and provide exhaust to outside the ship to remove all dust particulate.

5.5.4.9. Remove and dispose of the deck tiles and underlayment to bare steel. Complete deck surface preparation for installation of new underlayment and decking material.

5.5.4.10. Apply a complete decking system, to include lightweight epoxy underlayment and a polymeric deck covering system. Complete system shall be IMO and USCG approved, Dex-O-Tex Colorflake VP, or equal.

5.5.4.11. Replace the cove base with a 4" black cove to match existing cove base on Main Deck.

5.5.4.12. Upon completion of work, remove protective coverings and clean bulkheads and vacuum overhead.

5.5.5. Quality Assurance

5.5.5.1. Flooring company carrying out all work shall provide documentation validating required experience identified in Reference 5.5.2.1.

5.5.5.2. Prior to applying any paint or coatings, and prior to each subsequent coat of paint, verify to the COR that all surfaces have been properly prepared and that weather conditions are suitable for painting.

5.5.5.3. Validate all deck drains are free flowing after flooring is installed.

5.5.5.4. After cleaning is accomplished, inspect all spaces affected by this work with Government representative to validate cleanliness of each spaces is equal to level of cleanliness prior to commencement of work. Contractor shall be responsible to restore all spaces to as-found condition.

5.5.6. Notes

5.5.6.1. This work item includes 2nd Deck spaces as follows:

5.5.6.1.1. Access 2-16-2
5.5.6.1.2. Exercise Room 2-19-0
5.5.6.1.3. Passage 2-24-0
5.5.6.1.4. Passage 2-29-0
5.5.6.1.5. Passage 2-39-0
5.5.6.1.6. Access 3-31-0

5.5.6.2. This work item includes Main Deck spaces as follows
5.5.6.2.1. Toilet 1-43-2
5.5.6.2.2. Watercloset 1-63-2
5.5.6.2.3. Passage 1-36-0
5.5.6.2.4. Access 1-51-2
5.5.6.2.5. Access 3-47-0
5.5.6.2.6. Access 3-31-0
5.5.6.2.7. Mess 1-19-0
5.5.6.2.8. Passage 1-7-01
5.5.6.2.9. Access 2-16-2
5.5.6.2.10. Dry Stores 1-7-1
5.5.6.2.11. Access 2-19-0

5.5.6.2.12. Chemistry Lab 1-31-1

5.5.6.3. This work item includes 01 Level spaces as follows
5.5.6.3.1. Access 1-51-2
5.5.6.3.2. Passage 01-19-0

5.5.6.4. This work item includes 02 Level spaces as follows
5.5.6.4.1. Passage 02-38-0
5.5.6.4.2. Toilet 02-50-1
5.5.6.4.3. Access 1-51-2
5.5.6.4.4. Access 02-51-2

5.5.6.5. One source for IMO approved products:

Dex-O-Tex Marine
140 Valley Road
Roseelle Park, NY 07204
Phone: 908-245-2800

END OF ITEM

5.6 ITEM 506: HVAC REHEATER REPLACEMENT

5.6.1. Scope:

5.6.1.1. Replace the ship's reheaters as specified.

5.6.2. References:

5.6.2.1. Drawing M284-512-FV05 "HVAC Heater List"

5.6.2.2. Drawing M282-300-FE01 "Power One Line"

5.6.2.3. Drawing M282-512-FV02 "HVAC Diagram"

5.6.2.4. Drawing M284-512-FV-03 "HVAC FCU & Cooling Coil List"

5.6.3. Government Furnished Material:

5.6.3.1. AC01 Preheater – estimated value: $6,000 (Indeeco Type TFZU, 36.00 x 24.00 dimensions, 55.25 kW, 600VAC, 3 PH, 53.16 heater amps, 3 steps, 24V control volts; Item Number 201-282087, Special Feature Code: C1C5FH2H3L6M3Q3S21T2U4ZZ2)

5.6.3.2. AC04 Preheater – estimated value: $6,000 (Indeeco Type TFZU, 48.00 x 36.00 dimensions, 119.50 kW, 600VAC, 3 PH, 119.50 heater amps, 3 steps, 24V control volts; Item Number 210-155476, Special Feature Code: C1C5FH2H3L6M3Q3S21T2U4ZZ2)

5.6.4. Requirements:

5.6.4.1. Procure replacement Pre/Reheaters for each unit listed below. Existing heaters are manufactured by Indeeco. Replacement heaters shall meet all the salient characteristics of Reference 5.6.2.1 for Electric Duct Heaters.

5.6.4.1.1. S04 Preheater – Max flow: 1,320 CFM, Heater Rated KW: 18.25 kW, 600VAC/60Hz/3PH, Indeeco Model No: TFZU-18.25, 3 Stage

5.6.4.1.2. TA02 Reheater – Max flow: 660 CFM, Heater Rated KW: 6.25 kW, 600VAC/60Hz/3PH, Indeeco Model No: TFZU-6.25, 3 Stage

5.6.4.2. Coordinate mechanical & electrical tagouts of all systems affected by this work with ships force.

5.6.4.3. Coordinate this work item with Item 5.7 HVAC Duct Cleaning.

5.6.4.4. Replace the following electric duct heaters:

5.6.4.4.1. AC01 – House HVAC located in the CO2 Room (01-44-1)

5.6.4.4.2. AC04 – Lab HVAC located in 01 Level Fan Room (01-37-0)

5.6.4.4.3. S04 – Supply air to AMR located in 01 Level Fan Room (01-37-0)

5.6.4.4.4. TA02 - Laundry located in the Laundry (2-11-1)

5.6.4.5. Disassemble the ducting and chilled water cooling coils as needed to access the Pre/Reheaters. Secure chilled water to each system as needed.

5.6.4.6. Remove and dispose of the old Pre/Reheaters.

5.6.4.7. Replace the Pre/Reheaters with the new contractor furnished Pre/Reheaters. Contractor is responsible for modifying the ducting and/or cooling coils as needed to fit the new Contractor furnished units.

5.6.4.8. Complete all Pre/Reheater electrical installations.

5.6.4.9. Test the new duct Pre/Reheaters.

5.6.4.10. Reinsulate all disturbed insulation with new insulation and paint all disturbed surfaces to match surrounding surfaces.

5.6.4.11. Paint new Pre/Reheaters.

5.6.4.12. Label each Pre/Reheater.

5.6.5. Quality Assurance

5.6.5.1. Test and operate the ship's Pre/Reheaters. Pre/Reheaters shall operate at maximum heating capacity for a minimum of one (QTY 1) hour.

5.6.6. Notes

5.6.6.1. One possible source for replacement heaters are provided below:

Bill Magill
Indeeco
425 Hanley Industrial Court
St. Louis, MO 63144
Phone: 800-243-8162 / 314.644.4300 EXT 348
Email: bmagill@indeeco.com / kguelker@aspeqheating.com

END OF ITEM

5.7 ITEM 507: HVAC DUCT CLEANING

5.7.1. Scope:

5.7.1.1. Clean the ship's HVAC ducts.

5.7.2. References

5.7.2.1. NOAA Standard Specification AMC-510-1, "HVAC Cleaning"

5.7.2.2. Drawing M282-512-FV02 "HVAC Diagram"

5.7.2.3. Drawing M283-512-FV04 "HVAC Fan List"

5.7.2.4. Drawing HB-512-FV05, "HVAC Heater List"

5.7.2.5. Drawing M282-512-FV01 "HVAC Load Calculations"

5.7.3. Government Furnished Material

5.7.3.1. None

5.7.4. Requirements

5.7.4.1. Contractor shall clean the following ventilation systems in accordance with Reference 5.7.2.1 or other standard industry approved cleaning method:

E01 – 01 & 02 Level Exhaust
E02 – Reefer Machinery Room
E03 – 01 Level Lockers - FWD
E04 – Gallery / Scullery
E05 – Dry Lab
E06 – Main Deck Exhaust
E07 – Chemistry Lab
E08 – Wet / Fish Lab
E09 – HAZMAT / Paint Storage
E10 – 2nd & Main Decks T & S Exhaust
E11 – 2md Deck T & S Exhaust
E12 - Bow Thruster Machinery Room
E13 – General Stores Exhaust (MSD Room)
E14 – Alcove
E17 – Trash Room
E18 – AMR

S01 – EDG Room
S02 – MMR

S03 – MMR
S04 – MMR
S05 – Oceanographic Winch Room
S06 – Trawl Winch Room
S07 – Bow Thruster Machinery Room
S08 – Transducer Room
S09 – Scientific Stores

TA-01 – Reefer machinery room
TA-02 – 2nd & Main Decks forward supply air
TA-03 – Gallery / Scullery
TA-04 – General Stores Supply (MSD Room)

AC-01 – House HVAC
AC-02 - EOS
AC03 – HAZMAT / Paint Locker
AC-04 – Lab spaces HVAC

5.7.4.2. Use of a skipper hose is not required in round ducts, provided a system using single, round brushes, each matched to the duct diameter is utilized to clean the entire inside of the ducts. Rectangular or square ducts shall not be cleaned with round brushes; use of a skipper hose is required. In either case, a vacuum truck meeting the requirements of Paragraph 3.2.4.a of Reference 5.7.2.1 shall be provided.

5.7.4.3. Deleted

5.7.4.4. Each system in paragraph 5.7.4.1 is to be cleaned in its entirety, inclusive of fan, filters, cooling and heating coils, diffusers, vents, all branches, filters, all hardware exterior of fan motor, fan discharge to the duct terminus and terminus screens. Ship's fans shall not be used to facilitate duct cleaning.

5.7.4.5. Prior to starting cleaning operations, Protect, Blank, Wrap, Cover or Mask equipment and openings to preclude damage and prevent entry of contaminates outside the affected ducts.

5.7.4.6. Remove any small components of the HVAC system that may be damaged by the cleaning including flow sensors, etc. Submit a CFR if any system components may be damaged by the cleaning and should be removed prior to cleaning.

5.7.4.7. Match-mark and remove ventilation access plates as required to allow access for cleaning operations. Contractor shall obtain COR approval to install any new access plates. Retain existing ventilation access plates for reuse.

5.7.4.8. Clean interior surfaces free of loose rust, dirt, grease, lint and other foreign matter.

5.7.4.9. Cleaning shall to include Gaylord systems and registers above ovens, steamers, and griddles.

5.7.4.10. Contractor shall prove Gaylord wash down systems, fire suppression, and vent closure systems are fully operational prior to and after work is complete. An OEM technician shall inspect system upon completion to verify work is properly completed. Contractor may tie inspection into the Annual Fire Inspection of Item 3.21.

5.7.4.11. Accomplish a visual inspection after cleaning of interior surfaces of each ventilation system branch line listed in 5.7.4.1 for verification of cleanliness and completion of work prior to installation access plates. Ducts shall be free of dust and debris.

5.7.4.12. Reinstall all removed ventilation covers using new gaskets and hardware and any removed equipment. Restore mating surfaces if necessary. Install new sheet metal covers for all new access ports using new materials. Covers shall be left airtight. No sharp corners allowed.

5.7.4.13. Reinstall all disturbed installation and repair or replace all damaged insulation. For bidding purposes, estimate 150 square feet of insulation repair.

5.7.4.14. Touch-up paint and label all ducting or insulation affected by this work item.

5.7.4.15. All dirt and debris resulting from this work shall be removed from the ship daily and disposed of in accordance with all Federal, State and Local Environmental Regulations.

5.7.4.16. Submit an Inspection Report to COR upon completion of Work.

5.7.5. Quality Assurance

5.7.5.1. Prior to closing up ducting inspection ports, present each ventilation system listed in Paragraph 5.7.4.1 to the COR.

5.7.5.2. Conduct operational test of each HVAC System affected by this work. Verify all duct repairs are leak-free and proper operation of all dampers, fan coils, heaters, and other system components.

5.7.5.3. Cleaning operations may be accomplished at night (1800-0600) to facilitate schedule and minimize onboard work. Inspections shall occur during normal working hours.

5.7.6. Notes

5.7.6.1. During the time the ventilation system is taken off line, the ship will be deemed "uninhabitable". Contractor shall make all practical efforts to minimize “uninhabitable” ship conditions.

5.7.6.2. PISCES contains no asbestos.

END OF ITEM

5.8 ITEM 508: CABLE TRANSIT REPAIRS

5.8.1. SCOPE

5.8.1.1. Remove unused cables from the ship's cable trays and repair MCT penetrations.

5.8.2. REFERENCES

5.8.2.1. Drawing M282-300-FE01 "Power One Line"

5.8.3. GOVERNMENT FURNISHED MATERIAL

5.8.3.1. None

5.8.4. REQUIREMENTS

5.8.4.1. Remove and dispose of unused or dead-ended / terminated cables from the ship. **For estimating purposes, estimate 50 hours of labor for excess cable removal**. Notify the COR if additional man-hours are required.

5.8.4.2. With the ship's ET and designated EEB On-site Representative, Inspect all cable trays for unused, dead-ended, or terminated cables. Mark/label all such cables slated for removal with bright colored tape/adhesive.

