NOAA Ship *Okeanos Explorer* (R-337)

FY 2021
DRYDOCK REPAIR SPECIFICATIONS
REV 1



FY 2021 Drydock Repairs for NOAA Ship *Okeanos Explorer*

TABLE OF CONTENTS

	DESCRIPTION/TITLE	PAGE
1.	SCOPE	4
2.	GENERAL	5
3.	BASE ITEMS	16
	3.1 Annual Liferaft Inspections	16
	3.2 Annual Fire Detection and Suppression Inspect.	18
	3.3 Temporary Services	23
	3.4 Vestdavit Annual Servicing	32
	3.5 02 Level Raised Deck Steel Repairs	35
	3.6 Sea Valves	43
	3.7 Bow and Stern Thruster Maint.	51
	3.8 Paint Sewage & Laundry tanks, BT & E.R. Voids	54
	3.9 Dock Trials and Sea Trials	61
	3.10 Drydocking and Routine Drydock Work	65
	3.11 Underwater Hull and Freeboard Preservation	72
	3.12 Propeller and Tailshaft Inspection and Repair	80
	3.13 ABS Special Survey Hull-7	85
	3.14 LED Navigation Lights	94
	3.15 Mission UPS Annual Maintenance	98
	3.16 Underwater Scientific Equipment Preserv.	100
	3.17 Stack Repairs/Paint, AC Vent Refurb.	104
	3.18 Forepeak Tank Preservation	102
	3.19 Various Steel and Structural Repairs	112
	3.20 Binnacle Compass, Searchlight and FLIR	126
	3.21 Various Repairs, Inspections and Servicing	131
	3.22 Dive Compressor Installation	158
	3.23 Various compartment Deck Replacement	160
	3.24 Door Installations	168
	3.25 Ballast System Maintenance and Valve Repair	172
	3.26 Ethanol Storage	174
	3.27 Radar Replacement	179
	3.28 DP Above Deck Upgrade	188
	3.29 Food Grinder	192

4. ADDITIONAL WORK 197

4.1 Additional Work 197

5. OPTION ITEMS 198

5.1 Transmitter Array Replacement 198
5.2 Fuel Locker Replacement 205
5.3 86 Ballast Tanks Preservation 208
5.4 Main Engine Room Bilge Painting 211
5.5 Transducer Survey 216
5.6 ROV Stairwell Preservation 222
5.7 Galley 3-Way Valve 227
5.8 DYNACON OEM Tech Rep Support and System Groom. 230
5.9 EK80 38 kHz Transducer Replacement 233
5.10 Superstructure and Stack Painting 237
5.11 Anti-Roll and Anti-Roll Dump BWT Preserv 242
5.12 CHT V2 Tank Replacement 245
5.13 Ballast Tank Vent Replacement 248
5.14 CCTV Camera Upgrades 252
5.15 Separation of Chain Locker, Hyd. Cooler drain 259
5.16 Lower Boson Stores Preservation 261
5.17 Vent Repairs 264
5.18 Transducer Moon Pool Pipe Replacement 271
5.19 Inverted Tank Vent Replacement 275
5.20 Upgrade IMO Sounder SE-700 280
5.21 HVAC Duct Cleaning 283
5.22 Bunk Bed Replacement 286
5.23 Hull Laser Scan 290
5.24 SWBD and Transformer cleaning & Torqueing 293

1.0. SCOPE

1.1 The National Oceanic and Atmospheric Administration (NOAA) operates a fleet of 16 research vessels that supports research and mapping for the National Marine 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.

1.2 The work items in the repair specification are identified well in advance of the performance period in order meet the contracting lead times. Additional work items (emergent work) may arise during the period between the work package submittal, contract award, or even prior to the start of or during the contract performance period. In accordance with Commerce Acquisition Regulation (CAR) clause 1352.271-72, the Contracting Officer may order additional changes during the contract period of performance to address any additional work items identified as necessary to ensure the intent of the drydock or dockside repair contract is met; that is, that the vessel shall be able to safely perform its mission, that it will meet all habitability requirements and regulatory body requirements, and that such repairs will be timely performed to ensure to the maximum extent practicable that the ship’s schedule is not adversely impacted.

1.3 These Detail Specifications contain the requirements for Drydock repairs and modifications to NOAA Ship *Okeanos Explorer*.

2.0 GENERAL

2.1 References

2.1.1 NOAA Standard Specification No. AMC-000-1G, “General Requirements for Ship Repair Work on NOAA Ships.”

2.1.2 NOAA Standard Specification S1600, “Structural Access Cuts.”

2.1.3 NOAA Standard Specification, S2906, “Arc Welding on Waterborne Vessels.”

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

2.1.5 Drawing No. OE-601-101, “NOAA Ship Okeanos Explorer General Arrangement.”

2.1.6 Drawing No. OE-123-101, NOAA Ship Okeanos Explorer Tank Soundings Tables.”

2.1.7 NOAA Form 57-17-09 – NOAA Hot Work Permit

2.1.8 NOAA Weight Report Form, Microsoft XL Format, “Weight Report.xls”

2.1.9 Drydock Worksheet

2.2 Requirements

2.2.1 Reference 2.1.1 forms a part of these Detail 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.

2.2.2 References 2.1.2 and 2.1.3 are amplifications of the requirements contained in reference 2.1.1 sections 4.17 and 4.21.

2.2.3 Some of the ship’s drawings have not been updated to reflect modifications to the ship during activation and conversion in 2007. These drawings and reference documents are for planning purposes only. Actual shipboard configurations and conditions may be different from what is listed. Contractor shall be responsible for verifying all current configuration, construction, and arrangement changes, as necessary, to comply with and perform the work requirements of these specifications. Contractors are encouraged and expected to review ship’s drawings and to perform a field inspection to inspect the locations and shipboard conditions where services are to be performed

aboard the Okeanos Explorer prior to submitting a bid proposal. This inspection should satisfy potential contractors regarding all general and local conditions, (including locations, interferences, tolerances and necessary "work-arounds, etc.) that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to inspect the sites constitute grounds for a change order or claim after contract award.

2.2.4 Ship's drawings and technical publications may be borrowed during the performance period. It would be preferable for the contractor to make copies of these drawing and technical publications if their intended use will be outside an office environment. All reference materials borrowed by the Contractor shall be signed for, and then returned to the COR after no further use of the reference materials is required.

2.2.5 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. Submit weekly ABS status reports to the COR, along with the preliminary progress reports.

2.2.6 All visual examination, hydrostatic testing, and non-destructive testing 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 specialist program.

2.2.7 On the first day of the contract performance period, provide the COR a detailed resource loaded production schedule. Then, on a weekly basis (24 hours preceding the Weekly Progress Meeting) provide the COR a revised and updated production schedule reflecting actual work progress. Schedules shall have enough granularity to show the number of workers, by trade, for all given tasks. Once a Notice to Proceed (NTP) is issued, all additional work shall be added to and reflect in the resource loaded production schedule. These deliverables shall be in Microsoft Project electronic format and 3 paper copies.

2.2.7.1 The contractor shall have daily production meetings with trade supervisors and the COR to discuss progress, milestones, labor staffing levels and other project issues. These production meetings shall be attended by both the project manager and project superintendent (trade superintendent or ship manager)

2.2.7.2 Contractor shall have a project manager and/or ship

superintendent assigned exclusively to the Okeanos Explorer for the duration of the project. Project Manager or COR approved alternate shall attend all shipboard safety meetings (normally at 0800 on the bridge) during the contract period for all days in which the contractor will be performing work on the ship.

2.2.8 Safety and housekeeping walkthrough inspections of the ship, pier, and other productions areas shall be conducted on a regular basis (daily or more frequent) by the contractor as per section 4.11.5 of reference 2.1.1.

2.2.8.1 Contractor shall clean up all production areas, sweep up messes, clear all trash and debris and roll back all lines and leads at the end of each shift.

2.2.8.1.1 All subcontractors and contractors shall clean areas to the condition they were in prior to the beginning of work. Any areas of concern shall be documented by the Contractor prior to commencing work

2.2.8.1.2 Any and all areas damaged by media blasting and/or paint overspray shall be sanded, primed and painted to match the surrounding area.

2.2.8.1.3 The contractor and subcontractors shall not use the shipboard restrooms/heads, sinks, electrical outlets or other shipboard services.

2.2.8.1.3.1 The contractor shall provide restroom and handwash facilities that are cleaned and restocked with toilet paper, antibacterial soap and paper towels, no less than once each 24-hour period.

2.2.8.1.3.1 The contractor shall provide trash services for themselves and the ships crew during the contract period.

2.2.9 All new equipment and furnishings purchased by the Contractor for installation on the vessel shall be provided with factory or vendor supplied certificates, technical manuals, and data sheets, complete with parts listings. Faxed copies of this information are not acceptable. This documentation shall be turned over to the COR after installation is completed. Equipment technical manuals shall provide detailed information necessary to operate, maintain, troubleshoot, and repair the equipment. The manuals shall include detailed procedures for disassembly of equipment, parts lists, drawings, inspection criteria, troubleshooting, and test procedures. Provide four paper copies of each manual, plus one electronic copy in Abode Acrobat (PDF) format.

2.2.10 Submit all inspection, test, and quality reports to the COR in Corel WordPerfect or Microsoft Word electronic software formats, in addition to providing hard paper copies.

2.2.11 Weigh all materials and items removed, installed, or relocated on the ship. Provide a summary report to the COR indicating the total weight in pounds of items and a breakdown of their locations by space, deck, frame, distance from centerline, and height above the deck. Reference 2.1.7 has been provided for the Contractor to identify, record, and document all weight changes for submitting the summary reports. Contractor may use their own weight report form for documenting weight changes. All the information required must be tracked and documented on any form provided.

2.2.12 The removal of all recyclable material from the ship (valves, steel, etc) shall be coordinated with COR for scrap recycling with the value credited to the Government

2.2.13 Unless otherwise stated in the individual work items, prepare and coat all new steel, all existing steel surfaces identified to be cleaned and painted, and all paint systems disturbed while accomplishing work items, in accordance with Reference 2.1.4. Finish coat colors and paint type shall match those of the surrounding, unmodified area.

2.2.14 Ship’s 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 0800 and 1500 local time, Monday through Friday. Unless otherwise specified, provide a minimum of two working days’ prior notice for any equipment operations or system tag-outs.

2.2.15 All new and disturbed machinery and services shall be operated 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.

2.2.16 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, ABS, and/or USCG 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.

2.2.17 The Contractor and COR shall designate a “on-load/off-load” area of the ship that shall be covered by the appropriate media (planks/tarps/etc) as to not damage the existing deck or surrounding structures. Rails, handrails and gunnels shall have appropriate chaffing protecting as to protect the paint from any cables hanging over the side.

2.2.18 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.

2.2.19 Frame numbers and space names are derived from ship’s drawings. All equipment changes and space modifications over the ship’s life span may not all be reflected in the referenced drawings. 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. Contractors may review available drawings and technical manuals on board ship.

2.2.20 On weekly basis, provide the COR with a project staffing plan (paper and electronically) by trade/craft and subcontractor showing how the project will be appropriately staffed to be completed by the end of the performance period. The plan should be “resource loaded” showing the planned labor needed and actual labor hours assigned

2.2.20.1 The contractor will issue an updated staffing plan within 48 hours each time any growth work is approved or a Notice to Proceed is issued.

2.2.20.2 During the last three weeks of the contract period, the contractor shall develop a requirements tractability matrix (Punchlist) of all outstanding items from the contract and have daily meetings to go through all remaining items. During the final 14 days, the meetings shall be conducted twice daily.

2.2.21 Maintenance of ABS Class and Certificates

2.2.21.1 All ABS rules required to maintain the ship's Class and Certificates shall be adhered to by the contractor. This includes all rules for material, fabrication, quality control, inspection, and ABS on-site survey of work. Specifications may call out ABS surveyor inspection, but not all ABS inspections are necessarily identified in the specifications. The contractor shall consult with ABS on the entire work package and changes and assure ABS involvement where required to maintain Class and Certificates.

2.2.21.2 Contractor shall develop, in consultation with the American Bureau of Shipping (ABS) Surveyor, a written survey schedule that lists the items to be inspected and the scheduled dates and times of the inspections. Submit the survey schedule to the COR within 48 hours after the start of the contract performance period. The survey schedule shall list all initial inspections required by the ABS Surveyor. In addition, 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.

2.2.21.3 The contractor is responsible for initiating, scheduling and facilitating all ABS inspections and surveys and shall provide NOAA with copies of all correspondence with ABS. The costs of ABS ship surveys/inspections will be borne by NOAA.

2.2.21.3.1 The following is a partial list of ABS Surveys and Inspections due during the contract performance period and shall be scheduled and facilitated by the contractor:

2.2.21.3.1.1 Annual and Period Special Automation Survey - 7

2.2.21.3.1.2 Annual Hull Survey

2.2.21.3.1.3 Annual and Continuous Machinery Survey - 7

2.2.21.3.1.4 Renewal Load Line Survey

2.2.21.3.1.5 STBD Tail Shaft Survey

2.2.21.3.1.6 Port Tail Shaft Survey

2.2.21.3.1.7 Special Continuous Survey - 7

2.2.21.3.1.8 Structural Inspection of 4-23-0 Ballast Tank

2.2.21.3.1.9 STBD tail shaft oil

2.2.21.3.1.10 Thrust and line shaft bearing inspections

2.2.21.3.1.4.1 Contractor shall empty, open, clean and certify (safe for entry) all shipboard ballast tanks, Bilge tanks, CHT, grey water, fuel oil, potable water and Waste Oil tanks to support ABS Surveys at no additional cost to the Government.

2.2.22 In addition to the contractor's requirements for hotwork and firewatches – Firewatches for hotwork shall be required as outlined in section 4.11.3 of Reference 2.1.1. Additionally, the contractor is required to fill out, maintain and comply with reference 2.1.9 (NOAA Hot Work Chit) for all hotwork completed on the ship.

2.2.23 The Ship's crew will empty all tanks to the lowest point possible using the ships systems. All remaining fluid in the tanks that must be removed by the contractor to complete the tasks associated with these specifications will be the responsibility of the contractor at no additional cost to the Government.

2.2.24 The contractor shall provide electronic copies all material certificates to COR and ABS within 24 hours of work being completed. Material certificates include, but are not limited to, pipe, valves, gauges, steel and equipment.

2.3 Quality Assurance

2.3.1 All welders shall be certified and only perform welding or brazing for processes and filler materials in which they are certified. A list of all welders and their respective certifications who will be performing work aboard the vessel during the period of performance shall be provided to the COR within 3 days after the beginning of the period of performance.

2.3.2 Contractors shall ensure the ship remains water right during the repair period. This includes rain water, hydrostatic testing, system drainage and water from high pressure water jetting.

2.3.3 The contractor shall repair all damaged paint, insulation, flashing and nonskid preservation as a result of work performed by these specifications. Paint shall match surrounding area. Non-skid shall be repaired with American Safety Technologies MS-7CZ Anti-Corrosive Low VOC Metal Primer (MIL-PRF-24667B) (5 mils DFT), and a full coat of American Safety Technologies AS-2500 epoxy anti-slip deck coating, 8 mils DFT, color: gray.

2.3.4 All paint preparations and application shall be completed in accordance with NACE, SSPC, IMO or QP1 Standards. Other paint certifications may be submitted for consideration. A paint inspector

shall be onsite during all painting and painting preparation activities and continually inspect the process, product, preparation and application during the process.

2.3.5 All steel repairs shall conform to the standards of ABS and shall be inspected and approved by ABS.

2.4 Government Furnished Equipment

2.4 1 Listed individually under each work item

2.4.2 The contractor shall take receipt of, secure and store Government furnished equipment up to 30 days before the beginning of the contract performance period. The Government will have up to 30 days following the start of the period of performance to deliver Government Furnished Equipment.

2.5 Notes

2.5.1 Contractors are encouraged to review ship's drawings and are expected to attend the Okeanos Explorer pre-bid inspection to inspect the locations and shipboard conditions of the work items in this package prior to submitting a bid proposal. This inspection should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to inspect the sites during the pre-bid inspection constitute grounds for growth work, change order or claim after contract award.

2.5.2 Much of the ship's original paint contains zinc chromate. Contracts will encounter this paint during the work aboard the vessel and should take this into account when preparing their bid as it relates to the necessary work required to accomplish the specific tasks.

2.5.3 The contractor and all subcontractors, regardless of tier, shall review other work items under this contact to determine their effect on each other.

2.5.4 **Within 7 days following contract award, the contactor shall purchase all long lead material and provide a copy of the order/invoice and estimated delivery date to the COR.**

2.5.4.1 The below list is not an all-inclusive list, but is a minimum list of equipment that shall be ordered under 2.5.4. Specific information on each item below can be food in the spec item.

1) Misc Temp. Service items listed under 3.3.4.2.23

2) New valves listed in 3.6.4.1 and 3.6.4.2, 3.6.4.2.2

3) Stern thruster seals, shafts and bearings listed in 3.7.4.4.3.1

4) RSC Envirologic 3046 VGP biodegradable hydraulic oil listed in 3.7.4.4.4

5) RSC Biosolutions Envirologic 2010 EP oil listed in 3.7.4.5.4

6) 6 Elinca Anodes (3 copper & 3 iron) listed in 3.10.4.6.2

7) 220 MKII Aft Seal Kits listed in 3.12.4.13

8) Castrol Biostat 100 oil listed in 3.12.4.14

9) LED lights and control box listed in item 3.14

10) Searchlights, power supply, control station and Thermal Camera equipment listed under 3.20.4.8.1, 3.20.4.8.2, 3.20.4.8.3, 3.20.4.8.5 and 3.20.4.9

11) Binnacle, Spare Compass, Compass Box and certification listed under 3.20.4.1

12) Tank Float listed in 3.21.4.2.6

13) Dive Compressor listed in 3.22.4.2

14) Radar equipment listed in 3.27.4.1.1, 3.27.4.1.2 and 3.27.4.1.3

15) Equipment listed in 3.28.4.1, 3.28.4.1.1, 3.28.4.1.2 and 3.28.4.1.3 (see Reference 3.28.2.1)

16) Food Grinder and sink listed in 3.29.4.1.2.1, 3.29.4.1.2.2 and 3.29.4.1.2.5

17) Transmitter Array items listed in 5.1.4.1.1, 5.1.4.1.2, 5.1.4.1.3, 5.1.4.1.4 and 5.1.4.1.5 (upon award)

18) 3-Way valve listed in Item 5.7 (upon award)

19) MSD V2 Tank Listed in 5.12.4.3.1 (upon award)

20) Fan Motors (QTY – 2) listed in 5.17.4.4.1 (upon award)

21) Furuno FE 700 Display unit listed in 5.20.4.5 and Furuno FE 8020 Transceiver Unit listed in 5.20.4.6 (upon award)

2.5.4.2 The contractor shall provide weekly status updates to the COR on the projected delivery dates for material ordered under 2.5.4.1 beginning 14 days after contract award.

2.5.4.3 The contractor Project Manager shall schedule, facilitate and conduct material status meetings daily with the COR for the first 7 days of the contract and then twice weekly after the first week until the COR is satisfied of the delivery dates of all required material.

2.5.5 The following descriptive data of the ship is provided for information:

Length, Overall.....224’ 0”
Length, BP.....194’ 0”
Beam, Molded.....43’ 0”
Mean Draft, Loadline.....15’ 1”
Displacement, Loadline.....2311.5 LT
Displacement, Lightship.....1591.2 LT
Cruising Speed.....11 knots
Officer & Crew Size.....26
Scientists and Technicians.....20
Electric Service.....450 VAC, 60 Hz, 3 PH, 800 Amp Service
Propulsion.....Diesel electric, twin screw

2.5.6 NOAA Ship *Okeanos Explorer* is classed ✠A1, E, ✠AMS, and ✠ACCU and identified with the following:

Official Number - CG023672
ABS ID - 901987
IMO NUMBER – 8835114

2.5.7 The ship will not be available for pre-bid inspection due to ongoing health precautions related to COVID-19. Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.0 BASE ITEMS

3.1 ANNUAL LIFERAFT INSPECTIONS

3.1.1. Intent:

3.1.1.1. Inspect, repair and recertify shipboard life rafts.

3.1.2. References

3.1.2.1 NOAA Standard Specification AMC-583-1B, "General Requirements for Life Raft Inspections"

3.1.2.2 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.1.3. Government Furnished Equipment

3.1.3.1. None

3.1.4. Requirements

3.1.4.1. Perform an annual inspection on the ship's six (6) 25-person Elliot liferafts in accordance with Reference 3.1.1.1. Remove the liferafts and attached hydrostatic releases from the cradles on the ship and transport them to the inspection location. Cost to ship the rafts to and from the inspection location shall be borne by the contractor and shall be included in the unit price for inspection.

3.1.4.2. Renew all expired SOLAS equipment pack items.

3.1.4.3. Inspect the hydrostatic release for each liferaft

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

3.1.4.5. Liferafts without a radar reflector shall be affixed with a weather proof label that reads "RADAR REFLECTOR NOT INCLUDED" on the liferaft case near the manufacturers plate.

3.1.4.6. All replacement pyrotechnic signaling devices (including aerial flares and hand held signals) must be within 9 months of the date of manufacture when replaced on the liferafts during servicing. **Expired pyrotechnics shall be given back to the COR**.

3.1.4.7. If any additional parts or repairs beyond those specified

are found necessary, submit a Condition Report to the COR. Additional cost for replacement parts and repair work must be approved by the Contracting Officer (CO) prior to performance of the additional work.

3.1.4.8. After servicing, return the liferafts and hydrostatic releases to the ship and install in their respective cradles.

3.1.4.9. The contractor shall guarantee workmanship and material against defects for twelve months.

3.1.4.10 Turn over all items removed and replaced from the life raft to the COR

3.1.5. Quality Assurance

3.1.5.1 Following the completion of the work item, contractor management shall schedule and conduct a walkthrough inspection of work completed with COR.

3.1.5.2 Contractor shall provide a certificate of services for all life rafts and provide a detailed list of all work completed and equipment replaced.

3.1.6. Notes

3.1.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.2 ANNUAL FIRE DETECTION AND SUPPRESSION SYSTEMS INSPECTION

3.2.1 Intent:

3.2.1.1 Inspect, repair and certify shipboard fire detection, fire suppression and lifesaving equipment.

3.2.2 References

3.2.2.1 Drawing OE-555-001, Rev B, "Fire Control Plan"

3.2.2.2 Drawing OE-436-001, "Fire & General Alarm System Modifications"

3.2.2.3 T-AGOS 13 Drawing 555-6233815, Rev C, "Fire Extinguishing System Diagram"

3.2.2.4 T-AGOS 13 Drawing 436-6233675, Rev H, "Fire & Smoke Detection System"

3.2.2.5 T-AGOS 13 Drawing 436-6233675, Rev H, "Fire & Smoke Detection System" Redline

3.2.2.6 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.2.3 Government Furnished Material

3.2.3.1 None

3.2.4 Requirements

3.2.4.1 All personnel (shop or sub-contractors) are to be trained at a manufacturer's approved course and specialized in the inspection and repair of fixed and portable CO_2, Halon, AFFF, dry chemical, fire main and sprinkling systems and equipment and be certified by the American Bureau of Shipping (ABS) to conduct these inspections.

3.2.4.2 Portable Extinguishers: Inspect and weigh all portable extinguishers identified in Reference 3.2.2.1, including the discharge hose. Inspect and weigh an additional 3 portable fire extinguisher located on the ship but no listed on 3.2.2.1. Check the condition of the powder in dry chemical type extinguishers.

3.2.4.2.1 Evacuate, hydrostatically test and refill 38 dry chemical portable fire extinguishers. Affix or stamp date of testing on bottles

after completion. Reinstall on ship.

3.2.4.2.2 Evacuate, hydrostatically test and refill 5 Carbon Dioxide portable fire extinguishers. Affix or stamp date of testing on bottles after completion. Reinstall on ship.

3.2.4.2.3 Submit a report to the COR identifying the size and number of extinguishers requiring recharging or hydrostatic testing.

3.2.4.2.4 Any extinguisher found to be rejected, for whatever reason shall be set aside. Submit a report to the COR identifying the extinguisher(s) found to be rejected and the reason(s) why.

3.2.4.2.5 Upon completion, return all portable extinguishers to their designated stations (or stowage locations in the case of spares).

3.2.4.2.6 Stamp on cylinders and record all hydrostatic testing dates of all portable CO2 extinguishers and provide in a report to the COR. Report shall also include the next required hydrostatic test date for each portable extinguisher

3.2.4.3 Fixed CO_2 Systems: Port and Starboard Main Motors (direct inject) and Paint Locker.

3.2.4.3.1 Inspect and weigh fixed CO_2 cylinders identified in Reference 3.2.2.3

3.2.4.3.2 Demonstrate all interlocks, shutdowns, time delays (see Note 3.2.6.4), automatic fire dampeners and controls operate correctly and verify intake and exhaust fan shutdowns, and main motor breaker trips (Note: Main Motors must be online to verify breakers trip).

3.2.4.3.3 Submit a report to the COR identifying the size and number of cylinders requiring recharging or hydrostatic testing (if any). Include as part of item proposal, cost to hydrostatically test, and refill 3 large fixed CO_2 cylinders. Stamp new test dates on cylinders.

3.2.4.3.4 Inspect hoses between fixed cylinders and the distribution piping. Submit a report to the COR identifying any issues found and recommendations.

3.2.4.3.5 Inspect all fixed piping, nozzles and valves to ensure their satisfactory material condition. Connect an inert gas (nitrogen) to the system and blow-out the piping to prove it is clear.

3.2.4.3.6 Record all hydrostatic testing dates of all fixed CO2 cylinders and provide in a report to the COR. Report shall also include the next required hydrostatic test date for each fixed extinguisher

3.2.4.4 Fixed Halon Systems: Main Generator Room, Propulsion Motor Room, AC Machinery Room, Emergency Generator Room, and Bow Thruster Compartment.

3.2.4.4.1 Visually inspect all fixed Halon cylinders identified in Reference 3.2.2.1

3.2.4.4.2 Demonstrate that all interlocks, shutdowns, time delays (see Note 3.2.6.4), automatic fire dampeners and controls operate correctly and verify that intake and exhaust fans shutdown. Coordinate with the COR to start the Ship Service Diesel Generators (SSDG's) for testing (Note: SSDG's must be running to test shutdowns).

3.2.4.4.3 Inspect hoses between fixed cylinders and the distribution piping. Submit a report to the COR, identifying any issues found and recommendations.

3.2.4.5 Galley Gaylord Hood System (ProTex II MCH2)

3.2.4.5.1 Accomplish inspection and testing of the Galley Gaylord Hood system and associated heat sensing vent closure devices in the exhaust ducting, including over the oven, the fryer, and the griddle.

3.2.4.5.2 Prepare a Certificate of Servicing and report, listing the Gaylord Hood System and heat sensing vent closure devices, equipment, and components inspected and tested, and the results. Submit the original and two (2) copies of the service report to the COR.

3.2.4.6 Fireboy:

3.2.4.6.1 Inspect and weigh the Fireboy System bottle in the flame locker in the Upper Motor Room.

3.2.4.7 Fire Detection System (see Refs. 3.2.2.4 and 3.2.2.5)

3.2.4.7.1 Test all smoke and/or fire detection systems and demonstrate their proper functioning. Upon completion of the tests and demonstrations, all systems shall be restored to normal operating configuration and left in a ready for use condition.

3.2.4.7.2 Testing shall include all smoke detectors using spray smoke and all heat detectors.

3.2.4.7.3 Inspect all alarm bells for corrosion and verify proper operation.

3.2.4.7.4 Submit a condition report to the COR with test results and any recommendations.

3.2.4.8 SCBA Respirators, Cylinders and EEBD's

3.2.4.8.1 Conduct a visual inspection of twenty-four (24) SCBA Cylinders. Conduct a hydrostatic test of 14 SCBA cylinders. Stamp or affix test dates on hydrostatically tested SCBA cylinders.

3.2.4.8.1.1 Submit CFR with findings

3.2.4.8.2 Conduct a flow test on fourteen (14) SCBA respirators.

3.2.4.8.2.1 Submit a condition report to the COR documenting test with findings and any recommendations.

3.2.4.8.3 Conduct inspection and testing of 30 Ocenco EEBDs

3.2.4.8.3.1 Submit CFR documenting test and with findings and recommendations

3.2.4.8.4 After completion of testing, all fire-fighting systems shall be reconnected, the cylinders properly secured in the bank, and the system left in a ready for use condition.

3.2.4.8.5 All extinguishers, hoses, cylinders and fixed systems shall have tags attached indicating the date of service and the name of the company performing the servicing.

3.2.4.8.6 Prepare a Certificate of Servicing, listing all portable extinguishers and fixed systems examined and tested and the results of those tests and inspections. Deliver the original and two (2) copies of the report to the COR.

3.2.5 Quality Assurance

3.2.5.1 Following the completion of the work items, contractor project manager shall schedule and conduct a walkthrough inspection of work completed with COR.

3.2.5.2 All cylinders that are hydrostatically tested and inspection shall be marked with the appropriate markings to indicate their test date.

3.2.6 Notes:

3.2.6.1 Adequate fire protection must remain on the ship at all times during the performance of this item. No more than 30% of the portable extinguishers are to be removed from the vessel at any one time. No fixed fire-fighting system shall be left in an inoperable condition overnight.

3.2.6.2 Reference 3.2.2.2 shows system modifications that were made during the ship's 2008 conversion.

3.2.6.3 Reference 3.2.2.5 is a redline of the original drawing, showing 3 zones added to the fire detection system in 2014 (total of 26 zones in the system).

3.2.6.4 Time delay standards are +20% / -0%. (Ref: 46 CFR §193.05-10; §95.16-45(a)(2); NFPA 12, Section 9.4.3.2. For 30-second time delays, the maximum time allowed is 36 seconds. For 20- second time delays, the maximum time allowed is 24 seconds. The ship has 30-second time delays on Halon and 20-second time delays on the direct inject CO_2.

3.2.6.5 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.3 TEMPORARY SERVICES AND SUPPORT EQUIPMENT

3.3.1 Intent

3.3.1.1 Provide Services, equipment, offices, protective coverings, training, security, parking, cleaning, and other services outlined below for the duration of the contract period.

3.3.2 References

3.3.2.1 NOAA Standard Specification AMC-000-2C, "Temporary Services at Contractor Facilities"

3.3.2.2 Photos of Temporary Services Piping Connections

3.3.2.3 NOAA Standard Specification No. AMC-000-1G, “General Requirements for Ship Repair Work on NOAA Ships.”

3.3.3 Government-Furnished Material

3.3.3.1 None

3.3.4 Requirements

3.3.4.1 Provide all temporary services required in accordance with Reference 3.3.2.1.

3.3.4.2 The following additional information and requirements apply:

3.3.4.2.1 Electric power: Provide two 450 VAC, 3 Phase, 60 Hertz, 400 Amp circuits [800 amps total] with NATO plugs and pig tails. All power supplied to the ship shall be clean, with no indications of ground faults on the ship’s main switchboard. Total Harmonic Distortion (THD) shall not be greater than 6%. Voltage at the ship’s switchboard shall not vary by more than 3% of the prescribed 450 VAC requirement. All ground fault deficiencies associated with the Contractor’s power supplied to the ship, shall be corrected at the Contractor’s expense. Such expense shall include housing allowance for ship’s crew, if the ship is still habitable at the time the deficiency is noted.

3.3.4.2.2 Telephone lines: Connect one voice line to the shore office (COR's office).

3.3.4.2.3 High-Speed Internet Service: Provide high-speed, broadband internet connectivity via a local Internet Service Provider (ISP), or privately owned, internal internet connection. High-speed, broadband internet is defined as Digital Subscriber Service (DSL), Cable Network,

or Fiber Optic Network services with minimum download speeds of 50 Mbps and upload speed of 10 Mbps. The service provided shall be a business-type account that supports Virtual Private Network (VPN) connections. Provide the proper number of connections necessary to satisfy the ship's wet berth and drydock locations, as well as the ship and COR's dockside office space(s). 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. The ship's electronic technician (ET) will provide the necessary routers and switches needed. Wifi Internet shall also be provided in the office spaces.

3.3.4.2.4 Provide onboard Security Service from 1600 to 0800 on weekdays and 24 hour on-ship security on weekends and federal holidays. In addition to Reference 3.3.2.1 requirements, increase security round frequency from two-hour intervals to one-hour intervals from 1600 to 0800 on weekdays. Additionally, the contractor shall provide 24 hour on-ship security during weekends and holidays, and security rounds should be completed every hour. Performance standards for security members are as follows:

3.3.4.2.4.1 Training and vessel familiarization will be provided by the ship's officers or designated crew members for the security watch supervisor and one initial group of security watch standers. Watch standers must be in uniform or a safety vest that identifies them as a security watch stander. Watch standers are for security and must be unarmed. The company must have Security Guard Credentials, Certifications or Licenses; individual guards do not. Security watch standers will present themselves for their watch in sufficient time to be briefed on any changes to the routine or special instructions from the off going watch. Approximately 10-15 minutes may be required to exchange the watch and transfer information. Security watch standers will not depart the ship without being properly relieved following their watch.

3.3.4.2.4.2 The security watch standers shall provide hourly security rounds, inspecting all spaces of the ship, excluding staterooms. Specific stations will be set up with Detex security stations, which will be logged using a ship provided Proxipen security wand. The security watch standers are required to contact the designated Officer of the Day (OOD), duty engineer or CO if any unusual events occur. Unusual events are defined as, but not limited to: bridge alarms, fire, flooding, unauthorized personnel boarding, and other dangers that can affect the security and safety of the vessel, or spills affecting the marine environment. Security rounds and all unusual events shall be

noted in the vessel's watch stander log. Security watches shall be attentive to the responsibilities of their position and should limit the use of their personal phones to emergencies and duties related to their security detail. Perceived excessive use of phones during security watches will asked to be investigated by the contractor by the COR.

3.3.4.2.5 Air: Provide 125 psi dry, filtered, compressed air to three manifolds on deck – forward, midships and aft. No connection shall be made by the contractors or their subcontractors to the ship's compressed air distribution system.

3.3.4.2.6 Cooling Water: Provide 300 gpm @ 100 psig capacity, for ship's auxiliary sea water system which supports all refrigeration plant cooling water, air conditioning plant cooling water, and sanitary system toilet flushing needs (NOTE, the ship's sea water system provides 600 gpm for full load – engines running). In the event the sea water or cooling water provided to these systems is disrupted or disabled, an alternate means of providing water service to these systems shall be the Contractor's responsibility. Provide a pressure regulator on the discharge side of the Contractor's cooling water supply to the ship's systems capable of regulating pressure between 25 psig and 80 psig. Contractor may provide separate cooling water service connections to meet the ship's cooling water systems needs at designated hook-up locations. See ship's Chief Engineer for individual cooling water service hook-up locations and pressure requirements for the separate systems. Make-up temporary by-pass hose and/or piping arrangements to support the ship's AC, firemain and refrigeration plant cooling water needs, in conjunction with the work requirements of other items in these specifications.

3.3.4.2.7 Protective Covering: In addition to the protective coverings specified in paragraph 4.5.1 of Reference 3.3.2.1, place a layer of heavy duty (minimum thickness of 4 mils) plastic sheeting between the deck and the protective covering of all habitable spaces were contractors will transit or work.

3.3.4.2.8 Parking Spaces: Provide twelve (12) reserved vehicle parking spaces within 100 feet of the dockside office spaces. Identify additional parking spaces for fifteen (15) vehicles, 250 yards away from the dockside officers,within or outside the shipyard, which may be available for parking by ship's personnel and other NOAA representatives.

3.3.4.2.9 Office Spaces: Provide three secure locked office spaces (one office space for the COR, one for the assistant Port Engineer, and one for ship's office space). Office spaces shall be no greater than 500

feet from the drydock and berthing area of the ship. The COR and Assistant PE office spaces shall be square or rectangular and a minimum of 100 square feet. The third office shall be square or rectangular and be a minimum of 400 square feet to be used by the shipboard personnel. Provide three sets of keys to each space to the COR. COR's and assistant PE office shall be made available five days prior to the ship's arrival at the Contractor's facility and shall remain so until five days after the ship has departed. Trash cans shall be provided in each office and emptied daily.

3.3.4.2.9.1 Dockside office for shipboard personnel shall be climate controlled and shall contain five desks along with six chairs. Provide high speed internet service as required in paragraph 3.3.4.2.3.

3.3.4.2.9.2 COR and assistant PE dockside office spaces shall be climate controlled, contain one desk, one circular table and three chairs in each space. Provide one voice phone line [described above]. Provide high speed internet service as required in paragraph 3.3.4.2.3 above. Provide one (1) color printer and color copy machine capable of multiple copying, sorting, and paper size conversion (enlarging/reducing) of documents, in paper size ranges from letter (8.5 x 11 inches), legal (8.5 x 14 inches), and "D" size drawings (11 x 17 inches). Provide three (3) spare cartridges of black and each color ink for printer and copy machine. Provide twenty (20) reams of 20 lb white 8 ½ x 11 inch paper. Provide four (4) 8 ½ by 11 ¾ inch legal pads and twelve (12) uni-ball Jetstream (or equivalent) roller ball black pens.

3.3.4.2.9.3 A climate-controlled restroom shall be located within 100 feet of office spaces. Sink shall have hot and cold running water and provided with both antibacterial and degreasing soap. Restroom shall be cleaned at least every 24 hours, including trash removal.

3.3.4.2.9.4 Drinking water shall be provided aboard the ship in the mess deck, inside the COR and Ship's dockside offices. Water dispensers for drinking water shall be capable of dispensing cold and hot water in each location. A minimum of 10 gallons of reserve drinking water shall be in each location at all times to prevent running out. Biodegradable disposable cups for hot and cold water shall be provided in both locations.

3.3.4.2.10 Storage Containers: Provide two enclosed, lockable storage containers for ship's personnel use, with minimum nominal dimensions of eight feet high by eight feet wide by twenty feet deep. Containers shall be available for the duration of the contract and up to 7 days before the period of performance begins. Provide COR three sets of keys to the lock for each storage container.

3.3.4.2.10.1 One container shall be a standard 20 foot container and stored within 250 feet of the ship.

3.3.4.2.10.2 One container shall be lockable and air-conditioned, humidity controlled and be used to store shipboard mission equipment. Container shall be lifted onto the ship (02 level) at the start of the contract period and removed once mission system equipment is loaded and transported to a pierside location for storage. Container shall be relifted onto ship within 48 hours of completion of the 02 level repairs (Item 3.5) to allow for removal of mission system equipment. Container box shall have exterior mounted humidity gauges and thermometer for conditions inside the container box. Temperature in container box shall be capable of maintaining temperatures between 60 and 70 degrees F. A fan shall circulate the air internally. Humidity shall be monitored and not reach greater than 50%. Provide electricity for storage container.

3.3.4.2.11 Oily Waste Disposal: Pump the bilge oily water holding tanks 4-60-1- F and 4-60-2 F (estimate 500 gallons on board, up to 3000 gallons maximum), and the sludge tank 3-50-2-F (estimate 50 gallons on board, up to 100 gallons maximum). Pumping of the bilge oily water holding tanks and the sludge tank shall be done at the beginning of the contract performance period. Additional pumping will be required whenever liquid is added to these tanks or spaces as a result of contractor washing down in order to maintain gas-free certification, or other incidental liquid drainage into these spaces as a result of the performance of work.

3.3.4.2.12 Bilge and CHT lift station Cleaning: Clean and pump Generator Room, AC Room, MSD Room, Aft Steering, and Propulsion Motor room bilges at the beginning of the contract period and at the end of the period. Pressure wash, pump, and clean all debris from the bilge of these spaces at the end of the contract period. Protect all electrical controllers and machinery from overspray and debris prior to pressure washing. Clean out all bilge rose boxes after pressure washing. Open and clean forward and aft CHT lift stations. Touch up paint inside lift stations as needed (assume 8 square feet in each) and high pressure flush piping from CHT lift stations to CHT tank with water at least 115 degrees F for 2 hours.

3.3.4.2.13 Crane Service: Provide crane operator and riggers for ship's force equipment and material lifts needed during normal working hours. Provide crane lifts with a 5-ton minimum capacity. The COR will provide a minimum of four hours’ notice prior to any lifting required for ship’s force needs. For bidding purposes, assume 5 lifts with the

crane each week. In addition, provide adequate clean and cleared pier space (approximately 1,0000 square feet) and vehicle access for staging mission equipment and loading provisions during the last two weeks of the contract period.

3.3.4.2.14 Toilet Facilities & Sewage Disposal: Provide temporary toilet facilities and perform sewage system effluent and turbid water disposal at any time the ship's sanitary system and marine sanitation plant and gray water system operation is disrupted, due to work performance on any other item of these specifications where disruption of these systems will be required. Ships sanitary systems are to be for ship's crew only. All shipyard personnel and shipyard subcontractors will have their own bathroom and sanitary facilities separate from the ship. Signs will be prominently placed to make all personnel aware of this rule. Temporary toilets shall be have sinks within 20 feet of toilet and be cleaned and stocked daily with anti-bacterial soap and paper towels.

3.3.4.2.14.1 Two (2) "ship's force only" toilets and 1 wash station with anti-bacterial soap and paper towels shall be located on the ship and be cleaned and serviced daily. Toilets shall be appropriately marked "ship's force only". One toilet shall be marked "Women Only."

3.3.4.2.15 Grey and Black Water Discharge: Provide a connection for the ship's grey water overboard discharges, located on the starboard hull side, just forward of the Plimsoll mark. Collect and properly dispose of all grey water overboard discharges which shall meet the same requirements for sewage and turbid water disposal, in accordance with paragraph 3.10 of Reference 3.3.2.1.

3.3.4.2.16 Trash and rubbish disposal: Provide trash and rubbish disposal containers or dumpsters to be used by the ship's crew during the period of performance and up to three days before and five days after. Containers shall be approved for normal trash disposal (general waste) and be located either on the ship or within 100 feet of ship gangway.

3.3.4.2.17 Service Interruption: In the event temporary services provided to the ship are reduced or disrupted due to the extent of contract work, thereby 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. 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.

3.3.4.2.18 Fueling and Stores: The Okeanos Explorer will take on fuel and lube oil (barge or semi-truck), scientific equipment and stores in the final days of the contract performance period. The Government will order and pay for all fuel and stores directly. Contractor shall support and coordinate arrival of fuel, lube oil and stores and provide shipyard services for ship to receive fuel, lube oil and stores in the event the shipyard moors vessels in a location that is not accessible by truck or barge.

3.3.4.2.19 Provide off-ship storage for shipboard fuel oil to support ABS inspections (Item 3.13) and other project repair work. Contractor shall be capable of unloading, storing and reloading up to 85,000 gallons of fuel.

3.3.4.2.20 Provide pierside berthing for the ship for up to 1 day before and 3 days following the period of performance. Potable water, sewage, electricity and trash services shall be provided. Shipyard shall provide line handlers for all berthing, departures, docking and undocking.

3.3.4.2.21 Provide 16 color copies of all pages of the contract specification turned over to the COR on the first day of the contract period. Specification shall be full size on 8 ½ x 11 inch and be hard covered (front and back) - spiral bound book.

3.3.4.2.22 Provide the use of high reach equipment with approximately 85 foot boom, for ship's force to use for up to 20 hours.

3.3.4.2.23 In the first 3 days of the period of performance, provide the following items to the COR:

3.3.4.2.23.1 3 – full face respirators and 36 vapor replacement cartridges. Sizes shall be 1 medium and 2 large.

3.3.4.2.23.2 1,200 disposable ear plugs. 32kb NRR.

3.3.4.2.23.3 Provide 5 pairs of nitrile coated cotton gloves – size large. Provide 5 pairs of cotton heavyweight jersey gloves or equivalent – size large. Provide one package (100 count) of disposable nitrile gloves – size large.

3.3.4.2.23.4 Provide 3 ultra-bright 2000 lumens XML-T6 LED adjustable focus, water resistant flashlights or equal with rechargeable batteries. Provide recharging equipment for each flashlight.