5.8.4.3. Submit a list of all proposed cable removes to the COR.

5.8.4.4. Upon COR approval, remove and dispose of all identified cables from the ship.

5.8.4.5. Ensure all cables are tagged out and the area is safe for work.

5.8.4.6. Repack and re-band all disturbed penetrations and cable transits in accordance with ABS regulations. Provide all transit blocks, wedges, fire seal, cable bands, cable tray repair materials, and other materials necessary to accomplish this work in accordance with ABS regulations.

5.8.4.7. Inspect all cable penetrations on the ship. Document and repair any cable penetration or multi-cable transit penetration deficiencies. Provide all transit blocks, wedges, fire seal, cable bands, cable tray repair materials, and other materials necessary to accomplish this work in accordance with ABS regulations. **For estimating purposes, Estimate 50 hours for cable transit inspection and repairs and $2,000 for consumables and parts.** Notify the COR if additional man-hours or parts are required.

Wet Lab Electrical Repairs

5.8.4.8. Install protective watertight covers around each Fan Coil Unit wall mounted thermostat (QTY 4). For bidding purposes, estimate a cost of $150 for each watertight cover and 4 labor hours for installation. Submit a CFR for any costs over the estimated costs.

5.8.4.9. Install a NEMA 4X enclosure on each overhead Fan Coil Unit and relocate the fan coil unit electrical controls to the NEMA enclosure. There are a total of three (QTY 3) overhead Fan Coil Units in the Wet Lab. For bidding purposes, estimate a cost of $750 for each NEMA 4X enclosure and 8 labor for installation. Submit a CFR for any costs over the estimated costs.

5.8.5. QUALITY ASSURANCE

5.8.5.1. Inspect all ship's cable penetrations with ABS to validate repairs.

5.8.6. NOTES

5.8.6.1. None

END OF ITEM

5.09 ITEM 509: ACOUSTIC TILE REPLACEMENT

5.9.1. Scope

5.9.1.1. Replace deteriorated acoustic tiles in the lower engine room bilge.

5.9.2. References

5.9.2.1. Drawing M282-636-FF05 “Damping Tile Layouts”

5.9.3. Government Furnished Material

5.9.3.1. None

5.9.4. Requirements

5.9.4.1. Replace deteriorated acoustic tiles in the Lower Engine Room bilge beneath the deck plate grating. For estimating purposes, Contractor shall estimate replacement of 25 acoustic tiles in the Lower Engine Room.

5.9.4.2. Submit a CFR if additional tiles require replacement throughout the vessel.

5.9.4.3. Inspect the bilges in the Engine Room and mark deteriorated acoustic tiles for replacement. After removal of the deteriorated acoustic tiles, Contractor shall conduct proper surface preparation to SSPC-11 and paint the shell or bilge plating beneath the removed acoustic tile in accordance with the Paint Schedule. Prior to painting, conduct a visual inspection of the steel shell and bilge plating with the COR and submit a CFR with inspection results. Submit a CFR if additional NDT testing is required

5.9.4.4. Replace all deteriorated or damaged acoustic tile mounting studs. For estimating purposes, Estimate welding thirty (QTY 30) mounting studs. Touching up external hull plating is not required by the contractor. Minimize any heat transfer through the hull for stud replacement.

5.9.4.5. Install new acoustic tiles and aluminum sheets in accordance with manufacturer’s recommendations.

5.9.4.6. Repair all disturbed bilge painting and any required stenciling on the new bilge tiles.

5.9.4.7. Upon completion of work, conduct a final inspection of all replaced acoustic tiles with COR.

5.9.5. Quality Assurance

5.9.5.1. Contractor and COR shall inspect all replaced deck tiles.

5.9.6. Notes

5.9.6.1. One possible source for the C-1002-025 damping tiles with aluminum sheets is provided below:

Aearo Technologies, LLC
7911 Zionsville Road
Indianapolis, IN
Phone: 317-982-3381 / 317-982-3296
POC: Carol Douglas
Email: carol.douglas@mmm.com / smims@mmm.com

END OF ITEM

5.10 ITEM 510: DISTILLATION PLANT REFURBISHMENT

5.10.1. SCOPE

5.10.1.1. Refurbish the two Alfa Laval Distillation Plants.

5.10.2. REFERENCES

5.10.2.1. Technical Manual FRV40-226-023-010 "Distillation Plant Model JWP-16-C40"

5.10.3. GOVERNMENT FURNISHED MATERIAL

5.10.3.1. None

5.10.4. REQUIREMENTS

5.10.4.1. Work with Ship's Force to tag-out, isolate, and drain the two (QTY 2) Model JWP-16-C40 Alfa Laval Distillation Plants (Serial Number of Unit 1 is N-010413; Unit 2 is comparable to Unit 1)

5.10.4.2. Remove both distillation plants as a unit and transport to an OEM approved overhaul and repair facility. Open, clean, inspect, re-gasket, and overhaul each Distillation Plant in accordance with Reference 5.10.2.1 and OEM recommendations. Provide a condition report upon completion of repairs. One OEM approved source is provided below:

Richard Whittmore
Alfa Laval Inc. Sales Manager, Marine & Diesel
955 Mearns Road
Warminster, PA 18974
Phone: (215) 443-4056 / (267) 750-9178
Email: richard.whittmore@alfalaval.com

5.10.4.3. Reassemble the distillation plants in accordance with Reference 5.10.2.1 and install the distillation plants as a unit using new hardware.

5.10.4.4. To the maximum extent practical, test the distillation plants pierside for leakage. Coordinate with Ship's Force to operate the distillation plants while underway on sea trials.

5.10.5. QUALITY ASSURANCE

5.10.5.1. Repairs shall be leak-free.

5.10.5.2. Operate the distillation plants while underway on sea trials to verify repairs and plant operation.

5.10.6. NOTES

5.10.6.1. None

END OF ITEM

5.11 ITEM 511: MAIN PROPULSION AND BOW THRUSTER MOTOR DRIVE CABINET SPARE PARTS

5.11.1. SCOPE

5.11.1.1. Procure miscellaneous OEM spare parts for the Main Propulsion and Bow Thruster Motor Drive Cabinets.

5.11.2. REFERENCES

5.11.2.1. Technical Manual FRV40-226-097-010 “Electric Propulsion System Rockwell Automation Project No. FSJV26”

5.11.3. GOVERNMENT FURNISHED MATERIAL

5.11.3.1. None

5.11.4. REQUIREMENTS

5.11.4.1. Procure miscellaneous spare parts for the Main Motor and Bow Thruster Propulsion Drive Cabinets. Parts shall be procured new or certified new from the OEM or an authorized OEM distributor.

5.11.4.2. Procure the services of the OEM (Rockwell) or an authorized distributor to inspect the drive cabinets and recommend additional spare parts not called out in this specification. Provide a CFR of additional recommendations.

5.11.4.3. Procure OEM spare parts identified below and turnover all parts to the COR.

Item No.	Rockwell Part Number	Description	Quantity
1	AB SK-H1-SINFB1-A0	POWERFLEX 700S/H INTERFACE BOARD	1
2	AB SK-H1-ASICBD-E1180	POWERFLEX 700H/S ASIC BOARD KIT	1
3	AB SK-H1-SVFB2-E1	POWERFLEX 700S VOLTAGE FEEDBACK KIT	2
4	AB SK-D9-SCRPRE1-F	PRE-CHARGE BOARD, SC BUS SUPPLY, 600/690VAC	1
5	AB 1794-ACNR15	FLEX ADAPTER, CNET RED MEDIA	1
6	AB 1794-IR8	FLEX 8 POINT DISTRIBUTED I/O COMB MODULE	1
7	AB 1794-TB3T	FLEX TERMINAL BASE	1
8	AB 1786-TPR	CONTROLNET COAXIAL T-TAP	2
9	AB 1756-L73	CONTROLLOGIX 8 MB CONTROLLER	1

10	1756-A10	CNTRLLGX CHASSIS, 10 SLOT	1
11	1756-A7	CNTRLLGX CHASSIS, 7 SLOT	1
12	1756-CN2R	CNTRLLGX CONTROLNET BRIDGE	1
13	1756-CNBR	CNTRLLGX CONTROLNET COMM	1
14	1756-ENBT	CNTRLLGX ETHERNET BRIDGE MODULE	1
15	1756-M02AE	CNTRLLGX ANALOG/ENCODER	1
16	1794-IA16	FLEX I/O DIGITAL INPUT, 16PT	1
17	1794-IF2XOF2I	FLEX I/O ANALOG COMBO, ISO	1
18	1794-IR8	FLEX I/O DIGITAL INPUT, 8PT	1
19	1794-OW8	FLEX I/O DIGITAL OUTPUT, ISO, 8PT	1
20	1794-PS13	FLEX I/O POWER SUPPLY, 1.3 AMP	1
21	SD3K-CBLDRVIO060	CABLE, DRIVE I/O	1
22	SK-H1-FOABD1	PCB, FIBER ADAPTER	1
23	SK-H1-SEMIFLTR1	PCB, COM FILTER, EMI	1
24	SK-H1-SFUSE2-F13	FUSE, DC LINK	1

5.11.4.4. Return the used ship furnished cards to the OEM for inspection. Used ship furnished cards are onboard. OEM shall conduct and inspection on the returned cards and determine if they can be restored or should be disposed of. Provide a CFR with any recommended repairs. Used cards that shall be inspected for repairs are listed below:

Item No.	Rockwell Part Number	Description	Quantity
1	AB SK-H1-SINFB1-A0	POWERFLEX 700S/H INTERFACE BOARD	1
2	AB SK-H1-ASICBD-E1180	POWERFLEX 700H/S ASIC BOARD KIT	2
3	1492-PD3C287	760 A POWER DISTRIBUTION BLOCK	1
4	SK-D9-SCRPRE1-F	PRECHARGE PCB 690V	1

5.11.5. QUALITY ASSURANCE

5.11.5.1. None

5.11.6. NOTES

5.11.6.1. One possible source for parts is provided below:

Stuart C. Irby
15288 Russel Blvd
Gulfport, MS 39503-4306
POC: Austin Poole

Phone: 228-865-9774
Email: poole@irby.com

END OF ITEM

5.12 ITEM 512: BOW THRUSTER MOTOR CABINET OEM INSPECTION

5.12.1. SCOPE

5.12.1.1. Complete an OEM inspection of the Bow Thruster Motor Cabinet.

5.12.2. REFERENCES

5.12.2.1. Technical Manual FRV40-226-008-010 “Bow Thruster Model: 40 T3S”

5.12.3. GOVERNMENT FURNISHED MATERIAL

5.12.3.1. None

5.12.4. REQUIREMENTS

5.12.4.1. The work of this item shall be completed after drydock work when the ship is back in the water and the SSDGs are operational. The Drive Cabinet must also be operational.

5.12.4.2. Procure the services of the OEM (Tees White Gill Thrusters) to inspect the Tees White Gill Cabinet and all OEM furnished electrical components. Troubleshoot any outstanding alarms. OEM shall be onsite for a minimum of two days (20 hours total). Travel time does not constitute onsite labor.

5.12.4.3. Provide a CFR with all recommended parts replacement and upgrades.

5.12.5. QUALITY ASSURANCE

5.12.5.1. Test and operate the Bow Thruster Motor with the OEM.

5.12.6. NOTES

5.12.6.1. Bow Thruster Original Equipment Manufacturer is Tees White Gill Thrusters. Contract information is below:

Tees White Gill Thrusters
North Skelton
Saltburn-by-the-Sea
Cleveland, TS12 2AP, England
Phone: 44 (0) 782-523-8910 / 44 (0) 128-765-0621
POC: Adam Robson
Email: adam.robson@teescomponents.co.uk

END OF ITEM

5.13 ITEM 513: QAWD DOOR #107 REPLACEMENT

5.13.1. SCOPE

5.13.1.1. Install QAWD #107 on Main Deck.

5.13.2. REFERENCES

5.13.2.1. Drawing M282-167-FH62, "Structural Doors, Hatches, Manholes & Scuttles"

5.13.2.2. NAVSEA Drawing 167-7379882, "Procedure & Welding Sequence for Non-Ballistic, Watertight & Airtight Quick Acting or Individually Dogged Personnel Doors"

5.13.3. GOVERNMENT FURNISHED MATERIAL

5.13.3.1. Quick Acting Watertight Door #107 (estimated value: $5,000)

5.13.4. REQUIREMENTS

5.13.4.1. Welding procedures to be carried out in accordance with References 5.13.2.1 and 5.13.2.2.

5.13.4.2. Crop out QAWD #107 at Frame 65 on Main Deck and replace with GFM furnished door and frame.

Figure 5.13.1 - QAWD #107

5.13.4.3. Remove the flashing and insulation in the Trash Room (1-65-2) and insulation in the Watercloset (1-63-2) as necessary to accomplish door replacement. Replace upon completion of work.

5.13.4.4. Disassemble the bulkhead in the Scientific Freezer (1-64-0) to expose the weld area. Upon completion of work, paint and reinsulate the exposed area. Reinstall the bulkhead and seal all surfaces. Inspect the freezer with the freezer OEM (Carrier) to validate replacement.

5.13.4.5. Paint all disturbed surfaces and reinstall all removed insulation.

5.13.4.6. Inspect and hose test the new and refurbished doors to the satisfaction of ABS.

5.13.5. **QUALITY ASSURANCE**

5.13.5.1. After door has been reinstalled, perform a chalk test; chalk imprint shall be centered, with 100% contact.

5.13.5.2. Perform operational test to prove correct operation.

5.13.5.3. After the door has been installed, accomplish the following additional testing: Perform a water hose test as follows: Use a 1 ½ inch hose with a minimum nozzle diameter of ½ inch at 50 psig nozzle pressure at a distance of 10 feet or less from the surface being tested. Direct the water stream against the structure in a manner most likely to disclose leakage. Allowable leakage: None.

5.13.6. **NOTES**

5.13.6.1. None

END OF ITEM

5.14 ITEM 514: ENGINE ROOM BILGE (4-49-0) PAINTING

5.14.1. SCOPE

5.14.1.1. Clean and paint the Bilge and all surfaces below lower engine room deck grating.

5.14.2. REFERENCES

5.14.2.1. NOAA Standard Specification MOC-631-2D, "Coating Systems for Steel Surfaces"

5.14.2.2. Drawing HB-631 FF04, "Painting Schedule"

5.14.3. GOVERNMENT FURNISHED MATERIAL

5.14.3.1. None

5.14.4. REQUIREMENTS

5.14.4.1. All surface preparation and painting shall be done by a QP-1 Certified Contractor.

5.14.4.2. Remove deck gratings from the lower engine room.

5.14.4.3. Cover all electronic items, electrical cables, sensors, gauges, flexible hose joints, hoses, motors, and any other electronics located in the bilge.

5.14.4.4. Power wash the entire bilge from the aft part of the engine room shaft alley at Frame 78 Forward to Frame 49, including the four SSDG platforms. Visually inspect all cleaned areas and submit a CFR for any damaged or corroded steel requiring repairs.

5.14.4.5. Ensure that the Main Motors remained covered and avoid any water spray or contamination on the Main Motors.

5.14.4.6. Complete surface preparation to SSPC-3 and paint the bilge deck plating, frames and steel below the lower engine room level deck plate, including all piping, pipe hangers, foundations, and SSDG Platforms in accordance with the Paint Schedule.

5.14.4.7. Label all piping with proper designation and flow direction.

5.14.4.8. Replace deck gratings and remove all protective coverings upon completion of work.

5.14.5. QUALITY ASSURANCE

5.14.5.1. Inspect the Bilge with COR and Ship's Force.

5.14.6. NOTES

5.14.6.1. None

END OF ITEM

5.15 ITEM 515: MACHINERY SPACE SUPPLY FAN OVERHAUL AND LOUVER MAINTENANCE

5.15.1. SCOPE

5.15.1.1. Overhaul the two (QTY 2) MMR Supply Fans and complete Louver maintenance.

5.15.2. REFERENCES

5.15.2.1. NOAA Standard Specification AMC-300-1, "Overhaul of Electrical Rotating Machinery"

5.15.2.2. Drawing M283-512-FV04 "HVAC Fan List"

5.15.3. GOVERNMENT FURNISHED MATERIAL

5.15.3.1. None

5.15.4. REQUIREMENTS

5.15.4.1. Remove the two Main Machinery Room two-speed 600VAC Supply Fans, S02 and S03, from the ship and transport to motor repair shop. Completely disassemble, clean and overhaul each fan and motor in accordance with Reference 5.15.2.1. Rewind each motor. Motor and fan overhaul includes replacement of all bearings, seals, consumables, etc., in accordance with Reference 5.15.2.1.

5.15.4.1.1. Balance fans prior to reinstallation.

5.15.4.1.2. Replace the air-sealing / noise- isolating rubber vibration collar, located between the bottom of the fan casing and the attached, cone-shaped transition section of ducting.

5.15.4.1.3. Replace the intake screen; new screens to be made from 316 stainless steel.

5.15.4.1.4. Replace all vibration isolators installed between the fan assembly and foundation.

5.15.4.1.5. Paint all new surfaces. Paint the motor and fan assembly.

5.15.4.1.6. Provide a CFR with any additional recommended repairs.

5.15.4.2. Remove the stainless steel louver assembly for each fan to an indoor shop. Disassemble and clean all components. Provide condition report, identifying any components requiring replacement. Reassemble. After all work with louver assembly is completed, shop test with government representative in attendance.

5.15.4.2.1. Remove, clean, inspect each of the louver control assemblies fastened to the side of the louver frames. Submit a CFR with any recommended repairs.

5.15.4.3. Using a QP-1 certified contractor, power tool clean all exposed metal not covered by insulation on the inside of the intake air plenum, to an SSPC-SP3 standard. This includes all structure, the overhead, the deck, the raised portion of the supply air trunk, and the frame where the existing screened entrance and access door are located. Repaint surfaces in accordance with the Paint Schedule.

5.15.4.4. Wipe down all bulkhead mounted insulation and paint all insulation.

5.15.4.5. Using a QP-1 certified contractor, clean all sections of supply duct to the bottom of the trunk, the portion of the two branch lines with existing flanges, and all exposed ledges, rails, and piping to an SSPC-SP3 condition. Paint all interior surfaces in accordance with the Paint Schedule.

5.15.4.6. Reinstall the overhauled fans and louvers.

5.15.4.7. Inspect and test the main intake stack mounted louvers for the MMR. Lubricate all mechanical joints. Provide a CFR for any additional repairs.

5.15.5. QUALITY ASSURANCE

5.15.5.1. Conduct operational testing of supply air system, with government representative, after all work is completed. Validate motor operation for both slow and high speeds and proper operation of dampers and lighting.

5.15.5.2. Provide service report upon completion of fan overhaul.

5.15.6. NOTES

5.15.6.1. None

END OF ITEM

5.16 ITEM 516: SSDG GENERATOR OVERHAUL

5.16.1. Scope:

5.16.1.1. Remove, overhaul, and reinstall all four (QTY 4) Ship's Service Generators.

5.16.2. References

5.16.2.1. NOAA Standard Specification AMC-300-1, "Overhaul of Electrical Rotating Machinery"

5.16.2.2. Tech Manual FRV40-226-041-010 "Generator, 3 Phase Synchronous, Models: 4P6-3000 – 1360 KW; SN 17824, 4P6-2700 – 910 KW; SN 17825"

5.16.3. Government-Furnished Material (GFM)

5.16.3.1. None

5.16.4. Requirements

5.16.4.1. Contractor is responsible for providing all the labor, materials, expertise, supervision, and rigging, to accomplish all work of this specification.

5.16.4.2. Order all required materials for Generator overhaul within 10 days of Contract award. Known materials that shall be ordered within 10 days of Contract award are provided below:

CAT 3508 SSDG Parts

Item Number	Part Number	Description	Quantity
1	2X3418A001	Vulkan Vulastik-L Rubber Coupling, VL3418 Element with Boss, Series 2810, Vulkan Aluminum Coupling Ring	2
2	012-42240-00	KATO Drive End Bearing (DE)	2
3	012-21202-00	KATO Opposite Drive End Bearing (ODE)	2
4	0026002500	KATO Inside Bearing Cap	2
5	0026000600	KATO Outside Bearing Cap	2
6	0076004601A	Drive End Adapter Housing (DE)	2
7	0046023100A	Opposite Drive End Bracket (ODE)	2
8	4X34058352-ABS	Hub, for VL 3418 Flexible Coupling	2
9	1591020103	KATO 0.030 Bearing Spacer	2
10	1591020106	KATO 0.060 Bearing Spacer	2

CAT 3512 SSDG Parts

Item Number	Part Number	Description	Quantity
1	1X40184315	Vulkan Vulastik-L Rubber Coupling, VL4018 Element with Boss, Series 2810, Vulkan Aluminum Coupling Ring	2
2	012-42260-00	KATO Drive End Bearing (DE)	2
3	012-21202-00	KATO Opposite Drive End Bearing (ODE)	2
4	0026015600	KATO Inside Bearing Cap	2
5	0026015700A	KATO Outside Bearing Cap	2
6	0076005001A	Drive End Adapter Housing (DE)	2
7	0046023100A	Opposite Drive End Bracket (ODE)	2
8	4X40058357-ABS	Hub, for VL 4018 Flexible Coupling	2
9	1591020103	KATO 0.030 Bearing Spacer	2
10	1591020106	KATO 0.060 Bearing Spacer	2

5.16.4.3. Prior to commencement of generator removals, and prior to drydocking, engage the services of a vibration analysis service to take vibration readings of the diesel engines and generators while they are operating dockside under ship's load. Repeat vibration readings upon completion of all work. Provide ship's force a minimum of 24 hours notice of need to run engines. Provide COR a report of before and after vibration readings.

5.16.4.4. Lockout the four ship's service diesel generators.

5.16.4.5. Disconnect all four generators from the diesel engines.

5.16.4.6. Remove all interferences, including transformers, cabling, or piping, and make an access cut in the shell plating to remove all generators. Contractor may elect to make two access cuts or, using one access, to remove all four generators from the ship.

5.16.4.7. Remove all four generators from the ship and transport to a KATO authorized overhaul and repair facility.

5.16.4.8. Disassemble each generator, including rotor removal. Inspect, clean, and perform a "standard overhaul" each generator in accordance with References 5.16.2.1 and 5.16.2.2. Inspect the rotor shaft for wear or scoring. Polish each shaft. All work shall be accomplished in accordance with manufacturer's recommended procedures. Submit a CFR if any machining is required to restore to "as-new" conditions.

5.16.4.8.1. Overhaul includes replacement of generator drive end and free end bearings, spacer plates, and gaskets.

5.16.4.8.2. Replace all failed RTDs and all defective rectifiers. For bidding purposes, estimate a total of 8 failed RTDs.

5.16.4.8.3. Replace the Drive End and Opposite Drive End bells on each generator.

5.16.4.8.4. Replace the hub for each generator.

5.16.4.8.5. Replace the Vulkcan Coupling and aluminum ring around each generator.

5.16.4.8.6. Paint the generators CAT yellow.

5.16.4.8.7. Submit a CFR with any additional recommended repairs.

5.16.4.9. Reassemble each generator as a unit. Test and balance each generator to ensure proper and complete overhaul.

5.16.4.10. Reinstall the overhauled generators back on the ship as a unit.

5.16.4.11. Using the services of the SME, connect each generator to the Caterpillar engine. Align and balance each generator. Test for soft-foot condition. SME contact information is provided in Paragraph 5.16.6.1.

5.16.4.12. Reinstall the access cut(s) and test the shell plating welds with ABS.

5.16.4.13. Paint the external hull in accordance with the Paint Schedule. Paint the internal shell plating and all disturbed surfaces made to accomplish the work of this item.

5.16.4.14. Reinstall all items temporarily removed for generator removal & reinstallation.

5.16.4.15. Replace all removed insulation with new.

5.16.4.16. After generator electrical sets are reinstalled, conduct final testing of the generators as follows:

5.16.4.16.1. Measure and record insulation resistance with a 500 Volt megger

5.16.4.16.2. Once the ship is back in the water, perform a no-load running test on each engine. Check for noise, end play, vibration, magnetic center, bearing temperature rise, and no-load current.

5.16.4.16.3. Perform a reactive load bank test at 100% load until all temperatures stabilize. Provide a copy of the proposed load test procedure to the COR for acceptance prior to performing the work. Provide the COR a copy of the load test results in a CFR.