3.3.4.2.23.5 Provide 3 pairs of noise reduction earmuffs with a Noise Reduction Rating of at least 30db

3.3.4.2.23.6 Provide 6 – 32oz Hand Sanitizer bottles with hand pump dispenser

3.3.4.2.23.7 Provide 20 disposable coveralls (Tyvek or similar) – size, large

3.3.4.2.23.8 Provide 120 – 3M 8000 Dual Strap Particle Respirator Masks or equivalent.

3.3.4.2.23.9 Provide three (3) ANSI Z89.1 adjustable hard hats (color – white) – size: Medium

3.3.4.2.23.10 Provide eight (8) sets of anti-scratch/anti-fog – ANSI Z87.1 compliant safety glasses.

3.3.4.2.23.11 Provide four (4) 12 oz. cans of gloss protective enamel Orange spray paint.

3.3.4.2.23.12 Provide six (6) boxes of Purell Cottony Soft White Sanitizing cleaning wipes (120-count per box) or equivalent

3.3.4.2.24 During the last 5 days of the performance period, the contractor shall steam clean all 02 level staterooms carpets and stateroom 01-28-2 carpets and the lounge and the library on the main deck level. All other shipboard stateroom decks and habitability spaces shall be mopped and sanitized.

3.3.4.2.25 Provide and install a 36 inch wide gangway from the ship to the pier (or drydock) for the entire period of performance. Gangway shall be nonskid to prevent slippage and shall be secured at both ends and have a safety net installed underneath as additional fall protection. The gangway shall be set so that maximum incline or decline does not exceed 20 degrees from horizontal.

3.3.4.2.26 Provide the COR a mailing address at the shipyard for the ship’s crew and COR to send and receive mail.

3.3.5 Quality Assurance

3.3.5.1 In accordance with Reference 3.1.5.1.

3.3.6 Notes

3.3.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed

additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.4 VESTDAVIT ANNUAL INSPECTION AND SERVICING

3.4.1 Intent:

3.4.1.1 The Vestdavit on the Okeanos Explorer completed its 5-year annual OEM certified Vestdavit inspection in early 2019. The inspection and servicing this year shall be a regular annual inspection

3.4.2 References

3.4.2.1 User Manual, Vestdavit – Type PLR-3600, Winch Type: C-356-1, Vestdavit Project Number – 6044

3.4.2.2 Vestdavit General Arrangement – PLR-3600, Drawing A-14300

3.4.2.3 Vestdavit Gravity Tank BLA4-100, Drawing A-21123

3.4.2.4 Vestdavit Hydraulic Diagram PLR-3600, Drawing A-22109

3.4.2.5 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.4.3 Government Furnished Equipment

3.4.3.1 None

3.4.4 Requirements

3.4.4.1 Lock out and Tag out the Vestdavits (port and STBD) with the COR and CME. Disconnect each davit hydraulic cylinders, pins and connections and remove davit foundation and frame from ship.

3.4.4.1.1 Remove boats from both davits and place on Government boat trailers. (The government will remove the boats from the contractor facility to be serviced by NOAA.) Reinstall both boats at the end of the period of performance with the help of the Chief Boson.

3.4.4.2 Transport davits (2) to an indoor facility and mask and protect all cables, wires, valves, filters, hoses and any other items that can be damaged by the blasting and painting process.

3.4.4.3 Blast davits to an SSPC-11 profile. Blasting shall not occur until joint inspection with contractor and COR is completed and signed off to ensure all protective coverings and maskings are adequately installed.

3.4.4.4 Paint the davits with the following Sherwin Williams painting system.

3.4.4.4.1 1 coat of Macropoxy 646 – Haze Gray (3-5 mils)

3.4.4.4.2 1 coat of seaguard 5000 HS – Buff (4-5 mils)

3.4.4.4.3 1 top coat of high solids poly – extra white (3-5 mils)

3.4.4.5 demask, reinstall and recommission davits

3.4.4.6 Liberally grease all wires, winches and bushings with OEM approved grease. Boson shall be present for greasing activities

3.4.4.7 – Provide the services of a Vestdavit (OEM) certified technician or engineer to perform and complete an annual inspection and servicing of the NOAA Ship Okeanos Explorer shipboard Vestdavit equipment.

3.4.4.8 – Remove and replace the following parts:

(a) Breather filler plug and washer (Part# 15821) – QTY 2
(b) Breather filler plug and washer (Part# 15822) – QTY 2
(c) Filler Breather Filter (Part #10827) – QTY 2
(d) Filler Breather Filter (Part #10248) – QTY 1
(e) Filter Cartridge, Return (Part #11242) – QTY 1

3.4.4.8.1 Turn over old parts to COR

3.4.4.9 Grease wires on davits

3.4.4.10 Weight Test Davits in accordance with OEM requirements and provide report of testing to COR.

3.4.5 Quality Assurance

3.4.5.1 Provide OEM certified documentation of Vestdavit annual inspection and servicing to the COR.

3.4.5.2 All Vestdavit painting activities shall be completed and the Vestdavits reinstalled prior to the OEM arrival and servicing.

3.4.6 Notes

3.4.6.1 Vestdavit Type: PLR-3600

3.4.6.2 Vestdavit winch type: C-356-1

3.4.6.3 Vestdavit Project Number: 6044

3.4.6.4 Annual certified inspection and servicing typically takes 2-3 days.

3.4.6.5 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.4.6.6 Possible points of contact for Vestdavit Parts and Servicing are:

3.4.6.6.1. Alex Mazik, Alex.mazick@vestdavitus.com (425-422-7948)

3.4.6.6.2. Magnus Oding, magnus.oding@vestdavitus.com (425-501-5936)

END OF ITEM

3.5 02 LEVEL RAISED DECK STEEL REPAIRS

3.5.1 Intent

3.5.1.1 Crop out, remove and replace Port, STBD and forward side of the 02 level Raised Deck. Complete Miscellaneous steel repairs in 02 raised deck.

3.5.2 References

3.5.2.1 PDF – 02 Level Raised Deck Steel Repairs – Supplemental Pictures

3.5.2.2 Drawing OE-601-101_Rev - (General Arrangement)

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

3.5.2.4 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP1), Solvent Cleaning

3.5.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

3.5.2.6 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.5.2.7 Drawing 631-623-3576 – Paint Schedule

3.5.3 Government Furnished Equipment

3.5.3.1 None

3.5.4 Requirements

3.5.4.1 Place firecloth containment around the areas of steel replacement to keep slag, sparks or splatter from damaging surrounding paint and equipment. Cover and protect all interior areas of ET shop, Dry Lab, Wet Lab, Mission Control Room, Server Room, vestibule and Scientific freezer with fire cloth and protective coverings. These are sensitive areas of the ship and great caution shall be taken by the contractor to ensure that equipment and furnishings in these spaces are not damaged with sparks, smoke, dust, slag, water or other debris. **The contractor Project Manager and COR shall perform a joint walk through of the spaces prior to the commencement of work.** Significant exhaust ventilation shall be set up and used to ensure that all hot work fumes

are immediately exhausted from the space during all hotwork and grinding activities.

3.5.4.1.1 Mask and wrap the server room racks to prevent any intrusion of smoke or dust particles. Build plywood protection over each of the three racks in the server room to prevent damage. Plywood shall protect rack tops and sides.

3.5.4.1.2 Wrap all cables within 20 feet of all hotwork with protective fire cloth.

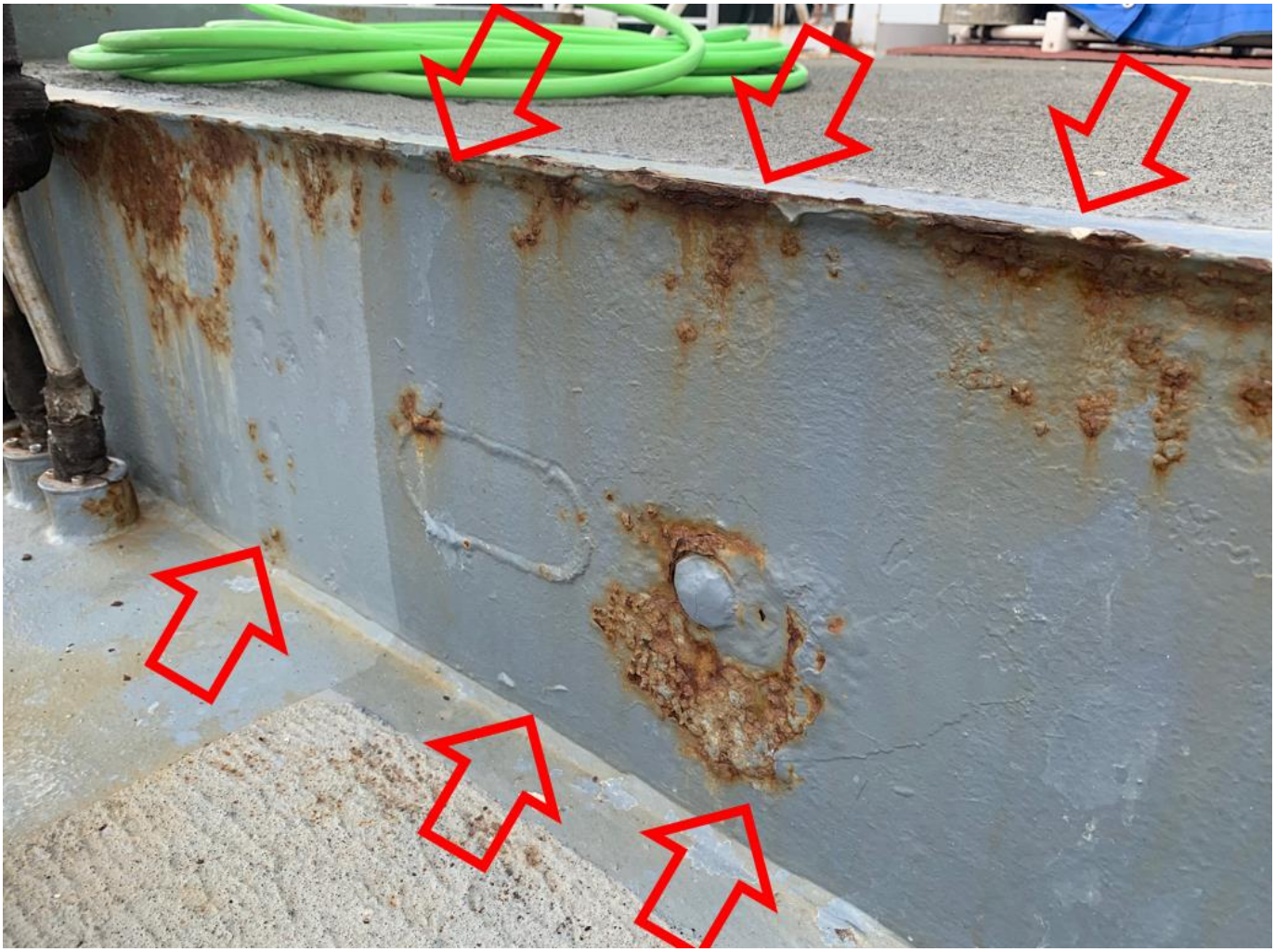
3.5.4.2 Remove insulation interferences on inside of steel and remove overhead panels, cables and other interferences as needed

3.5.4.3 With the CME and COR, lock out and tag out the Port and STBD davit hydraulics.

3.5.4.4 With the CME and the COR, lock out and tag out the compressed air system

3.5.4.5 Disconnect and remove all hydraulic and compresses air piping in way of steel repairs. Remove all interior interferences and insulation.

3.5.4.6 Crop out and remove 140 feet of 12 inch vertical plate on the 02-level raised deck.



Example of Area to be replaced

3.5.4.6.1 See Reference 3.5.2.1 for additional pictures

3.5.4.6.2 Replacement corners shall be formed (rounded) steel to match existing.



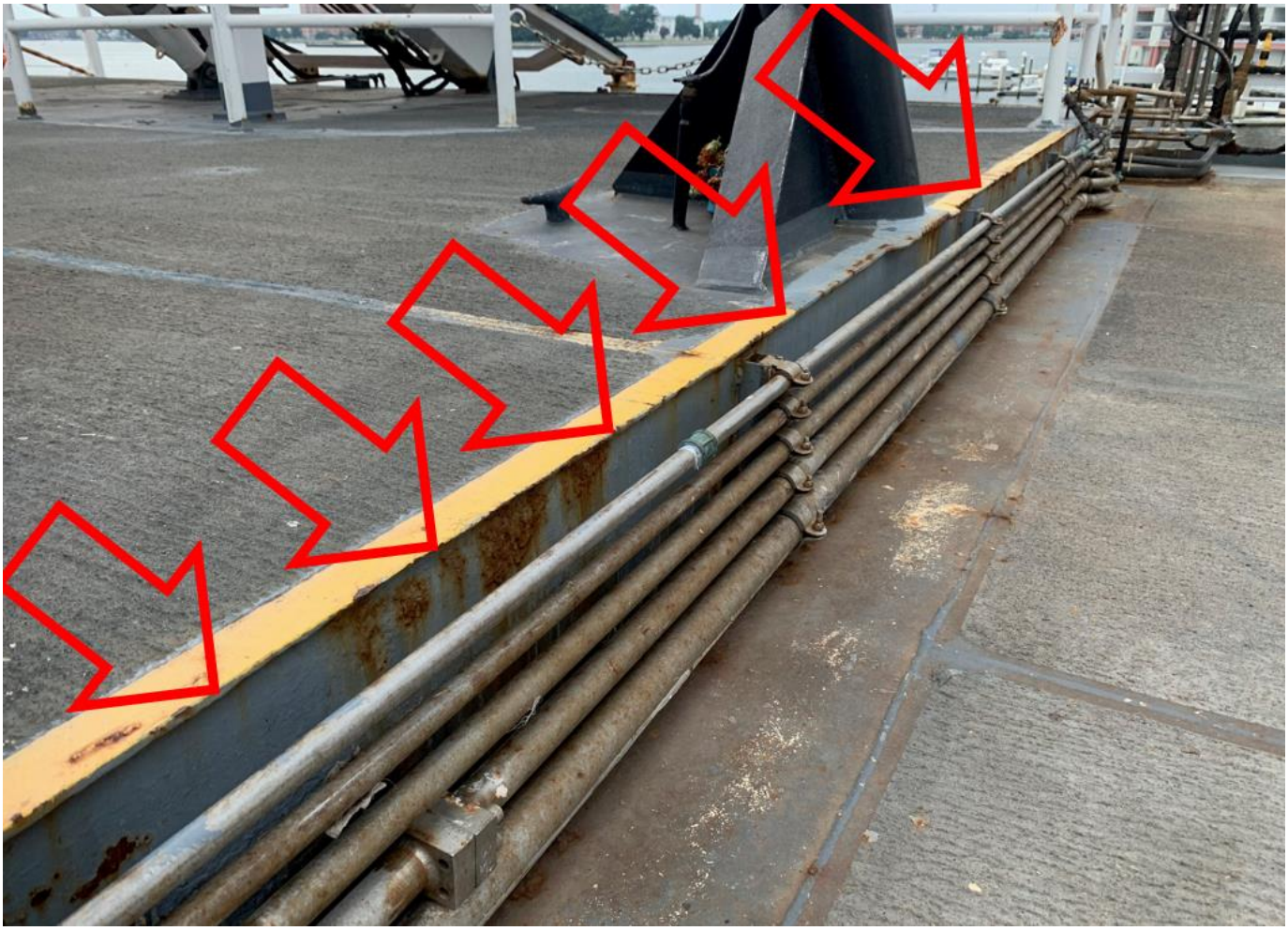
Example of rounded corner

3.5.4.7 Clean all slag and grind down all edge.

3.5.4.8 Replace in-kind with new steel. For bidding purposes, assume 3/8-inch thickness. Continuously weld all seams – interior and exterior.

3.5.4.9 Crop out and replace 140 non-continuous linear feet of inch of top side edge (lip) plating – 12 inches wide. Assume thickness of 3/8 inch. Edges shall be beveled to a 2 mm radius with a flapper wheel after installation and prior to paint. All corners shall be formed to match existing.

Picture showing portion of 12 inch lip to be replaced



Channel Hangers to be replaced



3.5.4.10 Remove and reinstall 6 handrail foundation interferences

3.5.4.11 Crop out and replace a 6 foot by 8 foot section of steel under the fuel station locker. For bidding purposes, assume steel thickness of 3/8 inch.

3.5.4.12 Crop out and replace two (2) 5 foot by 5 foot section of steel near and under the power washer. For bidding purposes, assume steel thickness of 3/8 inch.

3.5.4.13 Crop out and replace three (3) 6 foot by 4 foot sections of steel under each davit (6 total) – locations determined by COR. For bidding purposes, assume steel thickness of 3/8 inch.

3.5.4.14 Crop out two (2) 2 foot by 6 foot section of deck at the intersection of the 02 raised deck and 02 deck.

3.5.4.15 Schedule and coordinate the services of an ABS inspector and test all welds to the satisfaction of the onsite ABS representative. Provide material and weld certificates to ABS and COR.

3.5.4.15.1 Provide COR with ABS inspection documentation

3.5.4.16 Reinstall all interference piping, insulation and cables and pressure test affected piping to 1.5 working pressure for 4 hours. Check for leaks

3.5.4.17 Install new hangers or hanger channels, same spacing as existing for all removed and reinstalled air and hydraulic piping. Hangers shall be of stainless-steel material – Stainless 316L

3.5.4.18 Repair all damaged insulation and reinstall all overhead panels and interferences. Paint all insulation and disturbed areas to match.

3.5.4.19 Prepare new steel and hangers to an SSPC-11 standard. Take Profile readings with the COR. Solvent clean to an SSPC-1 standard

3.5.4.20 Paint steel to match the surrounding area in accordance with 3.5.2.7. Repair all nonskid preservation back as least 24 inches from repairs. Repair all non-skid damaged by steel replacement.

3.5.4.20.1. Non-skid shall be repaired with American Safety Technologies MS-7CZ Anti-Corrosive Low VOC Metal Primer (MIL-PRF-24667B) (5 mils DFT), and a full coat of American Safety Technologies AS-2500 epoxy anti-slip deck coating, 8 mils DFT, color: gray

3.5.4.21 Clear all lockouts/tagouts with CME and COR and recommission the compressed air system and port and STBD davit hydraulics. Add make-up hydraulic oil to hydraulic system for any lost hydraulic oil.

3.5.4.22 Renew all hydraulic hose wraps damaged by work

3.5.4.23 **Work on this item shall not start until the 29th day of the contract performance period to allow the mission systems personnel time to remove scientific equipment and secure the spaces. All work on this items shall be completed by the 80th day of the contract period to include paint touch up, insulation repair and the reinstallation of all interferences.**

3.5.5 Quality Assurance

3.5.5.1 All painting shall be of the same mileage as the existing to include non-skid paint repair.

3.5.5.2 All welds shall be inspected by level AWS Level II or Level III

weld inspector or equivalent.

3.5.5.3 Skip welding will not be permitted

3.5.5.4 All welders shall be certified in the process and filler material used in these repairs. The certifications shall be provided to the COR upon request.

3.5.5.5 All repairs shall be tested and inspected to the satisfaction of the attending ABS surveyor.

3.5.5.6 The contractor shall provide material certificate of all new material to the COR.

3.5.6 Notes

3.5.6.1 The vertical portion of the raised steel deck being replaced is the top 12 inches of the ET shop, wet lab, dry lab, mission control spaces, server room and scientific freezer. Inserts are above the ET shop, Wet Lab, server room, Dry Lab and mission control spaces.

3.5.6.2 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.5.6.3 The contractor shall provide a method of keeping all water out of the void and ship interior during the steel repairs.

3.5.6.4 Due to the sensitive nature of these areas, great care for protection from water, smoke, debris, and grit shall be taken by the contractor. Several negative exhaust ventilators shall be used any time hot work is being performed and be in close proximity to hot work to immediately remove smoke from spaces.

3.5.6.5 Contractor shall verify steel thickness prior to the commencement of work

END OF ITEM

3.6 SEA VALVE OVERHAULS

3.6.1 Intent:

3.6.1.1 Remove, clean, replace, and repair identified sea valves. Reinstall sea valves and test operation.

3.6.2 References

3.6.2.1 NOAA Standard Specification AMC-505-1B, "Valve Overhaul and Test"

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

3.6.2.3 Drawing No. 342-6233836, “Main Engine Sea Water Cooling Sys Arrgt.”

3.6.2.4 Drawing No. 524-6233839, “Auxiliary Sea Water Cooling Sys Arrgt.”

3.6.2.5 Drawing No. 524-6233814, “Auxiliary Sea Water System Diagram”

3.6.3 Government-Furnished Material

3.6.3.1 None.

3.6.4 Requirements

3.6.4.1 Remove, overhaul, test, and reinstall the valves listed in the table below in accordance with Reference 3.6.2.1, except as otherwise required below.

No	Description	Frame/Location	Size/Type	Waster Piece	Valve Location when in a Confined Space
1	BT Cooling OVBD	Bow Thruster Space 2-9-2	2" Gate		
2	BT Cooling OVBD	Bow Thruster Space 4-9-2	2" Swing Check		Inside FO Tank 4-6-1
3	BT HPU Oil Cooler OVBD	Bow Thruster Space 2-13-2	1-1/4" Gate		
4	BT HPU Oil Cooler OVBD	Bow Thruster Space 4-14-2	1-1/4" Swing Check	1" x 12"	Inside FO Tank 4-6-2

			(welded in place)		
5	Domestic Refrig Drain OVBD	Ship' Gym 4-20-1	2" Gate (welded in place)		Inside FO Tank 4-14-1
6	Domestic Refrig Drain OVBD	Ship' Gym 4-21-1	2" Check (welded in place)	2" x 12"	Inside FO Tank 4-14-1
7	Sewage Holding Tank Vent	Laundry Room 3-23-1	3″ Gate		
8	Sewage Holding Tank Vent	Laundry Room 3-23-1	3″ Swing Check		
9	Doppler Speed Log	Void Below Laundry Deck 4-23-1-T	6" Gate		In transducer trunk
10	A/C Cooling OVBD	A/C Machinery Space 2-27-2	6" Globe	6" x 16"	
11	A/C Cooling OVBD	A/C Machinery Space 2-27-2	6" Swing Check		
12	Sewage & Gray Water OVBD	Sewage Machy Room 2-30-1	5" Swing Check		
13	Sewage & Gray Water OVBD	Sewage Machy Room 2-32-1	4" Swing Check		
14	Sewage & Gray Water OVBD	Sewage Machy Room 2-29-1	4" Swing Check		
15	Gray Water Diverter Valve	Sewage Machy Room 2-31-0	4" 3-Way Ball		
16	Sewage Diverter Valve	Sewage Machy Room 2-29-0	4" 3-Way Ball		
17	Sewer Pump Overboard	Sewage Machy Room 2-30-1	2" Globe		
18	Main Sea Chest Suction	Main Generator Space 3-32-1	12" Gate	12" x 10"	
19	Main Sea Chest Suction	Main Generator Space 3-32-2	12" Gate	12" x 16"	
20	Sea Chest Vent	Main Generator Space 3-32-1	2" Gate		

21	Sea Chest Vent	Main Generator Space 3-32-2	2" Gate		
22	Sea Chest Blow Down	Main Generator Space 3-32-1	1" Globe		
23	Sea Chest Blow Down	Main Generator Space 3-32-2	1" Globe		
24	Port Evaporator Brine Overboard	Main Generator Space 4-37-2	3″ Gate		Inside Void 4-34-01
25	Port Evaporator Brine Overboard	Main Generator Space 4-37-2	3″ Swing Check		Inside Void 4-34-01
24	Main Sea Water OVBD	Main Generator Space 3-42-1	6" Motor-Operated Butterfly	6" x 10"	
25	Main Sea Water OVBD	Main Generator Space 3-42-2	8" Motor-Operated Butterfly	8" x 10"	
26	Main Sea Water OVBD	Main Generator Space 4-42-1	6" Swing Check		Inside Void 4-34-01
27	Main Sea Water OVBD	Main Generator Space 4-42-2	8" Swing Check		Inside Void 4-34-01
28	Bilge Pump OVBD	Main Generator Space 3-46-1	3" Butterfly	3" x 16"	
29	Galley Drain OVBD	Main Generator Space 4-49-1	3" Swing Check		Inside Void 4-34-01
30	Galley Drain OVBD	Main Generator Space 3-47-1	3" 3-Way Plug	3" x 12"	Inside Void 4-34-01
31	Emergency Bilge Suction	Main Generator Space 3-50-0	5" Globe		
32	Bilge Pump Overboard	Main Generator Space 3-50-1	3″ Swing Check		Inside Void 4-34-01
33	Oily Water Separator Overboard	Main Generator Space 3-50-1	1″ Gate		Inside Void 4-34-01
34	Oily Water Separator Overboard	Main Generator Space 3-50-1	1″ Swing Check		Inside Void 4-34-01

35	Tween Deck Trough & Dive Locker Drain Overboard	Mission Deck (S)	2″ Gate		Inside Ballast Tank 4-86-1
36	Tween Deck Trough & Dive Locker Drain Overboard	Mission Deck (S)	2″ Swing Check		Inside Ballast Tank 4-86-1
37	Wet Lab Deck Drain Overboard	Wet Lab (S)	2″ Swing Check		Inside FO tank 4-52-1
38	Wet Lab Deck Drain Overboard	Wet Lab (P)	2″ Swing Check		Inside FO tank 4-52-2
39	Science Seawater Overboard	Wet Lab (P)	3/4″ Swing Check (welded)		Inside FO tank 4-52-2
40	Science Reefer Cooling Overboard	Propulsion Motor Room 2-70-2	1-1/4″ Swing Check		
41	Aft Sea Chest Suction	Propulsion Motor Room 2-67-0	4" Angle Globe	4" x 12"	
42	Aft Sea Chest Vent	Propulsion Motor Room 2-67-0	2" Gate		
43	Aft Sea Chest Blowdown	Propulsion Motor Room 2-67-0	3/4" Globe		
44	Main Motor Cooling OVBD	Propulsion Motor Room 2-66-1	4" Butterfly	4" x 19"	
45	Main Motor Cooling OVBD	Propulsion Motor Room 4-66-1	4" Swing Check		Inside FO tank 4-52-1
46	Main Motor Oil Cooling OVBD	Propulsion Motor Room 2-68-2	2-1/2" Butterfly	2-1/2" x 20"	

47	Main Motor Oil Cooling OVBD	Propulsion Motor Room 4-67-2	2" Swing Check		Inside FO tank 4-52-2
48	Gray Water OVBD	Propulsion Motor Room 2-66-2	4" Swing Check		
49	Gray Water OVBD	Propulsion Motor Room 2-71-2	4" Swing Check		
50	Black Water OVBD	Propulsion Motor Room 2-70-2	4" Swing Check		
51	Gray Water OVBD	Propulsion Motor Room 2-69-2	3" Swing Check		
52	Gray Water Diverter Valve	Propulsion Motor Room 2-72-2	4" 3-Way Ball		
53	Black Water Diverter Valve	Propulsion Motor Room 2-72-2	4" 3-Way Ball		
54	Winch Room Sea Suction	Winch Room 2-80-2	2-1/2" Gate	2-1/2" x 16"	
55	HPU Cooling Water OVBD	Winch Room 2-75-1	2-1/2" Gate		
56	HPU Cooling Water OVBD	Winch Room 2-75-1	2-1/2" Swing Check		
57	Decon Station Drain OVBD	Anti-Roll Tank 2-73-1	2" Gate		Inside Anti-Roll Tank 2-72-0
58	Decon Station Drain OVBD	Anti-Roll Tank 2-74-1	2" Swing Check		Inside Anti-Roll Tank 2-72-0-W
59	Spare		2-1/2" Gate		
60	Spare		4" Gate		

61	Scientific Seawater Science	Inside Bow Thruster Void	2” Globe		Inside Void below Bow Thruster
62	Reefer Cooling Overboard	Propulsion Motor Room 2-70-2	1-1/4” gate		

3.6.4.2 All valves 2 inches and under shall be renewed in kind rather than overhauled. New valves shall have bronze bodies with monel trim. New valves must undergo and pass hydrostatic testing in the presence of the COR and ABS, same as overhauled valves.

3.6.4.2.1 All 2 inches and smaller valves that are removed and not installed shall be turned over to the COR or discarded, upon determination by the COR.

3.6.4.2.2 The main sea chest suction valves listed as #18 and #19 in the previous table shall be replaced with new bronze valves with monel trim. New stainless steel (316L) fasteners shall be procured and installed with new main sea chest suction valves.

3.6.4.3 The following additional requirements apply:

3.6.4.3.1 Match mark all flanges and spool pieces prior to removing from the ship to identify valve location and orientation for re-installation following shop overhaul.

3.6.4.3.1.1 No pipes shall be left open upon removal of valves. Pipe openings shall be immediately covered to prevent the introduction of foreign material until replacement valve is installed. New Gasket Material shall be used during reinstallation

3.6.4.3.2 Blast and paint the insides of sea suction pipe spool pieces in accordance with the Underwater Body Coating System Base Item.

3.6.4.3.3 Conduct a visual inspection of all spool pieces, flanges, vent pipes, and other areas for evidence of damage or deterioration. Provide COR with condition report. This shall include all overboard discharges and drain piping discharges which transit all fuel tanks and voids prior to exiting at the shell penetrations. Using neoprene gasket material, replace all check valve flange gaskets on all discharge lines transiting fuel tanks and voids.

3.6.4.3.4 Install new overhaul kits in all butterfly valves (boot, o-rings, o-ring fasteners, teflon bushing).

3.6.4.3.5 Renew all cotter pins and swing check clapper pins with monel.

3.6.4.3.6 After reassembly and prior to shop hydro test, prime coat all ferrous valves with blue wash primer or equal.

3.6.4.3.7 Prior to reinstalling on the ship, prime and paint two finish coats of enamel paint on all valves and spool pieces worked in this item. Retain existing color code. Bronze and stainless steel valves will not require exterior coating, but do require a color coded stripe applied on the valve body and handle.

3.6.4.3.8 Include in proposal the material cost to renew $500 in fasteners at the direction of the COR. All unused new and used fasteners shall be turned over to the COR. All reused fastens shall be wire wheel cleaned. Prior to installing and tightening up on threads, liberally coat all stainless steel bolts and stud threads with an anti-seize extreme pressure lubricant designed to protect metal parts against corrosion, rust, galling, and seizure in salt water environments. “Never-Seez Mariners Choice” anti-seize is an acceptable lubricant for this purpose.

3.6.4.3.9 Renew all waster pieces listed in the previous table. Locations and material requirements shall be in accordance with Reference 3.6.2.5. Conduct a magnetic particle test of all new welds in the presence of the COR. Hydrostatically test all new waster pieces to 50 psi in the presence of the COR. Do not paint interior of waster pieces.

3.6.5 Quality Assurance

3.6.5.1 As required by references 3.6.2.1 and 3.6.2.2.

3.6.5.2 In the presence of the COR and Chief Engineer, prove proper operation of reach rod assemblies after the installation of all valves.

3.6.5.3 Watertight integrity of all overhauled and replaced valves shall be checked and inspected in coordination with and witnessed by the COR during the undocking evolution, 48 hours after undocking the vessel and during sea trials.

3.6.5.4 Material certificate for new valves shall be provided to the COR prior to installation.

3.6.5.5 All valves shall be hydrostatically tested to the satisfaction

of the onsite ABS surveyor prior to installation. A CFR outlining the test results shall be provided to the COR

3.6.5.6 All valves shall be cycled at least three times in the presence of the COR after installation.

3.6.6 Notes

3.6.6.1 The contractor will be responsible for opening, cleaning, and the gas free certification for tanks and voids with valves inside as part of the ABS Survey.

3.6.6.2 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.6.6.3 All new valves shall be ordered within the first 7 days of the contract performance period with a copy of the invoice provided to the COR.

END OF ITEM

3.7 BOW AND STERN THRUSTERS MAINTENANCE

3.7.1 Intent:

3.7.1.1 Remove bow and stern thruster propellers, replace seals and identified parts. Polish propellers.

3.7.2 References

3.7.2.1 Thrustmaster Operator's Manual – Retractable Azmuthing Thruster Model TH-500MLRT (Bow Thruster)

3.7.2.2 Thrustmaster Operator's Manual – Hydraulic Tunnel Thruster Model 36TT250-AL (Stern Thrusters)

3.7.2.3 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.7.3 Government Furnished Material

3.7.3.1 None

3.7.4 Requirements

3.7.4.1 All work on this item must be accomplished under the direct on-site supervision of an authorized Thrustmaster of Texas (TMOT) service representative (see Note 3.7.6.1 for TMOT contact information.)

3.7.4.2 No work on this item shall be accomplished while grit blasting or painting is being accomplished in the drydock or general vicinity, or while the wind may carry such products from other locations into the drydock. During such times, wrap the thrusters with protective coverings to preclude contamination.

3.7.4.3 Provide the services of a TMOT certified technical representative for performance and oversight of this item. The TMOT technical representative shall provide an analysis report regarding the condition of the removed and replaced components.

3.7.4.4 Accomplish the following on each of the two stern thrusters:

3.7.4.4.1 Unbolt and remove gratings from stern thruster tunnels.

3.7.4.4.2 Completely drain and dispose of all of the hydraulic oil from the systems (pumps, reservoirs, piping)

3.7.4.4.3 Remove the propellers and renew the inboard and outboard propeller shaft seals, shafts and bearings.

3.7.4.4.3.1 Contractor to procure and provide new seals, shafts and bearings and install in both stern thrusters. Inspect with TMOT and COR.

3.7.4.4.3.2 Turn over old seals, shafts and bearings to COR or discard at the determination of the COR

3.7.4.4.4 Purchase 150 gallons of RSC Envirologic 3046 VGP, biodegradable hydraulic oil and refill system (approx. 60 gallons for each thruster) run through a new 3 micron filter.

3.7.4.4.4.1 All unused oil will be turned over to COR in original containers

3.7.4.4.5 Reinstall propellers and gratings.

3.7.4.4.6 Polish both Stern Thruster propellers to a Rupert Scale "A" Grade finish and inspect with COR.

3.7.4.5 Accomplish the following on the bow thruster:

3.7.4.5.1 Remove propeller.

3.7.4.5.2 Drain and dispose of the lubricating (gear) oil.

3.7.4.5.3 Renew propeller shaft seal.

3.7.4.5.3.1 Contractor to procure and provide new seal

3.7.4.5.4 Purchase at least 50 gallons of RSC BioSolutions Envirologic 210 EP oil and refill system (approx. 50 gallons); run through a new 3 micron filter.

3.7.4.5.4.1 All unused oil will be turned over to COR.

3.7.4.5.5 Reinstall propeller. Polish Bow Thruster propeller to a Rupert Scale "A" Grade finish and inspect with COR.

3.7.4.5.6 Contractor, with TMOT, shall provide a CFR with analysis of the removed seals and any notable findings during the replacements.

3.7.5 Quality Assurance

3.7.5.1 Operationally test the bow thruster and each stern thruster in clockwise and counterclockwise direction for a period of at least one hour in the presence of COR and manufacturer's technical representative. No leakage is allowed. Test the Bow Thruster for up to one addition hour during sea trials.

3.7.6 Notes

3.7.6.1 Contact information for parts and service for Thrustmaster of Texas (manufacturer of the ship's bow thruster and two stern thrusters):

Thrustmaster of Texas
6900 Thrustmaster Dr.
Houston, TX 77041
Attn: Tyson Griffin, Field Service Manager
Tel: (713) 937-6295/Cell: (832) 358-6396
e-mail: tyson.griffin@thrustmastertexas.com

3.7.6.2 Contractor shall order all oil listed in this specification within 7 days following contract award.

3.7.6.3 Within 7 days of contract award, contractor shall contact TMOT to order all replacement seals, shafts and bearings.

3.7.6.4 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.8 SEWAGE TANK, LAUNDRY SUMP TANK, MAIN ENGINE ROOM VOIDS AND BOW THRUSTER VOID PRESERVATION

3.8.1 Intent:

3.8.1.1 Prepare and paint the sewage tank, laundry sump tank, main engine room voids and bow thruster void.

3.8.2 References

3.8.2.1 Drawing OE-601-101, Rev. C, General Arrangement

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

3.8.2.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

3.8.2.4 Steel Structures Painting Council Surface Preparation Specification No. 10 (SSPC-SP 10/NACE No. 2), Near White Blast Cleaning

3.8.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

3.8.2.6 Drawing 631-623-3576 – Paint Schedule

3.8.2.7 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.8.3 Government Furnished Equipment

3.8.3.1 None

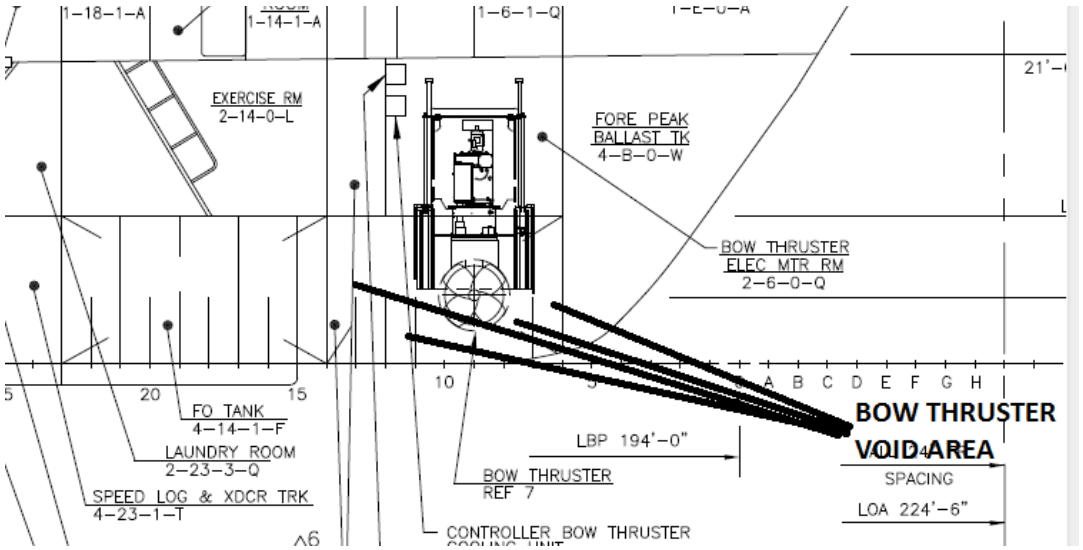
3.8.4 Requirements

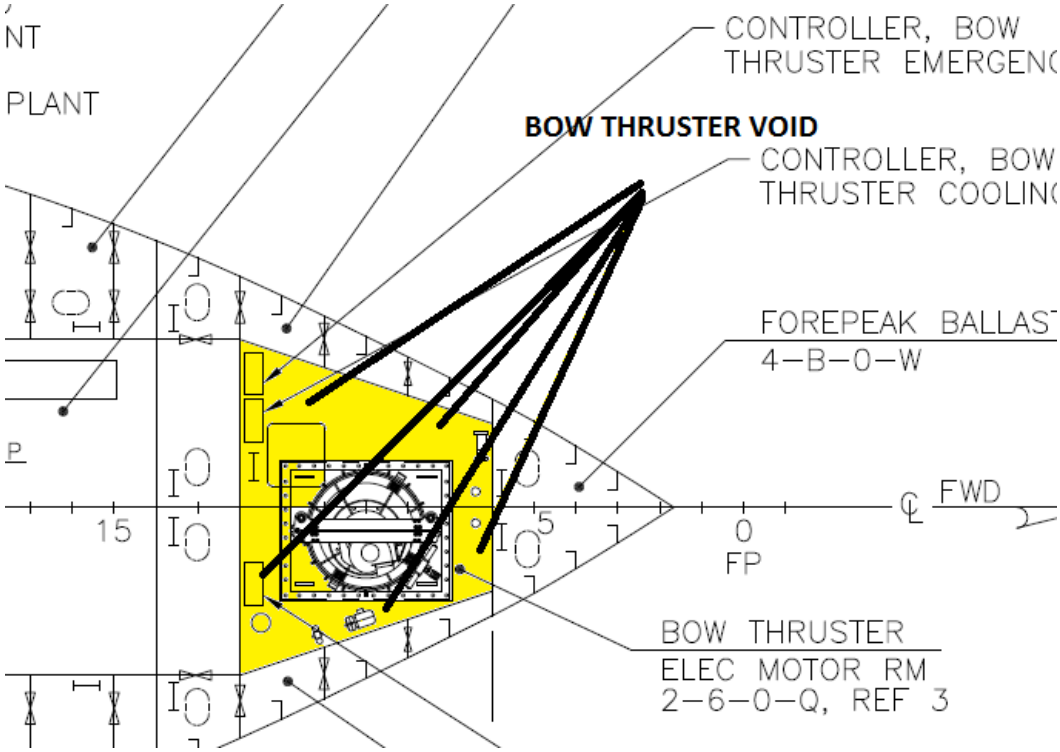
3.8.4.1 All surface preparation and painting work required by this specification shall be done in accordance with Reference 3.8.2.2 and shall be performed by an industry recognized certified paint contractor. Paint certification shall be provided to COR for review and approval prior to the commencement of work.

3.8.4.2 Remove all accumulated water from the Bow Thruster Void (4-6-0-V), and Engine Room Voids 4-34-01-V and 4-34-0-V. Use dehumidification (DH) equipment and maintain temperature and humidity within the voids to the paint manufacturer's specifications throughout the entire surface preparation and painting process. Complete UT gauge readings

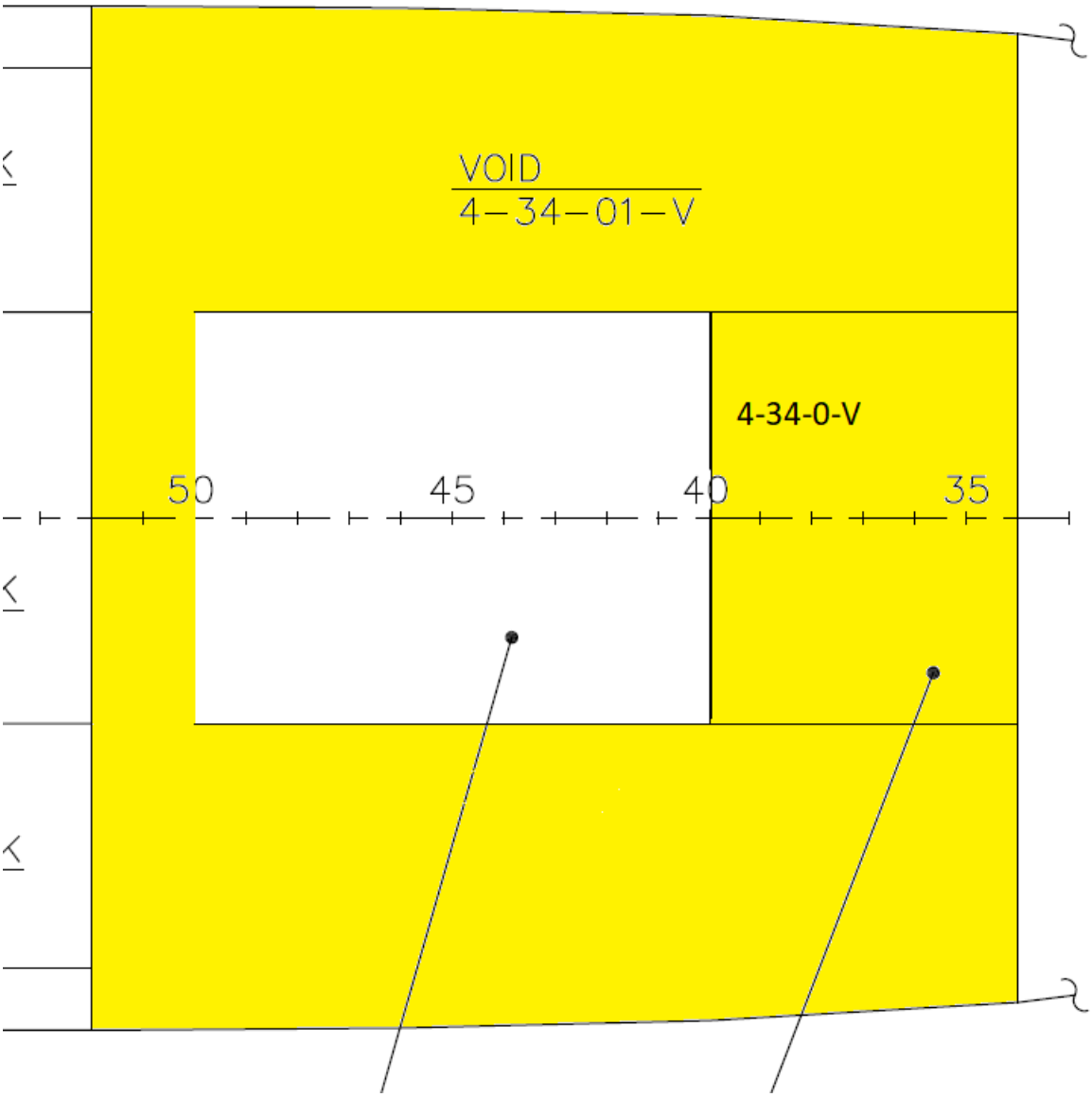
associated with Item 3.13 prior to the commencement of work.