5.16.4.16.4. Attach a metal tag to each generator stating the following:

5.16.4.16.4.1. Type of varnish and insulation used.

5.16.4.16.4.2. Record of megger readings taken before and after overhaul

5.16.4.16.4.3. Contractor's name and date of generator overhaul

5.16.5. Quality Assurance

5.16.5.1. All work shall be done in accordance with OEM procedures.

5.16.6. Notes

5.16.6.1. Recommended Subject Matter Expert (SME) for all generator parts, overhaul, and alignment is provided below:

KTM
37521 State Highway 225
Bay Minette, AL 36507
POC: Tony Smith
Phone: 251-459-1105
Email: tony2250@att.net

5.16.6.2. NOAA Ship PISCES SSDG and (engine and generator) details are below:

3512 Diesel Generator Sets No. 1 and No. 2
600 Volt, 1360 kW, 1700 kVA
MFG: Kato- Caterpillar
Model: 3512B DITA SCAC

Engine No. 1 Serial No: 8EM00549
Engine No. 2 Serial No: 8EM00550

Kato Generator Serial No 1: 17824-01
Kato Generator Serial No 2: 17824-02
Kato Generator Model No: AA27756000
600 Volt, 1360 kW, 1700 kVA

3508 Diesel Generator Sets No. 3 and No. 4

600 Volt, 910 kW, 1137.5 kVA
MFG: Kato- Caterpillar
Model: 3508B DITA SCAC

Engine No. 3 Serial No: 3DM00508
Engine No. 4 Serial No: 3DM00509

Kato Generator Serial No. 3: 17825-02
Kato Generator Serial No. 4: 17825-01
Kato Generator Model No: AA27757000

END OF ITEM

5.17 ITEM 517: ADDITIONAL PAD-EYE INSTALLATION

5.17.1. SCOPE

5.17.1.1. Install additional pad-eyes throughout the vessel.

5.17.2. REFERENCES

5.17.2.1. Drawing No. SH-110-FH03, "Hull Midbody Scantlings Frame 19-49"

5.17.2.2. Drawing No. SH-100-FH04, "Hull Sternbody Scantlings Frame 49-82"

5.17.2.3. Drawing No. SH-100-FH-05, "Hull Transom Scantlings Frame 82-Transom"

5.17.3. GOVERNMENT FURNISHED MATERIAL

5.17.3.1. None

5.17.4. REQUIREMENTS

5.17.4.1. Procure and install new lifting pad-eyes throughout the vessel rated for 1-ton. Pad-eyes shall be welded into place. Contractor may use existing frames or fabricate additional support to locate and install properly supported lifting pad-eyes. Pad-eyes shall be installed in line with direction of traffic for proper lifting support. Pad-eyes shall be installed in the following locations:

5.17.4.1.1. Trawl Winch Room (2-82-0) at Frame 83 (Centerline) over the watertight door
5.17.4.1.2. Oceanographic Winch Room (3-68-0) at Frame 81 (Centerline) over the watertight door.
5.17.4.1.3. Oceanographic Winch Room (3-68-0) at Frame 73 Port side over the watertight door.
5.17.4.1.4. EOS (2-63-0) at Frame 72 Port side over the watertight door.
5.17.4.1.5. MMR Upper Level (4-49-0) at Frame 56 port side over the ladderwell
5.17.4.1.6. MMR Lower Level (4-49-0) STBD side at Frame 50 over the watertight door to AMR.
5.17.4.1.7. MMR Lower Level (4-49-0) Centerline above the Main and Auxiliary Sea Water Pump Skid at Frame 50.
5.17.4.1.8. 2nd Deck Access (3-31-0) to Domestic Equipment Room at Frame 36.
5.17.4.1.9. Tank top in Access (3-31-0) in Domestic Equipment Room at Frame 30.

5.17.4.1.10. 2nd Deck Access (2-16-2) at Frame 18 over the Bow Thruster Room hatch.

5.17.4.2. Each pad-eye shall be rated for 1 ton (2,000 lbs).

5.17.4.3. Test each installed Pad-eye to 150% of the rated load.

5.17.4.4. Paint all new and disturbed surfaces. Reinsulate around each pad-eye.

5.17.4.5. Label each pad eye with the rated load and test date. Label shall be installed within a 12-inch radius of each pad-eye.

5.17.5. QUALITY ASSURANCE

5.17.5.1. Complete a weight test of each pad-eye with the COR.

5.17.6. NOTES

5.17.6.1. One source for padeyes is provided below:

Harbach Marketing, Inc
218 W Richey Road
Houston, TX 77090
Phone" 281-440-1725
Web: www.padeye.com

END OF ITEM

5.18 ITEM 518: MULTIBEAM SYSTEM INSTALLATION

5.18.1. Scope

5.18.1.1. Provide all labor, material, and equipment required to install a complete Kongsberg EM2040-04 Multibeam System.

5.18.2. References

5.18.2.1. Kongsberg Engineering Requirements Rev B

5.18.2.2. NOAA Vessel Offset Survey Specifications

5.18.2.3. NOAA Drawing HB-461-001, “EM2040 Mk11 0.4x0.7 Installation

5.18.2.4. NOAA Drawing HB 124930, “Casing”

5.18.2.5. NOAA Drawing HB-461-002, “Installation Cable Run Sheets

5.18.2.6. NOAA HB 124622, “Sleeve Doubler, 3-inch NPS”

5.18.2.7. NOAA HB 124931, “Cover”

5.18.2.8. Kongsberg EM2040 Installation Manual

5.18.2.9. EM2040 series - HAT procedure

5.18.2.10. EM2040 series - SAT procedure

5.18.3. Government Furnished Material

5.18.3.1. One complete Kongsberg EM2040-04 multibeam system comprising of: (– estimated value: $250,000)

a) 421502 Display 24" LCD MD24
b) 354265 Bracket for MD22, MD24, MD27, Ceiling, desk
c) 419321 Hydrographic Workstation (HWS)
d) 371931 19" rack mounting for HWS
SIS Realtime software for multibeam, including Software License
e) 460837 SIS 5 Geographical View
SIS logging of satellite data
Hardware key

f) Upgrade to Dual swath for all Dual RX systems:

i. 385411 Upgrade consists of 1x processing unit standard version with two CBMF cards and necessary firmware
ii. 337802 TX transducer 0.4 degree with 15m transducer cable
iii. 444735 RX transducer MKII, 0.7 degree with 15m transducer cable and 0.5m TX-RX sync cable
iv. 357554 Transducer mounting plate, hull installation, Single RX, 0.4x0.7

g) System Manuals
i. 88090070 SVP-70 Sound Velocity Probe; includes cables, junction box and mount.
ii. 348012 15m Tx cable extension
iii. 348011 15m Rx cable extension
iv. 351647 30m Tx Extra Cable (spare)
v. 351645 30m Rx Extra Cable (spare)
vi. 30m SVP Extra Cable (spare)

5.18.3.2. One Kongsberg (Transducer) Casing, 0.7 x 0.4 EM2040-04/SVP-70 – estimated value: $2,500

a) Tx cable wet side plug

b) Rx cable wet side plug

c) SVP-70 cable wet side plug

5.18.3.3. Anti-fouling paint and primer, 1 quart each – estimated value: $50

5.18.3.4. Sound Velocity Probe (SVP) Junction Box Assembly w/power supply – estimated value: $2,500

5.18.4. <u>Requirements</u>

5.18.4.1. Supply the services of fully qualified Kongsberg Field Engineer and a Kongsberg sub-contracted Marine Surveyor to oversee the installation of the system. No installation work shall commence without the review and onsite supervision of the Kongsberg engineer. Kongsberg Field Engineer and Kongsberg sub-contracted Marine Surveyor shall meet and complete all the requirements of Reference 5.18.2.1.

5.18.4.2. The shipyard shall support the Kongsberg engineer and Surveyor to attain the installation accuracy as outlined in Reference 5.18.2.1. If the vessel is docked in a floating drydock, the sensitivity to motion of survey instruments will require that survey work be accomplished during periods when there is very little movement of the dock.

5.18.4.3. Under the onsite direction and support of the Kongsberg engineer and marine surveyor, Reference 5.18.2.1, contractor shall provide all non GFE installation materials and equipment to modify the hull, install and align the GFE Transducer casing, References 5.18.2.3 and 5.18.2.4. ABS surveyor must be present to review fit up, back gouge, final welding (prior to coating) and integrity testing.

5.18.4.4. Provide and install a new gate valve and transducer for the relocation of the Furuno FE800 transducer, Reference 5.18.2.5. Deliver removed transducer to the COR. ABS surveyor must be present to review fit up, back gouge, final welding (prior to coating) and integrity testing of all hull and watertight welds.

5.18.4.5. Under the onsite direction of the Kongsberg engineer, cut cable penetration hole in the casing, Reference 5.18.2.3 and 5.18.2.4. Kongsberg shall provide a .pdf and AutoCad .dwg update to both references with the location of the actual penetration.

5.18.4.6. Supply material, manufacture and install the sleeve Doubler, References 5.18.2.3 and 5.18.2.6. ABS surveyor must be present to review fit up, back gouge, final welding (prior to coating) and integrity testing.

5.18.4.7. Supply materials, modify the compartments, and install the cable conduit, References 5.18.2.3, 5.18.2.4, and 5.18.2.6. ABS surveyor must be present to review fit up, back gouge, final welding (prior to coating) and integrity testing.

5.18.4.8. Perform a nondestructive test (magnetic particle, liquid dye penetrated or vacuum box) of the back gouge and final passes for all hull and watertight welds.

5.18.4.9. Under the onsite direction of the Kongsberg engineer, install and survey the GFE transducer modules and sound velocity probe in the casing, Reference 5.18.2.1, 5.18.2.2, and 5.18.2.8.

5.18.4.10. Run the GFE primary and spare Transmit, Receive and SVP cable set utilizing an existing, available pre-approved cable path by the onsite Kongsberg engineer, Reference 5.18.2.3.

5.18.4.11. Install the GFE SVP junction box (Second Deck, IMU room, near frame 28) as directed by the COR.

SVP Junction Box

5.18.4.12. Under the onsite direction of the Kongsberg engineer, apply the GFE anti-fouling paint, connect cables, tag/dress the cables and install the casing cover. Do not paint the sound velocity probe.

5.18.4.13. Install the EM2040 Processing Unit in the lower ME70 rack (Second Deck, IMU room, near frame 28) as directed by the COR. Reference 5.18.2.8. Connect to available AC power as directed by the COR.

5.18.4.14. Install the EM2040 work station in the Acoustic/Computer Lab (1-38-2) rack as directed by the COR. Reference 5.18.2.8. Connect to available AC power as directed by the COR.

5.18.4.15. Install the GFE Displays in the Acoustic/Computer Lab (1-38-2) as directed by the COR. References 5.18.2.3 and 5.18.2.

5.18.4.16. Provide Shielded CAT6 (plenum) Cable and pull the following new cables:

5.18.4.16.1. (Quantify = 3) From the ME70 computer rack (Second Deck, IMU room, near frame 28) to the Rack Room to the new workstation installed in the Acoustic/Computer Lab (1-38-2), Reference 5.18.2.3. Provide and install aluminum embossed cable tags at cable ends per IEEE-45, tags shall be labeled EM2040 Processor (#1,2,3);

5.18.4.16.2. (Quantity = 3) From the work station in Acoustic/Computer Lab (1-38-2), to the Olex work station on the bridge (Starboard conning console), Reference 5.18.2.3. Provide and install aluminum embossed cable tags at cable ends per IEEE-45 tags shall be labeled EM2040 OLEX (#1,2,3).

5.18.4.17. Kongsberg engineer in conjunction with the ship's ET shall identify outputs from all required system ancillary devices output ports and run inter-rack cables to the work station.

5.18.4.18. Kongsberg engineer shall provide and install all cable terminations and functionally test all newly installed cables.

5.18.4.19. Kongsberg engineer shall connect the EM2040 processor unit to the existing bridge mounted OLEX processor. The EM2040 processor shall be configured to output real time EM2040 bathymetry data output to be displayed by OLEX. OLEX ME70 historic data shall be preserved.

5.18.4.20. Kongsberg engineer shall perform a complete factory Harbor Acceptance Test (HAT) in the presence of the (COR). Reference 5.18.2.9.

5.18.4.21. Kongsberg engineer shall perform a complete factory Sea Acceptance Test (SAT). Reference 5.18.2.10.

5.18.5. Quality Assurance

5.18.5.1. The shipyard shall arrange a formal meeting prior to any installations with the shipyard shift supervisors, NOAA representatives, ABS Surveyor, and the Kongsberg engineer to perform a review of the specification details and references.

5.18.5.2. Applicable sections requiring ABS inspections certified on site by ABS.

5.18.5.3. To minimize electrical interference, the Kongsberg engineer shall review and specify a cable path utilizing existing cableways.

5.18.5.4. Successful HAT with detailed report delivered to the COR

5.18.5.5. Successful dockside and at sea demonstration of OLEX interface and operation

5.18.5.6. Successful SAT with detailed report delivered to the COR

5.18.5.7. At least two seeks prior to the scheduled SAT, the Kongsberg engineer shall formally meet with the ship's command and prepare a test plan and time line for the region of testing.

5.18.6. Notes

5.18.6.1. At the convenience of the government, the Sea Acceptance Test (SAT) may be held after the period of performance end date.