3.8.4.2.1 Approximate area of the bow thruster void taken from General Arrangement:





3.8.4.2.2 Approximate area of the Engine Room voids taken from General Arrangement (in yellow):



3.8.4.3 Crop out and replace in kind three (3) 3ft by 4 feet steel sections in the engine room void. For bidding purposes assume steel thickness of ½ inch.

3.8.4.3.1 Provide steel material certifications to the COR and ABS and test and inspect in the presence of the attending ABS surveyor.

3.8.4.4 In the Bow thruster void, crop out and replace in kind two (2) 3 feet by 3 feet steel sections. For bidding purposes assume thickness of ½ inch.

3.8.4.4.1 Provide steel material certifications to the COR and ABS and test and inspect in the presence of the attending ABS surveyor.

3.8.4.5 Blast the interior of the voids referenced in 3.8.4.2 (bow thruster void and two engine room voids) to near-white metal in accordance with NACE 2/SSPC-SP10 (the contractor is permitted to powertool clean the voids to an SSPC-SP11 standard in lieu of the SSPC-SP10 standard). Use caution to prevent sandblast material from entering other areas of 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 voids with ducting run to the exterior of the ship. Solvent clean void to SSPC-SP1 Standard. COR to inspect void following solvent cleaning. Take and record profiles and perform surface chloride checks (in at least 10 locations in each void, actual locations to be selected by COR). Maximum chloride measurements shall not exceed 5 ug/cm2 or 50 mg/m2. If chloride measurements exceed this level, fresh water wash at 3000 psi and repeat surface cleaning, if necessary, and testing until satisfactory measurements are achieved.

3.8.4.6 Clean the voids of all traces of blast products and dust, then coat the void with the following system in accordance with Reference 3.8.1.2.

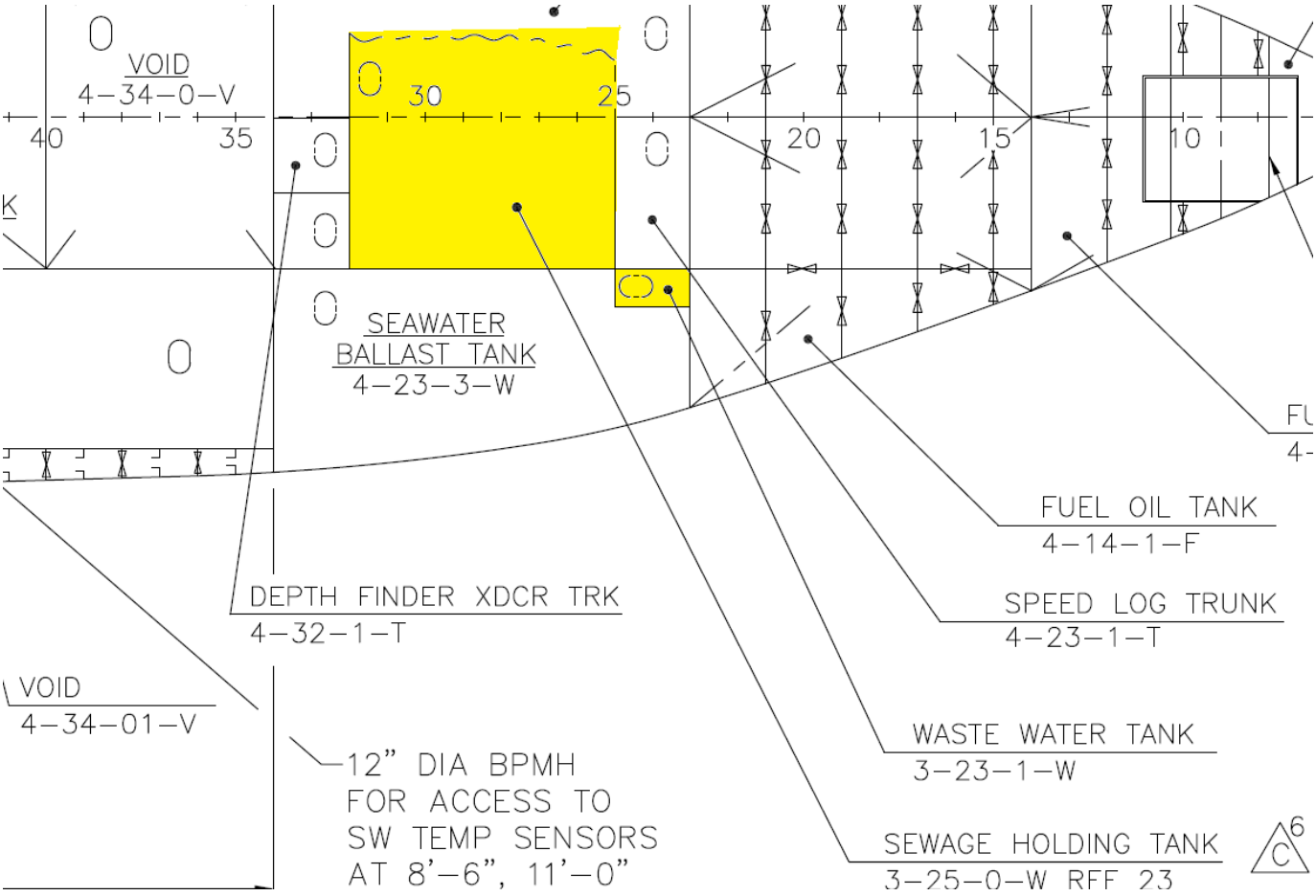
(a) One full coat of International Intershield 300V, 6 mils DFT (Color – bronze)
(b) One full coat of International Intertuf 262, 6 mills DFT (color - red)
(c) (one full coat of International Intergard 263, 5 mills DFT (color – grey)

3.8.4.7 Following the cure time per Reference 3.8.1.2, close up the void using new gaskets and hardware for manholes, same thickness and material as existing.

3.8.4.8 Open, clean and gas free Laundry Sump Tank (3-23-1-W) and Sewage holding tank (3-25-0-W). Make safe for entry and hot work. Crop out and replace three (3) steel inserts in either the CHT or Laundry sump tank at the direction of the COR. Inserts shall be 2 ft by 3 ft. Assume steel thickness of ½ inch.

3.8.4.6.1 Install a 3 inch diameter, schedule 80, 12-inch long pipe approximately 12 inches inboard of Sewage Holding Tank TLI pipe in the AC room penetrating the top of the Sewage Holding tank. Final location and length shall be approved by COR. Paint pipe inside and out to match

surrounding. Pipe shall have a 4-bolt, 3 inch flanged welded at the top. Provide a new gasket and bolt a 300 lb blank flange to the end of the flange. (Pipe to be used at a later time by ship's force to install a radar type TLI)



3.8.4.7 Blast the interior of the Sewage Holding tank and Laundry Sump tank to a near white metal in accordance with NACE 2/SSPC-SP10 (the contractor is permitted to powertool clean the tanks to an SSPC-SP11 standard in lieu of the SSPC-SP10 standard). Use caution to prevent sandblast material from entering other areas of 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. Solvent clean void to SSPC-SP1 Standard. COR to inspect tanks following solvent cleaning. Take and record profiles

and perform surface chloride checks (in at least 10 locations in each void, actual locations to be selected by COR). Maximum chloride measurements shall not exceed 5 ug/cm2 or 50 mg/m2. If chloride measurements exceed this level, fresh water wash at 3000 psi and repeat surface cleaning, if necessary, and testing until satisfactory measurements are achieved.

3.8.4.8 Apply Sherwin-Williams Novaplate UHS Ultra High Solids paint system (existing system)in the CHT holding tank and the laundry sump tank in accordance with the manufacturer's recommended procedure

(a) Apply full primer coat, 6-8 mils DFT

(b) Apply one stripe coat (contrasting color), of top coat paint, at 8 - 10 mils DFT, to all cut-outs, welds, backsides of angles, edges, and other difficult to reach areas.

(c) Apply one full coat (color white) of top coat, 10-12 mils DFT.

(d) Pump dry air through the coated tanks, providing adequate ventilation to ensure proper curing of the paint system application.

3.8.4.9 Following the cure time of the paint, close up the Laundry Sump Tank and the Sewage Holding Tank using new rubber gaskets for manholes, same thickness as existing. Conduct a 2 psi air pressure test of each tank to ensure air tight seal of manhole covers. .

3.8.5 Quality Assurance

3.8.5.1 As required by References 3.8.1.2 through 3.8.1.5

3.8.5.2 Contractor or subcontractor paint certifications shall be provided to and approved by COR prior to commencement of work.

3.8.5.3 Contractor shall facilitate inspections with paint inspector, COR and PM between void and tank cleaning, paint preparation and each coat of paint applied.

3.8.5.4 Material certificates for all steel inserts shall be provided to ABS and the COR

3.8.5.5 All welders shall be certified in the weld process and filler material used in the weld process.

3.8.5.6 All steel repairs stall be tested and inspected to the satisfaction of the on-site ABS surveyor.

3.8.6 Notes

3.8.6.1 The Bow Thruster Void is a small and compact void located below the deck of the bow thruster room. Contractors are advised that multiple steel inserts/openings may need to be cut and reinserted in this void to accomplished required preservation and should be taken into account when bidding on this work.

3.8.6.2 The bow thruster extends down through the center of the void when deployed and care shall be taken to ensure all bow thruster and associated parts inside the void are adequately covered during the blasting and painting process.

3.8.6.3 The contractor shall maintain a negative pressure ventilation system in compartments being painted to ensure fumes and dust are not distributed around the ship.

3.8.6.4 COR to be formally notified of inspection of cleaned areas after each step of the cleaning process (bilges pumped, each power wash/cleaning, degreasing, solvent wiping, and paint coat application

3.8.6.5 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.9 DOCK AND SEA TRIALS

3.9.1 Intent:

3.9.1.1 Perform dockside and at sea testing of the ship and affected systems following repairs, servicing, overhauls and installation of equipment.

3.9.2 References

3.9.2.1 NOAA Form 57-10-01 – Health Services Questionnaire

3.9.2.2 NOAA Form 57-10-02 – Tuberculosis Screening Document

3.9.2.3 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.9.3 Government Furnished Material

3.9.3.1 None

3.9.4 Requirements

3.9.4.1 Conduct Dock Trials

3.9.4.1.1 At least one week before the ship is scheduled to leave the Contractor's facility, conduct one working day of dock trials. The date for the dock trials must be approved by the COR.

3.9.4.1.2 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.

3.9.4.1.3 All equipment will be operated by ship's force personnel.

3.9.4.1.4 During the dock trials, all utilities will be transferred to the ship.

3.9.4.1.5 Schedule testing during normal working hours.

3.9.4.1.6 No Contractor work shall be performed during dock trials without the prior approval of the COR.

3.9.4.1.10 Provide a supervisor with access to contractor personnel in all trades to oversee the repair and adjustment of equipment repaired and installed by the Contractor.

3.9.4.1.11 Provide a dock trial report including all deficiencies and their projected resolutions to include material needed, material delivery dates, labor levels needed, and estimated completion dates.

3.9.4.1.12 The contractor Project Manager shall provide a "Statement of Readiness" 24 hours prior to the Dock Trials that indicates the contractor has completed all work and is ready to complete dock trials. The Statement of Readiness shall be signed by the Project Managers attesting to the readiness to conduct dock trials.

3.9.4.2 Conduct Sea Trials

3.9.4.2.1 Following satisfactory completion of dock trials, schedule and participate in a sea trial to witness testing of all repaired or newly installed equipment and machinery. The sea trial shall be an underway at sea condition for a duration of at least 20 hours, departing from and returning to the contractor's facility. 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. The contractor shall coordinate the sea trial dates with manufacturers' technical representatives as required, and provide at least 72 hours' notice.

3.9.4.2.1.1 The contractor shall determine which subcontractors and technical representative need to attend sea trials in order to commission, test, operate and calibrate equipment.

3.9.4.2.2 The date for the sea trial must be approved by the COR. The sea trial agenda shall be set and an estimate total sea trials timeline submitted to and approved by the COR. Prior to departure, submit a list of Contractor's and 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.

3.9.4.2.2.1 Should the total "pier-to-pier" sea trials time take more than 24 hours, each contractor, technical representative, and subcontractor rider shall be cleared medically by NOAA and have submitted NOAA Forms 57-10-01 (Health Questionnaire) and 57-10-02 (Tuberculosis Screening Document).

3.9.4.2.3 Correct all dock trial discrepancies prior to the sea trial.

3.9.4.2.4 All equipment will be operated by ship's force.

3.9.4.2.5 No Contractor work will be allowed during the sea trial without the prior written approval of the COR.

3.9.4.2.6 Provide a supervisor or shipyard technician with access to contractor, subcontractor, and technical representative personnel in all trades to oversee the repair and adjustment of equipment installed and repaired by the Contractor.

3.9.4.2.6.1 The COR may approve the use of multi-skill tradesman on a case by case basis to reduce the number of riders on sea trials

3.9.4.2.6 Provide a sea trial report including all deficiencies and their resolutions to include material needed, material delivery dates, labor levels needed, and estimated completion dates

3.9.4.2.7 Correct all sea trial discrepancies before the ship leaves the Contractor’s facility.

3.9.4.2.8 The contractor Project Manager shall provide a “Statement of Readiness” 24 hours prior to the Sea Trials that indicates the contractor has completed all work and is ready to complete sea trials. The Statement of Readiness shall be signed by the Project Managers attesting to the readiness to conduct sea trials.

3.9.5 Quality Assurance

3.9.5.1 Tests, inspections, and reports shall be in accordance with the approved schedule as required in paragraphs 3.9.4.1.2 and 3.9.4.2.2.

3.9.6 Notes

3.9.6.1 Provide the American Bureau of Shipping surveyor with prior notice and the opportunity to inspect any or all portions of ongoing work during the dock trials or the sea trials. Provide ABS the option to ride the ship for sea trials.

3.9.6.2 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably

obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.10 DRYDOCKING & ROUTINE DRYDOCKING WORK

3.10.1 Intent:

3.10.1.1 Drydock and ship and perform identified drydocking work.

3.10.2 References

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

3.10.2.2 NOAA Standard Specification S1205, "Zinc Protectors"

3.10.2.3 Drawing No. OE-085-001 Rev F, "Docking Plan"

3.10.2.4 Drawing No. 243-6233870, "Main Propeller Shaft Installation Arrangement and Details"

3.10.2.5 Drawing No. 562-6233911, "Rudder Stock Carrier Bearing Arrgt and Details"

3.10.2.6 Drawing No. 633-6233582, "Zincs Arr & Details"

3.10.2.7 ELINCA Technical Manual, "The ELINCA Anti-Biofouling System", Series P000 (US), Manual No. 154 in Ship's Technical Publication Index

3.10.2.8 Form S0700, "NOAA Docking Report"

3.10.2.9 Drydock Worksheet

3.10.2.10 NOAAS Okeanos Explorer Fairing and Transducer Locations Rev 6

3.10.2.11 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

3.10.3 Government Furnished Equipment

3.10.3.1 None:

3.10.4 Requirements

3.10.4.1 To allow the Government to evaluate the certification of the drydock and other services, complete the Drydock Worksheet (Reference 3.2.2.9) and submit along with the bid/proposal. Submit a separate completed drydock worksheet for each drydock Contractor may use.

3.10.4.2 **Drydock the vessel within the first 5 days of the contract**

performance period. Provide drydocking and routine drydock work in accordance with Reference 3.10.2.1. When washing the propellers with high pressure water per paragraph 3.4.1 of Reference 3.10.2.1, the water pressure shall not exceed 10,000 psi.

3.10.4.3 The following information and additional requirements apply:

3.10.4.3.1 Block the ship with a minimum of six feet clearance under the keel (forward and aft of the Transducer Fairing Unit (TFU)) in Docking Position No. 1.

3.10.4.3.2 When the vessel is set on the keel blocks, prior to lifting it out of the water, have divers ascertain that the bilge blocks are contacting the hull properly and not landing on any underwater appendages or in between frames. The divers shall inform the Dockmaster and COR and then lifting shall continue.

3.10.4.3.2.1 The COR shall be given a radio used by the divers and dockmaster to listen to communication during the docking and undocking.

3.10.4.3.3 Make special note the requirement in Note 9 of Reference 3.10.2.3 for divers to remove the drainage plug in the TFU before the draft reaches 3 feet in way of the TFU. The plug is located in the center of a manhole cover, stbd side, at approx. Frame 35. Divers will need a 1-inch Allen wrench to remove the drainage plug.

3.10.4.3.4 Provide rudder clearance readings in a CFR to the COR within the first seven days of ship drydocking during the contract performance period.

3.10.4.3.5 In the presence of the ABS surveyor, open drain plugs on rudders. Drain liquid, if any, from rudder interiors. Conduct a 2 psi air test on rudders. Apply an environmentally friendly float coat to rudder interiors by the fill and drain method. See Note 3.10.6.4.

3.10.4.3.6 Polish the propellers a Rupert Scale “A” Grade finish. Hard tools and wire brushes shall not be used. See Note 3.10.6.1. Inspect with COR following polish

3.10.4.3.7 Perform the following inspection on the port and starboard rudders and provide all findings in a CFR:

3.10.4.3.7.1 Jack the rudders forward and aft. Using a dial indicator, measure the amount of travel at the lower end of the lower rudder bearing.

3.10.4.3.7.2 Jack the rudders port and starboard. Using a dial indicator, measure the amount of travel at the lower end of the lower rudder bearing.

3.10.4.3.7.3 With the rudder centered forward and aft and port and starboard, Jack the rudder up and down. With a dial indicator, measure the amount of travel.

3.10.4.3.7.4 Submit a technical findings report (that includes drawings) to the COR within 24 hours of completion indicating the amounts of travel in the rudder bearings for both port and starboard rudders.

3.10.4.4 Provide the ABS Surveyor with prior notice and the opportunity to inspect any or all portions of ongoing work ordered by this item.

3.10.4.5 Renew hull, sea chest, bow thruster tunnel, and shaft strut sacrificial anodes as designated by the COR in accordance with References 3.10.2.2 and 3.10.2.6. See Note 3.10.6.2.

3.10.4.5.1 Remove and scrap the 84 existing type zinc anodes. Clean, prime and paint the areas behind the anodes per Underwater Body Coating Item (Item 3.11) prior to installing the new anodes.

3.10.4.5.2 Install 84 new aluminum anodes (equivalent size as the original size of the removed zincs) in the same locations as those removed. Provide and install 5 new studs and fasteners for those damaged or missing.

3.10.4.5.3 Remove and scrap the existing 4 type zinc anodes bolted on the outer perimeter of the bow thruster kort nozzle. Remove these zincs. Install 4 new aluminum anodes in the same locations as those removed.

3.10.4.5.4 Anode attachment points and damaged hull paint shall be cleaned and painted after installation in accordance with Underwater Body Coating item (Item 3.11). No paint or other permanent coatings are to be applied to the exposed anode surfaces, which shall be clean bare metal. The underwater body side of the anodes shall not contact the hull.

3.10.4.5.5 After completion of all anode renewals, visually inspect each new anode with the COR to determine proper attachment, and to ensure that the anodes were not painted during painting of the hull.

3.10.4.6 Perform the following work on the ELINCA system in accordance with Reference 3.10.2.7, and under the guidance of an on-site manufacturer's field engineer (see Note 3.10.6.3):

3.10.4.6.1 Test/inspect the operation of the ELINCA system at the following milestones and provide findings in a CFR:

3.10.4.6.1.1 prior to drydocking while the vessel is still waterborne,

3.10.4.6.1.2 in the drydock following all work on the system, and

3.10.4.6.1.3 after the ship has been refloated.

3.10.4.6.2 Purchase and renew one copper anode (ELINCA part no. EL40040-9) and one Government-furnished iron anode (ELINCA part no. EL40039-9) in each of the ship's 3 main sea chests – two located port and starboard in the Main Generator Room 3-34-0-E, and one in the Main Propulsion Motor Room 3-60-0-E.

3.10.4.6.2.1 A total of 3 ea. copper anode (ELINCA part no. EL40040-9) & 3 ea. iron anode (ELINCA part no. EL40039-9) shall be purchased by the contractor for installation as per 3.10.4.6.2. Due to lead times, the contractor shall order these anodes within 7 days following contract award.

3.10.4.6.2.2 A source for Elinca Anodes is:

Admiral Filter
18C Green Pond Rd.
Rockaway, NJ 07866
Tel: (973) 948-3252
Attn: Liz Baldwin

3.10.4.6.3 After installation of the new anodes and refloating of the ship, test the ELINCA system's control cabinet with the CME and COR for proper voltage adjustments to the newly installed anodes. Test for leakage.

3.10.4.6.4 Turn over removed anodes (3 each copper and iron) to COR after replacement.

3.10.4.7 After all modifications and repairs to the underwater hull are completed, including all underwater hull modifications required in other items of these specifications, provide the COR a final marked-up copy of the ship's docking plan in accordance with Reference 3.10.2.1, section 3.5.6. Contractor shall also document repairs and alterations

made on a final docking report form and submit the report with the marked-up copy of the ship's docking plan.

3.10.5 Quality Assurance.

3.10.5.1 After the blocks have been set and before lowering the drydock for hauling the ship, conduct a final inspection of the blocking with the COR, Project Manager and the dockmaster. **This requirement is not a delegable responsibility and the ship shall not be drydocked until this joint inspection has occurred and a contractor furnished inspection document has been signed by the COR, Project Manager and DockMaster.** COR to be given 24-hour notice of when the dock will be ready for final inspection. Recheck measurements as necessary to satisfy the COR that the block locations are in accordance with the contract requirements. Acceptance of the blocking arrangement by the COR in no way relieves the Contractor of the responsibility for safely drydocking the ship without strain or damage.

3.10.5.1.1 Contractor shall provide a 300-foot measuring tape and drydock drawings for reference during inspection

3.10.5.2 Record all measurements and observations required on NOAA Docking Report, Reference 3.10.2.8.

3.10.6 Notes

3.10.6.1. The ship's propellers are an anti-singing design. The leading and trailing edges of these propellers are finely finished, and care must be taken not to damage these areas. Exercise caution when polishing the propeller surfaces to minimize removal of metal.

3.10.6.2 Reference 3.10.2.6 shows type ZHS-23 (weld-on strap type) zincs. These were subsequently replaced by type ZHC-23 (bolt-on) zincs.

3.10.6.3 The manufacturer's representative for the ELINCA system is Admiral Filter. The following address and telephone numbers are provided to purchase parts and to arrange for field engineer service:

Admiral Filter
18C Green Pond Rd.
Rockaway, New Jersey 07866
Tel: (973) 948-3252
Fax: (973) 948-3252

3.10.6.4 The following products are acceptable environmentally friendly float coats for rudder interiors:

Eureka Fluid Film NAS
Kellsport Products
22 Boomer St.
Fall River, MA 02720
Tel: (888) 341-4600

Cortec® M-645 Float Coat
Cortec Corporation
White Bear Mountain, MN
Tel: (800) 426)-7832
Fax: (651) 429-1122

3.10.6.5 The ship carries approximately 150,000 gallons of diesel oil (with tanks at 95% full) and can be assumed to have up to approximately 65% of its fuel on board upon arrival at the Contractor's facility.

3.10.6.6 There are transducers on the transducer fairing that are not listed or shown on drawing OE-085-001 Rev F. (All transducers are shown on Reference 3.10.2.10). Slight deviations from the docking plan can cause significant damage to these transducers. Care shall be taken by the contractor to ensure the docking blocks are accurately placed per drawing OE-085-001 and that the divers are aware of what they are looking at when inspecting the hull during the docking process.

3.10.6.7 The ship will be "dead stick" during the drydocking and undocking. The contractor should anticipate no propulsion from the ship for either evolution and plan tug support accordingly.

3.10.6.7.1 The ship will not go directly into dry-dock upon arrival to the contractor facility. Contractor shall have a docking conference with COR and ship's crew before drydocking. At a minimum, the Dockmaster, divers and Project Manager shall be in attendance.

3.10.6.8 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of

contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.10.6.9 The contractor shall order the 6 anodes listed in 3.10.4.6.2 within 7 days of contact award. A copy of the invoice shall be provided to the COR.

END OF ITEM

3.11 UNDERWATER HULL AND FREEBOARD – PRESERVATION AND COATING

3.11.1 Intent:

3.11.1.1 Prepare and paint the underwater hull and freeboard of the Okeanos Explorer. Protect the propellers, thrusters, shafts and all scientific equipment mounted on the ship hull prior to the commencing preservation activities.

3.11.2 References

3.11.2.1 NOAA Standard Specification MOC-631-3B, "Underwater Body Ablative Coating System"

3.11.2.2 NOAAS Okeanos Explorer Fairing and Transducer Locations Rev 6

3.11.2.3 NOAA Standard Specification No. AMC-000-1G, “General Requirements for Ship Repair Work on NOAA Ships.”

3.11.2.4 Drawing 631-623-3576 – Paint Schedule

3.11.3 Government Furnished Material

3.11.3.1 None.

3.11.4 Requirements

3.11.4.1 All work on this item shall be in accordance with Reference 3.11.2.1.

3.11.4.2 All work on this item shall be performed by an industry recognized certified paint contractor. Certification shall be submitted to and reviewed by the COR prior to the commencement of work.

3.11.4.1 The existing underwater hull painting system is an International coating system; therefore, all paint used shall be International only to match and be compatible with the existing system.

3.11.4.1.1 A joint walkthrough of the transducer protective coverings shall be completed with the Paint Supervisor, contractor Project Manager and COR prior to the commencement of any underwater hull work.

3.11.4.2 Prepare and coat the entire underwater body with a “Maintenance System”. All preparations and painting shall be accomplished in accordance with the requirements in Reference 3.11.2.1.

3.11.4.2.1 The internal of the moon pool pipe from dive locker to the bottom of the hull shall be included in the preparation and painting activities.

3.11.4.2.1.1 Moon pool shall be blasted to bare-white (SSPC-10) and received a full coating system as outlined in 3.11.4.6. Contractor shall perform a joint inspection with the COR of the moon pipe internal using a snake camera following blasting and prior to painting and again after painting.

3.11.4.2.1.1.1 All painting work on moon pipe shall not complete until after UT readings and steel repairs are complete (listed in Item 3.19).

3.11.4.3 Perform Ultra High Pressure Water Jetting (UHP WJ) to prepare the underwater body for a "Maintenance System." The entire underwater body shall be swept and spotted to a WJ-4 visual surface preparation standard, in accordance with SSPC-SP 12. Ensure that all nozzles used in preparing the surface area of the underwater body are a sweeping type nozzle. Note: The term "water jetting" essentially defines the same process as "hydroblasting" or "hydrojetting," which is not to be confused with "high pressure water washing".

3.11.4.4 Remove all loose paint which is not tightly adhered to the hull entirely down to bare metal. Surface preparation of those areas shall be spot blasted to a WJ-2 visual surface preparation standard, in accordance with SSPC-SP 12. To those spot blasted areas of the hull, a "Complete System" shall be applied in accordance with Reference 3.11.2.1. For bidding purposes, assume that 2,400 square feet of non-contiguous areas the ship's underwater surface area shall be prepared and coated with a "Complete System".

3.11.4.5 All potential structural steel repairs, access cuts, NDT testing and thickness gauging, previous drydock blocking areas and hull plate inserts below the waterline, and repairs in other items of these specifications, shall be completed prior to applying the underwater body coating system and shall receive a "Complete System."

3.11.4.6 The complete coating system shall consists of:

(a) International Intershield 300V at 6 mils DFT (color: bronze)

(b) International Intershield 300V at 6 mils DFT (color: aluminum)

(c) International Interspeed 640 at 5 mils DFT (color: red)

(d) International Interspeed 640 at 5 mils DFT (color: black)

(e) International Interspeed 640 at 5 mils DFT (color: red)

3.11.4.7 Apply the following coatings to the boottop:

(a) International Interspeed 640 at 5 mils DFT (color: red)

(b) International Interspeed 640 at 5 mils DFT (color: black)

(c) International Interspeed 640 at 5 mils DFT (color: black)

3.11.4.8 Apply the following coatings to the draft marks:

(a) International Interspeed 640 at 5 mils DFT (color: white)

3.11.4.9 In 2015, the rudders were coated with a Hydrex Ecoshield system. This system is expected to last 10 years without maintenance. If necessary, product and technical representative support may be obtained from:

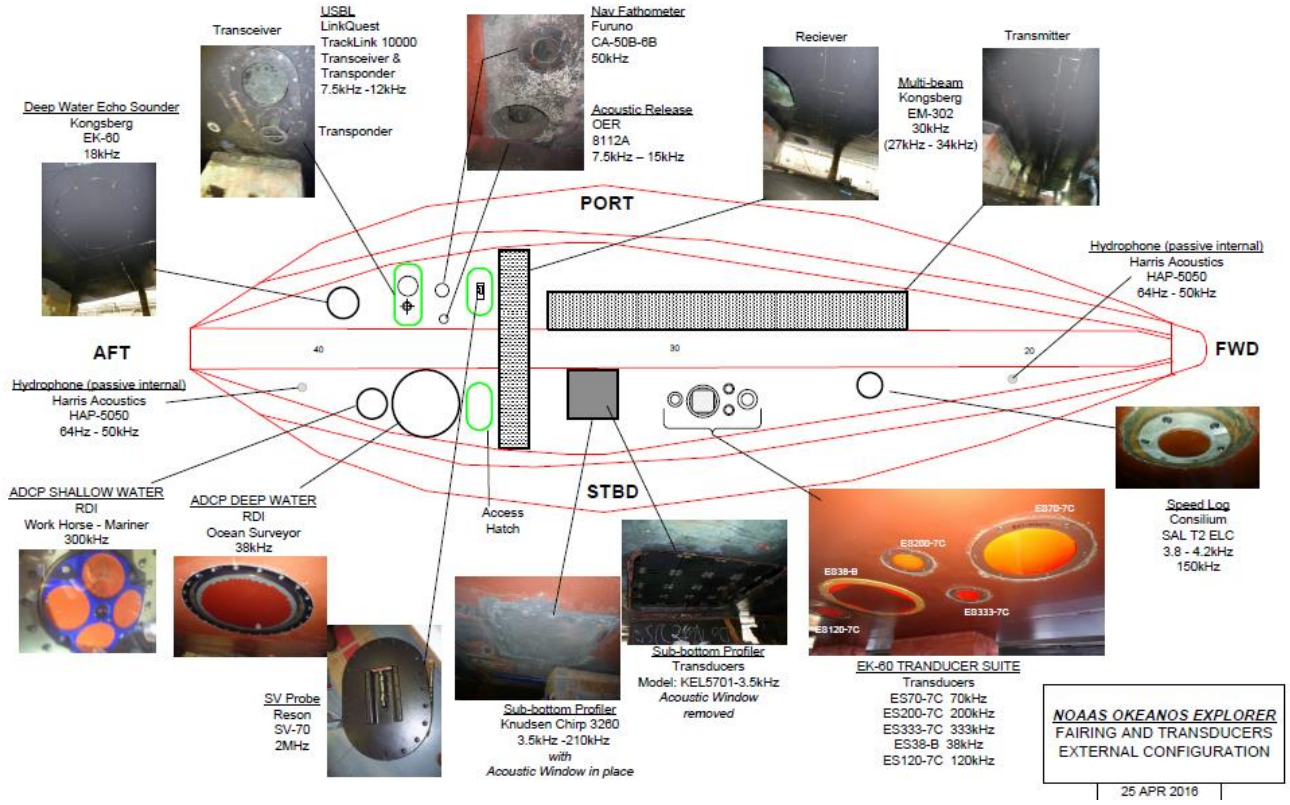
Hydrex
604 Druid Rd. E.
Clearwater, FL 33756
Tel: (727) 443-3900
www.hydrex.be

3.11.4.10 Upon completion of all coatings in this item and removal of all covering materials, perform a low pressure water washing of the hull and other areas of the ship using clean fresh water, to clean all dust, dirt, and debris from the ship. All deck drain openings and strainer plates shall be covered to prevent grit and blast materials from clogging the ship’s deck drainage system.

3.11.4.10 Contractor shall apply two coats of yellow paint(International Interspeed 640) around each of the transducers listed on page 2 of Reference 3.11.2.2 to outline each transducer for

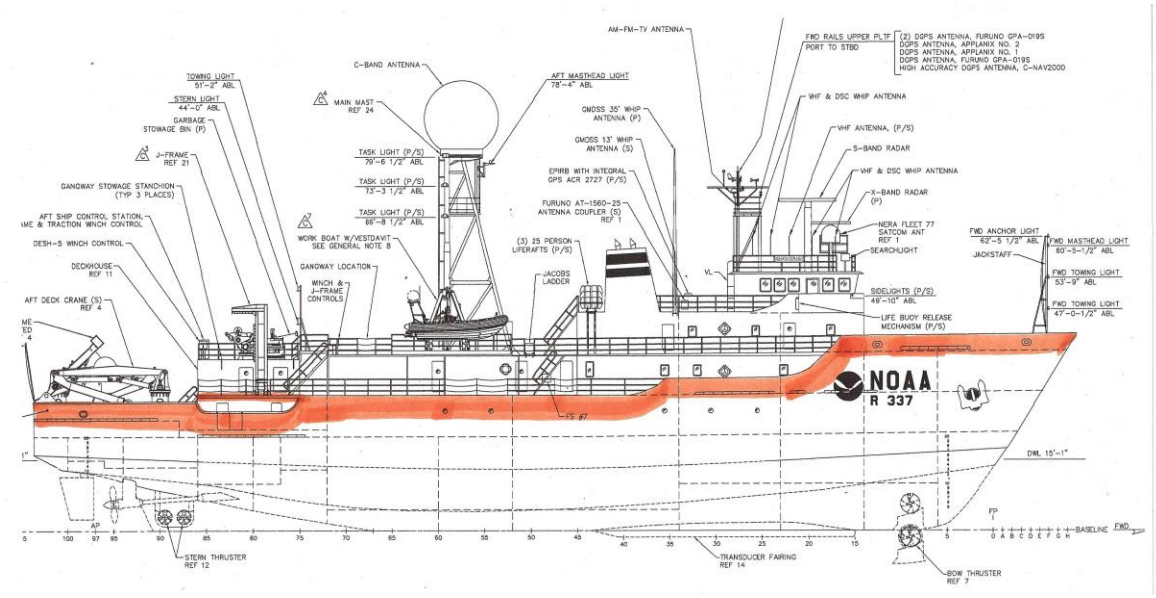
identification by divers. Outline of yellow paint shall begin at the edge of each transducer face and extend 4 inches out (width of neon yellow outline paint shall be 4 inches). Contactor shall apply same two coats of yellow paint around each of the three sea chests. COR shall approval color.

3.11.4.11 Contractor shall label each sea chest and each transducer identified in the below picture with 2 coats of yellow (International Interspeed 640). Labels shall include the information listed next to each of the below pictures including transducer name, manufacturer, model (were listed), operating range/hKz (where listed) and whether the transducer is a transponder or a received. The letters shall be in all capital letters and stenciled. Lettering for transducer names shall be 3 inches in height. All other lettering shall be 2 inches in height. Consult with COR prior to beginning process for final verification.

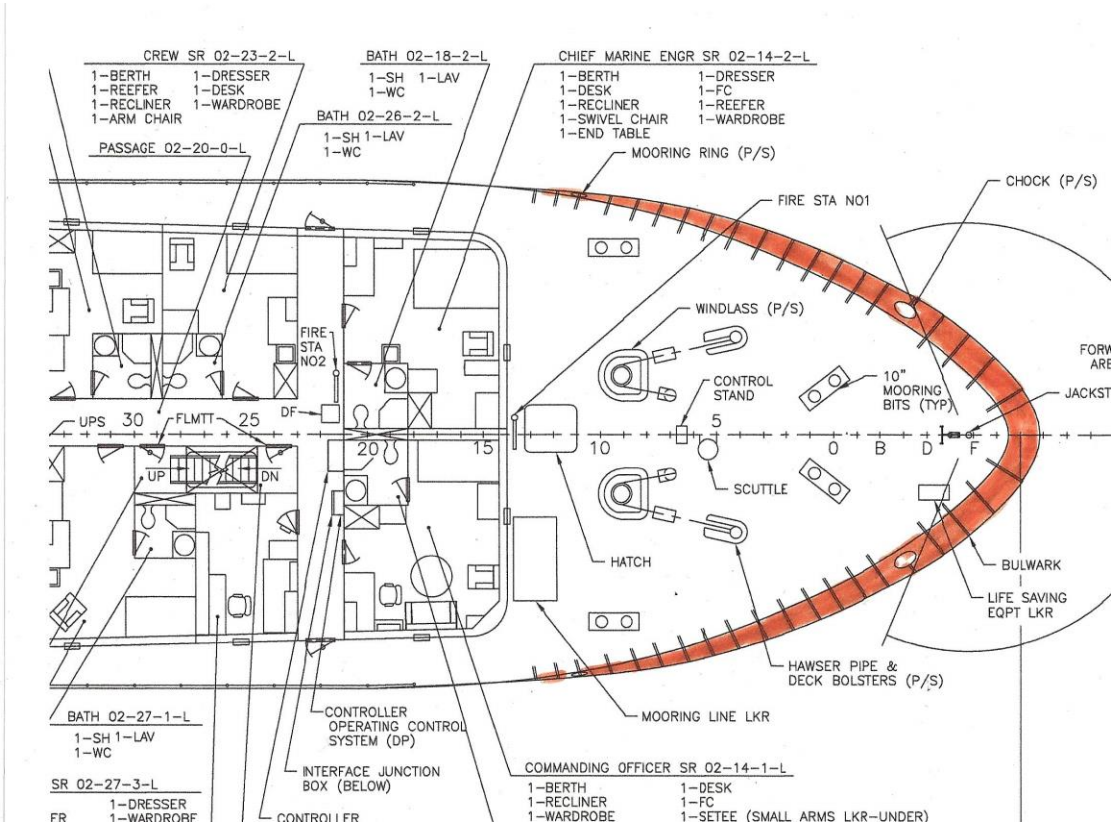


3.11.4.11.1 All new transducers added during this repair period but not listed above shall also be outlined and labeled per 3.11.4.10 & 3.11.4.11

3.11.4.12 Prepare the entire freeboard area (from the top of the boottop to the top of the bulwark at the 0-2 deck level) to an SSPC 3 standard. The upper limit of the freeboard is highlighted in orange in the following outboard profile view of the ship:



3.11.4.13 Likewise, prepare the inside of the bulwark and bulwark frames at the 0-2 deck to either an SSPC-SP3. The inside of the bulwark and frames are highlighted in orange in the following plan view of the 0-2 deck:



3.11.4.13.1 One the Port side, the freeboard shall include 01 and 02 vertical area outboard of the ROV hanger and ROV stairwell.

3.11.4.14 Apply the following coating system to all prepared surfaces:

(a) Two primer coats (5-7 mils dft each) of Sherwin Williams Seaguard 5000H HS Epoxy, color: red, followed by gray.

(b) Two top coats (3-5 mils dft each) of Sherwin Williams Hi-Solids Polyurethane, color: white.

3.11.4.15 Repaint markings within the freeboard area (i.e., ship's name, IMO numbers, NOAA logo, draft marks, thruster symbols, "donuts" at bottom of hawse pipes etc.) with 2-3 mils of Amercoat 450H of the appropriate color (black or NOAA Reflex or Process blue).

3.11.4.15.1 Prior to painting, complete the following repairs:

3.11.4.15.1.1 Weld Load line symbol Plimsoll Mark on the side of ship to create a 1/8 inch high bead weld outline of the symbol. Welding shall be to the satisfaction of the attending ABS surveyor.

3.11.4.15.1.2 Crop out and remove docking plug and docking plug socket to fuel tank 4-52-2. Insert shall be no smaller than 18 inch diameter. Replace docking plug sock and docking plug "in kind" and test to the satisfaction of the ABS surveyor. Repair damaged paint. Assume steel thickness is ½ inch.

3.11.5 Quality Assurance

3.11.5.1 As required by Reference 3.11.2.1.

3.11.5.2 Conduct joint inspection of hull with paint manufacturer's representative, COR, Contractor, and ABS surveyor after hull has been high pressure water-washed and again after the painting is complete. Provide the detail "Paint Plan" in accordance with Reference 3.11.2.1, para. 4.1.2 to COR prior to starting surface preparation.

3.11.5.3 Verify all transducers are protected prior to surface preparation and painting, as identified in Reference 3.11.2.2. Transducers shall be protected with plywood as per 3.16.4.1. Complete walkthrough inspection of transducer protection with COR prior to any work working being completed on this item. Protection shall remain in place until all work completes on hull.

3.11.5.4 No pressure shall be applied to the surface of any transducers listed in Reference 3.11.2.2

3.11.5.5 COR will witness temperature and humidity readings prior to each coat of paint applied.

3.11.5.6 Conduct joint inspection with COR of DFT gauging after each coat of paint is applied.

3.11.5.7 Provide all additional documentation identified in Reference 3.5.1.1, section 4, "Quality Assurance."

3.11.5.8 Following completion of the work and inspection by the ABS Surveyor, provide the ship with an International Anti-Fouling System Certificate from ABS.

3.11.5.9 Contractor or subcontractor paint certifications shall be provided to and approved by COR prior to commencement of work.

3.11.6 Notes

3.11.6.1 A complete underwater hull paint system was applied to the hull in November 2015 when the ship was docked in Position #3. The ship

was drydocked again in May/June 2017 in Position #1 and the block areas that were covered in the 2015 drydocking received a complete system. The ship was drydocked again in August of 2018 in Position 2 without any preservation work being completed. In 2019, the ship was drydocked in position #3 with a top coat applied to the freeboard and underwater hull.

3.11.6.2 The surface area square footage for the following areas below the waterline is provided:

U/W Hull up to 16'6" Waterline.....11,475 sq.ft.
Rudder P/S exterior.....450 sq.ft.
Rudder P/S inside.....500 sq.ft.
Skeg Inside.....750 sq.ft.
Skeg Exterior.....500 sq.ft.

3.11.6.3 In accordance with SSPC-SP 12, Ultra High Pressure Cleaning (UHP WJ) is defined as surface preparation cleaning performed at pressures above 170 MPa (25,000 psi).

3.11.6.4 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.11.6.5 All gauge thickness readings (Item 3.13) and underwater hull steel repairs shall be completed prior to commencing hull painting activities.

END OF ITEM

3.12 PROPELLER, TAILSHAFT INSPECTION AND REPAIR

3.12.1 Intent

3.12.1.1 Perform propeller and tail shaft inspection and repair.

3.12.2 References

3.12.2.1 Technical Manual "Stern Tubes, Bearings and Seals"

3.12.2.2 Drawing No. 243-6233870, "Main Propeller Shaft Installation Arrangement and Details”

3.12.2.3 ABS Rules for building and Classing Steel Vessels, Part 1, Section 1/3.11

3.12.2.4 Ship’s Stern Tube Bearing Wear Down Record (if available)

3.12.2.5 NOAA Standard Specification AMC-240-1, “Propeller Shafts and Propellers”

3.12.2.6 Propulsion Motor Thrust and Aft Journal Bearings Instruction Manual

3.12.2.7 NOAA Standard Specification No. AMC-000-1G, “General Requirements for Ship Repair Work on NOAA Ships.”

3.12.3 Government Furnished Equipment

3.12.3.1 None

3.12.4 Requirements

3.12.4.1 Prior to drydocking the ship, conduct operational tests of both rudders and both propeller shafts and provide a CFR with any notable and unusual findings.

3.12.4.2 No sandblasting or painting shall be permitted in or near the drydock while the propeller, shaft, seals, or bearings are being worked on in the drydock.

3.12.4.3 While the ship is drydocked, accomplish the following work on the tail shafts and stern tube assemblies in accordance with References 3.12.2.1 – 3.12.2.3.

3.12.4.4 Remove and dispose of all oil and water (if any) from both port and starboard stern tube lube oil systems, including stern tube and forward seal head tanks and sumps, (approximately 150 gals per side). While draining the oil, obtain a sample from each stern tube and send out for comprehensive laboratory analysis including spectrometer. Provide results in a CFR and a copy to ABS. Analysis should be completed and returned to the COR before the period of performance is 25% complete. At a minimum, report viscosity, water content and the following trace metals in parts per million: Iron, Chromium, Aluminum, Lead, Tin, Copper, and Nickel. Also report TAN (total acid number).

3.12.4.5 Open port and starboard sumps and head tanks. Clean each tank of all dirt, rust, sludge, and sediment using lint free rags and solvent. Flush the stern tube lube oil piping systems with 40 gallons of new oil and drain. Re-clean the sumps and head tanks and replace the filters. Inspect with COR between cleanings at following final cleaning and prior to closure.

3.12.4.6 Schedule the services of an American Bureau of Shipping (ABS) surveyor to the extent necessary, to accomplish all required inspections and technical reviews to maintain compliance with ABS class requirements as outlined in the general requirements. NOAA will pay ABS for survey costs under a separate purchase agreement.

3.12.4.7 All work on the tail shafts, stern tube seals, liners, and bearings shall be accomplished under the guidance of a manufacturer's technical representative from Wärtsilä Defense, Inc. Provide the services of a manufacturer's technical representative from Wärtsilä Defense, Inc. to oversee bearing weardown readings and perform a check of the stern tube seals. It is imperative that the manufacturer’s technical representative provided have experience inspecting and servicing the stern tube bearing assemblies installed aboard NOAA Ship *Okeanos Explorer*, in order to properly obtain bearing wear down measurements and evaluate the condition of the bearings and seals.

3.12.4.8 Under the guidance of the Wärtsilä technical representative, take bearing wear down readings on the forward, intermediate, and strut bearings of both tailshafts. Prior to taking the readings, the propellers shall be oriented such that the lifting eyes on the propeller hubs are at the 12 o’clock position. To the extent practicable, use the bearing wear down gauges provided by the ship’s Chief Engineer. Using feeler gauges, take bearing clearance readings on the forward and aft (strut) bearings. All readings taken shall be witnessed by the ABS surveyor, COR, Chief Engineer, and the Wärtsilä technical representative. In addition to providing recorded readings

in an inspection report, readings shall also be entered in the ship's wear down record, to be retained with the wear down gages. Return the wear down gauges to the ship's Chief Engineer after recording all measurements are taken. Upon completion of all measurements reinstall all plugs using a non-hardening sealer, (Permatex #2 or equal) on the threads. Renew the plug in kind on the port side forward bearing. Tighten all plugs and install safety wire.

3.12.4.9 Prior to sandblasting, liberally coat the propellers with grease. Remove the grease coating prior to polishing and undocking.

3.12.4.10 Measure and record the air gap between the motor rotor and stator on the forward and aft ends of both the port and starboard propulsion motors. Ship will provide a special set of feeler gauges for this purpose. Take at least 8 readings equally spaced around each of the rotors. Air gaps should be approximately the same all around the rotor. Provide a CFR written report of the Air Gap readings to the COR within 24 hours of measurements being taken.

3.12.4.11 Disconnect the tailshaft couplings from the port and starboard propulsion motor output flanges. Remove the couplings from the tailshafts. Slip the tailshafts aft approximately 18 inches or as needed to permit removal of the couplings. Remove couplings. See Note 3.12.6.2.

3.12.4.12 Disassemble and clean the forward and aft stern tube seal assemblies. Perform an inspection of the tail shafts' forward and aft stern tube seal assemblies under the guidance of the Wärtsilä technical representative. Provide a condition report to the COR including findings, measurements taken, and recommendations for any additional repairs or parts needed.

3.12.4.13 Provide and install new 220 MKII Aft Seal Kits, including Bio Seal o-rings, garter springs, gaskets, and lock washers. Provide and install new 200 MKII Fwd Seal Kits, including Bio Seal O-rings, garter springs, and gaskets. Only genuine Wärtsilä parts may be used. Note: The most current information from Wärtsilä Defense at the time this specification was prepared, indicates delivery to be approximately three weeks after receipt of order (ARO). **Verify seal kit delivery from the supplier, and ensure that new seal kits are ordered in time to perform seal renewals while the ship is on drydock.** Provide a report to the COR for any additional parts or repairs needed, if any. Stern tube seal replacements shall be scheduled for the last two weeks on the drydock.

3.12.4.14 After all inspections and repair work are completed, fill

the entire stern tube, including lube oil head and sump tanks, with Castrol BioStat 100 oil. New oil shall be filtered through a filter cart with a 3 micron filter and gravity fed, not pumped, into the stern tube lube oil systems. Contactor shall provide no less than 400 gallons of Castrol BioStat 100 oil. Capacity of each stern tube lube oil system is approximately 150 gallons. All remaining unused oil shall be turned over to the COR in original containers.

3.12.4.15 Conduct an operational test of the stern tube lube oil system for each tail shaft and inspect for leaks for 72 hours prior to undocking the ship.

3.12.5 Quality Assurance

3.12.5.1 After completion of all work, perform operational tests of the port and starboard propellers and shaft assemblies, first at the dock during dock trials, and then during the sea trial. Measure and record the vibrations, lube oil pressures, and water temperatures throughout their full speed range.

3.12.6 Notes

3.12.6.1 Parts ordering information and manufacturer's service representative arrangements for the tailshaft stern tube seals and bearings can be obtained from the following source:

Wärtsilä Defense, Inc.
3617 Koppens Way
Chesapeake, VA. 23323
Attn: Scott Miller
Tel: (757) 966-5420
Fax: (757) 558-3627
e-mail: scott.miller@wartsiladefense.com

3.12.6.2 Castrol BioStat 100 oil shall be ordered by the contractor within 7 days following contract award. Provide the COR with a copy of the invoice and estimated delivery date.

3.12.6.3 Verify seal kit delivery from the supplier, and ensure that new seal kits are ordered in time to perform seal renewals while the ship is on drydock

3.12.6.4 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These

questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.13 ABS SPECIAL PERIODICAL SURVEY – HULL 7

3.13.1 Intent

3.13.1.1 Plan, support and execute ABS Special Periodic Survey as outlined in the following specification.

3.13.2 References

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

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

3.13.2.3 Drawing No. OE-123-01, “Tank Sounding Tables.”

3.13.2.4 Drawing No. OE-601-101, "General Arrangement"

3.13.2.5 Drawing No. 101-6233544, “Scantlings Main Deck and Below”

3.13.2.6 Drawing No. 101-6233545, “Scantlings Focsle Deck and Above”

3.13.2.7 Drawing No. 101-6233546, “Scantlings Inboard Profile”

3.13.2.8 Drawing No. 101-6233547, “Scantlings Midships”

3.13.2.9 Drawing No. 581-6233594, “Anchor Handling Arrangement & Details”

3.13.2.10 Technical Manual T9581-AH-MMC-010/76727, “Description, Operation, and Maintenance, Anchor Windlass and Capstan”

3.13.2.11 American Bureau of Shipping (ABS), “Rules for Survey After Construction 2005", Part 7.

3.13.2.12 American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels, Section 2/1.13, “Anchor Chains”

3.13.2.13 NAVSEA Standard Item 009-32, “Cleaning and Painting Requirements; accomplish,” date: 01 AUG 2008, CATEGORY: II.

3.13.2.14 NOAA Standard Specification AMC-533-1, “Potable Water Tank Disinfection.”

3.13.2.15 Ultrasonic Thickness readings from ABS Special Survey – Hull

5, dated December 2010.

3.13.2.16 Drawing No. 437-6233672, “Tank Level Indicator System & Elementary Wiring Diagram.”

3.13.2.17 Ultrasonic Thickness Readings from ABS special Survey – Hull 6 – December 2016

3.13.3 Government-Furnished Material

3.13.3.1 None.

3.13.4 Requirements

3.13.4.1 All work shall be conducted in accordance with References 3.13.2.1 and 3.13.2.2.

3.13.4.2 Schedule, plan and coordinate all services of the American Bureau of Shipping (ABS) surveyor to accomplish all ABS inspections and surveys required under Special Periodical Survey – Hull 7 (listed under 2.2.21.3.1). All inspections shall be accomplished with COR, or other designated government representative present. Government will compensate ABS for survey costs under a separate purchase order. Contractor shall prepare vessel for various survey parts 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.

3.13.4.3 Assist ship’s chief engineer in transferring fuel oil, lube oil, ballast water, and potable water between ship’s fuel oil tanks, ballast tanks, and potable tanks as required to accomplish 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 and ABS discretion. If accomplished while on drydock, identify sequence to ensure transfer of fluids will not cause instability or damage to vessel or drydock. Existing water in ballast tanks, or fresh water provided by Contractor, shall be used for ballast tank boundary inspections.

3.13.4.4 Handle all shipboard diesel oil, lube oil, and water in accordance with all requirements of reference 3.13.2.1, section 3.4, “Tank Inspections”. In addition to “safe for entry” requirements of paragraph 3.4.1, all tanks and voids scheduled for opening and inspection shall be certified “safe for hot work” by a Marine Chemist.

3.13.4.5 Remove all residual oil from manifolds and piping to and from each respective tank, to ensure no oil drains back to the tanks, effectively voiding any gas-free certification obtained. Connect compressed air to ship's oil storage tank manifolds, and blow back through the suction lines serving the tanks to clear any residual oil in the piping lines and manifolds.

3.13.4.6 Provide the services of a Marine Chemist to certify all tanks and voids scheduled for opening and inspection to be "safe for hot work" in addition to the "safe for entry" requirements of paragraph 3.4.1 of Reference 3.13.2.1.

3.13.4.7 Diesel or lube oil removed from the ship and later to be returned to the ship shall pump the fuel or lube oil through a 10 micron filter system with a hygroscopic (moisture absorbing) component when it is returned to the ship. 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.

3.13.4.8 Facilitate, schedule and coordinate inspection of the tanks in accordance with Reference 3.13.2.1, section 3.4 "Tank Inspections." In compliance with survey schedule and the requirements of the ABS surveyor for tank openings and inspections, and in a coordinated sequence with other work requirements in these specifications, perform the following:

3.13.4.9 Open and prepare the following tanks and voids for inspection. Information on tank locations, capacities, and structure is available on References 3.13.2.3 through 3.13.2.8. Voids have the same inspection requirements as tanks, but do not have to be power washed. Disinfect potable water tanks after inspection and closure in accordance with Reference 3.13.2.16.

(a) Diesel oil fuel tanks:
4-6-1-F,
4-6-2-F,
4-14-1-F
4-14-2-F
4-52-1-F (see note below)
4-52-4-F,
4-52-3-F (day tank),
4-52-4-F (day tank),
4-72-1-F,
4-72-2-F,

4-72-3-F,
4-72-4-F.

Note: Before entering 4-52-1-F, add protective layer of plywood on top of UPS battery box to prevent damage to unit and exhaust fans. Do not block exhaust fans.

(b) Lube oil tanks:
2-60-1-F,
2-60-2-F,
3-54-2-F.

(c) Ballast tanks:
4-B-0-W (fore peak tank),
4-23-0-W
4-23-2-W,
4-23-3-W,
4-40-0-W (anti-roll dump tank),
4-52-0-W,
2-72-0-W (anti-roll tank),
4-86-1-W,
4-86-2-W,
3-94-1-W (aft peak tank),
3-94-2-W (aft peak tank).

(d) Potable water tanks:
3½-52-1-W,
3½-52-2-W.

(f) Slop tanks:
4-60-3-FF,
4-60-4-FF.

(g) Voids, trunks, cofferdams:
4-34-0-V,
4-34-01-V,
4-23-1-T (transducer trunk)
4-32-1-T (transducer trunk)
Bow Thruster Void

(h) Sewage Holding Tank and Laundry sump tank
3-23-0-W
3-23-1-W

3.13.4.10 All tanks and voids listed above shall be emptied, cleaned,

ventilated and made safe for hotwork and entry no later than the 20th day of the contract performance period.

3.13.4.11 Prepare and accomplish ultrasonic testing (UT) on the following areas, in accordance with Reference 3.13.2.2, 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 1,400 thickness gaugings will be taken on hull plating, 600 gaugings on webs and flanges of frames, and 600 gaugings on decks, bulkheads, hatch covers, coamings, and other miscellaneous areas identified by ABS or the COR. Provide scaffolding or lifting arrangements for contractors and Surveyor to prepare and survey exterior parts of hull and decks as required. If the total amount of gaugings is greater or less than 2,600, a contract modification shall be made to increase or decrease the total on a per-unit basis based on original proposal for 2,600 gaugings:

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

(b) Internals in forepeak and after peak tanks

(c) All hatch covers and coamings (stiffeners and plating)

(d) Wind-and-water strakes, port and starboard, full length.

(e) All exposed main deck and superstructure deck plating.

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

(g) Plating of seachests and shell plating in way of overboard discharges.

(h) Chain lockers.

(i) Shell plating

(j) Moon Pool Pipe and Transducer moon pipes (x3)

(h) Internals of ballast, fuel, sewage and laundry sump tanks

(i) at COR's discretion

3.13.4.11.1 All UT Testing of gauging thickness shall be completed,

with the findings submitted to the COR, no later than by the end of the 40th day of the contract performance period.

3.13.4.11.2 All UT Testing shall be completed and repairs made before all painting work is started.

3.13.4.12 Perform routine service of the anchor chains and both anchors in accordance with the requirements of References 3.13.2.1 and 3.13.2.12. If the ship is in a graving dock, all work on the anchors and anchor chain must be accomplished off the dock, where a dry work surface may be maintained.

3.13.4.13 Remove, prepare, inspect, and test the anchors and anchor chain (eight shots port and seven shots starboard) in accordance with Reference 3.13.2.2. In accordance with Reference 3.13.2.2, the anchor chain shall be cleaned via abrasive blasting and painted with a primer coat prior to testing.

3.13.4.14 After all anchor chain inspections have been completed, provide a condition report to the COR with current conditions of the anchor chain and anchor recorded and for additional anchor chain repairs required and/or any anchor chain shots requiring renewal.

3.13.4.15 Prepare and paint anchors in accordance with Table 5, line 14 of Reference 3.13.2.13.; color: black.

3.13.4.16 Prepare and paint the retained and new anchor chain, if any, in accordance with Table 5, line 15, 16, 17, or 18 of Reference 3.13.2.13; color: in accordance with Reference 3.13.2.2.

3.13.4.17 Accomplish the following work on the hawse pipes and spill pipes while the anchor chains have been removed for inspection and preservation:

3.13.4.17.1 Prepare the interior of the hawse pipes and spill pipes (port and starboard) by machining and/or grit blasting using 16 grit virgin aluminum oxide to achieve SSPC-SP5 finish and a 2-3 mil profile.

3.13.4.17.2 Degrease with Zep solvent to remove all dust and other contaminants.

3.13.4.17.3 Coating system shall be applied by a certified applicator of thermal spray coatings of austenitic stainless steel with bond coat using twin electrical arc process. See note 3.13.6.7 for a recommended source.

3.13.4.17.3.1 Pre-heat steel locally in hawse pipe and spill pipe interiors to approximately 150°F using open flame.

3.13.4.17.3.2 Apply a bond coat of Ni/Al (80/20) alloy, followed by a top coat of 316 stainless steel; coating thickness shall be 10 mils.

3.13.4.17.3.3 Paint raised edge of spill pipe, hawse pipe and entire anchor pads black with International 640

3.13.4.18 Detergent power-wash, and solvent wipe to an SSPC-SP-1 standard, all inside surfaces of both chain lockers. Remove deckplates at bottom of lockers and clean surfaces and chain locker sump below plates. Route-out, then flush chain locker sump overboard drain piping. Demonstrate operation of chain locker sump overboard drain piping to ABS surveyor, Chief Engineer, and COR. Note: chain locker drain piping runs in common with bow thruster cooling water discharge piping.

3.13.4.19 Following ABS inspection and ultrasonic testing, prep chain locker interior and opening to SSPC-6. Paint chain locker interiors as follows:

(a) One stripe coat MIL-PRF-23236, Type VII (6-10 mils dft) color: red;

(b) One full coat MIL-PRF-23236, Type VII (6-10 mils dft) color: black.

3.13.4.20 Reassemble the chain, marking it in accordance with Reference 3.13.2.2. Reinstall on the ship, end for ending it so that the last shots out will be the last shots reinstalled. Contractor shall consider “end-for-ending” the chain in mind when they repaint the anchor chain.

3.13.4.21 Close all opened tanks with new gaskets material. Conduct 2 psi air test on tank to provide manhole adequately sealed.

3.13.4.2 Reinstall all removed fuel oil and lube oil.

3.13.5 Quality Assurance

3.13.4.1 Per Reference 3.13.2.1, provide initial ABS survey schedule prior within 48 hours of start of the contract performance period, clearly identifying loading conditions that correlate to initial tank boundary inspections. Update survey schedule at weekly progress meetings.

3.13.5.2 Submit a written report containing the results of inspection and testing required by Reference 3.13.2.1 and 3.13.2.2. The report shall contain the test date, time, results, and names of witnesses.

3.13.5.3 Submit documentation for new anchor chain shots provided, if any, certified ABS Grade 2 in accordance with Reference 3.13.2.12.

3.13.5.4 COR will witness cleaned and painted chain lockers prior to reinstalling the preserved and new anchor chain.

3.13.5.5 Provide COR evidence of paint contractor's certification to apply thermal spray coatings in accordance with NAVSEA and American Bureau of Shipping (ABS) standards.

3.13.5.6 Provide COR with DFT readings following the thermal spray coating application.

3.13.5.7 Submit the reports required by Reference 3.13.2.1, section 3.3, "Ultrasonic Tests (UT) for Thickness Gaging."

3.13.5.8 Submit the ABS reports and new Load Line certification required by Reference 3.13.2.1, section 3.5, "ABS Documents."

3.13.6 Notes

3.13.6.1 A Drydocking Survey, which is part of Special Periodical Survey – Hull 7, shall be completed with partial items inspected under Item 3.10.

3.13.6.2 The ship carries approximately 150,000 gallons of diesel oil (with tanks at 95% full) and can be assumed to have approximately (65%) of this fuel on board upon arrival at the Contractor's facility.

3.13.6.4 Ultrasonic Thickness (UT) gaugings were performed on NOAA Ship Okeanos Explorer during drydocking in 2010 and drydock 2016 as part of Special Periodical Surveys – Hull 5 & 6 (References 3.13.2.15 and 3.13.2.17). The UT findings for this items shall be submitted in format that is similar to 2016.

3.13.6.5 Anchor chain is 1¼-inch ABS Grade 2 stud link anchor chain, eight shots in the port chain locker, and seven shots in the starboard.

3.13.6.6 Port and starboard anchors: 3,500 pound, U.S. Navy stockless style.

3.13.6.7 Recommended source for thermal spray coating:

Omega Coatings, Inc.
6422 Calle Lozano Dr
Houston, Texas 77041
Phone: (713) 896-4417

ASB Industries, Inc.
1031 Lambert St.
Barberton, Ohio 44203
Phone: (888) 241-1088

3.13.6.8 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.14 LED NAVIGATION LIGHTS UPGRADE

3.14.1 Intent:

3.14.1.1 This work item is intended to accomplish the installation of new arctic type LED navigation lights to replace the existing legacy incandescent lights from Reference 3.14.2.5 and a new navigation light control panel (Reference 3.14.2.7) to replace existing panels installed on Reference 3.17.2.2.

3.14.2 References

3.14.2.1 ABS Steel Vessel Rules Under 90m

3.14.2.2 OE-422-01, Navigation Lights and Control Panel Removal

3.14.2.3 OE-422-02, Navigation Lights and Control Panel Installation

3.14.2.4 OE-422C-02, Navigation Lights Foundation

3.14.2.5 OE-422-101, Navigation Lights System Elementary Wiring Diagram

3.14.2.6 General Repair Requirements

3.14.2.7 J-BOX Navigation Control Panel Schematic, Model NLFM10D6SGN120ADP-PFA

3.14.3 Government Furnished Material

3.14.3.1 None

3.14.4 Requirements

3.14.4.1 Pilot House Control Console Navigation Light Panel

3.14.4.1.1 Removal requirements per Reference 3.14.2.2

3.14.4.1.1.1 Disconnect circuits SP106/EP107-1-1-A and EL110-12 from the existing navigation light control panels.

3.14.4.1.1.2 Remove the two (2) existing navigation light control panels located port side of the Pilot House Control Console. Disconnect

and record all connections for reconnection to the new navigation light control panel.

3.14.4.1.2 Installation requirements per Reference 3.14.2.3

3.14.4.1.2.1 Install one (1) navigation light control panel in the port side of the Pilot Hose Control Console. Reconnect all wiring in accordance with removal record. Ensure that each task light is independent controlled.

3.14.4.1.2.1.1 NOTE: The contractor is responsible for determining the size of the opening needed for the new navigation light control panel in the console, cutting the new opening, and filling any openings left by the removal of the existing panels to the satisfaction of the COR.

3.14.4.1.2.2 Reconnect power circuits SP106/EP107-1-A (normal) and EL110-12 (Emergency) to the new navigation light control panel.

3.14.4.2 Foundations

3.14.4.2.1 No modifications to Reference 3.14.2.4 is anticipated except for new mounting holes on the foundations if the new lights have a different hole pattern.

3.14.4.3 Navigation Lights

3.14.4.3.1 Removal requirements per Reference 3.14.2.2

3.14.4.3.1.1 Remove the existing incandescent navigation lights and receptacle boxes. Pull back and retain cabling for reuse. The Jack Staff, Bridge Wings and Stub Mast lights have receptacle boxes, the task lights and aft anchor light on the Ensign Staff are hard wired. The contractor shall record the cabling and connections of the task lights in connection box N1 in the overhead of the Pilot House and the existing navigation light control panels and submit to the COR. These lights have been recabled and the task lights may not be on individual circuits to support the new navigation light control panel Reference 3.14.2.7.

3.14.4.3.2 Installation requirements per Reference 3.14.2.3

3.14.4.3.2.1 Install new LED navigation lights in all existing locations in accordance with Reference 3.14.2.3. All lights will

require receptacle plugs with pigtails except the aft anchor light which is hard wired. Additional cable may be required from the task lights to connection box N1 to ensure each task light is individually connected to the new navigation light control panel.

3.14.4.4 Inform the COR of the completion of installations of the new navigation light system for inspection to ensure that all are satisfactory and repairs incident to the modifications have been performed in accordance with References 3.14.2.3 and 3.14.2.6

3.14.4.5 Deliverables:

3.14.4.5.1 Contractor shall provide as-built drawings including a bill of materials for each drawing. As-built drawings may be provided as a revision to the references provided herein.

3.14.4.5.2 Contractor shall provide all test data for the installed system to prove functionality.

3.14.4.5.3 Contractor shall provide spare parts, scheduled maintenance items and similar materials as recommended by the manufacturers for the new installed navigation lights and navigation light control panel.

3.14.4.5.4 All deliverables shall be provided in number and formatting as follows:

3.14.4.5.4.1 Drawings:

- One (1) electronic PDF copy,
- One (1) electronic CAD copy in AutoCAD 2015 or later
- Two (2) paper copies

3.14.4.5.4.2 Test Data and All other deliverables:

- One (1) electronic copy in PDF, MS Word and/or MS EXCEL, as applicable
- Two (2) hard copies

3.14.5 Quality Assurance

3.14.5.1 New and modified cabling shall be tested in accordance with IEEE 45 and ABS requirements with findings provided in a CFR to the COR.

3.14.5.2 The navigation light system shall be inspected and tested to comply with current COLREGS and USCG requirements.

3.14.6 Notes

3.14.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.14.6.2 Within 7 days following contract award, the contractor shall order the LED lights and control box listed in this specification and provide a copy of the invoice to the COR with the estimated delivery date.

END OF ITEM

3.15 Mission UPS Annual Maintenance

3.15.1 Intent

3.15.1.1 Perform annual maintenance and inspection of the Power Systems and Controls UPS.

3.15.2 References

3.15.2.1 Maintenance report Mission UPS service report 14JAN2020

3.15.3 Government Furnished Equipment

3.15.3.1 None

3.15.4 Requirements

3.15.4.1 Supply the services of a qualified/certified Power Systems and Controls field service engineer to perform maintenance on the shipboard installed Power Systems and Controls UPS and MG set; Model #MG130042. Maintenance shall be the same as performed as Reference 3.15.2.1. The field service engineer shall also review the error logs with the ship's ETs and address any questions/concerns on performance and maintenance.

3.15.4.2 Before performing any maintenance on the Mission UPS MC75, in conjunction with the ship's ET, follow log out and tag out procedures to properly secure power in and out of the mission UPS.

3.15.4.4 Power Systems and Controls shall include in the report recommendations on installed battery style end of life forecast as well as a suggested upgrade to other batteries, providing the same anticipated performance, that can be used on the existing system utilizing the existing battery cabinets and wiring.

3.15.5 Quality Assurance

3.15.5.1 Provide a service report of tests run, status and recommendations.

3.15.6 Notes

3.15.6.1 The Mission UPS is located in the Propulsion Motor Room (3-60-0-E), frames 60-65.

3.15.6.2 Mission UPS suggested service provider contact;

Danielle Somers
Power Systems and Controls
3206 Lanvale Ave
Richmond, VA 23220
DSomers@pscpower.com
PH: 804/355-0498

3.15.6.3 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.16 UNDERWATER SCIENTIFIC EQUIPMENT PRESERVATION

3.16.1 Intent:

3.16.1.1 Clean and service underwater scientific equipment as outlined in the following specification.

3.16.2 References

3.16.2.1 NOAA Standard Specification AMC-631-3B, "Underwater Body Ablative Coating Systems"

3.16.2.2 Drawing OE-165-101, "NOAA Ship Okeanos Explorer Transducer Fairing Structural Mods"

3.16.2.3 Drawing OE-461-101, "NOAA Ship Okeanos Explorer Transducer Arrangement"

3.16.3 Government Furnished Material

3.16.3.1 Twelver (12) Wooden Scrapers - $12.00

3.16.4 Requirements

3.16.4.1 Immediately following the drydocking evolution, and before sand blasting, cleaning, or painting the hull, clean the faces of the transducers listed in Table 1 below and then cover the transducers faces with ¼ inch of rubber sheeting, then 3/8 inch plywood. Rubber and 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.

3.16.4.1.1 When performing cleaning and maintenance on the existing transducers, extreme care must be taken to not scratch or move them. Do not remove any clamps or disturb any orientation.

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

3.16.4.2 The COR will appoint a TPOC (Technical Point of Contract) to oversee work on or near the transducers. NOAA representatives will be inspecting/servicing some transducers. Coordinate with the TPOC to permit the maintenance and inspections on a not to interfere basis.

3.16.4.3 Notify the TPOC at least two hour prior to any work being done on the transducers or transducer fairing.

3.16.4.4 Remove the cover plate of the Knudsen Sub Bottom profiler to expose the transducer faces.

3.16.4.5 In conjunction with the TPOC, perform a walk through evaluation and inspect each of transducer. Issue a condition report for any transducer or window showing signs of damage, peeling of antifouling paint, or in need of additional antifouling paint.

3.16.4.6 To clean, spray each transducer listed in Table 1 face with vinegar to soften any growth and grime. Using the GFE wooden scrapers, carefully and completely scrape any growth or grime down to the paint. Wipe clean and rinse with fresh water.



Typical wooden scraper to be supplied.

3.16.4.6.1 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.

3.16.4.6.2 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.

SONAR	MANF	MODEL	LOCATION
Multi-beam	Kongsberg	EM-302	Fairing Port - Transmitter: Fr 23.5 - 33.5; Receiver Fr 34-35
ADCP 38 kHz Window	Teledyne	Ocean Surveyor	
ADCP 300 kHz Window	Teledyne	Workhorse	

Sub-bottom Profiler (16 elements)	Knudsen	3260	Fairing Stbd- Fr 32.5 - 33.5
Speed Log	CONSILIUM	SAL T2 ELC	Fairing Stbd- Fr 24 - 25
Single-beam (Six Transducers)	Kongsberg	EK-60	Fairing Port- Fr 39 - 40
Nav Fathometer	Furuno	CA-50B-6B	Fairing Port- Fr 36 - 37
Acoustic Release	OER	8012A	Fairing Port- Fr 36 - 37
USBL	LinkQuest	TrackLink 10000	Fairing Port- Fr 37 - 38
SV Probe	Reson	SV-70	Fairing Stbd- Fr 35 - 36

Table 1. Transducers to be cleaned and fairing locations

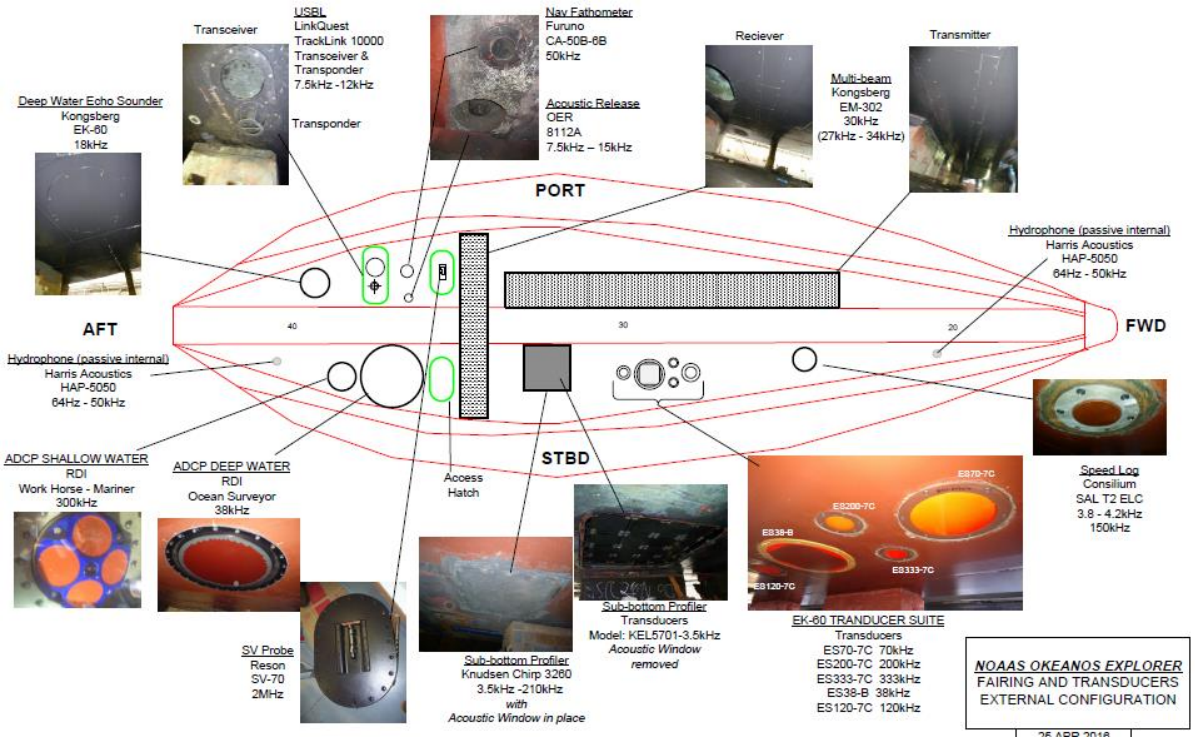


Figure 1. Transducer layout and illustration

3.16.4.7 Following cleaning of the transducers, perform a walk through inspection with the TPOC. Reinstall the Sub Bottom profiler cover plate. Cover each transducer as outlined in 3.16.4.1

3.16.4.8 Perform a walk through with the TPOC to inspect and certify all transducers are properly covered prior to sandblasting or painting.

3.16.4.9 The USBL Tracklink 10000 and the Reson SVP-70 will removed by NOAA personnel as soon as practical and replaced with calibrated units. Assist the NOAA personnel with removal of the transducers as needed, but limited to unbolting and re-bolting the mounting screws and plates as requested. NOAA personnel will reinstall the USBL and Reson transducers before the ship is refloated.

3.16.5 Quality Assurance

3.16.5.1 Follow the manufacturer's specifications for paint dry and cure times before applying a second coat or refloating the vessel. Under certain conditions, this can take at least 24 hours. COR will confirm sufficient dry time is met before vessel is refloated.

3.16.5.2 Proper cleaning of all transducers and windows using only GFE wooden scrapers.

3.16.5.3 Walk through verification of satisfactory cleaning with the TPOC.

3.16.5.4 Walk through verification of transducer covering prior to sandblasting or painting.

3.16.6 Notes

3.16.6.1 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.17 STACKS REFURBISHMENT/REPAIRS, AC MACH AND MAIN DECK SUPPLY VENT REPAIRS

3.17.1 Intent:

3.17.1.1 To repair and preserve the vessel stacks and replace the deck penetration of the AC Mach. and main deck supply vent.

3.17.2 References

3.17.2.1 Drawing OE-601-101 – General Arrangement

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

3.17.2.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP1), Solvent Cleaning

3.17.2.4 Steel Structures Painting Council Surface Preparation Specification No. 10 (SSPC-SP10/NACE No.2), Near White Blast Cleaning

3.17.2.5 Steel Structures Painting Council Surface Preparation Specification No. 7 (SSPC-SP 7), Power Tool Cleaning

3.17.2.6 Stacks/Vent Supplemental Pictures PDF

3.17.2.7 Drawing 631-623-3576 – Paint Schedule

3.17.2.8 NOAA Standard Specification No. AMC-000-1G, “General Requirements for Ship Repair Work on NOAA Ships.”

3.17.2.9 Drawing 512-623-3792 “Heating, Ventilation & Air Conditioning Diagram”

3.17.2.10 Drawing 512-623-3800 “HVAC Upper Deck and Above”

3.17.3 Government Furnished Material

3.17.3.1 None

3.17.4 Requirements

3.17.4.1. Open manhole accesses to both port and STBD stack

3.17.4.2. Unbolt and remove forward screen guards on port and STBD stacks. Transport to blast facility and Blast to an SSPC 11 profile.

Paint in accordance with 3.17.2.7. Reinstall after stack refurbishment is complete using . (See 3.17.2.6 for additional pictures)

3.17.4.3 Crop out and remove drains in rear of both STBD and port stacks including 200 inches inside each stack. Penetrations shall be included in the replacement. Replace "in-kind". For bidding purposes, assume drains are 1 1/2 inch in diameter



3.17.4.4 Remove forward stack screens on port and STBD stack (located behind stack guards) and discard. Manufacture and install replacement stack screens identical to those removed and discarded.

3.17.4.5 Crop out forward lip/edge of each stack screen opening located on each stack ([behind screen guards), 4 inches x 96 inches – each stack]. Replace in kind. Assume ¼ inch think carbon steel. Remove and replace in kind stack plenum drains in forward area of the stack. Assume each is 30 inches long, 1 ½ inch diameter with a single bend.

3.17.4.6 Grind out 20 non-continuous linear feet of cracked weld in 6 sections. Repair cracked weld and repair paint.

3.17.4.7 Between the two stacks, Crop out and replace eight (8) sections of steel approximately 4 feet x 4 feet in size. Assume thickness is 3/8 inch. Crop out and replace 3 ladder rungs on stacks at COR's direction.

3.17.4.8. Power wash entire stack exterior including top and all appendages. Prepare port and STBD exterior stack (sides and top) to an SSPC 10 or SSPC 11 standard. Solvent clean to an SSPC-1 standard.

3.17.4.9 Paint entire port and STBD stack (including top, sides and appendages) in accordance with 3.17.2.7 – minimum three coats. Colors and designs shall match existing and painted shall be feathered into existing.

3.17.4.10 Install refurbished stack vent guards and new screens.

3.17.4.11 Remove deck drain in deck forward of STBD stack on 03 level. Crop out piping (approximately 16 feet of 2 inch black carbon steel) and replace in kind.

3.17.4.11.1 Repair all damaged paint and insulation

3.17.4.11.2 Test new pipe to 10 psi and reinstall interferences

3.17.4.12 Unbolt AC Machine supply and main deck supply vent near port stack. Crop out deck penetration of including 10 inches above and 48 inches below penetration. Replace in kinds with 8 gauge steel. Paint to match existing in accordance with 3.17.2.6. Install new vent and repair all paint, insulation and non-skid.

3.17.4.13 Reinstall all interferences. Reinstall manhole accesses removed in 3.17.4.1 with new gaskets. Use anti-sieze compound on all bolts

3.17.5 Quality Assurance

3.17.5.1 In accordance with references 3.17.2.2 through 3.17.2.5.

3.17.5.2 All welders shall be certified in the weld process and weld filler material used for all welds

3.17.5.3 All material certs shall be provided to ABS and the COR.

3.17.5.4 Repairs shall be inspected and to the satisfaction of the ABS surveyor.

3.17.5.5 Repair all disturbed paint

3.17.6 Notes

3.17.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.18 FOREPEAK BALLAST TANK PRESERVATION

3.18.1 Intent:

3.18.1.1 Repair steel and prepare and preserve the Forepeak ballast Water Tank.

3.18.2 References

3.18.2.1 Drawing OE-601-101, Rev. C, General Arrangement

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

3.18.2.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

3.18.2.4 Steel Structures Painting Council Surface Preparation Specification No. 10 (SSPC-SP 10/NACE No. 2), Near White Blast Cleaning

3.18.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

3.18.2.6 Drawing 110-623-3556 – Module No 1 Structural Assembly

3.18.3 Government Furnished Equipment

3.18.3.1 None.

3.18.4 Requirements

3.18.4.1 All surface preparation and painting work required by this specification shall be done in accordance with Reference 3.18.2.2.

3.18.4.2 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.

3.18.4.3 Crop out and replace 3 sections of steel plating in tank prior to blasting. For estimating purposes, assume all sections are 4 feet by 6 feet in size and that 2 sections are hull plating and 1 section is interior bulkhead.

3.18.4.3 Powerwash the Forepeak Ballast Tank twice with COR inspecting between washing. Blast the interior of the Forepeak Ballast 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. Solvent clean tank to SSPC-SP1 Standard. COR to inspect tank following solvent cleaning. Take and record profiles and perform surface chloride checks (in at least 30 locations, actual locations to be selected by COR). Maximum chloride measurements shall not exceed 5 ug/cm2 or 50 mg/m2. If chloride measurements exceed this level, fresh water wash the tank at 3000 psi and repeat surface cleaning, if necessary, and testing until satisfactory measurements are achieved.

3.18.4.4 Clean the tanks of all traces of blast products and dust, then coat the tanks with the following system in accordance with Reference 3.18.2.2.

(a) 1st coat: Formula 150 epoxy applied at 3-5 mils DFT (color: green).

(b) Stripe coat: Formula 156 applied at 3-5 mils DFT (color: red).

(c) 2nd coat: Formula 156 applied at 3-5 mils DFT (color: red).

(d) Stripe coat: Formula 152 applied at 3-5 mils DFT (color: white).

(e) Final coat: Formula 152 applied at 3-5 mils DFT (color: white).

3.18.4.5 Following the cure time per Reference 3.18.1.2, close up the tank using new rubber gaskets and hardware for manholes, same thickness and material as existing. Conduct a 2-psi air pressure test of each tank to ensure air tight seal of manhole covers.

3.18.4.6 Inform American Bureau of Shipping (ABS) of progress and arrange for inspection of the tanks as required by the local ABS office.

3.18.4.7 Prior to blasting and painting, Remove all zinc and provide and install 18 new type ZHC-23 zinc anodes conforming to MIL-A-18001K in ballast tank

3.18.4.7.1 Prime and paint all new and disturbed surfaces

3.18.4.8 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.

3.18.4.8.1 New zincs shall not be installed until after painting has completed.

3.18.4.9 All activities under this item shall be completed while the ship is in drydock.

3.18.5 Quality Assurance

3.18.5.1 As required by References 3.18.2.2 through 3.18.2.5

3.18.5.2 Painting shall be completed by an industry recognized certified paint contractor. Contractor shall provide certification to the COR for review at the beginning of the contract period.

3.18.5.3 Material certificates for steel shall be provided to the COR and ABS for all repairs

3.18.5.4 All repairs shall be inspected and to the satisfaction of the attending ABS surveyor.

3.18.5.5 All welders shall be certified in the weld process and filler material used.

3.18.5.6 COR shall inspect tank between all cleanings, blasting and paint coatings

3.18.6 Notes

3.18.6.1 Forepeak Ballast Tank Capacity is 9,727 gallons

3.18.6.2 Stripe Coats shall be painted on all tank weld seams, corners, penetrations, frame structure edges, longitudinal structure edges, girder edges, lighting hole edges and drain hole edges.

3.18.6.3 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.18.6.4 After blasting and prior to painting, the contractor shall give the COR 24 hours to conduct a material assessment inspection of the ballast tank steel

END OF ITEM

3.19 VARIOUS STEEL AND STRUCTURAL REPAIRS:

3.19.1 Intent

3.19.1.1 Repair various identified steel and structural area of the ship identified in this work item

3.19.2 References:

3.19.2.1 Drawing OE-601-101 – General Arrangement

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

3.19.2.3 NOAA Standard Specification MOC-000-1G, General Requirements for Ship Repair

3.19.2.4 Drawing 631-623-3576 – Paint Schedule

3.19.2.5 Drawing OE-165-101 Rev B – Transducer Fairing Structural Mods

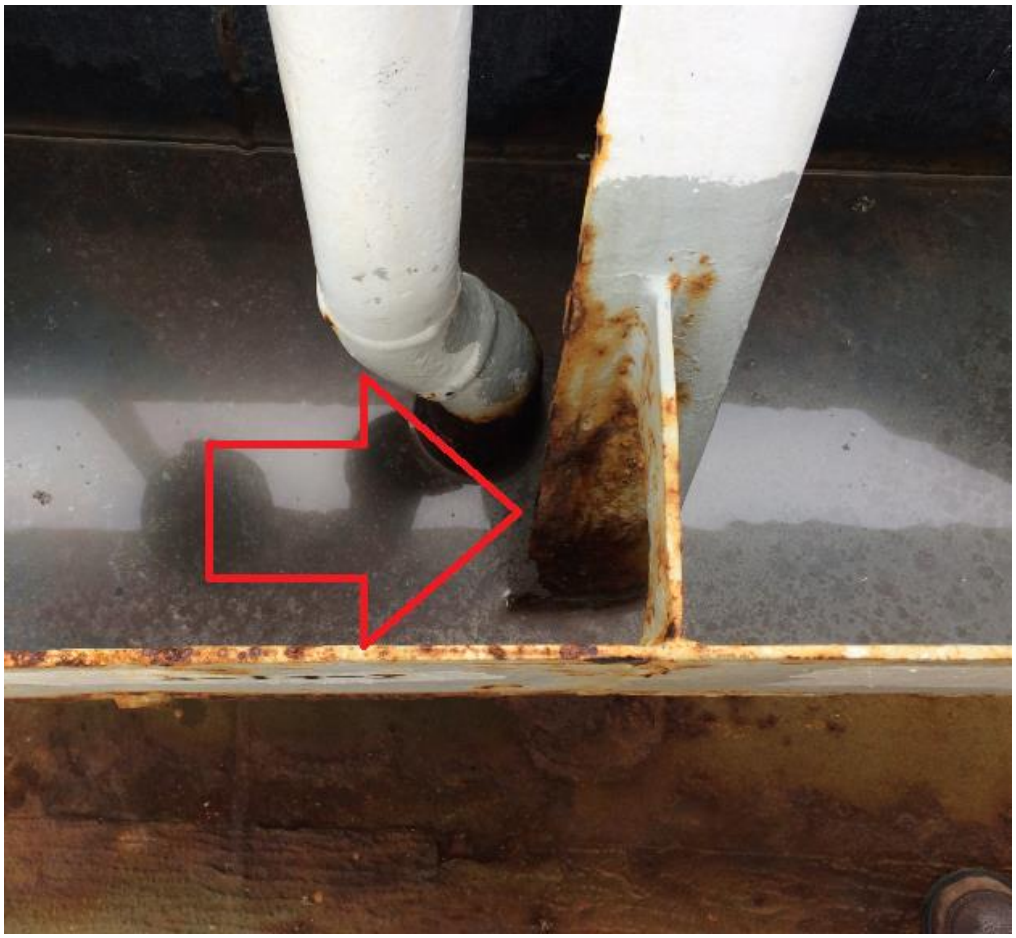
3.19.2.6 Drawing OE-303-101 Rev C – Transducer Array Moon Pipes Installation

3.19.3 Government Furnished Equipment

3.19.3.1 None

3.19.4 Requirements

3.19.4.1 Crop out and replace 4 square feet of formed 01 level web frame near vent for 1-14-2 F.O. Tank vent. (shown in the following picture). Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. For bidding purposes, assume steel thickness is 3/16 inch.