END OF ITEM

5.19 ITEM 519: EK80 SYSTEM INSTALLATION

5.19.1. Scope

5.19.1.1. Upgrade EK80 GPTs, 38 kHz transducer and install 333 kHz transducer.

5.19.2. References

5.19.2.1. EK80 Transducer specification sheets

5.19.2.2. EK80 Mounting Rings

5.19.2.3. EK80 Installation Manual

5.19.2.4. SH-160-FH19-Centerboard Bottom Void Scantlings

5.19.2.5. FE93-001-03ab-Transducer Arrangement and Installation

5.19.2.6. 184 NAVIGATION SYSTEM ALIGNMENT

5.19.2.7. FE89-001-04ab-Mission Scientific Block Wiring Diagram

5.19.2.8. EK80 SAT with calibration

5.19.3. Government Furnished Material

5.19.3.1. MOUNTING RING FOR ES200-7C AND ES333-7C (Est Value: $2,500)

5.19.3.2. ES333-7C SPLIT BEAM 7 EG X 7 DEG 333KHZ W/SUBCON (Est Value: $10,000)

5.19.3.3. CLAMPING RING ASSY FOR ES200-7 AND ES333-7C (Est Value: $2,500)

5.19.3.4. ES333-7C TRANSDUCER CABLE (Est Value: $1,000)

5.19.3.5. ES38-7 38khz 7X7 DEGREE SPLIT BEAM (Est Value: $20,000)

5.19.3.6. EK80 WBT 10-30KHZ (Est Value: $30,000)

5.19.3.7. EK80 WBT 25-50KHZ (Est Value: $30,000)

5.19.3.8. EK80 WBT 45-90KHZ, SPLIT W/LIC (Est Value: $30,000)

5.19.3.9. EK80 WBT 85-170KHZ, SPLIT W/LIC (Est Value: $30,000)

5.19.3.10. EK80 WBT 150-300 KHZ, SPLIT W/LIC (Est Value: $30,000)

5.19.3.11. EK80 WBT 250-500KHZ, SPLIT W/LIC (Est Value: $30,000)

5.19.3.12. EK80 333 kHz dry side pig tail (Est Value: $1,000)

5.19.3.13. EK80 70 kHz wet side pig tail (Est Value: $1,000)

5.19.3.14. EK80 70 kHz wet side connector plug (Est Value: $1,000)

5.19.4. <u>Requirements</u>

5.19.4.1. This work item must be done in conjunction with Item 5.18 Multibeam System Installation.

5.19.4.2. Supply all miscellaneous installation components, cables, connectors, terminations, mounting bolts, hardware, tools, sub-contractors, installation customizations and equipment required to fully meet the installation to manufacturer requirements.

5.19.4.3. Exercise extreme care when handling the transducers. Support and protect to avoid damage during the installation, cabling and painting process. Never pick up a transducer by the cable.

5.19.4.4. When welding, cutting and grinding, cover transducers and cables inside the centerboard with appropriate fire protection blankets and cover the transducer faces. Do not weld the mounting ring with a transducer installed.

5.19.4.5. In conjunction with the ships ET and CET, log out and tag out all power to the EK60 GPTs

5.19.4.6. Disconnect and remove the existing 38 kHz centerboard mounted transducer/cable and deliver to the COR (Figure A). Retain all mounting hardware for re-use. Install the GFE ES-38-7 transducer in the exact location and orientation as per references 5.19.2.1, 5.19.2.2, 5.19.2.3, 5.19.2.4, 5.19.2.5. Pull the 200’ potted cable reusing the same path as transducer removed, into the EK60 junction box, Reference 5.19.2.7. Kongsberg field engineer supplied in Item 5.18, shall make the connections in the junction box.

Figure A. 38 kHz transducer

5.19.4.7. Modify the centerboard to install the GFE 333 kHz transducer mounting ring with proper orientation. Exact location of the transducer shall be as directed by the COR, Figure B. The mounting ring must be installed in conjunction with the a marine surveyor (supplied in Item 5.18) to achieve proper alignment, References 5.19.2.1, 5.19.2.2, 5.19.2.3, 5.19.2.4, 5.19.2.5, 5.19.2.6.

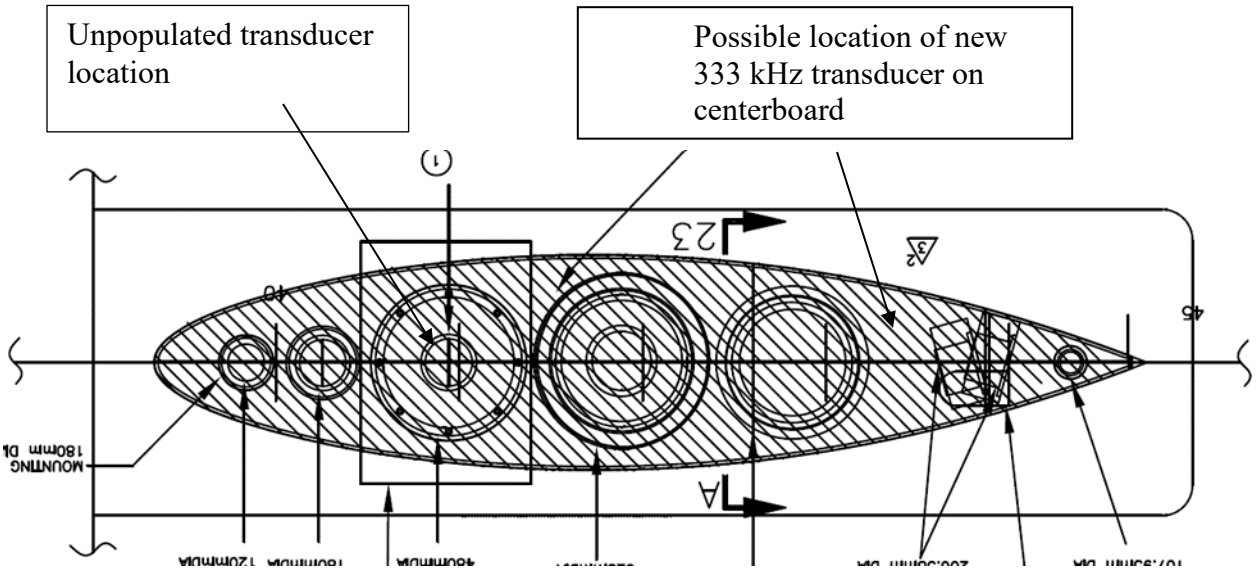


Figure B. Possible location of 333 kHz transducer

5.19.4.8. The GFE 333-7C transducer is supplied with a 200’ potted cable. As directed by the COR, pull the cable through the mounting ring and in an unused centerboard conduit path and into the EK60 junction box, Reference 5.19.2.7. Secure the transducer in the mounting ring with the GFE clamping ring, References 5.19.2.3, 5.19.2.4, 5.19.2.5, 5.19.2.6.

5.19.4.9. Install the GFE 333 kHz pig tail from the EK60 junction box and route through the existing MCT to outside of the Chemistry lab (1-31-1 near frame 44 starboard). The Kongsberg engineer shall make all connections in the EK60 J-Box.

5.19.4.10. As directed by the COR, pull the GFE EK80 70 kHz wet side pig tail cable using an unused centerboard conduit path and into the EK60 junction box, Reference 5.19.2.7. Position the wet side cable in the centerboard for future use near the unpopulated transducer location, Figure B. Install the EK80 70 kHz wet side connector plug.

5.19.4.11. Remove the four existing GPTs mounted outside of the Chemistry Lab on the bulkhead and deliver to the COR, Figure C.

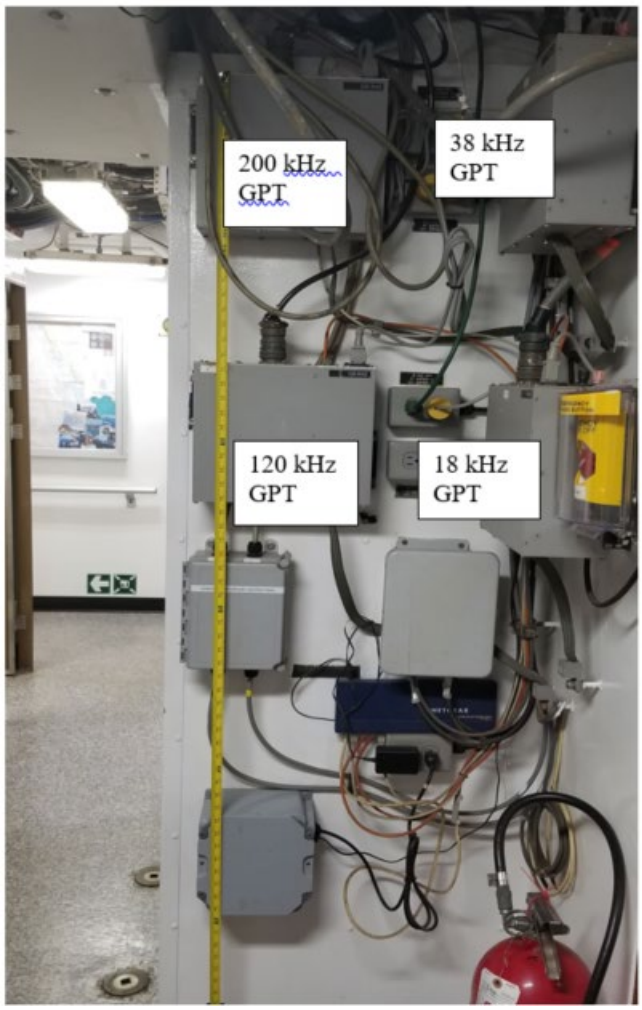


Figure C. Existing GPT bulkhead locations outside of Chemistry lab

5.19.4.12. In conjunction with the ship's CST, ET, CME and COR, replace the removed GPTs with corresponding GFM EK80 WBTs on the bulkhead in locations as directed by the group. The WBTs must generally align with the removed frequencies of the GPTs to ensure cables have slack for connections. Mount on bulkhead as follows;

18kHz GPT mount; EK80 WBT 10-30KHZ
38 kHz GPT, mount EK80 WBT 25-50KHZ
120 kHz GPT, mount; EK80 WBT 85-170KHZ, SPLIT W/LIC
200 kHz GPT, mount; EK80 WBT 150-300 KHZ, SPLIT W/LIC

5.19.4.13. Remove, reconfigure and reinstall the miscellaneous bulkhead components (power outlets, junction boxes, etc) as directed by the COR and install the two new WBTs on the bulkhead as directed by the CST, ET, CME and COR;

(for future 70 kHz transducer); EK80 WBT 45-90KHZ, SPLIT W/LIC

(for new 333 kHz transducer); EK80 WBT 250-500KHZ, SPLIT W/LIC.

5.19.4.14. The ship's ET and Kongsberg field engineer supplied in 5.18, shall verify the required interface, modify the terminations and make the required connections to all of the newly installed WBTs.

5.19.4.15. Supply the at sea services of a qualified, certified Kongsberg engineer to perform underway calibration followed by a sea trial to certify the EK80 system, Reference 5.19.2.7.

5.19.4.16. A sea test plan must be submitted to the ship's command 30 days in advance of the end of the POP.

5.19.5. Quality Assurance

5.19.5.1. Proper installation alignment verified by the marine surveyor.

5.19.5.2. Successful calibration and at sea acceptance test of the EK80 system.

5.19.5.3. Proper MCT packing and integrity verification.

5.19.6. Notes

5.19.6.1. Drawings are for general information only and may not represent the actual as-built conditions.

5.19.6.2. Configuration and dockside testing after refloat will be performed by Kongsberg with an existing NOAA contract.

END OF ITEM

5.20 ITEM 520: SCANMAR COMPUTER INSTALLATION

5.20.1. Scope

5.20.1.1. Procure and install a SCANMAR computer in the Computer Lab.

5.20.2. References

5.20.2.1. None

5.20.3. Government Furnished Material

5.20.3.1. None

5.20.4. Requirements

5.20.4.1. Procure the computer for the PISCES Scanmar ScanBas System. Scanmar ScanBas system must be procured new and certified from the OEM. One possible source is provided below:

Rapp Marine, LLC
2260 W Commodore Way
Seattle, WA 98199
POC: Rune Pederson
Phone: 206-446-1704
Email: rune.pedersen@macgregor.com

5.20.4.2. Scanmar ScanBas system computer components include:
- 5.20.4.2.1. ScanBas SRU-SB01 CW (PL)
- 5.20.4.2.2. SW Function : MultiTrawl
- 5.20.4.2.3. FW Function: TrawlEye, ScanBas
- 5.20.4.2.4. Hydrophone Distribution Box SHD 06(PL)
- 5.20.4.2.5. ScanBas Keyboard SCP-01 (PL)
- 5.20.4.2.6. Display SC19-01(PL)CE
- 5.20.4.2.7. Remote Control SB/SS/SM/SC(PL)

5.20.4.3. Turnover the computer to the Chief Survey Tech for installation on PISCES.

5.20.5. Quality Assurance

5.20.5.1. Test the system installation during sea trials with the Chief Survey Tech.

5.20.6. Notes

5.20.6.1. None

END OF ITEM

5.21 ITEM 521: MISCELLANEOUS SCIENTIFIC AND NAVIGATION EQUIPMENT REPAIRS AND UPGRADES

5.21.1. Scope

5.21.1.1. Perform 18 month Gyro maintenance and at sea calibration of Consilium speed log.

5.21.2. References

5.21.2.1. SALT2 Speed log specification sheet

5.21.2.2. Consilium_Model_SAL_R1a_Doppler_Speed_Log_Installation_Manual

5.21.2.3. Sperry Marine 2018 Gyro maintenance report

5.21.2.4. Sperry_Navigat_MKI_Gyro_Operation-Installation- Service_Manual.pdf

5.21.2.5. Yokogawa LR525 dual axis EML500 Display

5.21.3. Government Furnished Material

5.21.3.1. None

5.21.4. Requirements

5.21.4.1. Procure the services of a qualified, certified Consilium field engineer dockside, to review the existing installation of the SAL-T2 speed log system (Figure 1), review manufacturer recommended transducer maintenance with the ship's ETs and command, and provide at least four hours of demonstration and training for six of the ship's staff on how to remove and reinstall transducer from the gate valve when floated. The Consilium field engineer shall also attend a one day sea trial and perform a complete calibration of the existing SAL-T2 speed log per manufacturer's specifications, References 5.21.2.1, 5.21.2.2. For bidding purposes, Contractor shall estimate two (QTY 2) trips for the field engineer and a total of twenty-four (QTY 24) hours on-scene support. Contractor shall submit a CFR for any additional required support to accomplish this work item.