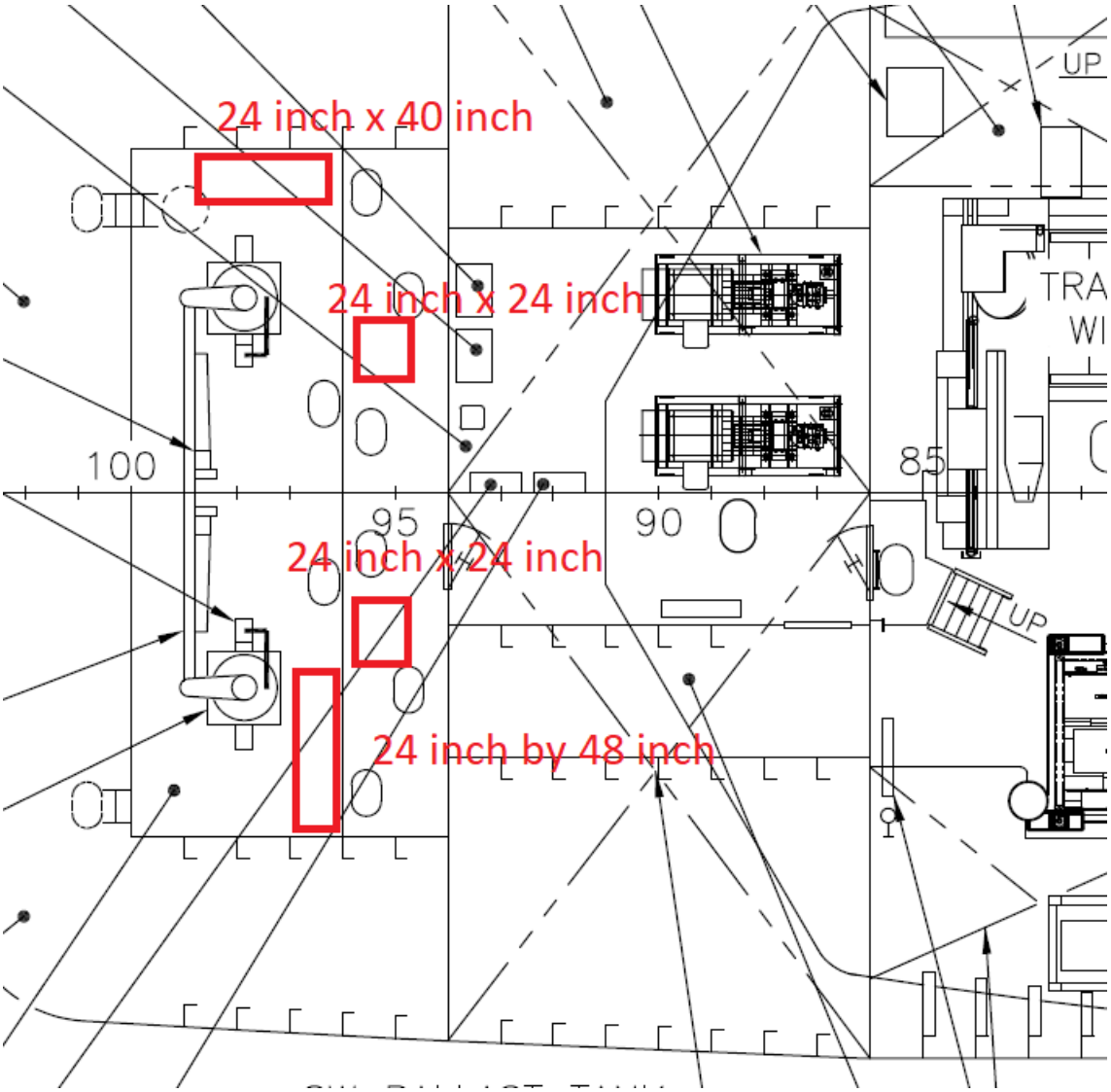


3.19.4.2 Crop out and replace a formed web frame under 1-14-2 vent catch basin on 01 level – Approximately 4 square feet (shown in the following picture). Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. For bidding purposes, assume steel thickness is 3/16 inch.

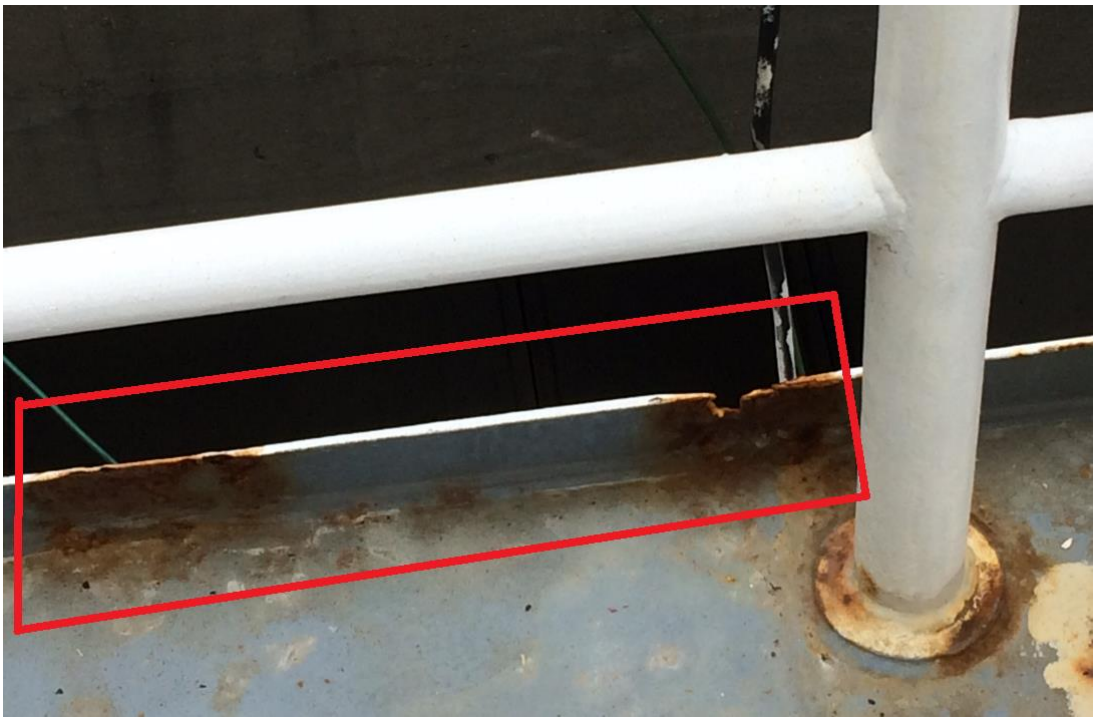


3.19.4.3 Crop out and replace four sections of steel in aft steering (shown in the following picture). Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. For bidding purposes, assume steel thickness is ½ inch. Repair all paint to match surrounding.

3.19.4.3.1 Boundaries of repairs are steering gear room and the 94 ballast tanks (port and STBD)

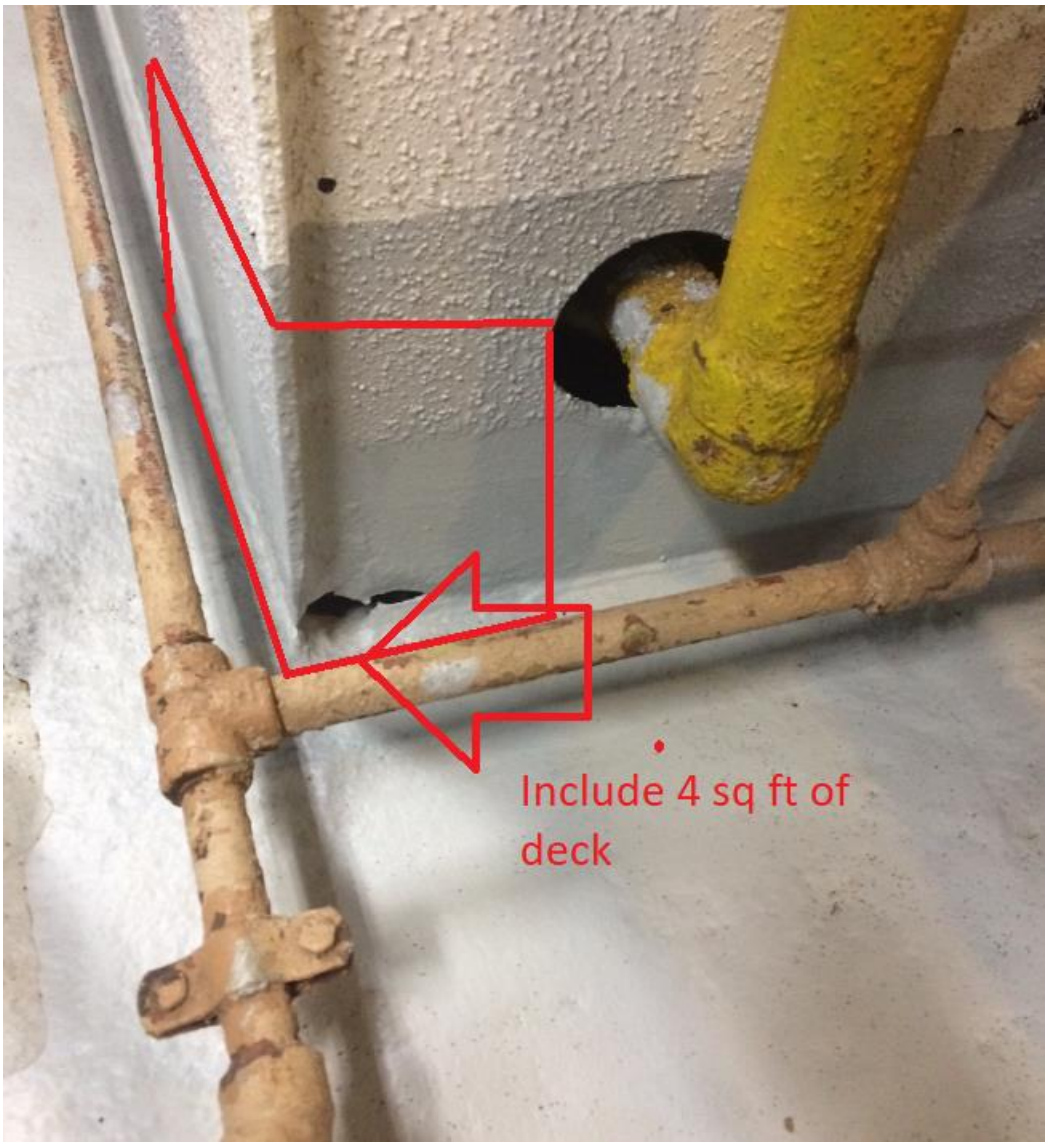


3.19.4.4 Crop out and replace 24 non-continuous linear feet (in 6 different sections) of 3 inch coaming on 01 and 02 level exterior. Paint and repair nonskid. For bidding purposes, assume thickness of ¼ inch. Example of coaming to be replaced in the following picture:



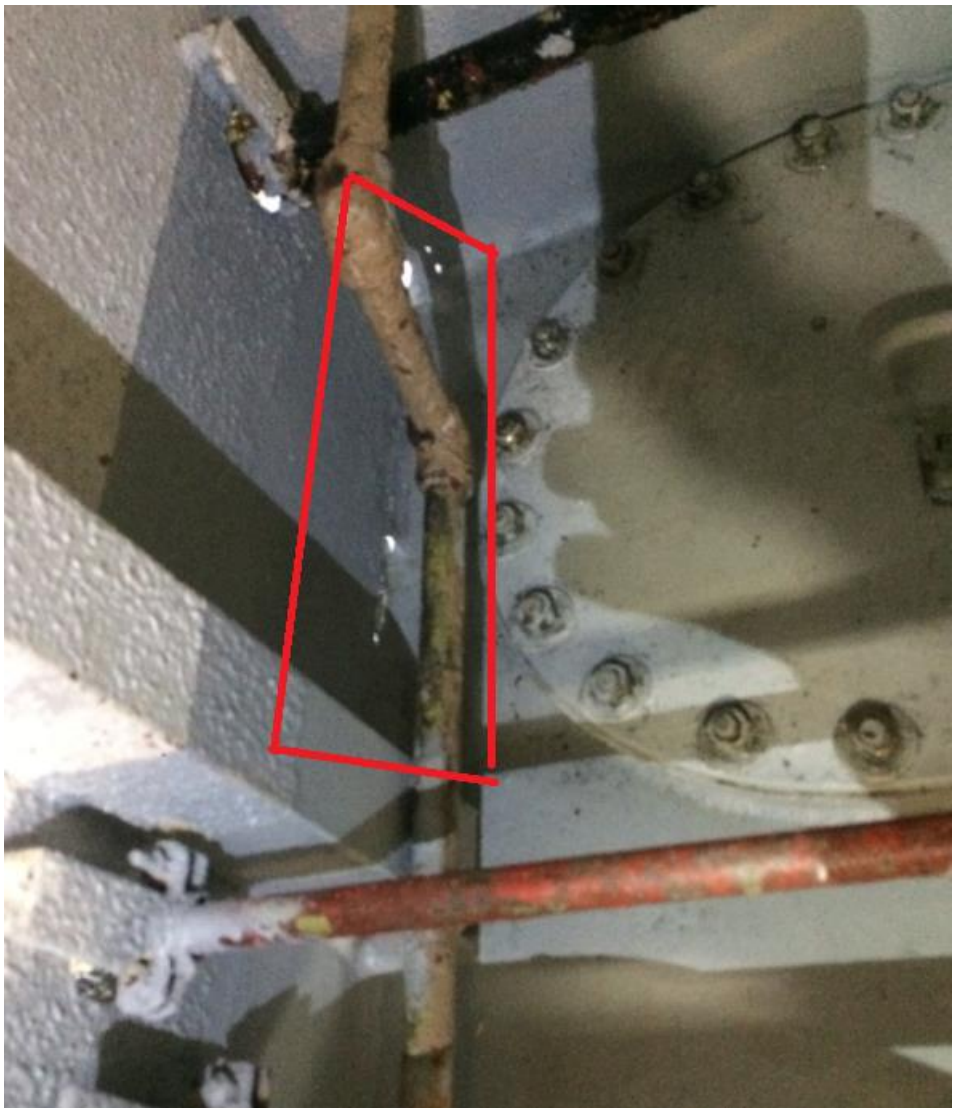
3.19.4.5 In the Main Propulsion Motor Room, crop out and replace 6 square feet (2 ft x 3 ft) of wasted bulkhead and 4 square feet (2 ft by 2 feet) of deck as shown in the following picture. Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. For bidding purposes, assume steel thickness is ½ inch. Repair all paint to match surrounding.

3.19.4.5.1 Boundaries of repairs are Main Propulsion Motor Room and the 4-52-0 ballast tank



3.19.4.6 In the Main Propulsion Motor Room, crop out and replace 10 square feet (2 feet by 5 feet) of wasted bulkhead and 5 square feet (1 ft by 5 ft) of deck as shown in the following picture. Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. For bidding purposes, assume steel thickness is ½ inch. Repair all paint to match surrounding.

3.19.4.6.1 Boundaries of repairs are Main Propulsion Motor Room and the 4-52-0 ballast tank



3.19.4.7 In the Main Propulsion Motor Room, crop out and replace the 15 inserts show in the following diagram. Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. For bidding purposes, assume steel thickness is ½ inch. Repair all paint to match surrounding.

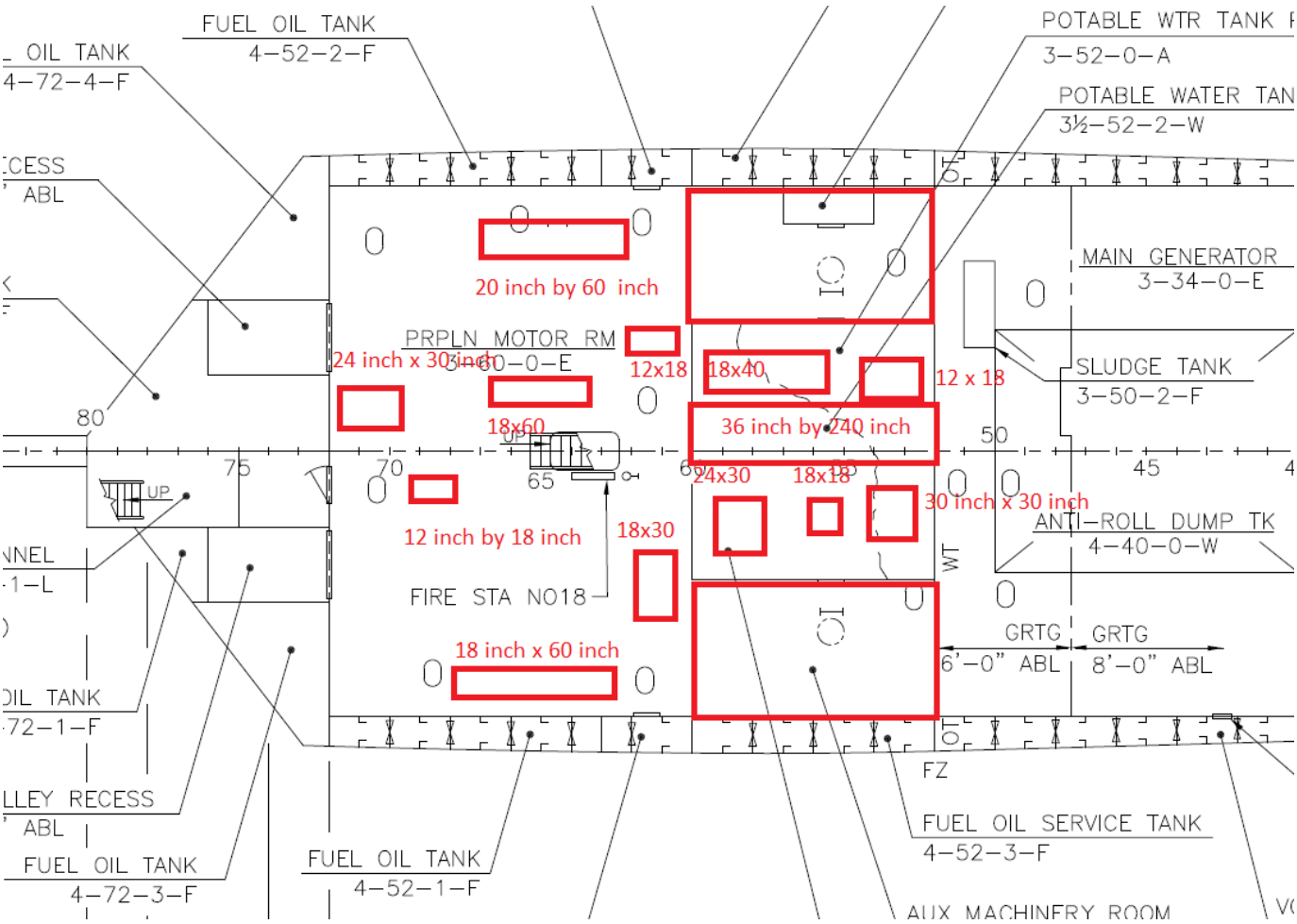
3.19.4.7.1 Boundaries of 13 smaller steel repairs are the Main Propulsion Motor Room and the 4-52-0 ballast tank

3.19.4.7.2 Boundaries of the two larger inserts are the Main Propulsion Motor Room, the 52-1 and 52-1 fuel tanks and the 4-52-0 ballast tank

3.19.4.7.3 The two large deck steel inserts shown in the following picture extend from frame 52 to frame 60 on both sides and from the

void below the potable water tanks to the port and stbd bulkheads

3.19.4.7.4 Several platforms, structures, supports and manholes are located in/on the two large inserts. These items shall be remove and reinstalled as needed to support the steel replacement. The manholes shall be replaced in kind.



3.19.4.8 In addition to the 15 inserts listed in 3.19.4.7 and the previous drawing, replace 3 additional inserts size 3 feet by 2 feet in the deck Main Propulsion Motor at the direction of the COR. For bidding purposes, assume steel thickness is ½ inch. Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. Assume boundaries shall be the Main Propulsion Motor Room and ballast tank 4-52-0 and fuel tanks 4-52-3 and 4-52-4.

3.19.4.9 Inside the 4-23-0 ballast tank, crop out and replace two (2) 6 ft by 10 ft steel insert on the aft bulkhead of the tank behind the transducer cable moon pipes. Crop out and replace two additional 4 ft by 6 feet inserts in the aft bulkhead. [boundaries are transducer trunk (4-32-1-T), engine room (3-34-0-E) and engine room void (4-34-0-V)]. For bidding purposes, assume steel thickness is ½ inch. Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. Repair all paint to match surrounding. Location of transducer moon pipes should be consider as inserts are located behind pipes (see references 3.19.2.5 and 3.19.2.6).

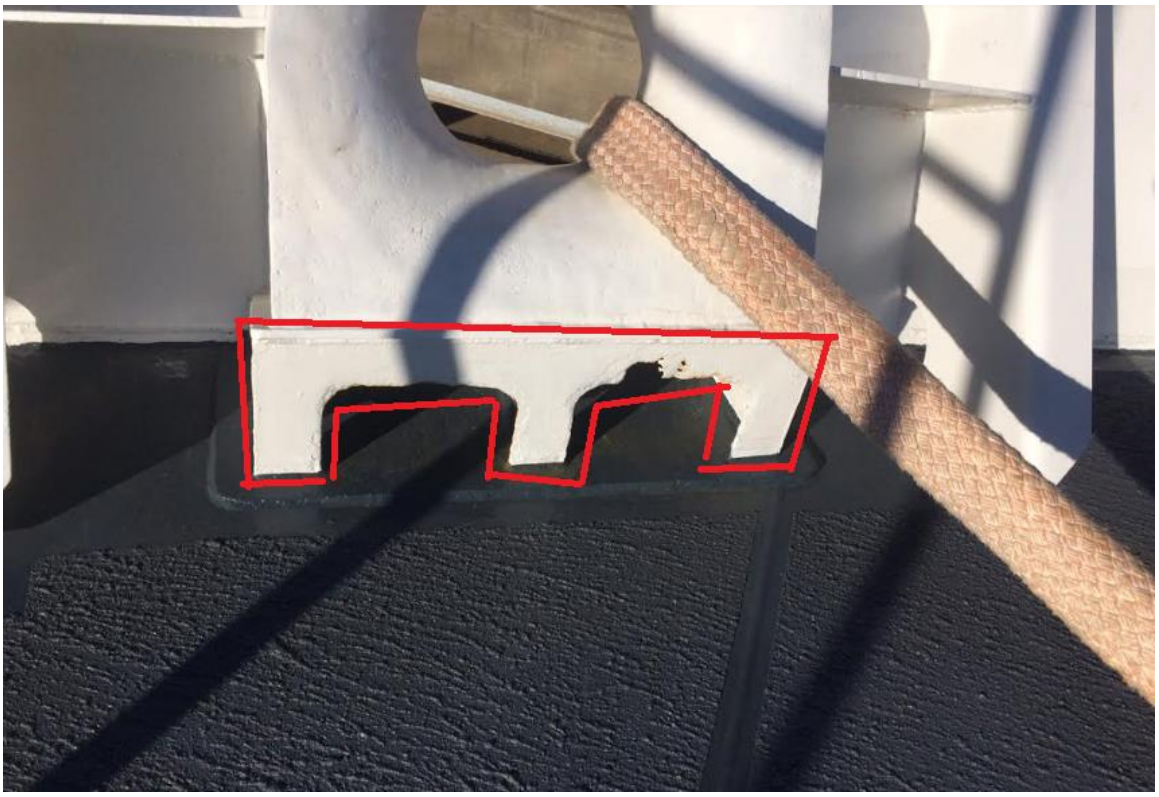
3.19.4.9.1 Repairs shall be completed before engine room void painted is completed

3.19.4.10 In the anti-roll tank (2-72-0-W), crop out and replace in kind 16 non-continuous feet of vertical stiffeners (in 4 different sections) as shown in the following picture. Remove and replace 2 hangers (approx. 28 inches long each) and 36 inches of 2-inch carbon steel piping. Piping shall be in two sections. Assume steel thickness is ½ inch. Replace in kind and inspect in the presence of an ABS surveyor. Repair paint to match surrounding. Repair all paint to match surrounding.



3.19.4.11 On the bow, crop out and replace in kind the foundation steel on the port and STBD chocks as shown in the following picture. Replacement shall consist of the front plate and the three underside structures (about 1 square foot each) on each chock. For bidding purposes, assume steel thickness is ½ inch. Replace in kind and inspect in the presence of an ABS surveyor. Repair all paint and nonskid to match surrounding.





3.19.4.12 In the moon pool pipe which runs from the Dive Locker to the bottom of the ship (STBD side), crop out and replace two (2) 5 foot sections of the moon pool piping. Moon pipe is approximately 16 inches in diameter and schedule 160. This shall be completed after UT readings are completed and before underway hull preservation commences.

3.19.4.12.1 This is not the same moon pipes that run from the hospital to the transducer trunk listed elsewhere in the specifications

3.19.4.13 In ballast tank 4-23-2, crop out and replace a 48 inch by 48 inch section of steel. For bidding purposes, assume ½ inch thickness. Picture of repair as follows:



3.19.4.14 In the MSD Room, crop out and replace a 2 foot by 2 foot section of steel deck under the sink along the forward bulkhead. For bidding purposes, assume 3/8 inch thickness. Boundaries of insert will be the laundry room, side shell and 4-23-3 ballast tank. After testing and inspection by ABS, paint to match surrounding.

3.19.4.15 On the 01 level STBD side exterior, grind out 10 feet of weld and reweld. Exact locations to be provided by the COR. Repair paint following weld in accordance 3.19.2.4. (Picture below of weld repair locations below)



3.19.4.16 Crop out and replace 2 (two) 2ft by 2ft steel inserts in the exterior deck on the 02 level (open underneath to the outside). For bidding purposes, assume steel is 3/8 inch thick. Repair paint and non-skid.

3.19.5 Quality Assurance

3.19.5.1 In accordance with 3.19.2.3

3.19.5.2 Contractor shall provide all welder certification and material certifications to ABS and COR upon completion of the repairs.

3.19.5.3 All repairs shall be surveyed, inspected and be to the satisfaction of the onsite ABS surveyor.

3.19.5.4 Repair all paint to match surrounding area.

3.19.5.5 All welders shall be certified in the process and filler material used.

3.19.6 Notes

3.19.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.19.6.2 Contractor shall verify all steel thicknesses during inspection and prior to commencing work.

END OF ITEM

3.20 BINNACLE AND COMPASS, SEARCHLIGHT, FLIR REPLACEMENT

3.20.1 Intent:

3.20.1.1 The Okeanos Explorer has a Baker, Lyman and Company Inc. Binnacle Compass on the exterior of the 04 level above the bridge (Serial Number 1-87-02). The unit needs to be refurbished and binnacle and compass replaced. Install new searchlights and FLIR.

3.20.2 References

3.20.2.1 Drawing OE-601-101 – General Arrangement

3.20.3 Government Furnished Equipment

3.20.3.1 None

3.20.4 Requirements

3.20.4.1 Procure the following Cassen and Plath Type 21 (Model 208632) or Equivalent Compass, Binnacle, and Spares:

3.20.4.1.1 Binnacle (Model 210020)

3.20.4.1.2 Spare Compass (Model 210023)

3.20.4.1.3 Compass Box (Model 208638)

3.20.4.1.4 ABS Certification (208660)

3.20.4.2 Disconnect and remove existing Baker, Lyman and Company, Inc. Binnacle and Compass from NOAA Ship Okeanos Explorer and turn over to COR.



3.20.4.3 Clean deck and prepare deck where existing binnacle and compass was installed to an SP-11 finish. Prime area and paint to match the surrounding area

3.20.4.3.1 Refurbish compass and binnacle housing and foundation. Blast and repaint housing and foundation. Replace fasteners and seals. Polish glass and nameplates. Crop out and replace two (2) 2ft by 3 ft steel inserts in the deck. For bidding purposes assume steel is ¼ inch thick.

3.20.4.4 Install the new binnacle and compass in the same locations as the removed Baker, Lyman and Company, Inc Model. Modify decking, structures, frame, base, electrical components, bridge overhead and dropdown ceiling.

3.20.4.4.1 Touch up paint, repair insulation, cabling and dropdown ceiling.

3.20.4.5 Seal the binnacle and compass and deck against water intrusion. Perform inspection with COR

3.20.4.6 Prove full operational use of newly installed Binnacle & Compass to the COR

3.20.4.7 Remove two searchlights on top of the bridge house, Port and

STBD and turn over to COR. Remove all cabling associated with old search lights



3.20.4.8 Procure and install two (QTY 2) Carlisle & Finch 1000 W Xenon Searchlights or equivalent with the following specifications:

3.20.4.8.1 Searchlight Model XE9664LG-RF (QTY 2) or equivalent Made of stainless-steel materials. 1000 Watt Xenon Searchlight with 72 Inch Length Lever Gear Controls, Remote Focus Feature and white coat finish. Each light shall have a 10000 TRC Lamp.

3.20.4.8.2 LED Hybrid with K15242-1000 installed on XE9664LG-RF (QTY 2) – Model K15215X-1000

3.20.4.8.3 Electronic Power Supply for XE9664LF-RF, 115 volt (QTY 2) – Model 1PSN115-L

3.20.4.8.4 485 mm diameter beam

3.20.4.8.5 Control station with ON/OFF Start & Remote Focus Switches (QTY 2) – Model 9754X-RF

3.20.4.9 NightFINDER Thermal Camera or equivalent and encloser. Cable Connector and cables. (QTY 1). Model NF14400X-19

3.20.4.9.1 COR will designation location of the Thermal Camera and screen on bridge

3.20.4.10 Modify deck, structures and foundations and equipment to install and mount new Searchlights, Power Supplies and Control Stations.

3.20.4.11 Procure and run power and control cables from Bridge Power panel to Power Supply, control panel and search light. Band cables in accordance with ABS with stainless steel banding

3.20.4.12 Pack cable stuffing tubes and MCT's disturbed by work

3.20.4.13 Test Operation of New Searchlight and Thermal Cameral with the COR

3.20.5 Quality Assurance

3.20.5.1 Prove weather tight integrity and full operational use of new search lights, FLIR and binnacle compass to COR.

3.20.5.2 Repair all paint, flashing, gaskets, packing, MCT's, and insulation following installation

3.20.5.3 Prove operational use of searchlight and nightfinder thermal camera to COR. Thermal Cameral Testing shall be complete after dark.

3.20.5.4 All material certificates shall be provided to ABS and the COR. All repairs shall be inspected and to the satisfaction of the attending ABS surveyor.

3.20.5.5 All welders shall be certified to weld in the process and filler material used.

3.20.5.6 All bridge equipment shall be covered and protected prior to the commencement of work and throughout the duration of the work. The protection shall be inspected by the contractor project manager and COR prior to work commencing.

3.20.6 Notes

3.20.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.20.3.2 The contractor shall order the binnacle, spare compass, compass box, searchlights, power supplies, control system and Thermal Camera within 7 days following contract award. The contractor shall provide a copy of the invoice to the COR.

END OF ITEM

3.21 VARIOUS REPAIRS, INSPECTIONS AND SERVICING

3.21.1 Intent

3.21.1.1

3.21.2 References

3.21.2.1 Technical Manual T9568-AC-MMO-010 – Main Propulsion Motors, Bow Thruster Motors, Ship Service Transformers

3.21.2.2 Technical Manual T9324-AW-MMO-010 – System Description and Propulsion Drive System

3.21.2.3 NOAA Standard Specification MOC-000-1G, General Requirements for Ship Repair

3.21.2.4 Drawing 631-623-3576 – Paint Schedule

3.21.2.5 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

3.21.2.6 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

3.21.2.7 Drawing 437-623-3672 – "Tank Level Indicator System Isometric and Elementary Wiring Diagram"

3.21.2.8 Drawing OE-601-101 – General Arrangement

3.21.2.9 Spill Basin-Vent Overflow Supplemental Pictures (PDF)

3.21.2.10 Drawing 561-623-3915 – Steering Gear Hydraulic Arrangement

3.21.2.11 Drawing 561-623-3984 – Steering Gear Arrangement

3.21.2.12 Drawing 561-197-8049 – Steering Gear Hydraulic Systems T-AGOS

3.21.2.13 Steering Gear Hydraulic Pictures (PDF)

3.21.2.14 EX Weather Deck Penetration Survey (Excel)

3.21.2.15 EX Weather Deck Penetration List (PDF)

3.21.2.16 Drawing 541-623-3816 – Fuel Fill and Transfer System Diagram

3.21.2.17 Drawing 541-623-3941 – Fuel Oil Fill and Transfer Arrangement

3.21.2.18 Drawing 543-623-3809 – Lube Oil System Diagram

3.21.3 Government Furnished Equipment

3.21.3.1 Main Propulsion Motor Brushes – 2 sets

3.21.3.2 QTY – 2: 6-drawer Vidmar cabinets

3.21.4 Requirements

3.21.4.1 Steel Repairs

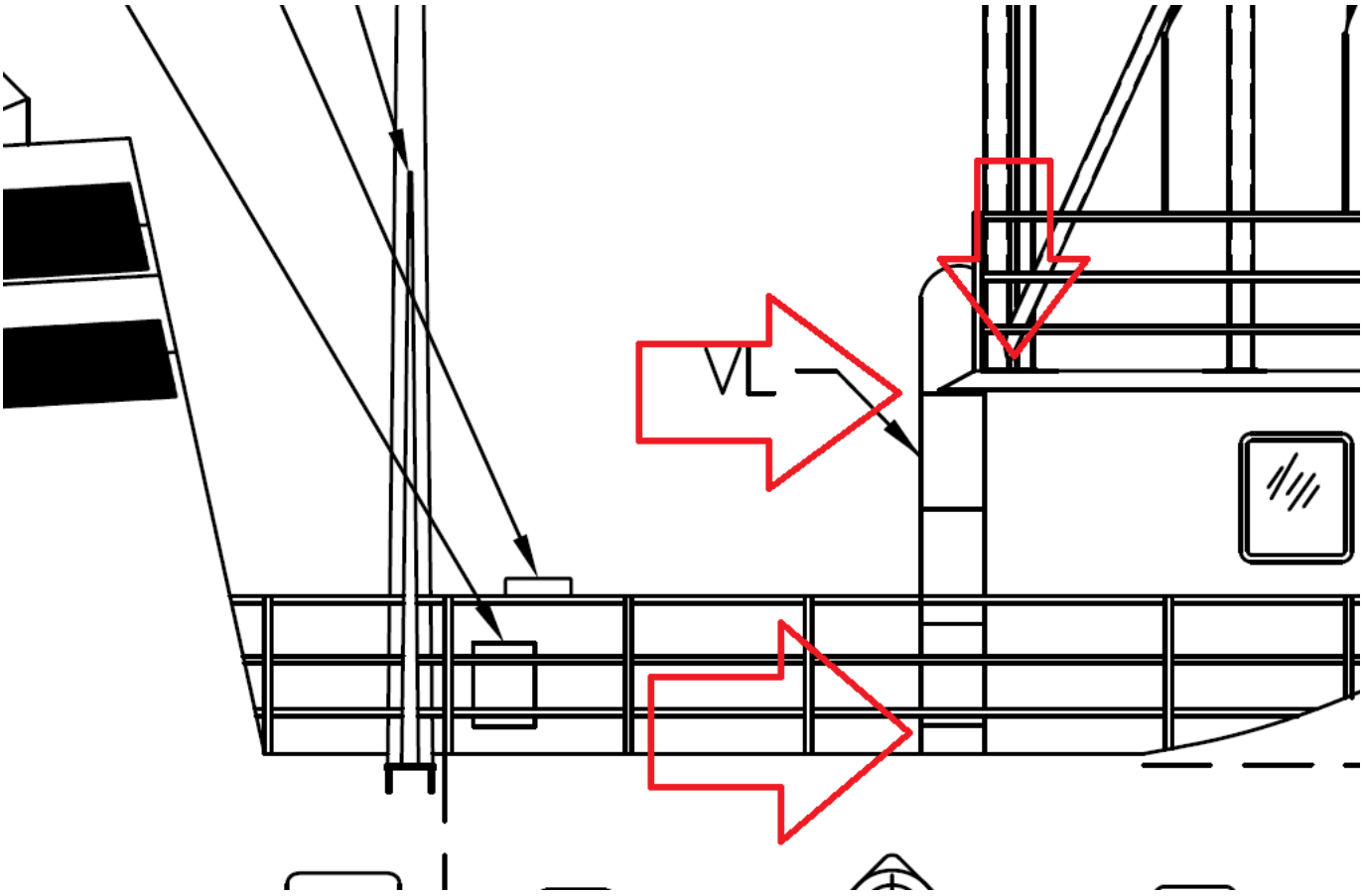
3.21.4.1.1 On the 01 level port breezeway, crop out and replace the vertical handrail. Add metal staples (4 total) to match existing for chains as seen in the following picture. Paint to match surrounding area.



3.21.4.1.2 On the STBD 03 Level, crop out and replace "in kind" 48 inches of corroded handrail in two sections. Touch up paint to match (see the following photo)



3.21.4.1.3 On the 03 level – Crop out and replace the foundation and mounting steel tabs (6 total) on the ladder that goes from the 03 level to the flying bridge. Each tab is approximately 12 inches long, 2 inches wide and ½ inch think. Each replaced tab will be welded to the ship structure on one side and bolted to the ladder on the other. An image of the ladder is shown in the following picture.



3.21.4.2 Electrical Repairs

3.21.4.2.1 Clear view heating element replacement

3.21.4.2.1.1 Tag out and disconnect two (2) “Clearview” windows (STBD and center) on the forward bridge.





3.21.4.2.1.2 Remove heating element from both "Clearview" windows and replace in kind.

3.21.4.2.1.3 Reconnect "Clearview" windows electrically and clear lockouts. Test operations of both windows and newly installed heating elements. Prove new elements work. Test shall be witnessed by COR.

3.21.4.2.2 Propulsion Motor Airgap readings, Bearing Inspection and Brush change out

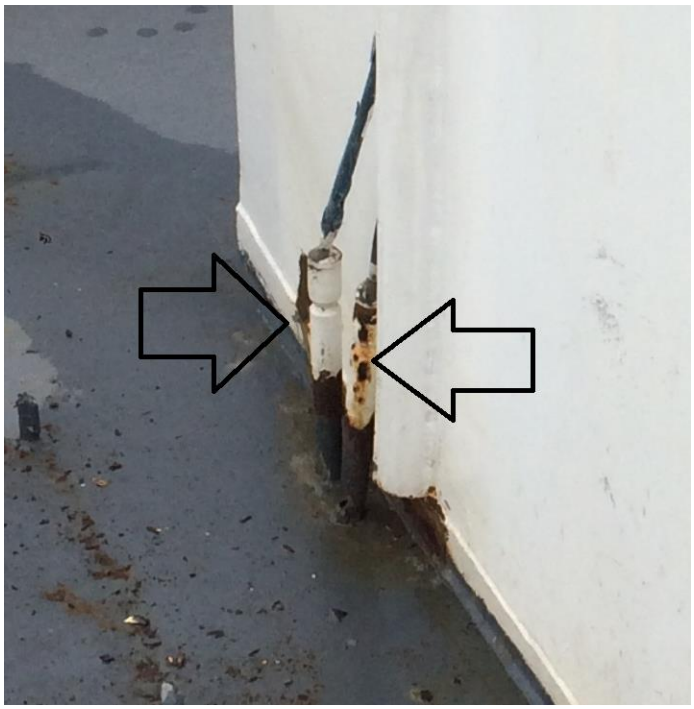
3.21.4.2.2.1 Take insulation readings of port and STBD main propulsion motors with armature leads disconnected. Submit report with findings.

3.21.4.2.2.2 Remove Port and Starboard Main Propulsion Motor brushes and replace with GFE provided brushes. Inspect newly installed brushes jointly with CME and COR prior to closing up motors.

3.21.4.2.2.3 One the Port and STBD propulsion motors, perform inspections on the aft propulsion bearing in the presence of ABS and the COR. Take wear and concentric readings and submit a CFR with results and notable findings within 24 hours of completion of inspection to include any recommendations.

3.21.4.2.3 Kickpipe Replacements

3.21.4.2.3.1 On 02 level exterior, disconnect two cables attached to junction box mounted on Motor Room supply vent. Roll back both cables (approximately 4 feet each) back through kickpipes shown in the following picture:



3.21.4.2.3.2 Crop out and replace in kind two kickpipes. Touch up paint, pull cables back through (approximately 4 feet each) and reconnect.

3.21.4.2.3.3 At the discretion of the COR, crop out and replace two additional kickpipes similar to those shown in the above picture. For these kick pipes, ship's force will disconnect, remove and reinstall the cables. Touch up paint after installation

3.21.4.2.3.4 In the Transducer Trunk, crop out, remove and replace one "kick-pipe" similar to those shown in previous picture. Transducer will have be disconnected from inside the transducer fairing and the cable pulled back. After replacement, repair paint and reinstall cable to transducer. Test Operation.

3.21.4.2.4 4-52-1 Fuel Oil Tank Float Tank Level Indicator Replacement

3.21.4.2.4.1 Referencing 3.21.2.7, Procure and replace "in-kind" float type tank level indicator for Fuel Oil Tank 4-52-1. Install new float TLI and electrically connect. Perform joint inspection with COR and CME of newly installed TLI and demonstrate accurate operation to Machinery Control System. Thermoplastic jacketed cables shall be replaced.

3.21.4.2.4.1.1 Parts numbers of components to be replaced are as follows:

Item	Part Number	Qty
1.0	**112272** XM-36485-057-00510-O-L	1
2.0	**64373** XM-36465-071-00510-O-L	2
3.0	**117403** XM-36460-027-00510-O-L	1
4.0	**143020** 45485-005-LP JUMPER CABLE	1
5.0	**604210** 45485-012-LP JUMPER CABLE	1
6.0	**172359** 45490-005-005-020-LP T CABLE	1

3.21.4.2.4.1.2 A source for procurement of this float switch is as

follows:

Gems Sensors & Controls(www.gemssensors.com)
One Cowles Rd – Plainville, CT 06062
Jim Karvoski
Phone: 860-793-4527
Jim.karvoski@gemssensors.com

3.21.4.2.4.1.3 **There is an approximate 10 week lead time for the TLI float and associated parts**

4.21.4.2.5 Add General Alarm Speakers

4.21.4.2.5.1 Purchase two (2) Edwards Signaling 889D-AW AdaptaHorn Grill Type Hazardous Locations Horns or equivalent. Install one horn on the upper forward bulkhead of the Emergency Diesel Generator Room and one horn in the Boson Storeroom.

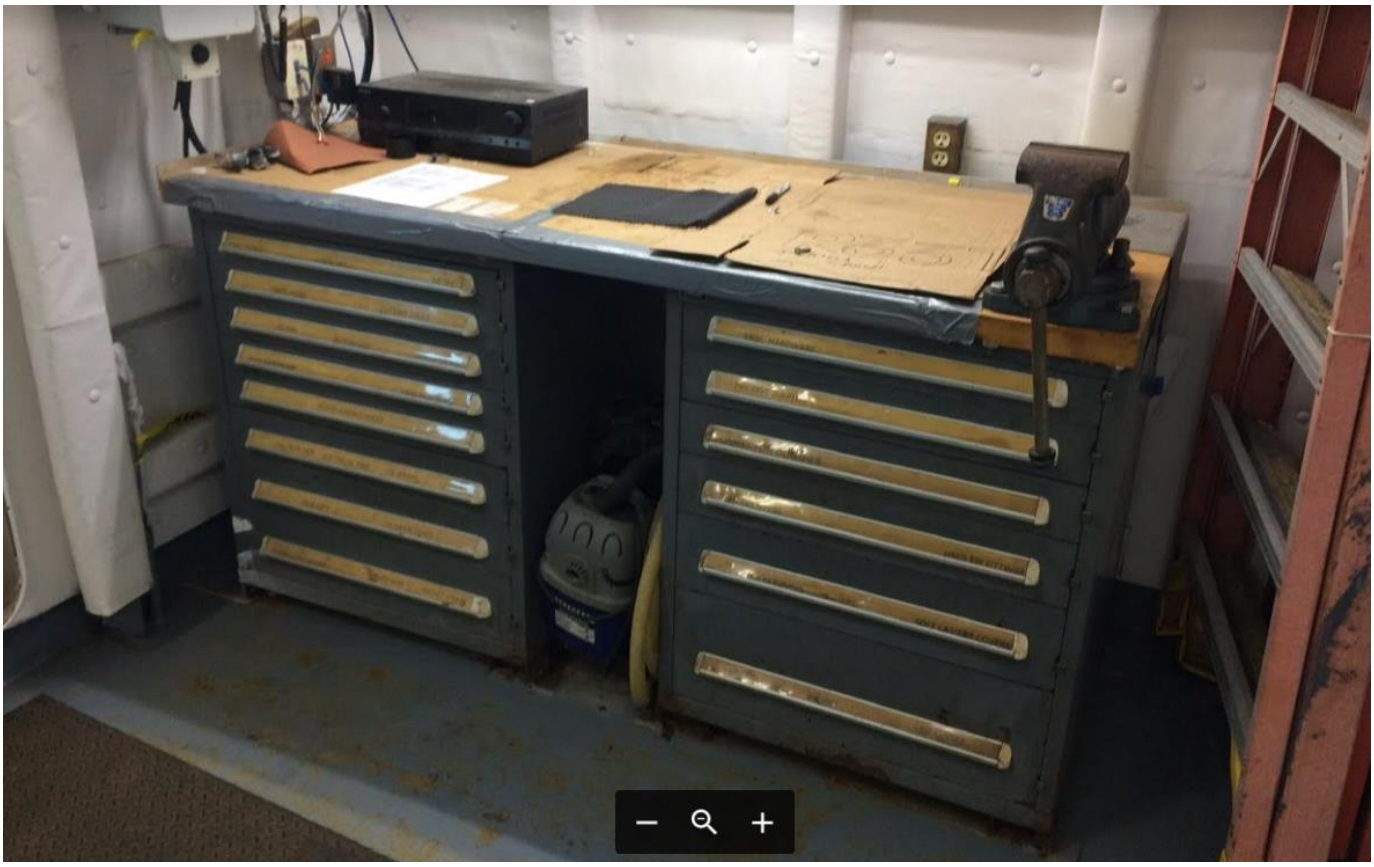
3.21.4.2.5.2 Procure 60 feet of appropriate cable for horns referenced in 4.21.4.2.5.1 which meets ABS and USCG standards and install. Connect Horns listed in 4.21.4.2.5.1 electrically at the direction of the COR. Cable will penetrate one MCT which will need to be reclosed after cable installation.

3.21.4.2.5.3 Procure one 100SB Series Pathfinder Heavy Duty Rotating Light Twin Sealed Beam (orange), or equal, and connect electrically to horn installed in the Emergency Diesel Generator Room.

3.21.4.2.5.4 Test operation of both Horns and rotating lights in the presence of the COR. All shall operate as designed when shipboard general alarm sounds.

3.21.4.3 Misc. Joiner Work

3.21.4.3.1 In the ROV Hanger, Remove two Vidmar Cabinets shown in the following picture. Discard or turn over to the COR (at the COR's discretion). Retain top working bench and vice.



3.21.4.3.1.1 Prep and paint under old cabinets removing all rust (SSPC-10 or SSPC-11) and painting to match surrounding. Install four new square bar brackets for foundation of new Vidmar. Each square bar bracket shall be 1 inch, schedule 80 – approximately 30 inches long.

3.21.4.3.1.2 Install new GOV provided Vidmar cabinets to new square bar. Reinstall work bench and vice.

3.21.4.4 Pipe Repairs

3.21.4.4.1 Bridge Window Drains:

3.21.4.4.1.1 On the bridge, crop out and remove three (3) 1 ¼ inch drain lines for bridge emergency escape windows (1 located on the port side, one located on the STBD side and 1 located on the aft side). Replace in kind including penetration.

3.21.4.4.1.1.1 All three drains located behind joiner bulkheads



Drain located behind join bulkhead



Drain penetration to exterior deck

3.21.4.4.1.2 Test drains to 10 psi and check for leaks. Reinstall all removed joiner material and touch up paint.

3.21.4.4.2 Deck Drain Repairs in Fuel oil tank 4-14-1

3.21.4.4.2.1 While fuel oil tank 4-14-1 is empty for ABS inspections, make safe for hotwork. Crop out and remove 40 feet of 2 inch steel deck drain piping (in 4 sections). Replace piping with 2 inch diameter schedule 80 carbon steel piping. Perform visual inspection of all welds by a Level II or Level III weld inspector and test in the presence of the ABS surveyor.

3.21.4.4.3 Deck Drain trap repair in stateroom 01-20-2-L

3.21.4.4.3.1 In the overhead of stateroom 01-20-2-L, crop out and replace 18 inches of drain as shown in the following picture. Pipe shall be replaced in kind to include cleanout. Replacement pipe shall be 2” schedule 80. Repair paint to match surrounding. Perform 24 hour standing water test on repair.

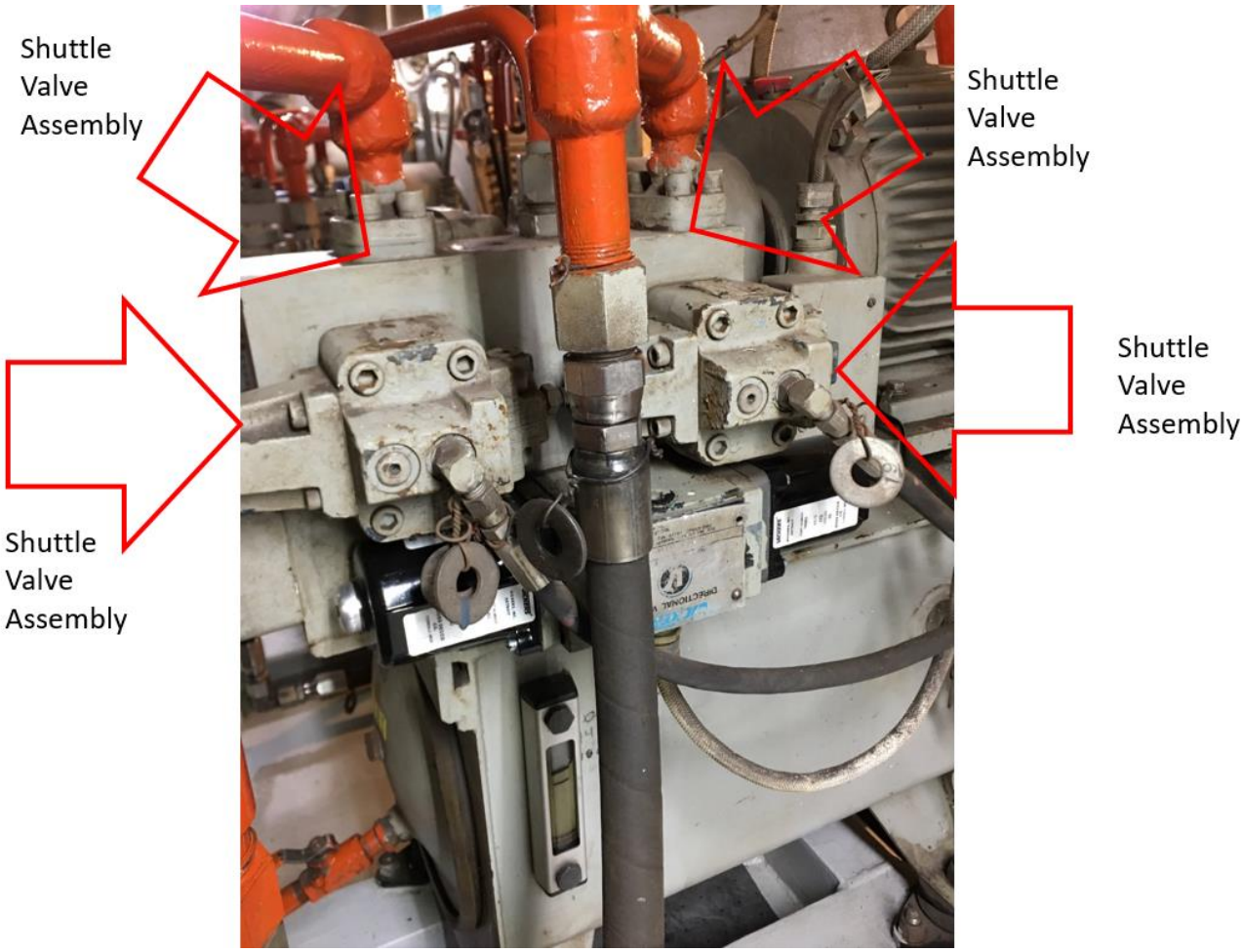


3.21.4.4.4 Hydraulic steering valve replacement and tank removal

3.21.4.4.4.1 Lockout and tag out the steering gear system with the CME and COR. Drain all piping and remove valves A, B, C, D, E, F, G H, S, T, U, V, W, X, Y Z listed in 3.21.2.12. Replace valves "in-kind". Valves shall be same size and pressure rating as existing (no less than 3000 PSI). Provide valve certification information to COR prior to installation. Supplemental information is provided in references 3.21.2.10 and 3.21.2.11.

3.21.4.4.4.2 Crop out and remove oil fill tank (approximately 40 gallon size) and 16 feet of fill piping in mission deck void and steering gear room. Discard and insert penetration. Cap the end of the piping in steering gear room. Repair damaged paint to match surrounding.

3.21.4.4.4.3 Remove shuttle valve and shuttle valve assemblies from the Port and STBD hydraulic pump steering units. Overhaul and recondition shuttle valves assemblies changing seals, solenoids and valve seats. Test operation in the presence of the COR prior to reassembly. Provide a CFR with all work completed on assemblies and notable findings Reinstall valve assemblies.



3.21.4.4.4.3.1 Additional Pictures of the hydraulics valves, shuttle valves and shuttle valve assemblies can be seen in reference 3.21.2.13

3.21.4.4.4.4 Clear lockouts with COR and CME and recommission steering system, purging all air out of system and testing operation.

3.21.4.4.5 Fuel Oil and Lube Oil Fill station pipe replacement

3.21.4.4.5.1 Clean and tag out Port and STBD fuel oil and lube oil fill station piping. Isolate piping and obtain a "safe for hotwork" certification.

3.21.4.4.5.2 Crop out and replace in kind all above deck piping(approximately 60 inches) and 36 inches below the deck (including penetrations) of the port lube oil fill, STBD lube oil fill, port fuel oil fill and stbd fuel oil fill piping. Replace valves, flanges and hardware in kind. Hardware shall be stainless 316L and new pipe shall be schedule 80. Repair paint to match existing.

3.21.4.4.5.2.1 Reference 3.21.2.14 and 3.21.2.15 provide additional information and pictures of piping. References 3.21.2.16, 3.21.2.17, and 3.21.2.18 show additional information of the lube oil and fuel oil system.

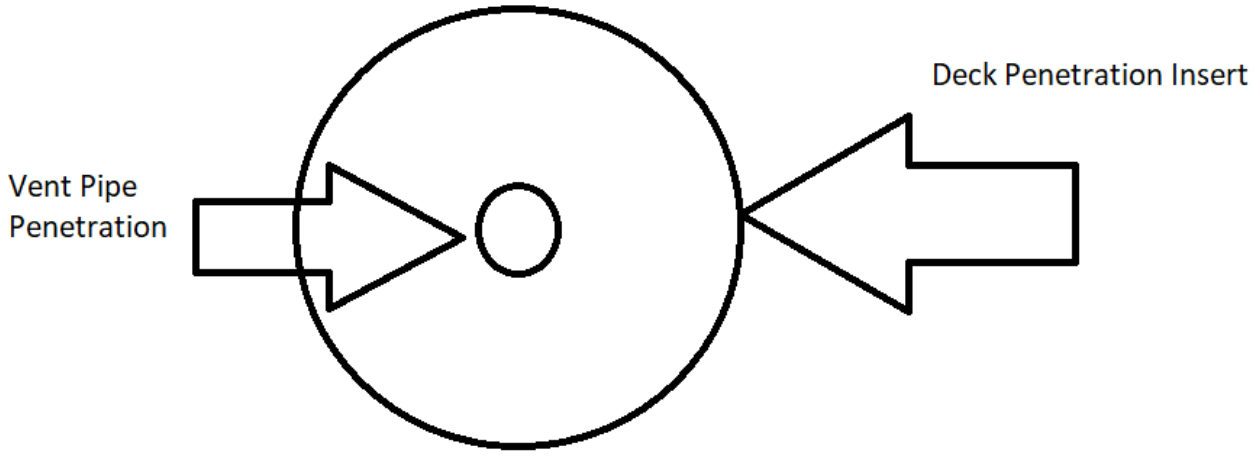
3.21.4.4.5.2.2 All welding shall be completed by a welder certified for the weld process and filler material used in the welding process

3.21.4.4.6 Seachest Piping replacement

3.21.4.4.6.1 Crop out and remove all above deck sea chest vent piping and 72 inches below deck piping including penetration for each of the three seachest (Port, STBD and Aft). References 3.21.2.14 and 3.21.4.15 provide picture and additional information of seachest piping.



3.21.4.4.6.2 Crop out a steel penetration insert around each vent pipe penetration in the deck no smaller than 18 inches in diameter



View of Pipe and Steel Replacement looking down

3.21.4.4.6.3 Renew removed vent piping to include all above deck piping 72 inches below the exterior deck. New piping shall be schedule 80 – 316L stainless steel and be the same size, shape, length as existing.

3.21.4.4.6.4 Replace removed 18 inch deck insert with stainless steel insert to be same shape and thickness as existing. Steel plating shall be stainless 316L. Assume ½ inch thickness for bidding purposes.

3.21.4.4.6.5 All welding shall be either MIG or TIG welding using 309L filler material. Paint all new and disturbed areas to match surrounding using reference 5.23.2.2 as a guide.

5.21.4.4.6.6 Reinstall interferences and repair paint and nonskid

3.21.4.5 Insulation

3.21.4.5.1 Provide 160 labor hours of a journeyman level insulator and $1500 in material for insulation work to be performed at the discretion of the COR. This work shall be above and beyond all other insulation work addressed in these specifications

3.21.4.6 General

3.21.4.6.1 Air Mixing Plenum cleaning

3.21.4.6.1.1 Provide 4 labor hours and 1 gallon of common household bleach and spray the air mixing plenum insulation, deck, structures overhead with bleach-water mix spray to kill any potential mold

3.21.4.6.1.2 Provide 8 labor hours and bleach-water mix rags to wipe down all air mixing plenum surfaces

3.21.4.6.1.3 Provide 30 labor hours and 4 gallons of Zinsser mold killing paint (or equivalent) and paint all surfaces inside the air mixing plenum with two coats.

3.21.4.6.1.4 Inspect with COR

3.21.4.6.2 Vent/Duct cleaning

3.21.4.6.2.1 Clean laundry exhaust ventilation from dryers to exterior of the ship. Clean interior of dryers. Remove all lint

3.21.4.6.2.2 Clean Gaylord hood and vent of all grease, dirt and grime to exterior of ship.

3.21.4.6.2.2.1 Clean the Gaylord Hood system as follows:

3.21.4.6.2.2.1.1 Disassemble, clean, inspect, and reassemble the internal nozzles, baffles, ducts, and wash down systems.

3.21.4.6.2.2.1.2 Route out the hood drains to remove all debris.

3.21.4.6.2.2.2 Test and operate the wash down system.

3.21.4.6.2.2.3 Use a grease solvent to clean the interior of the Gaylord Hood exhaust system ducts, and the exhaust fan.

3.21.4.6.2.3 Clean all bathroom exhaust ventilation. Bathroom ventilation is a negative pressure ducting that runs from the overhead of each Toilet and shower module and public head to the exterior of the ship through a common 2 inch vents.

3.21.4.7 Paint

3.21.4.7.1 Tank Vent catch/spill basins.

3.21.4.7.1.1 Powerwash and degrease 18 shipboard tank vent catch basins (spill basins) interior and exterior. Contractor shall prove catch basins and pipes are free of grease, oil, dirt and debris. Supplemental Pictures of basins can be seen in reference 3.21.2.9.

3.21.4.7.1.2 Powertool the bottom and all interior and exterior sides of the tank vent catch basins and vent piping within the catch basins to an SSPC-11 standard. Inspect with COR and solvent clean all prepared areas to a SSPC-1 standard.

3.21.4.7.1.3 Crop out and replace three (3) 12 inch by 18 inch steel inserts within the catch basins. Assume ¼ inch steel thickness.

3.21.4.7.1.4 Apply the following coating system to all prepared surfaces:

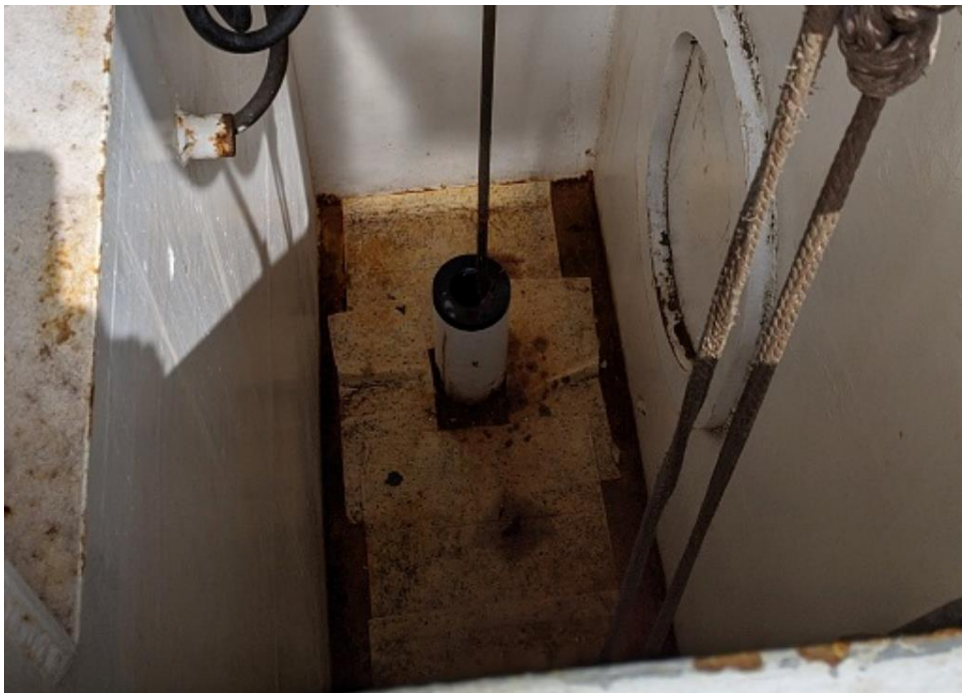
(a) Two primer coats (5-7 mils dft each) of Sherwin Williams Seaguard 5000H HS Epoxy, color: red, followed by gray.

(b) Two top coats (3-5 mils dft each) of Sherwin Williams Hi-Solids Polyurethane, color: (black for spill basins and steel, white for pipes).

3.21.4.7.1.5 Restencil tank vent names on pipes and spill basins (example 4-23-0) in 1.5 inch black lettering.

3.21.4.7.2 Paint Overboard blocking cavity

3.21.4.7.2.1 Powerwash and degrease Overboard blocking cavity (picture below). Contractor shall prove overboard blocking cavity are free of grease, oil, dirt and debris.



3.21.4.7.2.2 Powertool the deck and all sides of blocking cavity to a SSPC-11 standard. All cables shall be covered and masked. Inspect with COR and solvent clean all prepared areas to a SSPC-1 standard.

3.21.4.7.2.3 Apply the following coating system to all prepared surfaces:

(a) Two primer coats (5-7 mils dft each) of Sherwin Williams Seaguard 5000H HS Epoxy, color: red, followed by gray.

(b) Two top coats (3-5 mils dft each) of Sherwin Williams Hi-Solids Polyurethane, color: white

3.21.4.8 Metal Outfitting

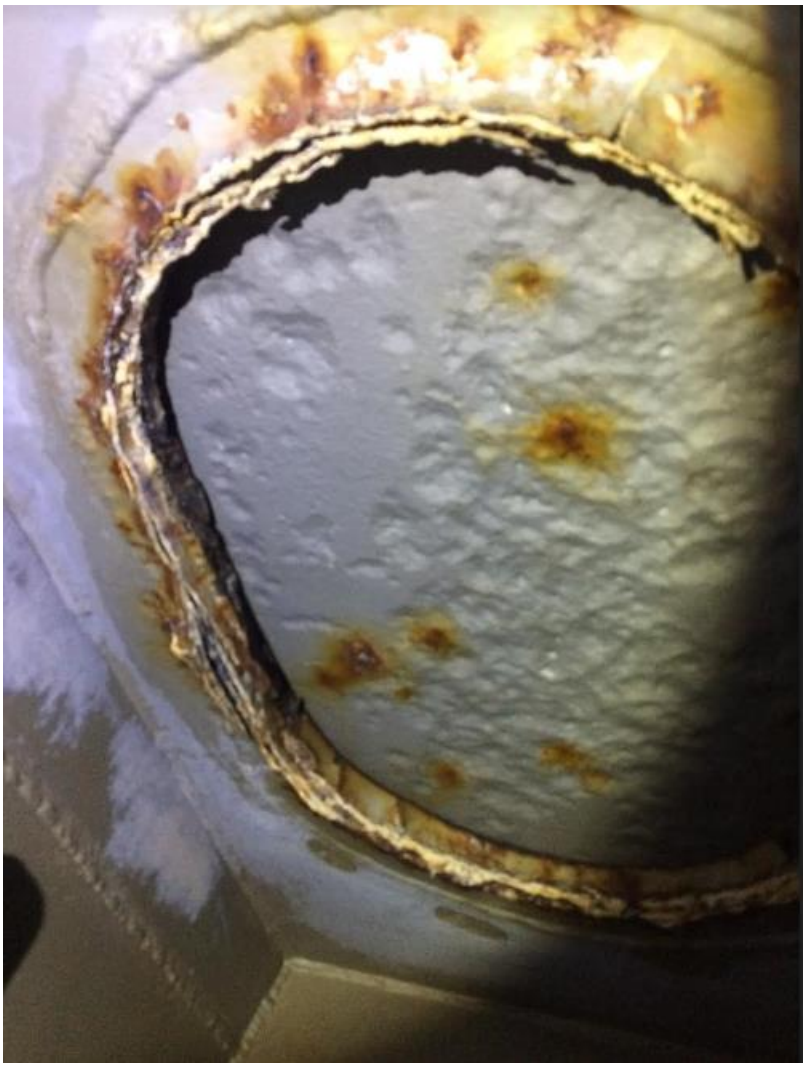
3.21.4.8.1 Ballast Zincs

3.21.4.8.1.1 Provide and install 36 new type ZHC-23 zinc anodes conforming to MIL-A-18001K to be installed to replace wasted zincs in either the frame 23 or frame 86 ballast tanks at the direction of the COR

3.21.4.8.1.1.1 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. Contractor shall install or repair 4 bolt fasteners for zincs

3.21.4.8.2 Ballast Tank Manhole Replacement

3.21.4.8.2.1 In the 4-23-0, 4-23-2 and 4-23-3 ballast tanks, crop out and replace six (6) manhole tank rings and covers. Manhole rings and cover shall be the same size, thickness and type as existing.



3.21.4.8.2.1.1 One manhole is approximately 27 inches by 19 inches and flush with the deck. All other manholes are 28.5 inches by 20.5 inches and raised approximately 2 inches.

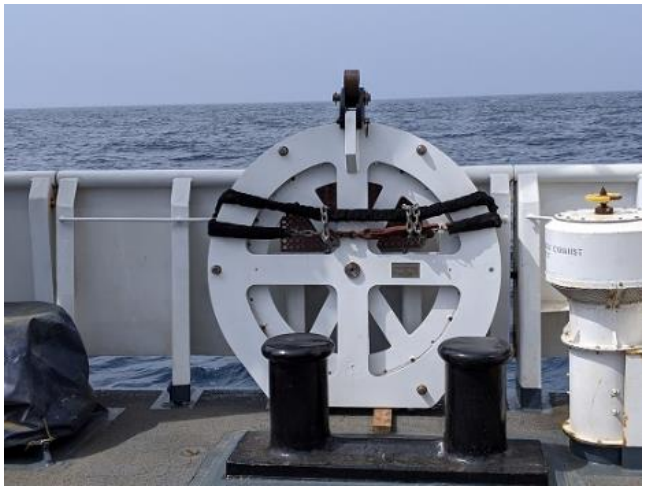
3.21.4.8.2.2 Test and inspect to the satisfaction of the attending ABS surveyor. Paint manhole and ring and repair all disturbed paint to match existing. Install with new gasket and air test to 2 psi.

3.21.4.9 Machinist

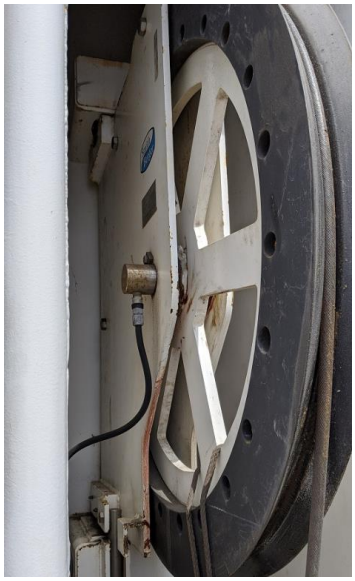
3.21.4.9.1 Turning Block and Overboard Block:

3.21.4.9.1.1 Inspect and Grease turning Block and Overboard Block on A-Frame and Traction winch. Grease all fittings. Submit a CFR with any notable findings.

Overboard Block Picture:



Turning Block Picture:

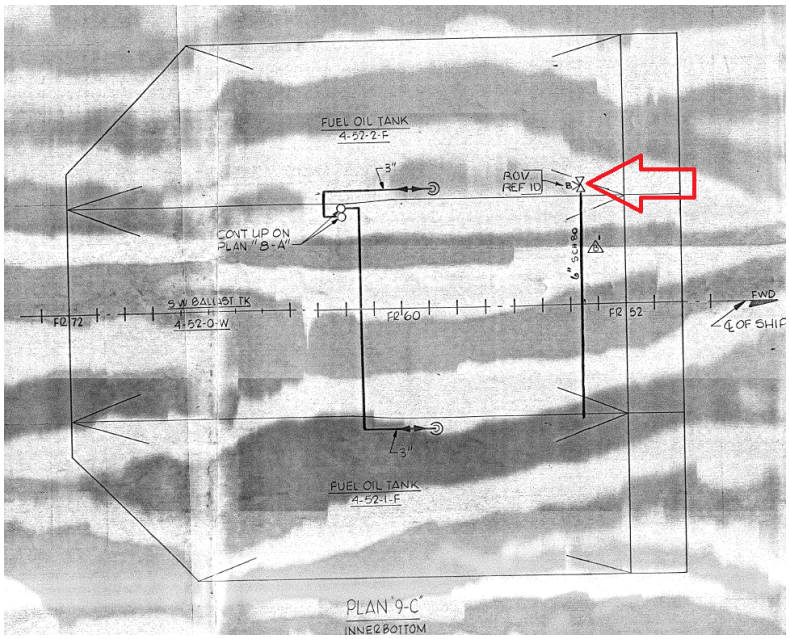


3.21.4.9.2 Fuel oil crossover valve replacement, gearbox overhaul and deckbox replacement

3.21.4.3.2.1 In the 4-52-2 fuel oil tank, remove and replace "in kind" the 6 inch remote operated valve in the cross over line between fuel tanks 4-52-2 and 4-52-1. Remove ROV gear box inside tank, clean, refurbish, overhaul and reinstall. Replace all seals and bearings and perform joint inspection with COR of gearbox prior to reassembly. Provide CFR with findings.

3.21.4.3.2.1.1 See reference 3.21.2.16 for additional information

3.21.4.3.2.1.2 The below image identifying the valve in question is taken from reference 3.21.2.16.



3.21.4.3.2.2 Crop out and replace in kind two (2) - 48 inch long sections of piping 6 inch diameter piping inside the tank. Test in the presence of the attending ABS surveyor.

3.21.4.3.2.3 Remove reach rod and crop out and remove deckbox penetration as shown in the following 2 pictures. Replace in kind and reinstall reach rod assembly. Test in the presence of the COR.





3.21.4.10 Welders

3.21.4.10.1 Weld Marks:

3.21.4.10.1.1 Provide 24 feet total of non-continuous weld bead at locations to mark each of the three sea chests (QTY – 3) and EK60 calibration rods – QTY – 6. COR will show and mark specific locations during period of performance. Weld bead shall be ¼ inch high. Contractor to repair burned paint to match surrounding.

3.21.4.11 Sheetmetal

3.21.4.11.1 Provide 24 labor hours and $750 in material to repair sheet metal bulkheads in the 01 Level STBD vestibule. Work shall be done at the CORs direction.

3.21.4.12 Miscellaneous

3.21.4.12.1 Replacement and calibration of gauges

3.21.4.12.1.1 On the EOS control console, remove and replace "in kind" STBD Propulsion Motor lube oil pressure gauge. Gauge shall be calibrated with affixed calibration sticker



STBD Propulsion Motor Lube Oil Pressure Gauge

3.21.4.12.1.2 On the SSDG #1 Switchboard in the EOS, remove and replace "in kind" the below voltmeter. Gauge shall be calibrated with affixed calibration sticker



SSDG #1 Switchboard Volt Meter

3.21.4.12.1.3 Replace “in-kind” the following listed gauges. All gauges shall be replaced in kind and calibrated during the contract performance period and affixed with a calibration sticker. Assume gauges are 2 inch diameter stainless steel and that pressure gauges are liquid filled.

T-93	3-72-1-l tunnel	aft thruster	fwd resivoir tank
T-94	3-72-1-l tunnel	fwd thruster	fwd resivoir tank
T-43	AC Room	Reefer 2	Freon
M-212	AC Room	refridgeator #1	freon rupture
M-217	Bow thruster	bow thruster	valves
M-93	Bow thruster	bow thruster	valves
M-94	Bow thruster	bow thruster	valves
M-219	EDG 01 FWD	EDG	LO pressure at sensor(behind engine)
E-10	EOS	SSDG 1	ac amps
E-121	EOS	fire main	pressure
M-240	ER L/L	bilge pmp	#2 pmp disch
M-241	ER L/L	bilge pmp	#2 pmp suct
M-25	ER L/L	bilge pmp	#3 pmp suct
T-95	ER L/L	Port propulsion motor	cooler s/w tmp out
M-19	ER L/L	fuel manif	fo pmp suct
M-177	ER L/L	stbd propulsion motor	l/o pmp inlet to filter
M-179	ER L/L	stbd propulsion motor	l/o stdby suct pres
M-23	ER L/L	STBD propulsion motor	LO cooler SW In
M-247	ER L/L	propulsion cooling pump	mtr #1 discahrge panel
M-248	ER L/L	propulsion cooling pump	mtr #1 suct
M-246	ER L/L	propulsion cooling pump	mtr #2 discharge panel
E-122	ER L/L	tli intri box	tank 4-72-3
E-48	ER L/L	tli intri box	tank 4-80-2
M-250	ER U/L	carrier transicold	discharge
T-112	ER U/L	stbd propulsion motor	sw outlet air cooler
M-157	fan tail	ships service air	air tool regulator
M-158	frb deck	port vest davit	accumulator press
M-238	frb deck	stbd vest davit	accumulator press
M-236	frb deck	stbd vest davit	vale pressure
M-237	frb deck	port vest davit	valve press
M-129	gen flat	ship service air	air hookup
M-124	gen flat	ship service air	air tool regulator
M-229	gen flat	Pot water	at hose bib
M-112	gen flat	aux 2 sw pmp	discharge press

M-152	gen flat	start air comp	discharge press @ switch
M-151	gen flat	ssdg #4	fuel
M-144	gen flat	Rosedale Filter	Inlet press
T-56	gen flat	ssdg #1	jw in
M-13	gen flat	ssdg #1	jw out
M-222	gen flat	ssdg #4	jw out
T-81	gen flat	ssdg #3	l manifold air
M-142	gen flat	ssdg #4	oil press
M-148	gen flat	start air comp	oil press
M-145	gen flat	Rosedale filter	Outlet Press
M-119	gen flat	port distiller	pot water press
T-66	gen flat	ssdg #1	r manifold air
T-67	gen flat	ssdg #2	r manifold air
M-130	gen flat	ship service air	ship svc reciever #3
M-233	gen flat	#1 fm ballast	suct press
M-235	gen flat	SS air	tool air by AC door
M-209	gen flat	ows	water inlet
M-41	genny flat	SSDG #4	3 way valve control air
M-39	genny flat	air comp.	air comp disch
T-10	genny flat	SSDG #2	JW cooler JW
M-47	genny flat	SSDG #2	ssdg 2 air valve control air
M-40	genny flat	SSDG #4	SW out
M-43	genny flat	SSDG #3	SW out
M-46	genny flat	SSDG #2	SW out
M-232	geny flat	MSD	Air ejector
M-35	scullary	Dishwasher	hot water pressure
M-193	Winch Room	cent hpu manifold #3	discharge
M-202	Winch Room	cent hpu #2 b	discharge
M-206	Winch Room	cent hpu #1 a	discharge
M-252	Winch Room	cent hpu #2 a	discharge
M-254	Winch Room	cent hpu #3 b	discharge
M-253	Winch Room	hyd oil storage tank	recirc filter
M-197	Winch Room	winch hpu	sw #1 A port
M-204	Winch Room	winch hpu	sw #2 charge
T-116	Winch Room	cent hpu	sw cooling supply

3.21.4.12.1.4 Repair and calibrate Bridge and EOS motor gauges. EOS gauge reads 165 RPM when Bridge gauge reads 150 EOS.

3.21.4.12.1.4.1 A recommended source for the Bridge/EOS gauge repair is as follows:

N. Waller & Associates
6300 Grelot Rd. Ste G-204
Mobile, AL 36609
Attn: Buddy Waller
Tel: (251) 634-8100
Cell: (251) 421-7040
e-mail: N Waller@prodigy.net

3.21.5 Quality Assurance

3.21.5.1 All repairs shall be inspected by and approved by the attending ABS surveyor

3.21.5.2 All welders shall be certified in the weld process and filler material used

3.21.5.3 All affected paint and new material shall be painted to match surrounding area

3.21.5.4 All material certificates shall be provided to ABS and the COR.

3.21.6 Notes

3.21.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.21.6.2 TLI Float switch listed in 3.21.4.2.4 for tank 4-52-1 shall be ordered by the contractor within 7 days following contract award to ensure availability. Contractor shall provide copy of invoice to the COR.

END OF ITEM

3.22 NEW DIVE COMPRESSOR INSTALLATION

3.22.1 Intent

3.22.1.1 Remove the shipboard dive compressor and purchase and install a new dive compressor equipped with CO2 and moisture alarms

3.22.2 References

3.22.2.1 Drawing OE-601-101 – General Arrangement

3.22.2.2 NOAA Standard Specification MOC-000-1G, General Requirements for Ship Repair

3.22.2.3 Mako Brochure (PDF)

3.22.2.4 Drawing 631062303576 Paint Schedule

3.22.2.5 Dive Compressor Photos (PDF)

3.22.3 Government Furnished Equipment

3.22.3.1 None

3.22.4 Requirements

3.22.4.1 Tag out and disconnect the shipboard dive compressor and remove from ship and turn over to COR. Cover all pipe openings to prevent entry of foreign debris.

3.22.4.2 Procure a MAKO BHA05 3-stage, 7.5 HP, 8.6 CFM, 5000 PSI high pressure or equivalent dive compressor with integrated Carbon Dioxide and moisture alarm and automatic shutdown audible alarm. Compressor shall be electric powered with control box mounted within the frame. Electric Motor for compressor shall be 60 Hz, three phase, 480 volt.

3.22.4.3 Provide 8 labor hours to remove, relocate and reinstall Vidmar cabinet currently installed in dive locker as directed by the COR.

3.22.4.4 Remove current dive compressor cable installed from Panel P452 circuit breaker panel outside of the workshop near mess room (1-52-0-L). Provide and install LSTSGU-9 cable from Dive Locker to Panel P452. Provide and change breaker in P452 to 30 amp to support new compressor. Label breaker and provide new cable tags.

3.22.4.5 Provide 24 labor hours of metal outfitting labor and $400 in

material to manufacture a foundation for the new dive compressor at the direction of the COR. Paint to match surrounding and install inside dive locker in accordance with 3.22.2.4.

3.22.4.6 Connect discharge of compressor to air bottle manifold. Use tubing of similar size, type and material as existing.

3.22.4.7 Touch up all paint and damaged installation

3.22.4.8 Commission new equipment and test operation in the presence of the COR, Chief Engineer and Chief Boson. Fill 2 SCBA bottles in the presence of the COR. Calibrate CO2 and moisture alarms.

3.22.4.9 Test new piping for leaks at 1.5 working pressure

3.22.4.10 Turn over maintenance, operations manual and old compressor to COR

3.22.5 Quality Assurance

3.22.5.1 In Accordance with3.22.2.2, 3.22.4.8, 3.22.4.9 and the equipment operator and maintenance manual

3.22.5.2 Air compressor shall be installed in a location so that maintenance can be conducted on the equipment without having to remove the compressor from the installed location.

3.22.5.3 Compressor shall pass NFPA and NDP/USN air quality parameters for SCBA & SCUBA air filling after installation.

3.22.6 Notes

3.22.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.22.6.2 Air Compressor shall be ordered within 7 days following contract award. Invoice shall be provided to the COR.

END OF ITEM

3.23 VARIOUS COMPARTMENT DECK, CARPET AND FLOORING RENEWAL

3.23.1 Intent

3.23.1.1 Remove and replace carpet in several staterooms and remove tile and flooring in the 01 Fidley, bridge head and hospital and install new flooring.

3.23.2 References

3.23.2.1 NOAA Standard Specification MOC-000-1G, General Requirements for Ship Repair

3.23.2.2 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

3.23.2.3 Navy MIL-D-3134J, Deck Covering Materials

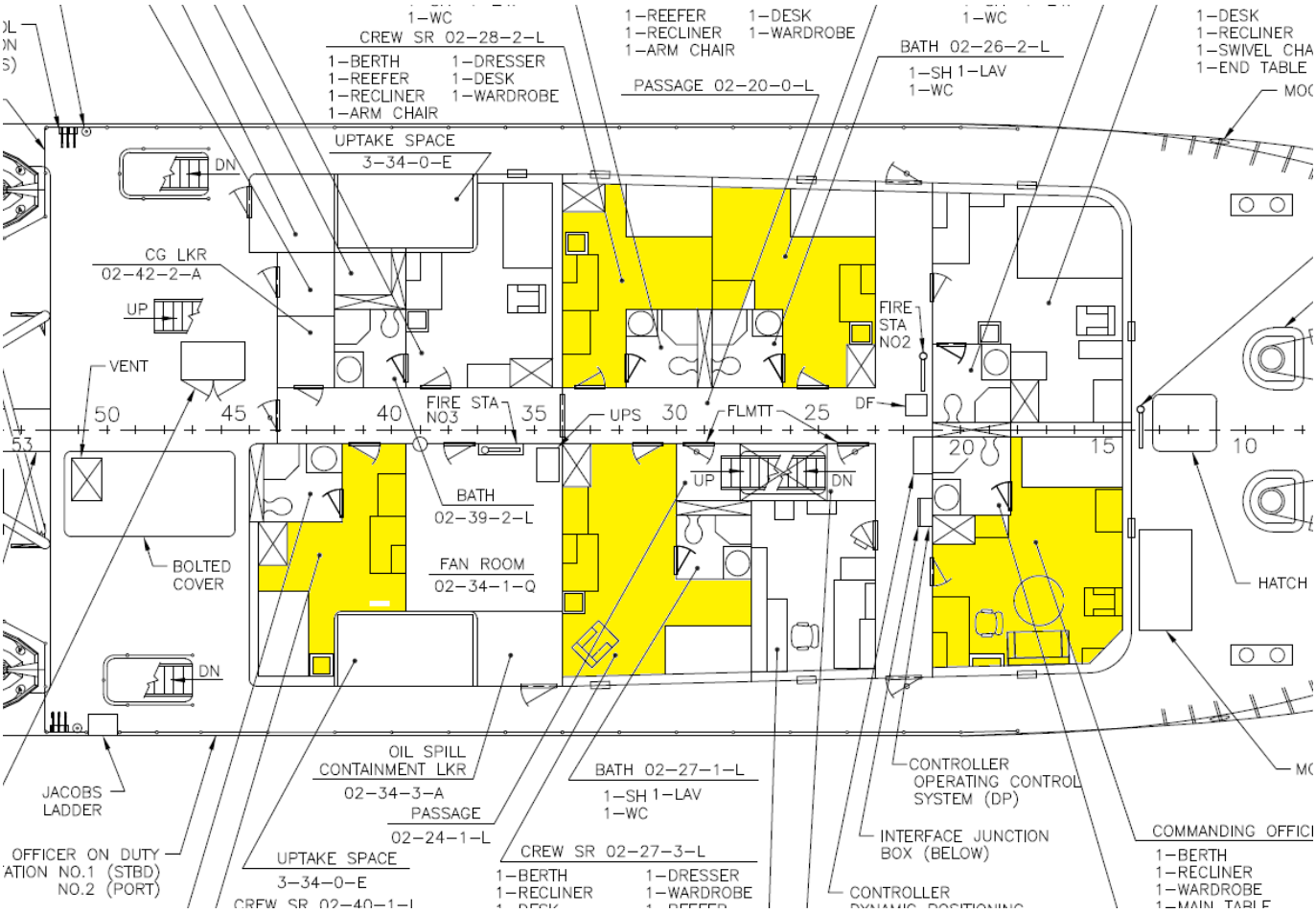
3.23.2.4 Drawing No. OE-601-101, "NOAA Ship Okeanos Explorer General Arrangement"

3.23.3 Government Furnished Equipment

3.23.3.1 None

3.23.4 Requirements

3.23.4.1 Remove carpet in the Commanding Officer Stateroom (02-14-1-L), XO Stateroom (02-26-2-L), 1 A/E Stateroom (02-27-3-L), OPS stateroom (02-23-2-L), and 3A/E Stateroom (02-40—1-L) and discard.