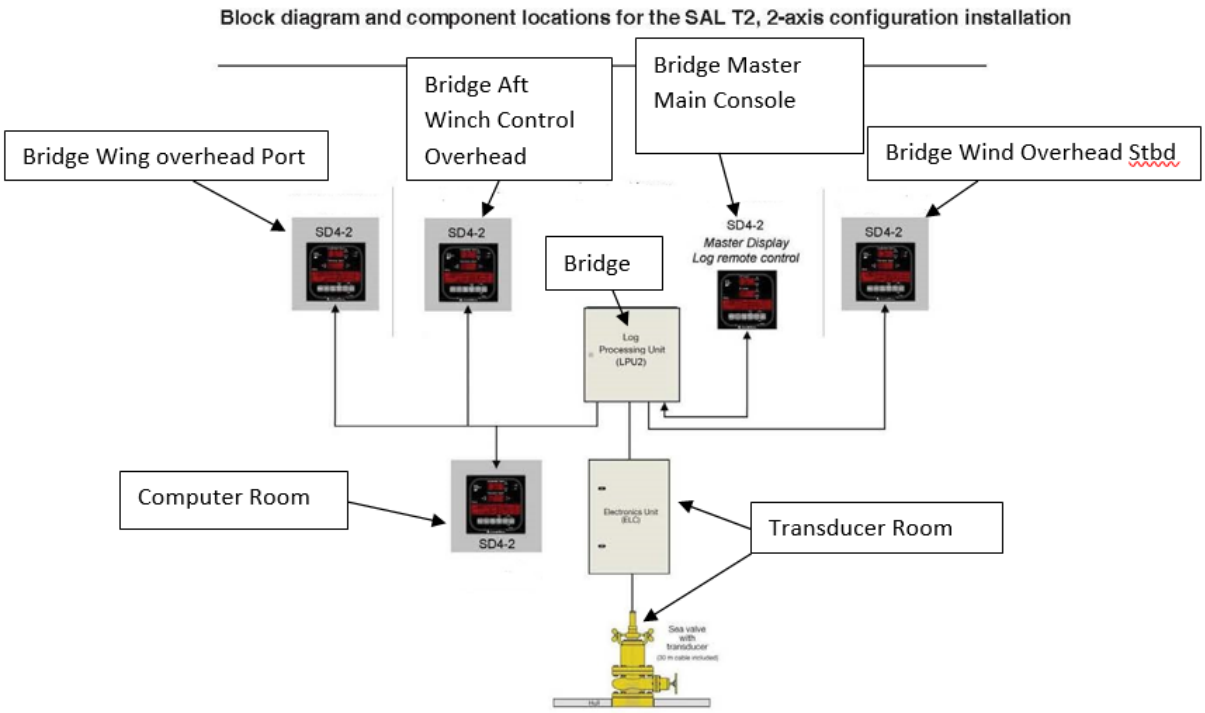


Figure 1. SAL T2 Speed log Block Diagram

5.21.4.2. The Consilium field engineer shall provide an at sea calibration test plan to the ship's command at least 30 days prior to the end of the period of performance date. Tests plan shall include #line(s) run, distances, estimated time to perform when on calibration station, and sonar frequencies that may interfere with calibration

5.21.4.3. Procure the services of a qualified, certified Sperry marine field engineer with all required fluids and parts to perform a 18 month factory maintenance on dual Sperry Navigat-X, Mod-3 gyros, SNs; 6222 & 6223, Reference 5.21.2.3, 5.21.2.4. The Sperry marine engineer shall review the operation of the gyros at dock and in conjunction with the ET perform a power down/spin down operation.

5.21.4.4. The Sperry Marine field engineer shall also review reported NAVITWIN IV display lockups with the ship's command and ETs and also provide a NAVITWIN IV display to replace defective unit or leave on the ship as a spare.

5.21.5. Quality Assurance

5.21.5.1. Successful at sea calibration of SAL T2+ Speed log with written report of tests performed.

5.21.5.2. Sperry Marine field engineer must be factory certified for warranty validation.

5.21.5.3. The Sperry Marine field engineer shall also provide a written report of maintenance performed, next required maintenance details, and any recommended additional work on the gyro system.

5.21.6. Notes

5.21.6.1. Possible source for Consilium field engineer;
Consilium Marine
4370 Oakes Rd Ste 720
Fort Lauderdale, FL, 33314-2235
(954) 791-7550

Mackay World Service 24/7:
+1-281-478-6245, or
service@mackaymarine.com

5.21.6.2. Possible source for Sperry Marine field engineer;
Sperry Marine
9193 Winkler Drive Suite G1
Houston, Texas 77017
Tel: +1 800 228 6126

5.21.6.3. Transducer training must be done in conjunction with work item 3.8 SEA VALVE OVERHAULS and after the overhaul of the SAL-T2 sea valve;

Seawater Valve in Transducer Void

	Valve Identification	Valve ID Number	Size	Valve Type	Mfg.
31	Doppler Speed Log Hull Isolation Valve, Lower Level,	529-VL-61	8-inch	Gate, flanged, Reachrod	

01

END OF ITEM

5.22 ITEM 522: CLOSED CIRCUIT TELEVISION SYSTEM UPGRADE

5.22.1. Scope

5.22.1.1. Provide all labor, materials and equipment to replace the Closed Circuit Television system (CCTV) onboard the NOAA ship PISCES.

5.22.2. References

5.22.2.1. NOAA Drawing FE65, "CCTV Block wiring Diagram Sheet 1 and Sheet 5"

5.22.2.2. NOAA Drawing FA02, "General Arrangements"

5.22.2.3. NOAA Drawing FE01, "Power One Line Sheets 27-30"

5.22.2.4. NOAA Drawing CCTV Upgrade, "Conceptual drawing"

5.22.2.5. NOAA Standard Specification No. 300-3, "General Requirements for Electrical/Electronic Items"

5.22.2.6. IEEE 45, IEEE "Recommended Practice for Electric Installations on Shipboard"

5.22.2.7. Camera and specification sheets

5.22.2.8. VideoXpert professional v3.12 product specification

5.22.3. Government Furnished Material

5.22.3.1. Existing CCTV Workstations; QTY=6 (Est Value: $18,000 total)

5.22.3.2. Existing CCTV Displays; QTY =7 (Est Value: $12,000 total)

5.22.4. Requirements

5.22.4.1. *Note: This Contractor Furnished Equipment (CFE) list is provided for this item to help clarify requirements and scope of work. This list is based on experiences and lessons learned from other NOAA ships and is provided as an extra information set. Contractor shall order below CFM within ten (QTY 10) days of Contact award.*

If requested part numbers are not available, the Contractor shall provide a specification sheet to the COR for review and approval prior to purchase and installation.

Part Number	Description	QTY	Remark/Location
Pelco "IBP531-1ER"	Fixed Pelco 5 Megapixel Sarix Pro Environment Short-Tele Bullet Camera	4	One Spare – Deliver to COR
Pelco "IBP3BBAP-ES"	Sarix Pro Bullet Surface Mount	3	
Pelco "IMP131-1IRS"	Fixed Dome Pelco Sarix IMP Series network surveillance camera	4	One Spare – Deliver to COR. Port and Starboard Transducer Void TLIs and Port Bow Thruster TLI
Pelco "IMPPMB-1I"	Wall Mount Bracket for Indoor Models	3	
Pelco "S7230L-EW1US"	PTZ Spectra® 7 Enhanced Series IP PTZ Domes	15	One Spare – Deliver to COR
Pelco "IWM-GY"	Wall Mt for Spectra Series	13	
Pelco/Custom – (TBD)	Adapter mount for Flying Bridge Starboard camera	1	Flying Bridge Starboard
Pelco "VXP-P2-72-5T"	Server, Power RAID 5 Network Video Recorder, 72TB	1	
Pelco "VXP-1C-3Y"	VideoXpert™ Professional 1 Channel License + 3yr Software Upgrade	21	
Pelco "POE190BT"	POE Injector 90WATT Single Port	14	
FLIR "M332"	Pan/Tilt Stabilized Marine Thermal Imaging camera	1	Flying Bridge Forward
FLIR "JCU-2"	FLIR Joystick Controller	1	In the Pilothouse
Cisco "CBS350-16FP- 2G"	POE Managed Switch	4	
"C6AXR-1167BK"	CAT6A 1000ft Indoor/Outdoor UV Resistant, Shielded CMX/CMR, Black, Spool	3	Spares – Deliver to COR
"C6APS-1089BK"	CAT6A Plenum Bulk Ethernet Cable, CMP, Shielded Solid Copper Conductors, 23AWG, 1000FT	4	Spares – Deliver to COR
"CN1-7902-8C6AS"	RJ45 CAT6A Shielded Connector, 100/PK	3	Spares – Deliver to COR
Altronix "EBRIDGE1CR"	IP over Coax receiver	2	

5.22.4.2. Perform all electrical work in accordance with Reference 5.22.2.1 and 5.22.2.6. Re-use existing cableways, penetrations, cable clamps, flexible conduits and preserved power circuits. Repack and verify disturbed Multi-cable Transits (MCTs) and cable transits.

5.22.4.3. Remove all unused flexible conduits and repack the existing cable penetrations for watertight integrity.

5.22.4.4. Replace all damaged flexible conduits with new flexible conduits.

5.22.4.5. Provide new cable penetrations and MCTs in locations as required. Bulkhead penetrations for electronic and network cable runs shall each have 50% spares.

5.22.4.6. CCTV network switches and workstations shall be connected to existing Uninterruptible Power Supply (UPS) SCP 111A and SCP 110A circuits.

5.22.4.7. Restore all disturbed bulkhead penetrations, fabrication works and any disturbed painted surfaces to original condition. Cables and liquid-tight conduit runs shall be securely fastened against movement. Cable standoffs and clamps to be added and installed as required. All cable ends are to be labeled with permanent metal cable tags adjacent to the cameras, switches, and power sources.

5.22.4.8. Watertight terminal boxes shall be provided in locations exposed to the weather.

5.22.4.9. All cables shall be rated as low smoke, plenum and rated for shipboard use. UV rated cables shall be provided in locations exposed to the weather.

5.22.4.10. Follow procedures contained in manufacturer's technical and operational manuals/guides.

5.22.4.11. This CCTV system shall function under its own network with option connecting to the ship's network.

5.22.4.12. Perform Optical Time Domain Reflectometers (TDR) copper cable test. Each cable shall be tested and recorded with an industrial approved LAN cable certifier or equivalent for electrical characteristics as outlined in ANSI/TIA-568-C.2 and compared to the cable manufacturing specifications. Submit a Conditions Found Report (CFR) to document test results to the Contracting Officer's Representative (COR).

5.22.4.13. Perform a walk through with the ship's ET, MSE and the COR to review the installation details of the new CCTV system, References 5.22.2.1 through 5.22.2.8. The review shall include but not limited to:

a) Cabling path and install direction for CAT6A cables.
b) Termination review for CAT6A cables.
c) Existing locations, relocated and camera mounting positions with defined

pointing angles.
d) Grounding instructions.
e) Mounting instructions for all components.
f) Power requirements and power plan.

Existing System Removal:

5.22.4.14. Preserve the existing CCTV monitors and workstations in various locations.

5.22.4.15. Remove the analog CCTV system in its entirety, including all old cabling and old power (115vac and 24vac transformers). Return the removed system to the ship's Electronics Department for disposal.

5.22.4.16. The following analog cameras shall be removed.

Camera Type	Original Location
PTZ	Main Deck Gallows (Starboard)
Fixed	Trawl Winch Room, Port (3-82-0)
Fixed	Trawl Winch Room, Starboard (3-82-0)
PTZ	Oceanographic Winch Room (3-68-0)
PTZ	02 Deck at Side Sampling Station (SSS)
Fixed	02 Deck Frame 65
PTZ	Auxiliary Machinery Room (3-39-01)
PTZ	Flying Bridge Starboard, SSS Work Deck
PTZ	Bow Thruster (2-16-2)
PTZ	Transducer Room (4-23-0)
PTZ	Aft Pilothouse 3rd Deck
PTZ	Port Aft Gallows
PTZ	Starboard Aft Gallows
PTZ	Stack (Port)
PTZ	Shaft Alley, Main Motor Room (MMR), Lower Lever Aft (4-49-0)
PTZ	Main Motor Room, Lower Level (4-49-0)
Pan/tilt	FLIR Camera, Flying Bridge Forward

New System Installation:

5.22.4.17. Supply all installation components, cables, connectors, terminations, hardware, mounts, installation customizations and equipment required to fully complete the installation to manufacturer standards.