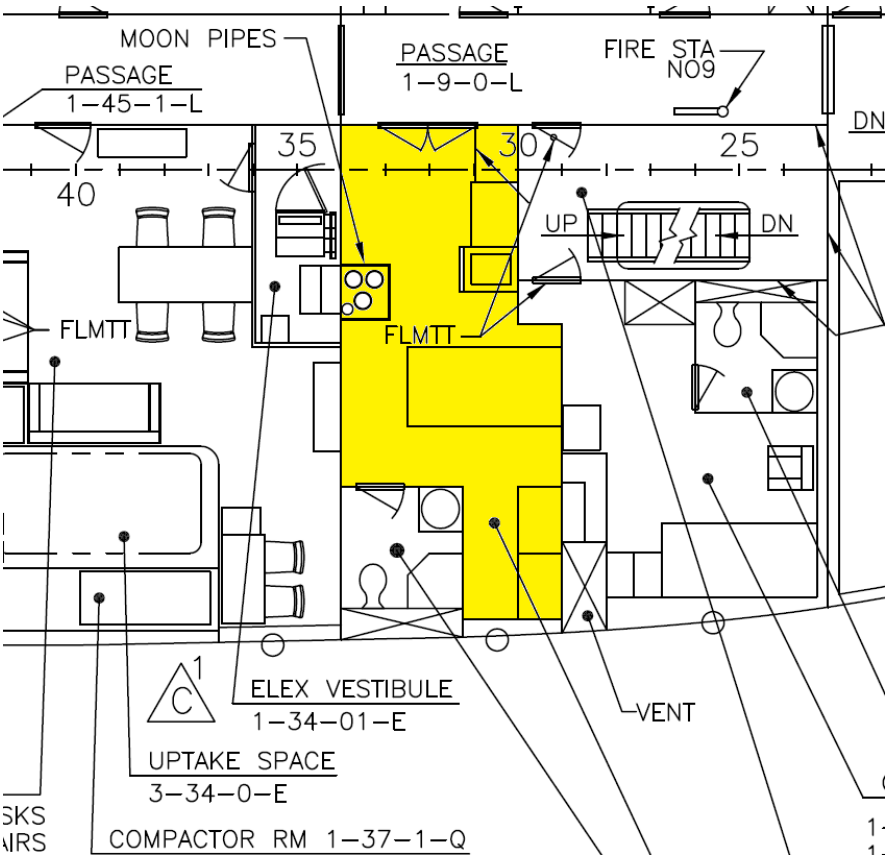


3.23.4.2 Procure and install MC200 Empire Blue 100% wool carpet (42 ounce woven loop – 3 ply) or equivalent in Commanding Officer Stateroom (02-14-1-L), XO Stateroom (02-26-2-L), 1 A/E Stateroom (02-27-3-L), OPS stateroom (02-23-2-L), and 3A/E Stateroom (02–40–1-L). Replacement carpet shall cover entire deck where old carpet was removed. There shall be no seams

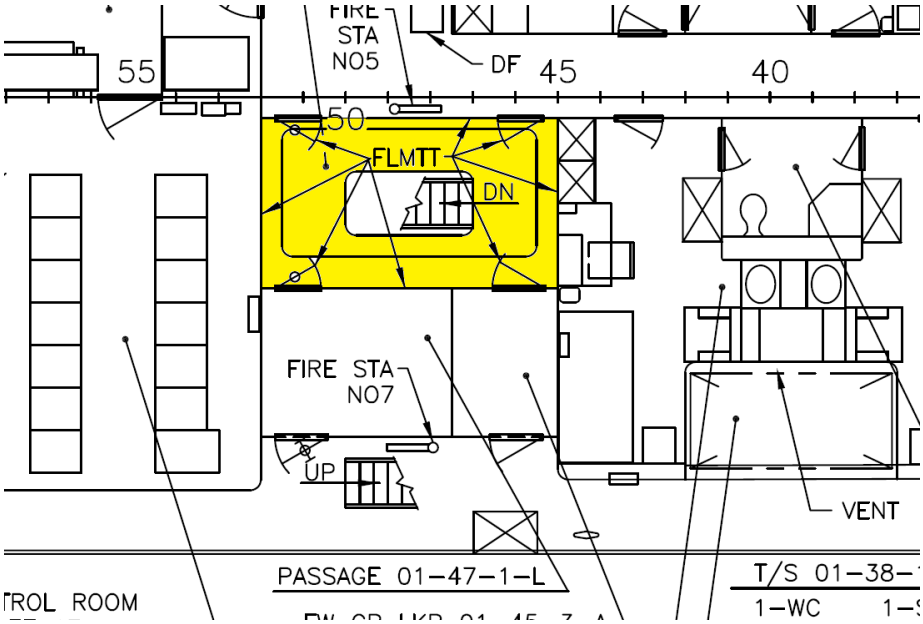
3.23.4.3 Engage the services of a deck coating specialist certified to apply the poured rubber deck system as described in this specification (see Note 3.23.6.1).

3.23.4.4 Replace the deck covering in the 01 level Fidley (1-45-1-L – 01 level), Bridge Head (03-25-1-L) and Hospital (1-30-0-L) with a Poured Rubber deck covering per the following requirements. The following diagrams are taken from Reference 3.23.2.4 and show the subject areas highlighted in yellow. Remove deck material, underlayment and tile before installation.

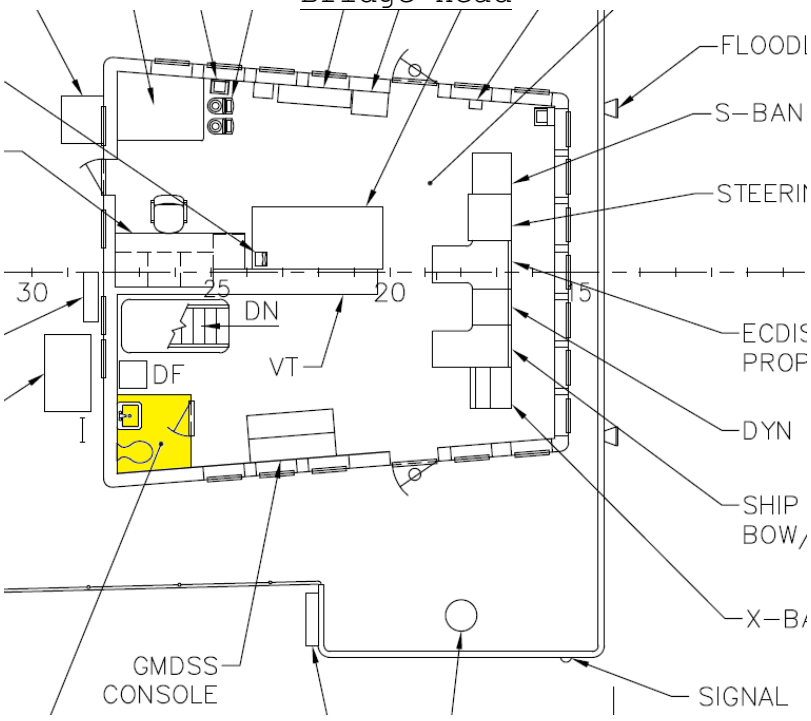
Hospital


MOON PIPES
PASSAGE
1–45–1–L
PASSAGE
1–9–0–L
FIRE STA
NO9
DN
35
30
25
40
UP
DN
FLMTT
FLMTT
C
1
ELEX VESTIBULE
1–34–01–E
VENT
UPTAKE SPACE
3–34–0–E
COMPACTOR RM 1–37–1–Q

01 Fidley



Bridge Head



3.23.4.5 Prove all deck drain(s) in spaces to be clear and free flowing. Plug the drain(s) to preclude introduction of debris resulting from this work item. Upon completion of the decking renewal, remove the plug(s) and again prove the drain(s) to be clear and free

flowing. The COR shall witness testing of all drains.

3.23.4.6 Submit a condition report to the COR listing any drain(s) found to be obstructed. Clearing such drains, if determined to be necessary by the COR, shall be handled as additional work subject to the approval of the Contracting Officer.

3.23.4.7 Install protective covering to protect the vessel's equipment and to contain the dust generated by this work item within the compartment. The COR will approve the protective covering prior to the start of productive work. Negative ventilation shall be maintained and exhausted to the exterior for all spaces where dust and airborne debris from work is generated.

3.23.4.8 Remove the existing deck compound and rubber cove moulding in Bridge Head and tiles in Fidley and Hospital. Chip up and remove the existing underlayment in its entirety. Remove debris from the vessel and properly dispose of it on a daily basis.

3.23.4.9 Power tool clean the entire deck, the bulkheads a line 4 inches above the deck, as well as all foundations, including under toilet, sinks and other interferences as per 3.23.2.1. Vacuum the compartment to remove all dirt and dust generated by the surface preparation activities.

3.23.4.10 In 01 Fidley, crop out and replace one (1) 12-inch x 24-inch steel plate section in deck. Welding shall be completed by a certified welder. Contractor to provide welding certificates to COR upon request

3.23.4.10.1 for bidding purposes, assume steel is 3/8 inch thick

3.23.4.11 Inspect the surface preparation with the COR. Inspection shall include the condition of all permanently attached fixtures in way of the deck covering installation. Upon approval of the surface preparation by the COR, apply one (1) coat of 150 zinc primer or equivalent product per flooring underlayment manufacturer's recommendations to all prepared surfaces. The primer shall be 3-4 mils DFT.

3.23.4.12 Submit a condition report to the COR listing deteriorated foundations or decking found during the inspection after all power tool cleaning has been completed. Additional repairs, if deemed necessary by the COR and approved by the Contracting Officer, shall be the subject of a change order.

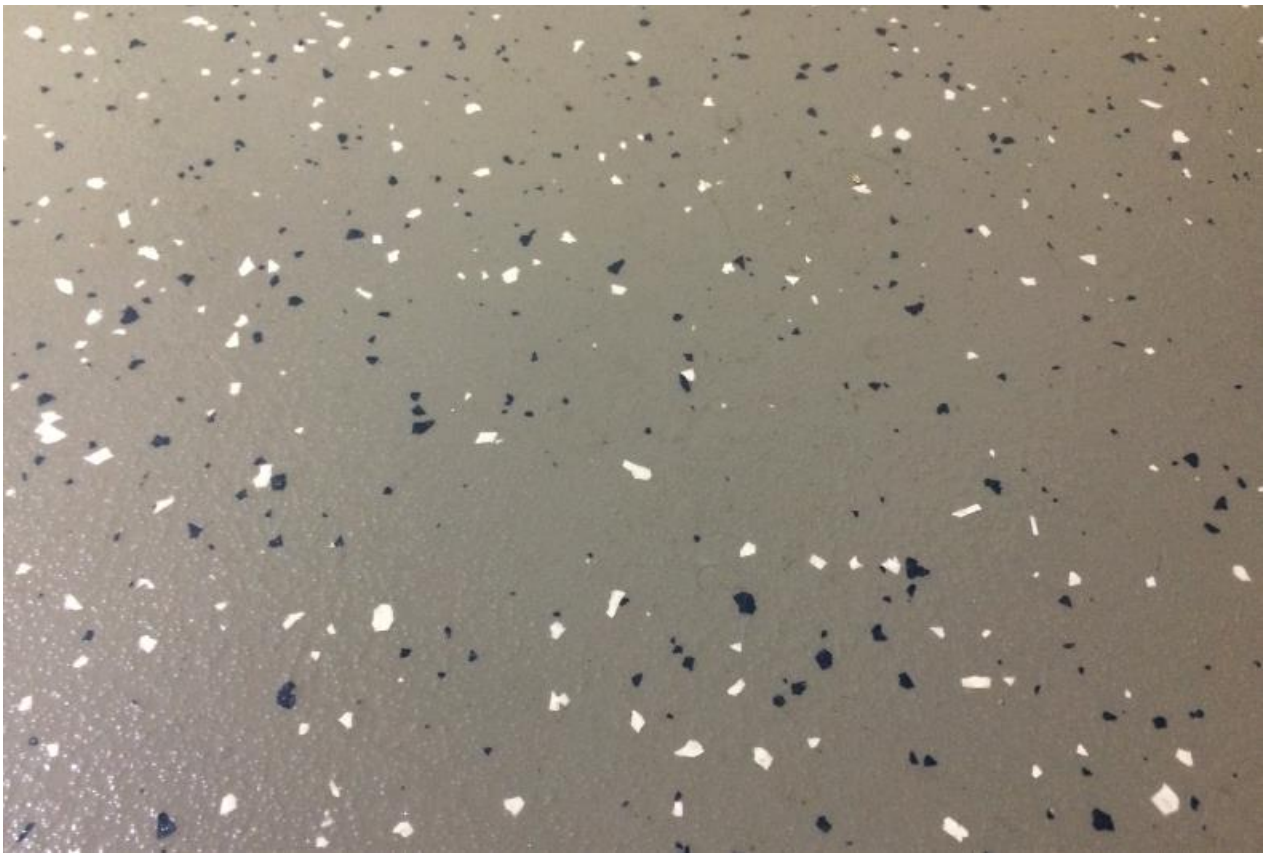
3.23.4.13 Upon approval by the COR, wipe down the primed surfaces with

solvent. When dry, install ultra lightweight underlayment similar to Epmar 1290. The underlayment shall be a minimum of thickness per manufacturer's recommendations and shall fair-in irregularities in the deck including weld seams, depressions, etc., and be coved up the bulkheads lowest 4 inches. Total thickness of the underlayment shall be dependent upon, and adjusted upward as necessary, to conform to the rubber deck covering thickness requirements as set forth in paragraph 3.23.4.14.

3.23.4.13.1 Ultra light weight underlayment, poured rubber membrane decking, and sealer are to be designed for installation as a complete deck cover solution. All materials shall be specifically intended for shipboard use on steel decking and are to be of suitable quality to stand up to heavy foot traffic.

3.23.4.14 Upon inspection and approval of the underlayment by the COR, install rubber deck membrane material (color to be determined by ship’s force) similar to American Safety MS1600 in accordance with References 3.23.2.1 and 3.23.2.2. The base coat shall be a minimum of ¼ inch thick but shall not exceed ½ inch thick. The thickness of the rubber basecoat shall be maintained within these limits with no allowable deviation. All flooring shall be sloped for positive drainage to the deck drains and shall be coved up the bulkheads 4 inches. The finished surface shall be even and free of pour marks or settling irregularities.

3.23.4.14.1 Poured decking must be pre-colored, painting the rubber decking after being poured will not be acceptable. Color should be grey and closely match the below picture:



3.23.4.15 When cured, prepare surface to a smooth and fair profile. Final surface shall be nonporous, smooth and free of pits, spalls, crevices and pour marks. Apply mixed white and gold colored flakes, uniformly distributed, firmly embedded and visible at the surface. Apply low profile texture coat and 3 coats of sealer similar to American Safety SC100. Cracks or voids found in the urethane or sealant shall be rejected as defects. Such defects shall not be patched. Acceptable corrective action shall be removal and re-installation of the sealer and subsequent layers.

3.23.4.16 When surface preparation of the rubber deck is completed, blow-down and vacuum the entire compartment, including protective covering and equipment and fixtures in the compartment.

3.23.4.17 Clean and paint disturbed surfaces to match the surrounding areas.

3.23.4.18 Remove all protective covering. Clean the compartment(s) and leave in a condition ready for use and meeting sanitary requirements. The COR shall inspect all areas after cleaning to be free of haze, film or other surface contamination on any surfaces.

3.23.5 Quality Assurance

3.23.5.1 Test the drainage of all deckdrains. Prove that the drainage is positive and without low spots which would tend to collect water.

3.23.5.2 In accordance with References 3.23.2.1 and 3.23.2.2.

5.23.5.3 Perform joint walkthrough inspection of deck replacement with COR upon completion

5.23.5.4 Protect all new carpeting and dock coverings following replacement for the duration of the contract period. New flooring that is damaged during the repair period shall be repaired or replaced, at the discretion of the COR.

3.23.6 Notes

3.23.6.1 A possible source for deck renewal work:

Surface Technologies Corp.
6607 Hwy 90 East
Moss Point, MS 39563
Attn: Elmer Headrick
Tel: (228) 475-6777
Cell: (228) 218-9375
e-mail: elmerstc@cableone.net

3.23.6.2 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.24 EXTERIOR DOOR RENEWAL

3.24.1 Intent

3.24.1.1 Crop out and replace 8 watertight doors with Government provided doors for the ROV Control Room, Fan Room, Rigging Locker, Dive Locker, ROV Garage, Quarterdeck near public head, STBD Fidley, and Aft Fidley.

3.24.2 References

3.24.2.1 Water Tight Door Drawings – Rev 1 (Pdf)

3.24.2.2 OE General Arrangement OE-601-101D

3.24.2.3 Drawing 631-623-3576 – Paint Schedule

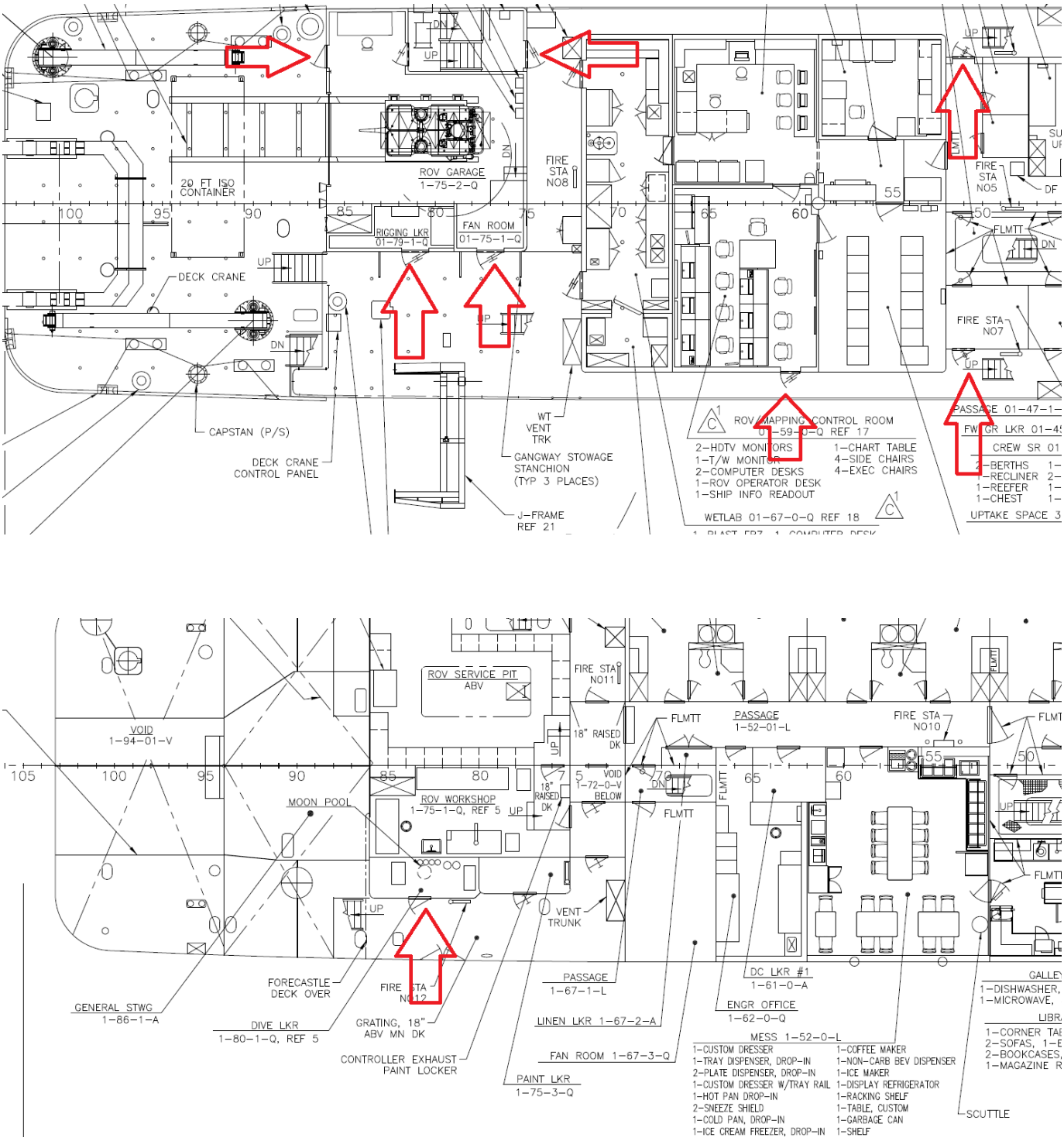
3.24.2.4 NOAA Standard Specification MOC-000-1G, General Requirements for Ship Repair

3.24.3 Government Furnished Equipment

3.24.3.1 Eight (8) Watertight doors shown in Reference 3.24.2.1

3.24.4 Requirements

3.24.4.1 Crop out and remove exterior doors and frames to the 01 Fan Room, Dive Locker, Rigging Locker, Port side of the Hanger, Quarterdeck, Forward Fiddley, Aft Fiddley and ROV Control Room



3.24.4.2 After removal of existing doors, install new doors using either MIG or TIG welding process with the appropriate filler material. Welders shall be certified to perform welding in the process and filler material used. Filler material must be approved by COR prior to welding commencing.

3.24.4.2.1 Existing doors shall not be removed until new doors arrive and are confirmed to be built correctly for the existing location.

3.24.4.2.2 Contractor shall modify bulkheads, structures and bulkhead frame areas as required to install doors to the satisfaction of the attending ABS surveyor

3.24.4.3 Contractor shall use a welding process and pattern that prevents door frames from warping during installation. COR shall approve pattern prior to commencing welding. Contractor shall be responsible for all warping.

3.24.4.4 Repair all structures, paint, insulation and flashing once doors are installed. Repair paint in accordance with 3.24.2.3.

3.24.4.5 Paint New Doors to match surrounding paint and in accordance with 3.24.2.3

3.24.5 Quality Assurance

3.24.5.1 Quality check the smooth opening and closing of all doors with COR and Chief Bosun. Doors shall close and seal along gasket and not be warped

3.24.5.1.1 Doors shall open smoothly after installation and without grinding or resistance.

5.24.5.2 Welders shall be certified in the process and filler material used to install doors.

5.24.5.3 Doors shall be installed evenly as to not creep over or shut when the ship is level

5.24.5.4 Door installation shall be inspected and to the satisfaction of the attending ABS surveyor.

5.24.5.4 In accordance with 5.24.2.4

3.24.6 Notes

3.24.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general

and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.24.6.2 The Government shall be able to deliver the doors to the Contractors facility up to 3 weeks prior to and up to 2 week following the beginning of the contract period.

END OF ITEM

3.25 BALLAST MANAGEMENT SYSTEM SERVICE AND BALLAST VALVE REPLACEMENT

3.25.1 Intent

3.25.1.1 Remove and replace ballast valves and provide annual servicing and calibration of Ballast Water Management System.

3.25.2 References

3.25.2.1 Ballast System Valve Replacement Picture PDF

3.25.2.2 Alfa Laval Pureballast 3.1 85 Compact Design and Installation Guide

3.25.2.3 OE-529-623-3822 BWMS Installation and MODS

3.25.2.4 Drawing 529-623-3819 – Bilge and Ballast System Diagram

3.25.3 Government Furnished Equipment

3.25.3.1 None

3.25.4 Requirements

3.25.4.1 Provide the services of an OEM Alfa Laval Ballast Water Management Tech Rep to provide the following inspection, cleaning and Calibration services of the Alfa Laval 3.1 Ballast Water Management System.

3.25.4.1.1 Conduct inspection and clean electrical cabinet
3.25.4.1.2 Replace UV lamp
3.25.4.1.3 Replace UV sensor (QT201-50)
3.25.4.1.4 Calibrate flow meter
3.25.4.1.5 calibrate pressure transmitters (PT201-16 and PT201-75)
3.25.4.1.6 calibrate transmitter (TT201-33)
3.25.4.1.7 calibrate temperature switch (TS201-601)
3.25.4.1.7 calibrate switch (LS201-29)

3.25.4.2 Provide to COR a CFR with all findings and a certificate of calibration and servicing.

3.25.4.3 Recommission Ballast Water Management System

3.25.4.4 Remove and replace in kind 17 ballast water and 1 fire main valve. Additional pictures are shown in reference 3.25.2.1. All valves shall be bronze. For bidding purposes, assume all are 3 inch

valves.

3.25.4.4.1 Remove all fasteners, wire-wheel clean and reinstall with anti-seize (or equivalent)

6.25.4.5 Remove and replace 1 additional valve not shown in 3.25.2.1 for ballast tank 4-52-0 located in the Main Motor Room. For estimating purposes, assume valve is 3-inch butterfly valve and is connected to a reach rod. Valve shall be bronze.

3.25.5 Quality Assurance

3.25.5.1 Pressure test valves in presence of an ABS surveyor prior to installation.

3.25.5.2 Inspect operation and integrity during dock trial and sea trials

3.25.5.3 Provide material certificate of all new valves to COR prior to installation

3.25.5.4 The Ballast Water Management System shall be tested and operated during the sea trials.

3.25.6 Notes

3.25.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.25.6.2 Contractors shall verify valve sizes prior to procuring valves.

END OF ITEM

3.26 NEW ETHANOL STORAGE

3.26.1 Intent

3.26.1.1 This work item is intended to accomplish the construction and installation of a 325-gallon ethanol storage tank on board the NOAA Ship Okeanos Explorer. This tank will be jettisonable and located on the Upper Deck, port side, at frame 73-75.

3.26.2 References

3.26.2.1 ABS Steel Vessel Rules Under 90m

3.26.2.2 OE-591-001 – Ethanol Storage Tank Installation

3.26.2.3 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships

3.26.3 Government Furnished Equipment

3.26.3.1 None

3.26.4 Requirements

3.26.4.1 Structure

3.26.4.1.1 Removal requirements per Reference 3.26.2.2

3.26.4.1.1.1 Remove approximately 8 feet of 3-course handrail and supports and cap handrails.

3.26.4.1.2 Installation requirements per Reference 3.26.2.2

3.26.4.1..2.1 Construct and install one foundation for the jettisonable ethanol storage tank. The foundation shall provide a surface inclined at 35 degrees above horizontal and sloping outboard. All surfaces where sliding will occur during tank jettisoning shall be lined with ½ inch UHMW to reduce friction. The foundation shall have a provision for connecting the ship side of the quick release mechanism.

3.26.4.1.2.2 Construct and install one ethanol storage tank of approximately 325 gallons. The tank shall be rectangular, approximately 52 inches long by 38 inches wide by 46 inches tall. The bottom shall be flat for the first approximately 20 inches before sloping up at 35

degrees to match the foundation. Tank plating shall be 3/8” (0.375”) 316L stainless steel plate. The tank shall be internally stiffened by 2x3/8” vertical flat-bar stiffeners spaced every 12”.

3.26.4.2 Arrangement

3.26.4.2.1 Removal requirements per Reference 3.26.2.2

3.26.4.2.1.1 The existing trash compactor shall be removed in way of the new jettisonable ethanol storage tank and retained for reinstallation. The foundations for the trach compactor shall be removed, ground flush, and the deck recoated with non-skid to match the surrounding deck.

3.26.4.2.2 Installation requirements per Reference 3.26.2.2

3.26.4.2.2.1 Reinstall the trash compactor at Frame 76 between the existing trash container and the existing stairs to port of centerline.

3.26.4.2.2.2 The ethanol storage tank shall be fitted with a quick release mechanism as described in reference 3.26.2.2 which allows for immediate jettison of the tank in emergency situations. The jettison mechanism shall be fitted with a remote release. This remote release shall be in the form of a manual pull cable which terminates at a point designated by the Contracting Officers Representative (COR). The termination point shall be no less than 35 feet from the tank and shall be arranged such that accidental operation is prevented. The termination point shall contain an aluminum or stainless steel placard which describes in words and shows pictorially the operation of the remote release.

3.26.4.2.2.3 The ethanol storage tank shall be equipped with a pressure/vacuum vent system as described in Reference 2.2. The pressure/vacuum valve shall be set such that it opens under a positive pressure of 3.0 psig and a vacuum pressure of 1.5 psig.

3.26.4.2.2.4 The ethanol storage tank shall be fitted with a bolted access cover located on the top. This bolted access cover shall be of sufficient size to allow a person to enter the tank.

3.26.4.2.2.5 The ethanol storage tank shall be fitted with padeyes located at each corner for the purpose of lifting.

3.26.4.2.2.6 The ethanol storage tank shall be painted yellow. Each vertical side of the tank shall have the words “DANGER – FLAMABLE!” and “ETHANOL” painted in red or black letters a minimum of 3 inches tall. The final, as constructed, volume of the tank shall be painted on at least two sides, in a clearly visible location, in red or black letters at least 3 inches in height.

3.26.4.2.2.7 The ethanol tank shall be fitted with a threaded filling cap which is vapor tight.

3.26.4.2.2.8 The tank shall be fitted with two (2) valves in series for dispensing of contents. The upstream valve shall be a standard globe valve and the downstream valve shall be a positive closing ball valve.

3.26.4.2.2.9 All components compatibility with ethanol shall be verified. Natural rubber, polyurethane, brass, zinc, and aluminum materials shall **NOT** be used where contact with ethanol may occur. Steel, stainless steel, Buna-N, neoprene rubber, Viton, and Teflon are all verified as compatible with ethanol. All other materials used shall be verified as compatible with ethanol.

3.26.4.2.2.10 Provide and install one (1) U.S. Coast Guard approved Type B, Size 1 fire extinguisher within 3 meters of the refilling location.

3.26.4.2.2.11 Provide a drip tray to collect drippings from spill filling and transfers. Drip tray stall be shall be at least 2 inches deep, made of 316L stainless and cover the footprint the filling and transfer locations. Drip tray shall be affixed to the deck to the tank structure.

3.26.4.3 Electrical

3.26.4.3.1 Removal requirements per Reference 3.26.2.2

3.26.4.3.1.1 Pull back the cabling to the existing trash compactor and plug the existing cable penetration.

3.26.4.3.2 Installation requirements per Reference 3.26.2.2

3.26.4.3.2.1 Reroute cable to new trash compactor location, provide new cable penetration, and reconnect the trash compactor.

3.26.4.4 Testing

3.26.4.4.1 New tank shall be hydrostatically tested by filling the tank with water to the point of overflowing and holding for a minimum of 120 minutes prior to the inspection of joints. There shall be no sign of leakage at any joint.

3.26.4.4.2 New pressure/vacuum valve shall be tested by pressurizing the tank for 30 minutes and drawing a vacuum for 30 minutes. The tank internal pressure shall not rise above 3 PSIG during pressure testing and 1.5 PSIG of vacuum during vacuum testing.

3.26.4.4.3 The contractor shall test and demonstrate the jettison functionality and prove to the satisfaction of the COR that the tank will jettison when the remote release is pulled. Tests shall be performed twice, once with the tank empty and once filled with fresh water. During testing the tank shall be restrained such that sliding is demonstrated but the tank does not leave the foundation and/or incur damage.

3.26.4.5 Deliverables

3.26.4.5.1 Contractor shall provide as-built drawings including a bill of materials for each drawing. As-built drawings may be provided as a revision to the references provided herein.

3.26.4.5.1.1 Contractor shall provide all test data for all installed systems to prove functionality.

3.26.4.5.1.2 All deliverables shall be provided in number and formatting as follows:

3.26.4.5.1.2.1 Drawings:

- One (1) electronic PDF copy
- One (1) electronic CAD copy in AutoCAD 2015 or later
- Two (2) paper copies

3.26.4.5.1.2.2 Test Data and All other deliverables:

- One (1) electronic copy in PDF, MS Word and/or MS EXCEL, as applicable
- Two (2) hard copies

3.26.4.5.2 Updated NOAA Okeanos Explorer fireplan in AUTOCAD with new ethanol storage and associated safety equipment and provide in electronic format to COR.

3.26.5 Quality Assurance

3.26.5.1 In accordance with 3.26.2.1 through 3.26.5.3

3.26.5.2 The contractor shall provide the COR with material certificates for all materials

3.26.5.3 All welders shall be certified in the weld process and filler material used.

3.26.6 Notes

3.26.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.27 RADAR REPLACEMENT

3.27.1 Intent:

3.27.1.1 Work Description – Provide all labor, material and equipment to remove the existing X & S Band radars and install new radars.

3.27.2 References

3.27.2.1 NOAA Standard Specification MOC-300-3, General Requirements for Electrical/Electronic Items

3.27.2.2 Drawing OE-426-101 Rev G, Ship Electronic Systems BWD.pdf

3.27.2.3 Drawing OE-601-101_Rev - (General Arrangement)

3.27.2.4 Removed

3.27.2.5 Furuno FAR 3000 Brochure

3.27.2.6 (X-Band) FAR-3220 Installation Manual

3.27.2.7 (S-Band) FAR-3230 Installation Manual

3.27.2.8 EX Furuno Radar System Block Wiring Diagram (Draft Sketch).pdf

3.27.2.9 10 CM (S Band) Radar Railing

3.27.2.10 3 CM (X Band) Radar Railing

3.27.3 Government Furnished Material (GFM)

3.27.3.1 One (1) ea. 500 foot spool CAT 5E shipboard cable or equivalent ($500.00)

3.27.3.2 Two (2) ea. Radar to ECDIS Interface Cables, 50M FURUNO P/N 001-259-920-00 ASSEMBLY RW-00136 ($1000.00 each)

3.27.4 Requirements

3.27.4.1 Contractor shall provide and install the following components;

3.27.4.1.1 (1 ea.) FURUNO S Band FAR3230SSSDBB/12 BB SSD CHART RDR W/PM Consisting of;

Antenna Unit; SN36CF (12’)

Monitor; MU231 (23.1”)
Radar Control Unit; RCU-025
Processor Unit; EC-3000
Power Supply; PSU 014

3.27.4.1.2 (1 ea.) FURUNO X Band FAR3220BB BB CHART RADAR X-25KW W/PM
Consisting of;
Antenna Unit; XN20CF (6.5’)
Monitor; MU231 (23.1”)
Radar Control Unit; RCU-025
Processor Unit; EC-3000
Power Supply PSU 014

3.27.4.1.3 (1 ea.) FURUNO Hub 3000 Transceiver

3.27.4.1.4 (2 ea.) TRANSAS p/n 18011202 RIB6B Hardware Unit (Radar Integrator)

3.27.4.2.1 Removed.

3.27.4.2.2 Contractor shall provide all remaining items and services; parts, installation materials, equipment, cables, cranes, lifting straps, services, sub-contractors, labor, travel costs, disposal fees, tools, and misc. related items necessary to fully complete this specification item.

3.27.4.2.3 Perform all electrical work in accordance with Reference 3.27.2.1. Re-use existing cable ways, penetrations and cable clamps. Repack all disturbed MCTs and cable transits.

3.27.4.2.4 Perform End-to-end continuity and electrical insulation resistance tests on GFE, new, re-used, modified, overhauled, or repaired system cables. Notify the COR if insulation values of any cable is less than 1 Megohm.

3.27.4.2.5 Electronic equipment enclosures shall be tested for continuity and resistance of the grounding path. The resistance of the grounding path between the equipment enclosure and a ship structural member shall not exceed 0.1 Ohm.

3.27.4.2.6 Provide the on ship services of a fully trained and certified Furuno factory authorized field engineer (hereafter referred to as “Furuno engineer”) to direct and assist with removals, installation, commissioning, and informal dockside operational and maintenance training. No removals or installation work shall begin until the Furuno engineer is on site. The Furuno engineer shall provide

instruction and assistance to the contractor for the proper assembly and installation of the new radars. The Furuno engineer shall confirm the re-use of existing cables, direct or perform all electrical connections (not pull cables) and be on site to initially energize, commission, configure, source configure ancillary signal output to radars, verify ancillary signal reception at radars, and provide up to 4 hours of informal dockside training, including but not limited to, powering, menus, basic operation and maintenance for up to ten of the ship's staff.

3.27.4.2.7 Provide the on ship services of a fully certified Furuno instructor (fully certified as a trainer on the exact model of installed FURUNO Radars) to provide at sea performance certification and operational training. The Furuno instructor shall attend a one day sea trial (up to 12 hours at sea) to verify the at sea performance, as well as to provide underway informal training for up to 8 of the ship's staff.

3.27.4.3 Removals:

3.27.4.3.1 Prior to removing the existing Radars, the Furuno Engineer in conjunction with the Ship's ETs, verify the ancillary interface signals (AIS, ECDIS, Gyro, Speed Log, Navigation, and two remote bridge displays) are fully operational with the existing FURUNO radars. Disconnect, accurately label, and protect all ancillary interface signal cables connected to the existing X and S Band Radar Stations for re-use with the new Radar installation, Reference 3.27.2.2.

3.27.4.3.2 In conjunction with Ship's force, follow ship's lockout and tag out procedures to secure all electrical power to the X Band and S Band Radar systems.

3.27.4.3.3 For re-use on the new radar installation, remove and retain all engraved warning placards as applicable. After installation is completed, reinstall in locations as directed by the COR.

3.27.4.3.4 Completely remove and environmentally dispose all of the existing FURUNO X and S Band radar system components, cabling, waveguides and ship's spare electronic module stores, Reference 3.27.2.2. The system components are listed on sheet 24 (Items 1,7,8,13,14&15). Remove Item 2, but deliver to the COR. Remove cables and other components as directed by the Furuno Engineer. Do not remove the AC power cables to the radar processor or monitors as these will be re-used. Antennas, turning units and the Man aloft switches are located on the top of the Pilot House and remainder of the components are mounted on the Bridge, Reference 3.27.2.3.



Figure 3.1.1 S and X Band Radar Stations



Figure 3.1.5 X and S Band Antenna and turning units and platforms

3.27.5.1 Mechanical Modifications and Installations:

3.27.5.1.1 Modify the existing S and X-Band antenna and turning unit foundations to properly align and mount the new S and X Band antenna units. Grind the surfaces of the turning unit foundations to bare metal. Prime and paint all disturbed surfaces to match existing color. Assemble and install the antenna units under the onsite direction of the Furuno engineer and in accordance with References 3.27.2.3, 3.27.2.4, 3.27.2.6 and 3.27.2.7.

3.27.5.1.2 Modify the existing S and X band monitor cut outs on the Ships Control Console (SCC) for flush mount installation of the new S-Band and X-Band monitors. Prime and paint to match existing color. Install both X and S Band monitors in the consoles. References 3.27.2.6 and 3.27.2.7.

3.27.5.1.3 Modify the consoles and flush mount the new X and S band Radar Control keyboards. Prime paint disturbed surfaces to match existing color.

3.27.5.1.4 Modify the existing X and S Band Radar Station processor foundations to accept the new X and S Band Processor Units. The foundations are located in the lower console under the X and S Band Radar Stations. Modifications shall be made under the onsite direction of the Furuno engineer and shall be made with respect to ease of service and cabling considerations. COR shall approve of the installation prior to modification. Install the X and S Band Processor Units on the modified foundations.

3.27.5.1.5 Provide, fabricate, paint and install a ~16” x 16” x 3/8” aluminum mounting plate and mount the power supplies on the plates as directed by the COR. Install on the existing on the bridge on the bulkhead or ceiling.

3.27.5.1.6 Install the Hub 3000 Transceiver in same compartment as the S-Band Processor Unit. COR shall approve the exact installation location.

3.27.5.1.7 Install the two RIB6B units in the compartments with the X and S band Processor units in a location directed by the COR.

3.27.5.1.8 Provide material, modify the platforms and and install the 10CM (S Band) and 3CM (X) Band Radar Railing, Per Reverences 3.27.2.9 and 3.27.2.10. Material is aluminum instead of steel. . Use exact

grade of materials specified. Prime and paint to match mast color. Figure 3.1.5

3.27.5.1.9 In the presence of the COR, Conduct weight tests using a 300 pound test weight in four randomly selected locations on the X-Band platform to ensure solid support with no deflections.

3.27.5.2 Electrical Power and signal cable installation:

3.27.5.2.1 Pull the GFE ECDIS interface cables from the X and S Band antenna units to the RIB 6B Radar Integrator units. Furuno Tech rep shall terminate and connect the cables.

3.27.5.2.2 Connect existing AC circuits to the X and S Band monitors, processor units and HUB 3000 Transceiver in accordance with References 3.27.2.7 and 3.27.2.8.

3.27.5.2.3 Using the GFE CAT 5E cable, run cables from the radar processor locations to the following ancillary bridge equipment locations as follows:

- Two cables from the serial Gyro interface junction box to the S Band Processor location
- Two cables from the serial Gyro interface junction box to the X Band Processor location
- Four cables to the ECDIS hub near the planning station on the bridge.
- Four cables to the GPS units in the overhead near the planning station.
- Two cables to the GPS units in the overhead near the above the conning station.

3.27.5.2.4 Under the onsite direction of or performed by the Furuno engineer, run, test all cables supplied with the X and S Band Radars to and from the respective S and X band system modules, References 3.27.2.6, 3.27.2.7 and 3.27.2.8. Terminate and connect existing ancillary and newly run ancillary signal cables to the X and S Band system processors from the Gyrocompass, Speed Log, Electronic Chart Display Information System (ECDIS), Automatic Identification System (AIS), Global Positioning Systems (GPS), HUB 300 Transceiver, starboard monitor and winch control monitor. Reference 3.27.2.8 is a preliminary “as built” drawing. The Furuno engineer shall review and mark up to reflect the complete and accurate “as built” configuration of the new system installation and deliver to the COR prior to the at sea test. The Furuno engineer shall also provide detailed individual cable

connections to all connection points and connectors. Provide to the COR for review, edits and final acceptance, prior to the at sea testing.

3.27.5.3 Commission and training:

3.27.5.3.1 The Furuno Engineer shall initially energize, configure and commission both S and X Band Radars.

3.27.5.3.2 The Furuno Engineer shall verify all software and firmware is up to date with the current regulations and FURUNO current operational guidance.

3.27.5.3.3 The Furuno Engineer shall verify all ancillary signals are received and processed correctly by the new radars.

3.27.5.3.4 The Furuno Engineer shall record all of the menu field and DIP switch settings. Provide the COR with one hard copy and a .pdf file.

3.27.5.3.5 The Furuno Engineer shall provide dockside and at sea training. The training shall include but not be limited to;

- Proper operation at dock and at sea including tuning, alignment, and night operation.
- Demonstrate and verify the proper operation of the interswitch.
- Demonstrate ancillary signal error messages are received when turned off and recover when turned on.
- Review Error messages, message logs, meaning, severity and appropriate reaction.
- Demonstrate Power up/down sequencing.
- Demonstrate X and S Band turning unit cutoff switch operation.
- Magnetron replacement procedure.
- Performance monitor operation and interpretation.
- Review menu configuration and DIP switch settings.
- Provide the COR with all system passwords.
- Provide instruction on procedure to update software and firmware.
- Set up Furuno automatic Email receipt for bulletins and available software upgrades.
- Warranty process execution, date of expiration, and limitations.

3.27.5.3.6 Provide the COR with all delivered hard and soft manuals as well as all unused/spare components as listed on the packing list with the delivered X and S Band radars.

3.27.5.4 Quality Assurance

3.27.5.4.1 The Furuno engineers must provide a certificate of qualification from the manufacturer for installation and as a certified trainer on the exact models of radars installed.

3.27.5.4.2 Verify exterior disturbed cable penetrations are properly sealed by performing a hose test witnessed by the COR.

3.27.5.4.3 The Furuno engineer shall verify that the installation is in accordance with the manufacturer's recommended installation guidelines, and shall validate the manufacturer's warranty from the date of system acceptance.

3.27.5.4.4 Successful commissioning and crew training.

3.27.5.4.5 Demonstrate proper RADAR data overlay on ECDIS stations.

3.27.5.4.6 Provide a certificate of electronic disposal to the COR.

3.27.6 Notes

3.27.6.1 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.27.6.2 Suggested source for FURUNO parts:

Furuno U.S.A., Inc
4400 NW Pacific Rim Blvd
Camas, WA 98607
Tel: 360-833-5090

3.27.6.3 Suggested source for TRANSAS parts;

Paul Welling
paul.welling@wartsila.com

751 North Drive Suite 9-12, Melbourne, FL 32934
Phone: + 1 321 426 9715

3.27.6.4 Suggested sources for Furuno Engineer:

Radio Holland – Main Office
9191 Gulf Freeway Building 'D' - Suite 100
Houston TX 77017
713 378 2100
service.houston@radioholland.com

Bart Disher
Gulf and West Coast Commercial Manager
Furuno USA, Inc.
Direct (360) 833-5005
Cell (503) 490-8232

3.27.6.5 Suggested sources for Furuno Instructor;

Bart Disher
Gulf and West Coast Commercial Manager
Furuno USA, Inc.
Direct (360) 833-5005
Cell (503) 490-8232

Drew Linzey; East Coast Regional Manager
Furuno USA, Inc.
dlinzey@furuno.com
(410) 479-4420 Office
443) 366-7547 Cell

3.27.6.6 All equipment listed under 3.27.4.1.1, 3.27.4.1.2 and 3.27.4.1.3 shall be ordered by the contractor within 7 days following contract award. A copy of the invoice shall be provided to the COR.