5.22.4.18. Prior to camera installation, the contractor shall supply a list of make/model and serial numbers for all cameras and deliver to the COR.

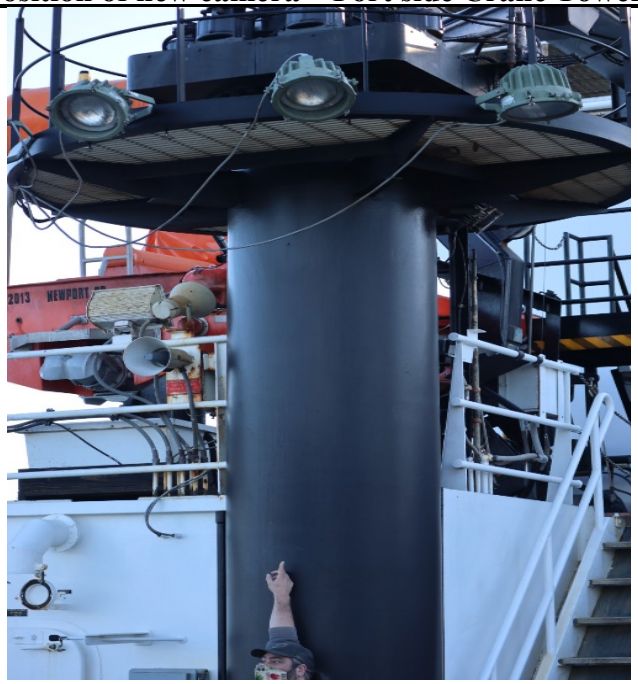
5.22.4.19. Install the new CFE Pelco Cameras (types) in the same original locations and new locations as listed below or as directed by the COR.

New CCTV Camera System:

Camera #	Location	Location Description	Camera Type	Service	Part No.	Mounting and Notes
1	Starboard Aft Main Deck	Main Deck Gallows	PTZ	OUTDOOR	S7230L-EW1	
2	3-82-0	Port Trawl Winch Cable Tension	FIXED	INDOOR	IBP531-1ER	Relocate - TBD
3	3-82-0	Starboard Trawl Winch Cable Tension	FIXED	INDOOR	IBP531-1ER	Relocate - TBD
4	3-68-0	Oceanographic Winch Room	PTZ	INDDOR	S7230L-EW1	
5	Starboard, 02 Deck	Side Sampling Station (SSS)	PTZ	OUTDOOR	S7230L-EW1	
6	02 Deck	02 Deck Frame 65	FIXED	OUTDOOR	IBP531-1ER	
7	Flying Bridge, Forward	FLIR - Flying Bridge	PAN/TILT	OUTDOOR	FLIR	Joystick Controller locates in the Pilothouse
8	3-39-01	Auxiliary Machinery Room (AMR)	PTZ	INDOOR	S7230L-EW1	
9	04 Deck	Flying Bridge Starboard, SSS Work Deck	PTZ	OUTDOOR	S7230L-EW1	
10	3-13-0	Bow Thruster Room	PTZ	INDOOR	S7230L-EW1	
11	4-23-0	Transducer Room	PTZ	INDOOR	S7230L-EW1	
12	03 Deck	Aft Pilothouse	PTZ	OUTDOOR	S7230L-EW1	
13	Aft Main Deck	Port Crane Tower	PTZ	OUTDOOR	S7230L-EW1	Relocate from Port Aft Gallows
14	Aft Main Deck	Starboard Crane Tower	PTZ	OUTDOOR	S7230L-EW1	Relocate from Stbd Aft Gallows
15	Port, 04 Deck	Stack	PTZ	OUTDOOR	S7230L-EW1	

16	4-49-0	Shaft Alley, Main Machinery Room (MMR), Lower Lever Aft	PTZ	INDOOR	S7230L-EW1	
17	4-49-0	Main Motor Room, Lower Level	PTZ	INDOOR	S7230L-EW1	
18	4-23-0	Transducer Void, Port, Tank Level Indicator (TLI)	FIXED	INDOOR	IMP131-1IRS	Add
19	4-23-0	Transducer Void, Starboard, Tank Level Indicator (TLI)	FIXED	INDOOR	IMP131-1IRS	Add
20	3-13-0	Bow Thruster Room, Port, Tank Level Indicator (TLI)	FIXED	INDOOR	IMP131-1IRS	Add
21	3-13-0	Bow Thruster Room, Starboard, Tank Level Indicator (TLI)	PTZ	INDOOR	S7230L-EW1	Add

Position of new camera – Port side Crane Tower:



Position of new camera – Starboard side Crane Tower:

Position of new camera – Transducer Void Port TLI:

Position of new camera – Transducer Void Starboard TLI:

Position of new camera – Bow Thruster Port TLI:

Position of new camera – Bow Thruster Starboard TLI:

5.22.4.20. Install the CFE Pelco server in Acoustic/Computer Lab Rack (1-38-2).

5.22.4.21. Install each of the CFE Cisco 16 port 240W POE Switches in the following location. The COR shall specify actual locations.

1. Dry Lab Rack (1-47-0)
2. Aft Pilot House ACS Console (03-34-0)
3. Trawl Winch Room (3-82-0)
4. EOS (2-63-0)

5.22.4.22. The following GFE workstations and displays shall be reused.

Location of the existing workstations and displays
Acoustic Lab (1-38-2)
Chemistry Lab (1-31-1)
Dry Lab (1-47-0)
Aft Pilot House – Over ACS Console (03- 34-0)
Forward Pilot House – Port Side Conning (03-34-0)
EOS
EOS
AMR

5.22.4.23. Pull and terminate all of the required cabling to all installed components. After terminating, test CAT6A cables as described in Section 5k. Re-use preserved power circuits. Re-use existing cable paths, wireways and cable penetrations.

5.22.4.24. Provide and install new aluminum, embossed cable tags when installing new cabling. Cable tags shall be located at each end of cable runs and where penetrating decks and bulkheads, reference 5.22.2.5 and 5.22.2.6. Label cable tags as follows (XX = sequential number beginning with 01).

Power cable code – CCTV PWR-XX
Video Cable code – CCTV CAMERA-XX
Workstation code – CCTV WS-XX

5.22.4.25. Provide an IP over Coax receiver, Altronix "EBRIDGE1CR" or equal to connect the existing TV modulators to the CCTV network switch located in the Pilothouse and Computer/Acoustic Lab.

5.22.4.26. Provide the ship services of a qualified, certified Pelco Engineer to certify the contractor installation, commission, configure and provide informal operational training. The Pelco Engineer shall confirm the contractor installation is to manufacturer standards, power, commission, configure/test the new system servers, workstations, load client workstations software, and configure all new cameras. The Pelco engineer shall ensure that all components software and firmware are at the latest revisions and configure the new workstations with full permissions. Set PTZ views for each camera and configure a "home" setting menu button to reset to a default view. Configure the main DVR to record all cameras for 30 days with the frame resolution.

5.22.4.27. Install the client software on up to 20 different ship workstations. In conjunction with the ship's ET, connect and configure the system to the ship's network and ensure all workstations loaded with client software, can access the camera network. Set permissions as directed by the COR.

5.22.4.28. The Pelco engineer shall provide up to 16 hours of individual and group informal operational training for up to 20 of the ship's officers and crew. Training shall focus on basic operations including accessing, pan, zoom, and focus of all cameras, optional settings, and programming viewing/saving clips from the DVR. Train the ship's ET on downloading and installing software and firmware revisions for all components subject to upgrades.

Deliverables:

5.22.4.29. Provide a copy of all reports and documentation of new CCTV Camera system as well as all documented test/operational values obtained during the initial light off and performance assessment of the new system to the COR.

5.22.4.30. The contractor shall use the conceptual drawing in Reference 5.22.2.4 to update all redlines/markups and deliver to COR the final installation drawings that include a complete parts list, block diagram, cable tag listing and a wiring diagram that show all component connections to the individual pin level in AutoCAD .dwg and .pdf format.

5.22.4.31. Provide hard copies and digital copies of all hardware and software manuals in .pdf format to the COR.

5.22.5. Quality Assurance

5.22.5.1. CCTV system configuration and commissioning shall be performed by an authorized Pelco service provider.

5.22.5.2. CCTV system shall function under its own network with option connecting to the ship's network.

5.22.5.3. Cable tags coded and installed correctly.

5.22.5.4. Pelco Engineer shall demonstrate to COR all cameras are functioning properly and displaying on each work station/client work stations and operate with all requested configurations and permissions.

5.22.5.5. Proper blocks installed and closure of all MCTs and unused penetrations.

5.22.6. Notes

5.22.6.1. Possible sources for Pelco and Non-Pelco components:

Surveillance - Video
Address: 387 Canal St New York, NY 10013
Phone: 1.800.955.5201
Email: info@Surveillance-Video.com

JMAC Supply Corp.
188 Atlantic Ave,
Garden City Park NY 11040
Phone: (516) 812-0917
sales@jmac.com

123securityproducts

(631) 696-5127
ask@123securityproducts.com
731 Union Parkway
Ronkonkoma, NY 11779

Anixter Inc.
2301 Patriot Blvd.
Glenview, IL 60026
anixter.com

Connection Inc.
1.800.800.0019
connection.com

CDW.com
Vernon Hills, Ill

Primus Cable
29415 Hunco Way
Lake Elsinore, CA 92530
PH: 951-824-1571
primuscable.com

ShowMeCables Showmecables.com
115 Chesterfield Industrial Blvd
Chesterfield, Missouri 63005
1-844-519-2601

BALTIC NETWORKS balticnetworks.com
2200 Ogden Avenue, Suite 240
Lisle, IL 60532
1-630-929-3610

Newegg www.newegg.com
18045 Rowland Street
Industry, CA 91748

Possible Source of Pelco Engineer:
Raymond Palatta – Business Development Manager
Email: Raymond.palatta@pelco.com
Tel: 559-292-1981
Cell: 718-840-9193

END OF ITEM

5.23 ITEM 523: SATELLITE TV SYSTEM GROOM

5.23.1. Scope

5.23.1.1. Perform a dockside and at sea groom of the SAT TV System

5.23.2. References

5.23.2.1. PE51-001-03-Antenna Arrangement
5.23.2.2. PI SAT TV BLOCK sketch scan0072
5.23.2.3. PI Intellian TV VISIO sketch Rev a. ET Tony
5.23.2.4. PI SAT TV reported issues Rev a.
5.23.2.5. PISCES SAT TV CHANNELS PURCHASED Rev. a
5.23.2.6. Henry Bigelow S6HD Quotation
5.23.2.7. MV Henry Bigelow Service Report FEB03_21
5.23.2.8. DWG MOCA-HB-434A-02 INSTALLATION Rev b

5.23.3. Government Furnished Material

5.23.3.1. None

5.23.4. Requirements

5.23.4.1. Procure the services of a qualified, certified Intellion (engineering office) Field Service Engineer (IFSE), to evaluate and tune the installed Satellite TV system; S6HD TVRO. Review shall include as built drawings, overall installation, recommend circuit improvements, firmware updates and perform low level adjustments in the software or firmware (tracking scale) to achieve optimal at sea performance. The IFSE shall also carry a service kit containing a selection of field replaceable units (such as belts and circuit cards) for the antenna and other FRUs (Field Replaceable Units).

5.23.4.2. In conjunction with the ship's ET and MSE (Mission System Engineer), the IFSE shall review the overall system installation, operational issues, evaluate the performance of the system dockside, and the as built schematic. Provide a condition report for recommended circuit changes to improve the quality of operation. References, 5.23.2.1, 5.23.2.2, 5.23.2.3, 5.23.2.4, 5.23.2.5, 5.23.2.6 apply.

5.23.4.3. Contractor shall support the IFSE and provide two shipyard staff members fully certified with proper safety gear, to climb the main mast and under the direction of the IFSE, inspect/tighten pedestal mounting, remove the SAT TV dome cover and evaluate the condition of the internal components. Contractor shall make all adjustments/repairs to the dome components as directed by the

IFSE and issue a condition report if parts are needed or if the dome needs to be removed to perform service.

Pisces Antenna top main mast

Bigelow Antenna in service

5.23.4.4. The IFSE shall provide at least four hours of dockside training with available ETs and the MSE to review regions of anticipated travel, APTUS-ACU (Antenna Control Software) menu setting adjustments for optimum viewing in those regions, ACU diagnostics and develop a written troubleshooting protocol, including but not limited to, capturing antenna data for distribution to Intellian customer service and possible remoting into system for future service issues.

5.23.4.5. The IFSE shall attend a one day sea trial to evaluate and program menu parameters or low level software and firmware changes to achieve optimal at sea performance. The IFSE shall provide a sea test plan with the COR at least 30 days in advance of the projected sea test date that defines maneuvers to exercise the system at its limits to evaluate dynamic performance. At sea tests shall also include a fixed heading incrementing speeds by 0.5 knots to full speed to evaluate possible vibration issues currently experienced by sister ship FSV HENRY BIGELOW. References 5.23.2.6 and 5.23.2.7 apply.

5.23.5. **Quality Assurance**

5.23.5.1. The dockside work must be performed within the 25% of the POP to ensure any repairs requiring significant time can be completed prior to the at sea evaluation.

5.23.5.2. Provide a detailed written report that outlines all of the hardware changes, repairs, menu or software changes performed on the system as well as red line mark ups to the SAT TV circuit and the written troubleshooting protocol procedure developed in line 5.23.2.4.

5.23.6. **Notes**

5.23.6.1. Drawings are for general information only and may not represent the actual as-built conditions.

5.23.6.2. The sister ship HENRY BIGELOW has the identical Antenna installed. References 5.23.1.6 outlines the at sea service changes made by an IFSE to resolve severe dish locking issues. The Bigelow is also currently experiencing apparent vibration issues at ~9-10 knots @98RPM. The PISCES is of the same class of the Bigelow and may experience similar issues.

5.23.6.3. Performance of antenna climb must be done when no precipitation is occurring and winds are minimal.

5.23.6.4. Possible providers of Intellian service

Radio Holland (sub-contracting may be required for Intellian Field Service Engineer)
9191 Gulf Freeway
Building "D" – Suite 100
Houston, TX 77017
USA Sales Responsible
T +1 713 378 2100 F +1 713 378 2183 Jason Couvillon
E service.usa@radioholland.com

Mitchell Perrill
Field Service Engineer | Technical Support (Americas).
Intellian
11 Studebaker, Irvine, CA 92618
T +1-949-727-4498 ext. 1153
M +1-949-294-9688
mitchell.perrill@intelliantech.com

END OF ITEM

Appendix A: Standard Specifications, Drawings, and Tech Manuals

Paragraph	Reference Title
2.1.3.1	ABS: American Bureau of Shipping "Rules for Building and Classing Steel Vessels Under 90 Meters in Length"
2.1.3.2	ABS: American Bureau of Shipping “Rules for Survey After Construction”
2.1.3.3	CFR: U. S. Coast Guard "Subchapter F - Marine Engineering", 46 CFR 50 through 46 CFR 64
2.1.3.4	CFR: U. S. Coast Guard "Subchapter J - Electrical Engineering", 46 CFR 110 through 46 CFR 113
2.1.3.5	Oceanographic Research Vessel (ORV)- 46 CFR chapters 188-196
2.1.3.6	Standard: IEEE Std 45-2002, "IEEE Recommended Practice for Electric Installations on Shipboard"
2.1.4.1	NOAA Standard Specification AMC-000-1G, “General Requirements for Contract Repair Work on NOAA Ships”
2.1.4.2	NOAA Standard Specification MOC-300-3, “General Requirements for Electrical/ Electronic Items”
2.1.4.3	NOAA Standard Specification MOC-631-2D, “Coating Systems for Steel Surfaces
2.1.4.4	NOAA Standard Specification AMC-631-4, “Coating Systems for Aluminum Surfaces”
2.1.4.5	NOAA Standard Specification AMC-997-1A, “Drydocking and Routine Drydock Work”
2.1.4.6	Drawing 085 FA04, “Docking Drawing” (PISCES only)
2.1.4.7	Drawing FA02, “General Arrangements”
2.1.4.8	Drawing M283-304-FE41 “Penetration Details”
2.1.4.9	Drawing M283-304-FE43 “Bonding and Grounding Details”
2.1.4.10	Drawing M283-304-FE45 “Electrical Installation Details”
2.1.4.11	Drawing FF04, “Painting Schedule”
2.1.4.12	Drawing M283-304-FF03 “Color Coordination Manual”
2.1.4.13	Drawing SH-081-FM10-Equipment Removal Routes
3.1.2.1	NOAA Standard Specification AMC-000-2D, “Temporary Services at Contractor Facilities”
3.1.2.2	NOAA Standard Specification AMC-000-1H, “General Requirements for Contract Repair Work on NOAA Ships”
3.2.2.1.	NOAA Standard Specification MOC-100-1A, “ABS Load Line Survey”
3.2.2.2.	Drawing M282-085-FA02 “General Arrangements”
3.2.2.3.	Drawing No. FC05-001-01, “Tank Capacity Curves.”
3.2.2.4.	Drawing No. SH-100-FH02, “Hull Forebody Scantlings Frame 0-18”
3.2.2.5.	Drawing No. SH-110-FH03, “Hull Midbody Scantlings Frame 19-49”
3.2.2.6.	Drawing No. SH-100-FH04, “Hull Sternbody Scantlings Frame 49-82”
3.2.2.7.	Drawing No. SH-100-FH-05, “Hull Transom Scantlings Frame 82-Transom”

3.2.2.8.	Drawing No. SH-101-FH11, “Fwd House Scantlings, 01-03 Level, Fr 39-Fwd”
3.2.2.9.	Drawing No. SH-101-FH12, “Aft House Scantlings, 01-03 Level, Fr 39-Aft”
3.2.2.10.	Drawing No. SH-101-FH14, “Pilothouse Scantlings 03-04 Level”
3.2.2.11.	Drawing No. SH-111-FH17, “Bulwarks Layout and Scantlings”
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3.2.2.13.	Drawing No. SH-161-FH-19, “Centerboard Bottom Void Scantlings”
3.2.2.14.	NOAA Standard Specification AMC-505-2, “Hydrostatic Pressure Tests”
3.3.2.1.	NOAA Standard Specification AMC-997-1A, “Drydocking and Routine Drydock Work”
3.3.2.2.	Drawing 085 FA04, “Docking Drawing” (PISCES only)
3.3.2.3.	Drawing HB-163 FP19, “Sea Chest Diagram”
3.3.2.4.	Drawing HB-243 FM01, “Shafting Layout and Details”
3.3.2.5.	Tech Manual HB-244 01 (FRV40-225-006-010), “Stern Tube Bearing (Thordon Compac) and Shaft Seal (Kobelco)”
3.4.2.1	Drawing HB-163 FP19, “Sea Chest Diagram”
3.5.2.1	Technical Manual FRV40-225-011-010 “Cathodic Protection System, Marimpress”
3.5.2.2	Technical Manual “Aquamatic 4 Impressed Current Cathodic Protection System”
3.5.2.3	Technical Manual FRV40-226-139-010 “Cathelco Antifouling System”
3.6.2.1	Tech Manual HB-562 (FRV40-226-071-010), “High Performance Flap Rudder, Model: Becker FKSR”
3.6.2.2	Drawing HB-562 FM02, “Rudder Arrangement”
3.6.2.3	Drawing HB-243 FM01, “Shafting Layout & Details”
3.6.2.4	NOAA Standard Specification AMC-240-1, “Propulsion Shaft and Propellers”
3.6.2.5	Tech Manual HB-244 (FRV40-225-006-010), “Stern Tube Bearing (Thordon Compac) and Shaft Seal (Kobelco)”
3.6.2.6	SKF Instruction File SKF C 3184 KM, “CARB Bearing Dismounting”
3.6.2.8	Tech Manual HB-243 (FRV40-225-099-010), “Marine Shaft Braking System, Twiflex Model: T40-EN Caliper(s) with 20:1 Air/Hydraulic Intensifier”
3.6.2.9	SKF Instruction Number 81489, “The SKF OKV Coupling Mounting & Dismounting Instruction”
3.6.2.10	SKF Drawing 25616 Rev 9, “Ovako Couplings AB”
3.7.2.1	Tech Manual HB-244 (FRV40-225-005-010), “Bearings, Lineshaft and Thrust; Model: SKF and Michell Bearing”
3.8.2.1	NOAA Standard Spec AMC-505-1B, “Valve Overhaul & Test”
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3.9.2.1	NOAA Standard Specification AMC-581-1A, “Inspection and Preservation of Ground Tackle”
3.9.2.2	Drawing OD-581-002, "R/V OSCAR DYSON Anchor Handling Modifications Key Plans" (2006) (use for below deck arrangement)
3.9.2.3	Drawing OD-581-03, R/V HENRY BIGELOW Anchor Handling Modifications Key Plans" (2009) (use for topside arrangement)
3.9.2.4	Drawing 582-FH20, "Anchor Storage and Handling Layout and Details", sheet 1 (use for painting and marking details)
3.9.2.5	Drawing 100-FH02, "Hull Forebody Scantlings FR0-FR18", sheets 3 and 4
3.9.2.6	Technical Manual FRV40-226-004-010 Rev 2 “Anchor Windlass”
3.10.2.1	NOAA Standard Specification AMC-631-1B, “Epoxy-Polyamide/Vinyl Underwater Body Coating System”
3.10.2.3	Drawing HB-085 FA01, “Outboard Profile”
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3.17.2.5	Drawing M284-256-PZ57 “Damage Control Diagram Bilge, Ballast, and SW Systems”
3.18.2.7	Drawing M283-191-FZ16 “Permanent Ballast Installation”
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3.20.2.1	Tech Manual HB-568 (FRV40-225-008-010), “Bow Thruster Model: 40 T3S”
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3.20.2.3	Bow Thruster Overhaul Parts Ship Set for NOAA Ship PISCES Enquiry No. 23196
3.21.2.1	Drawing FA05-001-07 “Fire Control Plan”
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3.21.2.4	Drawing M283-555-FP15 “CO2 Fire Suppression Systems”
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3.21.2.6	Drawing M282-300-FE01 “Power One Line”
3.22.2.1.	NOAA Standard Specification AMC-583-1B, General Requirements for Life Raft Inspections
3.23.2.1.	Technical Manual FRV40-226-093-010 “Rescue Boat Handling System, Rev 1”
3.23.2.2.	Technical Manual FRV40-226-027-010 “Encapsulated Liferafts and Davits Model: Davit SRR 360/3,65/21 Winch: 08-02 HVStop”
3.23.2.3.	NOAA Procedure 0606-01, “Shipboard Lifting Appliance Certification and Inspections”
3.24.2.1.	Technical Manual FRV40-226-012-010, "Centerboard, Retractable and HPU"
3.25.2.1.	Technical Manual FRV40-226-058-010 “Motor, Propulsion DC, Models: 2795AA, 2x1125 KW (2x1508 HP), 750VDC, 134 RPM”
3.26.2.1.	Tech Manual FRV40-226-134-010 “Knuckle Boom Crane”
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3.27.2.1. Technical Manual FRV40-226-015-010 “Chill Water Plant Model 30HXS086R-140”
3.27.2.2. Technical Manual FRV40-226-090-010 “Refrigeration System, Galley Model 90YR28MSF3ND1K9R”
3.27.2.3. Technical Manual FRV40-225-091-010 “Refrigeration System, Scientific Freezer Model 90YR16MSD3ND1K9R”
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3.30.2.4. PPI NBR 63421-006H (Rev 04), Preservation Process Instruction (PPI) for Cosmetic Polymeric Deck Coverings Type II, Classes 1 & 2 for Wet and Dry Interior Spaces
3.30.2.5. Navy MIL-D-3134J, Deck Covering Materials
3.31.2.1. Drawing M282-100-FH13 “Bimetallic Details”
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3.36.2.2. Technical Manual FRV40-226-028-010 “Diesel Engine Caterpillar 3508B”
3.36.2.3. Technical Manual FRV40-226-030-010 “Diesel Engine, Parts Manual Model: 3508B”, Volumes 1 and 2
3.36.2.4. Technical Manual FRV40-226-041-010 “Kato Generator, 3 Phase Synchronous”
5.1.2.1. Technical Manual FRV40-226-070-010 “Pumps Manual, Model: Various”
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5.4.2.1. NOAA Ship BELL M. SHIMADA R227 A/C Additions on 04 Level
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5.6.2.1. Drawing M284-512-FV05 “HVAC Heater List”
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5.13.2.1. Drawing M282-167-FH62, "Structural Doors, Hatches, Manholes & Scuttles"
5.13.2.2. NAVSEA Drawing 167-7379882, "Procedure & Welding Sequence for Non-Ballistic, Watertight & Airtight Quick Acting or Individually Dogged Personnel Doors"
5.18.2.1. Kongsberg Engineering Requirements Rev B
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5.21.2.3. Sperry Marine 2018 Gyro maintenance report
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5.21.2.5. Yokogawa LR525 dual axis EML500 Display
5.22.2.1. NOAA Drawing FE65, “CCTV Block wiring Diagram Sheet 1 and Sheet 5”
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