END OF ITEM

3.28 DP Above Deck Upgrade

3.28.1 Intent

3.28.1.1 Upgrade the shipboard dynamic positioning hardware, software and components.

3.28.2 References

3.28.2.1 56598-2 Okeanos Explorer WIN 10 Upgrade (PP1-18)Monitor MD 384633A

3.28.2.2 OE-426-101 - Rev D - Ship DP System BWD

3.28.2.3 EX DP Operation Procedures 20090917

3.28.2.4 EX DP Position Reference System Offsets 20090521

3.28.2.5 EX DP Trackline SOP

3.28.2.6 ROV Recovery and Reverting to Manual Control Checklist V3.4

3.28.3 Government Furnished Material

3.28.3.1 Spare Operator Station (MP5810) for upgrade as spare.

3.28.4 Requirements

3.28.4.1 Provide all hardware, software and components as well as qualified, certified Kongsberg and Thrustmaster engineers to perform Installation, Dockside Commissioning and Sea Trials for a Windows 10 upgrade to an installed Kongsberg K-POS system as outlined in Reference 3.28.2.1:

3.28.4.1.1 Provide all parts and software as listed in section 2.

3.28.4.1.2 Provide all parts software and service as listed in section 3.

3.28.4.1.3 Provide all parts, services, sub-contractors, and documentation as listed in section 4 through 5.2

3.28.4.2 Kongsberg shall supply all cable terminations and perform cable re-termination.

3.28.4.3 Shipyard shall provide installation support to Kongsberg as

outlined in section 5.3 of Reference 3.28.2.1 with the following exceptions;

3.28.4.3.1 NOAA will provide a person well familiar with the existing system.

3.28.4.3.2 Installed cables will be reused. Issue a condition report if additional cables are necessary.

3.28.4.3.3 NOAA will support function testing.

3.28.4.4 Dispose of all items as directed by Kongsberg. Kongsberg will retain items returnable for credit.

3.28.4.5 Shipyard shall remove existing conning station DP System monitor and install new 24” monitor, reference 3.28.2.2 , as directed by Kongsberg. Shipyard shall modify console, supply parts and labor to install new monitor.

3.28.4.6 Dockside, Konsgberg shall configure all delivered spare components for “plug and play” as ready spare that will require no additional configuration upon installation.

3.28.4.7 Dockside, Kongsberg shall temporarily install all delivered spare parts and demonstrate proper operation to the COR.

3.28.4.8 Dockside, Review GPS interface 1, 2 and 3 to the DP system. Determine, connect and configure the best interfaces and sequence from the existing GPS Trimble SPS855. Note in the field report any conditions that will warrant any underway changes to the configuration. Set primary to provide the best DP performance.

3.28.4.9 Provide a red line mark up of Reference 3.28.2.3 to reflect all parts, hardware and wiring changes. Review with ship’s Chief Engineer and Chief ET. Include the marked up drawing in the field report.

3.28.4.10 Dockside, review all system menu settings. Verify or program/adjust the entries for the proper settings. Review all adjustments made with the ship’s Chief Engineer, ET, MSE and command. Record the entries by capturing screen shot files or provide .jpg files of entries and include in the field report.

3.28.4.11 Dockside, perform factory recommended dockside testing of the DP system with emphasis on a complete certification of the upgraded hardware. Include a list of items tested and the procedures used in the

field report.

3.28.4.12 Dockside, temporarily remove the newly installed Operator station and install the modified, spare GFM Operator station per Reference 3.28.2.1, Section 3.1 Pos #4. Verify proper operation and configuration matches newly installed work station.

3.28.4.13 Dockside, review for accuracy, References 3.28.2.4, 3.28.2.5, 3.28.2.6, and 3.28.2.7. The References are SOPs (Standard Operating Procedure(s)). Provide a red line mark up for suggested updates for WIN 10 upgrade. Review all suggested updates with the ship's command. Provide a copy in the field report.

3.28.4.14 At sea, in addition to certifying the system performance, Kongsberg shall perform the following;

3.28.4.14.1 Make additional adjustments to hardware, software, and parameters to remedy any underway faults found.

3.28.4.14.2 Simulate the loss of primary navigation. Verify DP system reaction is seamless and secondary navigation engages as expected. Review warning/error/status messages for loss and return of primary navigation.

3.28.4.14.3 Training; Work with the command to schedule and provide informal hands on, under way training to each of the ship's officers/expected users of the DP system. Training shall include but not be limited to;

3.28.4.14.3.1 Initial DP settings and configuration
3.28.4.14.3.2 Rotation center
3.28.4.14.3.3 Sensor overview
3.28.4.14.3.4 GPS overview
3.28.4.14.3.5 Evaluation of weather for best setup
3.28.4.14.3.6 Alarms and actions
3.28.4.14.3.7 Gain settings
3.28.4.14.3.8 Blackout prevention
3.28.4.14.3.9 Setup for ROV ops
3.28.4.14.3.10 Control transfer
3.28.4.14.3.11 Overview of reference documents that are available on the hard drive.
3.28.4.14.3.12 aft station settings, configuration, use and loss of connection alarms/actions
3.28.4.14.3.13 Overview of environmental model
3.28.4.14.3.14 Emergency procedures for;
3.28.4.14.3.14.1 Loss of position reference

3.28.4.14.3.14.2 Drive off
3.28.4.14.3.14.3 Run away thruster
3.28.4.14.3.14.4 Loss of operator position computer.

3.28.4.15 Provide recommendations for additional modifications to increase reliability, specific operator training courses that are available or could be structured for the DP system installed, as well as a recommended upgrade path to replace the currently installed system. Include in the field report.

3.28.5 Quality Assurance

3.28.5.1 Written (digital) field report of dockside testing results and sea trials.

3.28.5.2 Satisfactory dockside and at sea certification.

3.28.6 Notes

3.28.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

3.29 FOOD GRINDER RENEWAL

3.29.1 Intent

3.29.1.1 This work item is intended to accomplish the installation of a 2-HP under-sink food disposal unit, a 23-inch disposal sink, and a new overboard discharge. This installation will take place in the Compactor Room (1-37-0-Q) located forward of the Galley on the Main Deck, starboard side, at Frame 37

3.29.2 References

3.29.2.1 ABS Steel Vessel Rules Under 90m

3.29.2.2 Drawing OE-656-001 – Compactor Room Modification Sink and Food Grinder Installation

3.29.2.3 General Requirements

3.29.2.4 Drawing OE-601-101 – General Arrangement

3.29.2.5 Disposal Sink (PDF)

3.29.2.6 Disposal Mounting (PDF)

3.29.2.7 Grinder (PDF)

3.29.3 Government Furnished Equipment

3.29.3.1 None

3.29.4 Requirements

3.29.4.1 Arrangement & Equipment

3.29.4.1.1 Removal requirements per Reference 3.29.2.2

3.29.4.1.1.1 Remove 4 levels of aluminum shelves located in the forward end of the Compactor Room. Final disposition of shelves to be at the determination of the COR.

3.29.4.4.1.2 Remove the overhead stainless panels in the Compactor Room and the Galley to facilitate the installation of the new potable water piping.

3.29.4.4.1.3 Remove the outboard false bulkhead/joiner bulkhead in the Compactor Room to facilitate the installation of the new grey water overboard.

3.29.4.4.1.4 Remove the foundation for the unused transformer in the Compactor Room.

3.29.4.1.2 Installation requirements per Reference 3.29.2.2

3.29.4.1.2.1 Install one (1) 23-inch, stainless steel, single bay, commercial sink in the forward end of the Compactor Room. The sink shall be installed centered transversely in the space. The existing strainer in the bottom of the sink will need to be removed to facilitate the connection to the new food disposal unit.

3.29.4.1.2.2 Install one (1) 2-HP Emerson SS-200 commercial food disposal unit under the sink and connect to the sink drain with an Emerson #5 mounting flange. Modify and/or adjust to length grinder support legs such that no strain is induced at the connection to the sink.

3.29.4.1.2.2.1 Prove to COR there is no strain on the connection to the sink

3.29.4.1.2.3 Reinstall the false overheads in the Galley and Compactor Room after the new potable water piping has been installed and satisfactorily tested.

3.29.4.1.2.4 Reinstall the outboard false bulkhead/joiner bulkhead in the Compactor Room after the installation and satisfactory testing of the new grey water overboard.

3.29.4.1.2.5 Provide one (1) complete spare 2-HP Emerson SS-200 grinder for ships stores. Deliver to the COR aboard the vessel.

3.29.4.2 Gray Water

3.29.4.2.1 Removal requirements per Reference 3.29.2.2

3.29.4.2.1.1 None.

3.29.4.2.2 Installation requirements per Reference 3.29.2.2

3.29.4.2.2.1 Install approximately 6 feet of new 2” gray water piping from the new food disposal unit to the shell. This piping run shall contain a swing check valve and lockable gate valve. The gate valve shall be positioned closest to the shell. Piping from the Gate valve to the shell shall be schedule 80. Provide a ½” thick, 4” diameter, doubler plate at the shell penetration.

3.29.4.3 Potable Water

3.29.4.3.1 Removal requirements per Reference 3.29.2.2

3.29.4.3.1.1 None.

3.29.4.3.2 Installation requirements per Reference 3.29.2.2

3.29.4.3.2.1 Install a new ½” cold potable water from the existing cold potable water piping in the overhead of the Galley to the new sink and food disposal unit in the compactor room. This piping shall be in the overhead of the Galley and the Compactor Room as much as practical. Provide one (1) shutoff valve at the sink and one (1) shutoff valve at the food disposal unit. Install one (1) solenoid valve, included with grinder controls, between the food disposal unit and the shut off valve. All potable water piping and valves shall be insulated to prevent condensation. Fiberglass insulation is not permitted.

3.29.4.4 Electrical

3.29.4.4.1 Removal requirements per Reference 3.29.2.2

3.29.4.4.1.1 Remove existing cable from P418-6 from the breaker to the terminus.

3.29.4.4.1.2 Remove the unused transformer in the Compactor Room. Remove cables to source panel and unused equipment.

3.29.4.4.2 Installation requirements per Reference 3.29.2.2

3.29.4.4.2.1 Provide and install one (1) new 15 amp trip breaker in P418-6. This installation will require moving breakers P418-2 and P418-4 upward in the panel to allow sufficient room for the new breaker.

3.29.4.4.2.2 Provide and install one (1) new LSTSGU-4 cable from the new P418-6 breaker to the new Emerson grinder control box.

3.29.4.4.2.3 Install manufacturer-provided controller for the Emerson grinder and all associated cabling to water flow control valve and grinder motor.

3.29.4.5 Using AUTO CAD or equivalent, updated Okeanos Drawings of Overboard Piping with new penetration and piping and submit to COR in CAD and PDF format.

3.29.5 Quality Assurance

3.29.5.1 All welders and silver brazer's shall be certified in the weld process and filler material for the process used.

3.29.5.2 The contractor shall prove successful operation of the newly installed Food Grinder to the COR and Chief Steward. The contractor shall provide all test data for all installed systems to prove functionality.

3.29.5.3 All piping, machinery, equipment and penetrations affected by the installation shall be tested to the satisfaction of the attending ABS surveyor. New piping shall be hydrostatically tested by filling the piping with water to the point of overflowing and holding for a minimum of 30 minutes prior to the inspection of joints. There shall be no sign of leakage at any joint

3.29.5.4 All deliverables shall be provided in number and formatting as follows:

3.29.5.4.1 Drawings:

- One (1) electronic PDF copy,
- One (1) electronic CAD copy in AutoCAD 2015 or later
- Two (2) paper copies

3.29.5.4.2 Test Data and All other deliverables:

- One (1) electronic copy in PDF, MS Word and/or MS EXCEL, as applicable
- Two (2) hard copies

3.29.5.5 All new and affected material shall be painted to match the surrounding area. Repair any cut or damaged flooring to match surrounding.

3.29.6 Notes

3.29.6.1 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

3.29.6.2 All equipment shall be ordered by the contractor within 7 days following contract award. A copy of the invoice shall be provided to the COR.

END OF ITEM

4.0 ADDITIONAL WORK

4.1 Intent

4.1.1 Accomplish additional work items identified after start of repair period necessary to complete other repair work or repair mission-essential equipment. Hours of skilled production labor required will be determined at time work is identified.

4.2 References

4.2.1 None.

4.3 Government Furnished Material

4.3.1 None.

4.4 Requirements

4.4.1 Provide up to 12,000 man-hours of labor to be used for additional work if ordered by the Contracting Officer pursuant to the Additional Item Requirements Clause (Section H) or mutually agreed upon by the parties by supplemental agreement to accomplish additional work not required elsewhere in the work items. **Such work shall be provided without change in the delivery date for the ship. (Note: Bidders should prepare their bids with this schedule in mind).** Pursuant to the Additional Item Requirements Clause, the above specified man-hours are estimates and the Government reserves the right to order up to the otal number of aggregate production man-hours set forth above.

4.4.2 The Contractor shall indicate in Section B (Bid Schedule) the man-hour reservation rate to be used in evaluation of the proposal and also to be used for negotiating changes as required by the Additional Item Requirements Clause. This rate shall be the rate for pricing changes negotiated under the Additional Item Requirements Clause up to the maximum man-hours specified therein.

4.4.3 Provide up to $230,000 for additional material/subcontractor plus markup.

4.1.4 Quality Assurance

4.1.4.1 As required by the activating item.

END OF ADDITION ITEMS SPECIFICATION

5.0 OPTION ITEMS

5.1 EM 304 ARRAY UPGRADE

5.1.1 Intent:

5.1.1.1 Replace existing Kongsberg EM302 TX Array with Kongsberg EM304 MkII 0.5-degree TX Array.

5.1.2 References

5.1.2.1 Drawing OE-165-101 Rev. B Transducer Fairing Structural Modifications

5.1.2.2 Drawing OE-461-102 EM304 Transducer Installation

5.1.2.3 Drawing 461647 Mounting Frame Assembly

5.1.2.4 Drawing 462326 Arrangement Drawing, Casing 0.5 Degree TX Mounting Frame EM304MkII

5.1.2.5 Drawing 631062303576 Paint Schedule

5.1.2.6 184 NAVIGATION SYSTEM ALIGNMENT

5.1.2.7 MAC_Survey_Report_Requirements_v0

5.1.2.8 Manual OE-424-02 Kongsberg EM302 Multibeam Echo Sounder Installation Manual

5.1.2.9 Removed

5.1.2.10 Manual 420527 Painting Instructions: Kongsberg Echo Sounder Transducers

5.1.2.11 EM 304 - HAT procedure

5.1.2.12 EM304 SAT-3 (EX SAT results 2019)

5.1.3 Government Furnished Equipment

5.1.3.1 None

5.1.4 Requirements

5.1.4.1 The contractor shall supply and install the following

KONGSBERG UNDERWATER TECHNOLOGY EM304 components;

5.1.4.1.1 (Qty = 1) p/n 424605 Kongsberg EM304 0.5deg TX- Frame

5.1.4.1.2 (Qty = 8) p/n 316228 EM304 MkII TX1 Modules

5.1.4.1.3 (Qty = 8) p/n 316234 EM304 MkII TX2 Modules

5.1.4.1.4 (set of 3 cables pr TD) p/n 316228 5m Extension cables, TX1

5.1.4.1.5 (set of 3 cables pr TD) p/n 316234 5m Extension cables, TX2

5.1.4.2 **This item must be completed prior to execution of work item 5.5 Transducer and Benchmark Survey, if executed.**

5.1.4.3 Remove the port and starboard fairing access covers to gain entry inside the fairing. Ensure the ship's ET has removed the Sound Velocity Probe (SVP) from the starboard cover prior to removal. Clean all residual water and debris from areas to be worked on inside the fairing, References 5.1.2.1.

5.1.4.4 Provide the services of qualified, certified Kongsberg Underwater Technology engineer and Kongsberg Underwater Technology Marine surveyor to oversee all removals, installation, alignment and testing.

5.1.4.5 In conjunction with the ship's ET, follow log and tag out procedures for the EM304 power circuits.

5.1.4.6 The Kongsberg Engineer shall disconnect EM302 transducer cabling from transceiver cabinet, located in the Sonar Closet adjacent to the ship's library.

5.1.4.7 Remove cover plates around the edges of the existing EM302 casing, Reference 5.1.2.2.



Figure 1 Installed EM302 TX array with side plates

5.1.4.8 Remove existing EM302 TX Modules and cabling. Do not cut the cable unless directed by the COR. Do not discard until authorized by COR, Reference 5.1.2.2.



Figure 1 Partial EM302 TX Modules and Frame

5.1.4.9 Remove existing EM302 TX Array Mounting Frame from casing and discard.

5.1.4.10 Remove all zinc anodes from interior of casing and discard.

5.1.4.11 Clean and prepare interior of EM302 casing to SSPC-SP10 Near-White standard. Ensure surrounding areas are masked or otherwise protected from damage by blast media, paying special attention to nearby sensors, cabling, local benchmarks, and moon pipes.

5.1.4.12 CHECKPOINT: Present surface profile measurements to COR and allow for visual inspection before applying coatings.

5.1.4.13 Coat interior of casing to match surrounding transducer fairing exterior in accordance with Reference 5.1.2.5 and Work Item 3.11.

5.1.4.13.1CHECKPOINT: Provide DFT readings for all coats to COR before application of subsequent coats.

5.1.4.14 Align and install EM304 0.5-degree TX Transducer Mounting Frame, ensuring adherence to all procedures outlined in References 5.1.2.6, 5.1.2.7 and 5.1.2.8 and as directed by the Kongsberg engineer and Marine Surveyor.

5.1.4.15 Install (11) zinc anodes to transducer casing to match existing using existing mounts. Ensure anodes are appropriately bonded to casing.

5.1.4.16 Install EM304 TX1 and TX2 modules to Mounting Frame, ensuring adherence to all procedures outlined and formats in References 5.1.2.6, 5.1.2.7 and 5.1.2.8 and as directed by the Kongsberg engineer and Marine Surveyor.

5.1.4.17 Pass TX module cabling through existing fairing cabling path and into the existing moon pipe of the removed cables, taking precautions to not damage or bend cabling beyond the minimum bending radius of 105mm. The Kongsberg engineer shall pre-approve the cable path and moon pipe distribution to ensure proper distancing is achieved away from other sonar cables, Reference 5.1.2.8.

5.1.4.17.1 Note transducer serial numbers and fill out Reference 5.1.2.8 Table 1 accordingly

5.1.4.17.2 Provide additional slack for the EM304 Receiver module cables through the moon pipes and into the sonar closet adjacent to the EM304 Electronic cabinets as directed by the Kongsberg Engineer.

5.1.4.18 The Kongsberg Engineer shall connect the EM304 Modules

cabling to transceiver cabinet.

5.1.4.19 Supply and apply only Kongsberg approved primer and anti-fouling paint. Do not substitute without prior approval from Kongsberg engineer. Paint TX module faces in accordance with References (h) and (k) and as directed by the Kongsberg engineer.

5.1.4.19.1 Vessel uses coatings from International Marine Coatings

5.1.4.20 Fabricate and install cover plates in accordance with Reference 5.1.2.2 using 15mm Delrin sheeting.

5.1.4.20.1 Install sealing compound between cover plates and transducer modules. Sealing compound shall be approved by authorized Kongsberg Maritime representative.

5.1.4.20.2 Ensure cover plate mounting bolts are installed flush with cover plate surface.

5.1.4.21 Sand and smooth cover plates and sealing compound flush to contours of surrounding transducer fairing to prevent the development unnecessary flow noise as directed by the Kongsberg engineer, and Reference 5.1.2.8.

5.1.4.22 Kongsberg engineer shall provide and install new Seafloor Information System (SIS) operating software on the controlling workstation.

5.1.4.23 Provide the dockside services of a certified Kongsberg engineer to perform a factory Harbor Acceptance Test (HAT) in accordance with Kongsberg Maritime recommended procedures Reference 5.1.2.11.

5.1.4.24 Provide the at sea services of qualified Kongsberg engineers to certify the operational performance of the system and make any software modifications to achieve factory performance requirements. In conjunction with the ship’s Operations Officer, prepare the Sea Acceptance Test (SAT) plan suited to the operational region for the ship’s review and planning at least 14 days prior to the scheduled underway date. Provide an updated SAT procedure reflecting the new transmit array installation testing requirements Reference 5.1.2.12.

5.1.5 Quality Assurance

5.1.5.1 Provide to COR a Condition Found Report detailing the following:

5.1.5.1.1 Details of any shims installed.

5.1.5.1.2 Details of any modifications made to frame or casing.

5.1.5.2 Alignment survey completed within tolerance and report delivered to the COR with specified details, format and conventions.

5.1.5. 3 Successful HAT and complete report.

5.1.5.4 Successful SAT and complete report.

5.1.6 Notes

5.1.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.1.6.2 Kongsberg EM304 0.5-degree TX Transducer Frame weighs approximately 528kg.

5.1.6.3 Kongsberg EM304 MkII TX1 and TX2 modules weigh approximately 37kg each.

5.1.6.4 Exact measurements for fabrication of cover plates shall be determined from configuration of transducer casing.

5.1.6.5 Source of KONGSBERG EM304 components, engineers and surveyor;

Jeff Condiotty
Kongsberg Underwater Technology Inc.
19210 33rd Ave West, Suite A
Lynnwood, WA 98036
TEL: 425 712 1107
CELL: 206 390 0138
Jeff.Condiotty@km.kongsberg.com

5.1.6.6 As sea testing will be scheduled at the convenience of the government and will likely extend beyond the end of period of performance.

5.1.6.7 The contractor shall order all contractor furnished equipment for this item (5.1.4.1.1 through 5.1.4.1.5) within 7 days after this item is being awarded. A copy of the invoice shall be provided to the COR.

END OF ITEM

5.2 FUELING LOCKER REPLACEMENT

5.2.1 Intent

5.2.1.1 Remove and replace Fuel Locker

5.2.2 References

5.2.2.1 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

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

5.2.2.3 Drawing No. OE-601-101, "NOAA Ship Okeanos Explorer General Arrangement."

5.2.2.4 Supplemental Pictures of Fuel Locker (PDF)

5.2.3 Government Furnished Equipment

5.2.3.1 None

5.2.4 Requirements

5.2.4.1 Perform all work in accordance with the requirements of the documents per Reference 5.2.2.1 and 5.2.2.2

5.2.4.2 In conjunction with ship's force, follow log out/tag out procedures to secure power to the Fuel Locker and fuel pump.

5.2.4.3 Remove and cap off fuel piping going into forward end of fuel locker. Remove Internal fuel pipe, valve and meter and retain.

5.2.4.4 Remove and retain emergency stop switch, internal cabling and junction boxes inside Fuel Locker

5.2.4.5 Crop off and remove current Fuel locker shown in 5.2.2.4. Grind legs smooth to deck.

5.2.4.6 Manufacture a new fuel locker, same dimension, shape and size as existing. New Fuel Locker shall be made of 4 gauge (15/64 inch) stainless steel (316L).

5.2.4.6.1 The new fuel locker shall have the following:

5.2.4.6.1.1 10-inch high coaming across the front – approximately 4 inches in from doors

5.2.4.6.1.2 Two lockable and latchable doors similar to existing – see pictures 5.2.2.4. Latches shall be installed inside of left door similar to who shown in picture of 5.2.2.4.

5.2.4.6.1.3 A sloped top similar to existing

5.2.4.6.1.4 Labeled "Fuel Locker" with 4-inch lettering on all 4 sides – color: Black

5.2.4.7 Remove all cabling, junction boxes and the emergency shut off switch and install in old fuel locker and install new fuel locker

5.2.4.8 Remove all fuel piping, hoses, valves, filter and meter in old fuel locker and install in new fuel locker

5.2.4.9 Procure and install new orange light on top of unit and connect all wiring. Light should be similar to existing.

5.2.4.10 Install new fuel locker in same location as old on 4 stainless steel (316L) legs. Touch up all disturbed paint and non-skid deck coating

5.2.4.10.1 Non-skid shall be repaired with American Safety Technologies MS-7CZ Anti-Corrosive Low VOC Metal Primer (MIL-PRF-24667B) (5 mils DFT), and a full coat of American Safety Technologies AS-2500 epoxy anti-slip deck coating, 8 mils DFT, color: gray.

5.2.4.11 Reconnect all fuel piping and electrical cabling.

5.2.4.12 Paint the interior and exterior of the fuel locker with the following Sherwin Williams painting system.

5.2.4.12.1 1 coat of Macropoxy 646 – Haze Gray (3-5 mils)

5.12.4.12.2 1 coat of seaguard 5000 HS – Buff (4-5 mils)

5.12.4.12.3 1 top coat of high solids poly – extra white (3-5 mils)

5.2.5 Quality Assurance

5.2.5.1 All fasteners used shall be stainless.

5.2.5.2 Pressure test all affected piping at 1.5 times operational pressure and check for leaks

5.2.5.3 Test operation of the unit including emergency shut off and operation of the light on top in the presence of the COR.

5.2.6 Notes

5.2.6.1 Reference 5.2.2.4 shows additional pictures of the locker that is to be replaced and should be consulted.

5.2.6.2 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.2.6.3 Picture of Fuel locker to be replaced:



END OF ITEM

5.3 BALLAST TANKS 4-86-1 & 4-86-2 REPAIRS & PRESERVATION

5.3.1 References

5.3.1.1 Drawing OE-601-101, Rev. C, General Arrangement

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

5.3.1.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

5.3.1.4 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

5.3.1.5 Drawing 631-623-3576 – Paint Schedule

5.3.2 Government Furnished Equipment

5.3.2.1 None.

5.3.3 Requirements

5.3.3.1 All surface preparation and painting work required by this specification shall be done in accordance with Reference 5.3.1.2.

5.3.3.2 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.

5.3.3.3 Remove existing residual water from ballast tanks and obtain a “Safe for Hotwork” certification from a Marine Chemist for BWT 4-86-1. Crop out, remove and replace 2 steel inserts in each tank (4 total). For estimation purposes, assume each insert is 4 feet x 5 feet and 3/8 inch think.

5.3.3.4 Test inserts in the presence of ABS

5.3.3.5 Powerwash tanks 4-86-1 and 4-86-2 with COR inspecting following washing. Blast entire tank to an SSPC-10 profile. COR to inspect areas following solvent cleaning. Take and record profiles and perform surface chloride checks (in at least 10 locations in each, actual locations to be selected by COR). Maximum chloride measurements shall not exceed 5 ug/cm2 or 50 mg/m2. If chloride measurements exceed this level, fresh water wash the deck at 3000 psi and repeat surface cleaning, if necessary, and testing until satisfactory measurements are

achieved.

5.3.3.4 Clean the tanks of all traces of blast products and dust, then coat the tanks with the following system in accordance with Reference 5.3.1.2.

(a) 1st coat: Formula 150 epoxy applied at 3-5 mils DFT (color: green).

(b) Stripe coat: Formula 156 applied at 3-5 mils DFT (color: red).

(c) 2nd coat: Formula 156 applied at 3-5 mils DFT (color: red).

(d) Stripe coat: Formula 152 applied at 3-5 mils DFT (color: white).

(e) Final coat: Formula 152 applied at 3-5 mils DFT (color: white).

5.3.3.5 Provide and install 2 new type ZHC-23 zinc anodes conforming to MIL-A-18001K in each ballast tank (4 total)

5.3.3.6 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 to frames in the ballast tanks. COR will designate exact locations.

5.3.3.6.1 Painters shall remove all currently installed zincs and blast and paint behind them. Zincs to be reinstalled once painting is complete

5.3.3.7 Following the cure time per Reference 5.3.1.2, close up the tanks using new rubber gaskets and hardware for manholes, same thickness and material as existing. Conduct a 2-psi air pressure test of each tank to ensure air tight seal of manhole covers.

5.3.4 Quality Assurance

5.3.4.1 As required by References 5.3.1.2 through 5.3.1.5

5.3.4.2 COR shall inspect after tanking washing, blasting and between each coat of paint. COR shall inspect tank prior to final closure

5.3.5 Notes

5.3.5.1 Ballast Tank 4-86-1 Capacity is 15,371 gallons

5.3.5.2 Ballast Tank 4-86-2 capacity is 15,543 gallons

5.3.5.3 Stripe Coats shall be painted on all tank weld seams, pipes, corners, penetrations, frame structure edges, longitudinal structure edges, girder edges, lighting hole edges and drain hole edges.

5.3.5.4 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.3.5.5 After power tooling and prior to painting, the contractor shall give the COR 24 hours to conduct a material assessment inspection of the ballast tank steel

END OF ITEM

5.4 MAIN GENERATOR ROOM BILDGE PRESERVATION RENEWAL

5.4.1 Intent:

5.4.1.1 To paint and preserve the bilges, walkways and equipment foundations in the Main Generator Room.

5.4.2 References

5.4.2.1 Drawing OE-601-101 – General Arrangement

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

5.4.2.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP1), Solvent Cleaning

5.4.2.4 Steel Structures Painting Council Surface Preparation Specification No. 10 (SSPC-SP10/NACE No.2), Near White Blast Cleaning

5.4.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

5.4.2.6 Drawing 631-623-3576 – Paint Schedule

5.4.3 Government Furnished Material

5.4.3.1 None

5.4.4 Requirements

5.4.4.1 Clean the Main Generator Room bilges of dirt, grime, oil, grease and debris. (completed under Item 3.3.4.2.12) Pump out and remove all accumulated content.

5.4.4.2 All bildge deck and tank top, drip pans, equipment supports, structural members, pipes, sidewalls and lower 72 inches of bulkheads shall be included in the preservation including:

5.4.4.2.1 All grating shall be removed, blasted and repainted

5.4.4.2.2 Ladders to Fidley and AC room

5.4.4.2.3 All walkway/grating structures

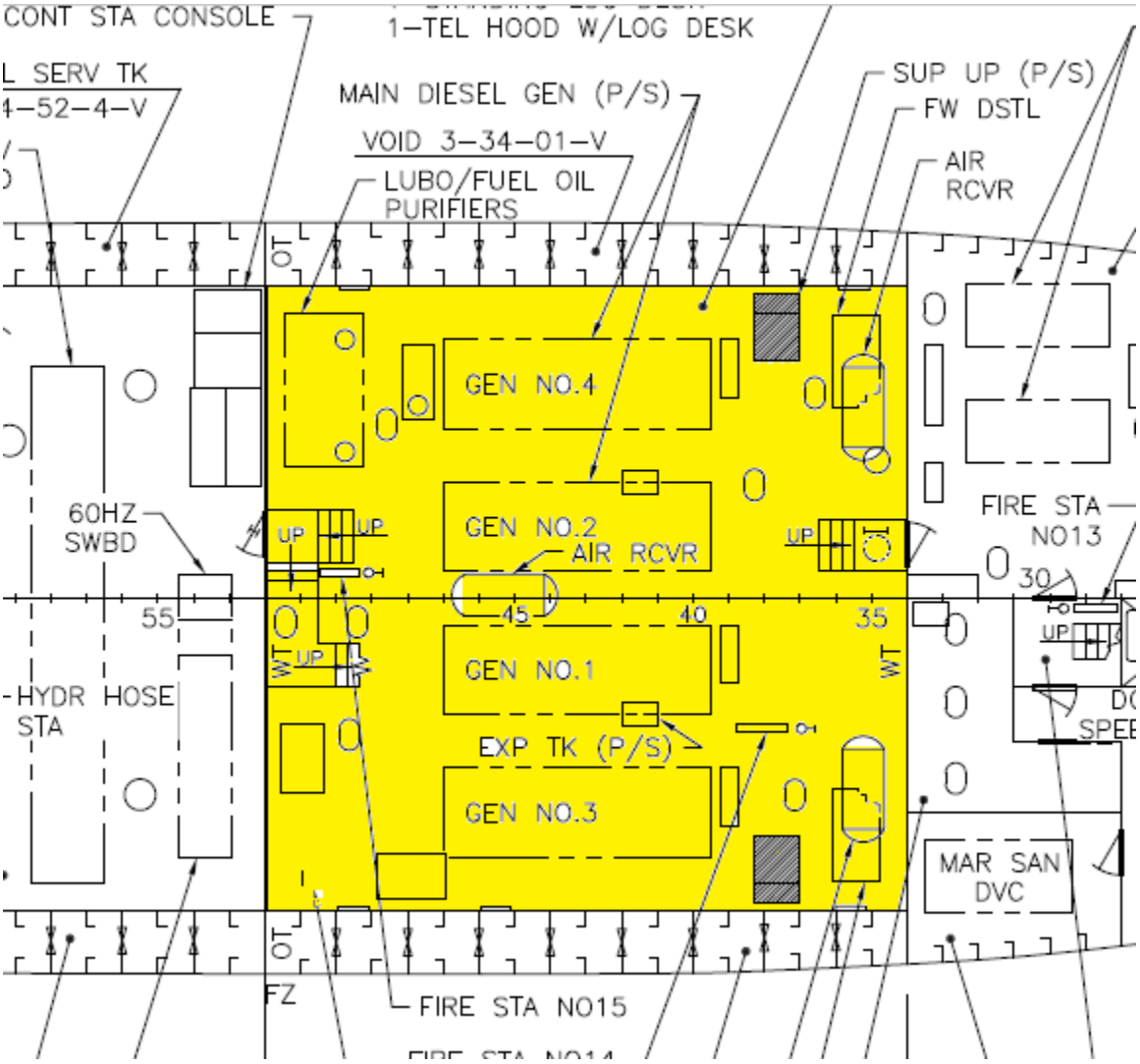
5.4.4.2.4 The foundations and drip containmaint for the following equipment: auxiliary salt water pumps, oily water separator, purifiers, air compressor, evaporator, SSDG's, bilge and ballast pumps, jacket water pumps, ballast water treatment system, manholes and lube oil pump foundation.

5.4.4.2.5 All pipes under the grating level and walkways

5.4.4.2.6 All ballast water piping in space

5.4.4.2.7 The lower 72 inches of the forward, aft, port and STBD bulkheads.

5.4.4.3 Cover and protect all machinery room equipment including (but not limited to) switchboards, transformers, evaporators, SSDGs, air compressors, pumps, motors, fuel purifiers, Ballast Water Treatment Systems, Control Valves, and control panels. Protection should keep dust, water and debris from entering the equipment during paint preparation. Remove all deck grating.



Rough Area of Main Machinery Room Bilges

5.4.4.3 Powerwash entire bilge and area below grating walkway grating three times with a soap/degreasing compound similar to simple green or ZEP Industrial Purple Cleaner and Degreaser. The COR will approve the soap/degreasing compound prior to use and shall inspect between cleanings. All surfaces shall be wiped with soapy sponges/rags as part of the cleaning process The COR will inspect between washings. Following the 3rd wash, fresh water rinse the entire area cleaned and allow to dry. Solvent clean all areas and surfaces to SSPC-SP1 Standard. COR to inspect tank following solvent cleaning. Take and record profiles and perform surface chloride checks (in at least 40 locations, actual locations to be selected by COR). Maximum chloride measurements shall not exceed 5 ug/cm2 or 50 mg/m2. If chloride measurements exceed this level, fresh water wash again at 3000 psi and repeat surface cleaning, if necessary, and testing until satisfactory

measurements are achieved. Powertool the deck of the bilge to near-white metal in accordance with NACE 2/SSPC-SP11. Use caution to prevent material from entering equipment and other parts of the ship.

5.4.4.3.1 Power Tool Surface Prep all tanktop surfaces, drip pans, equipment supports, structural members, pipes, sidewalls, bilge pockets and bulkheads below the deck grating to an SSPC-SP11 Standard. Take profile readings with COR.

5.4.4.3.2 UT gauge the thickness of the deck in up to 60 locations per Item 3.13. Provide a CFR with findings. Crop out and replace three (3) 4 foot by 5 foot sections of steel decking in front of the SSDG's. For bidding purposes, assume steel thickness is ½ inch.

5.4.4.3.2.1 These inserts shall be completed prior to the painting of the engine room void

5.4.4.4 Apply the following (or equivalent) paint system to the entire bilge area including walkway and equipment foundation structures, pipes, drip pans, bulkheads, and shipboard frames.

(a) One full coat of International Intershield 300V, 6 mils DFT (Color – bronze)
(b) One full coat of International Intertuf 262, 6 mills DFT (color - red)
(c) (one full coat of International Intergard 263, 5 mills DFT (color – red)

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

5.4.4.6 Reinstall all grating and remove all masking and protective coverings

5.4.4.7 Color code paint all pipes (in their entirety) below the deck to match and correspond with the system they represent. Stencil all piping with 1.5 inch lettering. Stenciling shall be at least every 6 feet. Color coding shall match existing. If none exists, contractor shall use the following:

5.4.4.7.1 Fuel Oil - Brown
5.4.4.7.2 Lube Oil – Yellow
5.4.4.7.3 Ballast - Green
5.4.4.7.4 Bilge - Black

5.4.4.7.5 Potable Water – Light Blue
5.4.4.7.6 Seawater - Green
5.4.4.7.7 Jacket Water - Blue
5.4.4.7.8 Compressed Air - White
5.4.4.7.9 Waste Oil – Black
5.4.4.7.10 Chill Water – Dark Blue

5.4.4.8 Provide 50 additional grating security clips and install to secure grating. Clips shall be made of 304 stainless steel.

5.4.4.9 replace 3 sections of grating – up to 20 square feet to match existing.

5.4.5 Quality Assurance

5.4.5.1 In accordance with references 5.4.2.2 through 5.4.2.5.

5.4.5.2 COR to be formally notified of inspection of cleaned areas after each step of the cleaning process (bilges pumped, each power wash/cleaning, degreasing, solvent wiping, and paint coat application).

5.4.6 Notes

5.4.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.4.6.2 Contract shall ensure that absolutely no oil is on the deck or drips into the bilge during the preparation or preservation process.

END OF ITEM

5.5. TRANSDUCER AND BENCHMARK SURVEY AND REPLACEMENT

5.5.1 Intent

5.5.1.1 Conduct a new high quality survey of install mission transducers, antennas and benchmarks

5.5.2 References

5.5.2.1 Drawing OE-601-101_Rev - (General Arrangement)

5.5.2.2 Fairing and SonarTranducers (rev 6)

5.5.2.3 Drawing OE-405-101_Antenna_Arrangment_Rev_C –

5.5.2.4 MAC_Survey_Report_Recommendations_v0

5.5.2.5 Westlake Survey_07122007

5.5.2.6 Final ADCP 11-16-15 ENCL 1

5.5.2.7 EX1810_EM302_SAT_20181028-1

5.5.2.8 Mapping Transducer locations and recorded offsets (1)

5.5.2.9 POS MV Antennas Survey Report NGS 2015_OkeanosExplorer

5.5.2.10 Final EK-60 11-16-15 Encl 2

5.5.2.11 WO#01203S_EM302-ES18-11_Install_Trip Report

5.5.2.12 WESTLAKE SHIP MONUMENT

5.5.2.13 150508-530 38kHZ ADCP Shop Drawing

5.5.2.14 300 kHz As-built drawing 150508-531

5.5.2.15 Drawing OE-165-101, Transducer Fairing Structural Mods

5.5.3 Government Furnished Equipment

5.5.3.1 None

5.5.4 Requirements

5.5.4.1 Provide the onsite services of a qualified, certified professional surveyor, with marine survey experience, to survey the

alignment of installed mission transducers, antennas, and benchmarks (monuments).

5.5.4.2 The survey must be done while the ship is in drydock and when weather conditions are optimal for the most accurate measurements. The survey may not be performed in rain or fog. The shipyard shall curtail some repair operations as necessary to prevent interference with survey while the survey is conducted. The survey must also be completed at least three weeks prior to the end of the period of performance. This will allow for the report to be completed and delivered prior to getting underway as data from the report will be required for at sea testing.

5.5.4.3 A comprehensive written Survey Plan shall be prepared and which completely describes the procedures to be used to meet the survey requirements of this work item. The Survey Plan shall include a step-by step procedure, list of instruments to be used, sketches showing lines of sight, and methods of verifying that the required accuracies can be attained. Survey plan shall be reviewed and approved by the COR prior to the commencement of the survey

5.5.4.4 Prior to the start of the survey, the shipyard shall arrange an onsite meeting with the surveyor, ship yard supervisor, and up to six representatives from the NOAA to review the survey plan, survey conditions, items to be surveyed, concerns from previous surveys, existing benchmarks, renewing missing benchmarks, additional benchmark locations, survey requirement details, and vessel survey report (VSR) content, References 5.5.2.3, 5.5.2.4, 5.5.2.5, 5.5.2.6, 5.5.2.7, 5.5.2.8, 5.5.2.9, 5.5.2.10, 5.5.2.11, 5.5.2.12.

5.5.4.5 Shipyard shall support the requests of the surveyor to ensure a complete and accurate survey is achieved. Support shall include but not limited to, removing/repositioning obstructions, opening fairing access/transducer plates, and erecting staging/ladders.

5.5.4.6 The surveyor shall perform a walk through with the COR and other NOAA staff to review the existing benchmark locations as previously surveyed, Reference 5.5.2.4 and physically verify as;

5.5.4.6.1 granite block(ship's reference point with x,y,z of 0, 0, 0)

5.5.4.6.2 starboard keel at fairing (*needs new)

5.5.4.6.3 port keel at fairing

5.5.4.6.4 02 Deck benchmark (* may have been removed)

5.5.4.6.5 gyro mounting bracket FWD (*needs new)

5.5.4.6.6 gyro mounting bracket AFT (*needs new)

5.5.4.7 Condition of each benchmark shall be reviewed and missing benchmarks shall be reinstalled, others renewed as directed by the marine surveyor.

5.5.4.8 Install up to ten (10) new benchmarks in the locations as outlined below and in the exact locations as directed by the surveyor;

5.5.4.8.1 Bow; near base of the jackstaff

5.5.4.8.2 Stern; center of fantail

5.5.4.8.3 CTD; deck area

5.5.4.8.4 Control station; Aft

5.5.4.8.5 10. Locations to be determined.

5.5.4.9 The Surveyor shall provide twenty (20) benchmarks for installation, Reference 5.5.2.12 or equivalent. The contractor shall temporarily epoxy new or to be replaced benchmarks in the locations defined by the Surveyor. The contractor shall permanently weld the benchmarks in place after the survey is complete under the observation of the surveyor, Reference 5.5.2.12. Unused benchmarks shall be delivered to the COR.

5.5.4.10 The surveyor shall perform a complete survey of the installed mission transducers, antennas, new/existing benchmarks listed below, References 5.5.2.1 and 5.5.2.2. Measurements shall be referenced from the ship’s Granit Block, to the level of resolution and convention as listed in Reference 5.5.2.4 and as specified below;

5.5.4.10.1 Multibeam TX array: survey all four corners of the array to meet leveling requirements - report angular offsets for heading, roll, and pitch of array. Measure offset location of array center.

5.5.4.10.2 Multibeam RX array: survey all four corners of the array to meet leveling requirements - report angular offsets for heading, roll, and pitch of array. Measure offset location of array center.

5.5.4.10.3 X, Y, Z offsets for 18, 38 (new transducer), 70, 120, and 200 kHz EK60/80 transducers. Pitch, roll, and heading angular offsets for new 38 kHz transducer as installed.

5.5.4.10.4 Knudsen SBP X, Y, Z offsets

5.5.4.10.5 300 kHz ADCP X, Y, Z offsets

5.5.4.10.6 38 kHz ADCP X, Y, Z offsets

5.5.4.10.7 Port POSMV antenna (primary POS antenna)

5.5.4.10.8 Starboard POSMV antenna (secondary)

5.5.4.10.9 Starboard and port gyro offsets (on bridge)

5.5.4.10.10 ROV USBL transducer X, Y, Z offsets

5.5.4.10.11 Bridge GPS antennas x, y, z offsets (Three TRIMBLE units for DP system)

5.5.4.10.12 IMU x, y, z offsets

5.5.4.10.13 All Benchmarks x, y, z offsets

5.5.4.11 Access to the Knudsen SPB transducers is via a hull plate. Contractor shall remove the plate and then reinstall after survey is complete.

5.5.4.12 Access to the both the 300kHz and 38kHz ADCP transducer faces require removal of delicate windows. Under the direction of the COR, remove the windows, inspect the transducers and windows, and issue a condition report for any evidence of abnormalities. After the survey is completed, supply, renew the gaskets, and reinstall the windows. Contractor shall supply distilled water, fill the tanks with distilled water, eliminate all air bubbles, check for and correct all leaks per Reference 5.5.2.12, 5.5.2.13, 5.5.2.14.

5.5.4.13 Within ten (10) business days after conclusion of the survey, provide a report to the COR to the level of detail and convention as outlined in Reference 5.5.2.4. The report shall document all readings taken during survey operations and shall describe the as-installed accuracy of the transducers, benchmark and antennas. The report shall also include a red line mark up of Reference 5.5.2.1 showing all benchmarks.

5.5.5 Quality Assurance

5.5.5.1 If suggested surveyor is not used, the COR shall certify the credentials of an alternate source prior to the shipyard hiring an alternate surveyor.

5.5.5.2 Survey completed to the standards and format as outlined.

5.5.5.3 Benchmark shall be permanently welded to the hull under the observation of the surveyor.

5.5.5.4 All welding shall be completed by a welder certified in the weld process and filler material used. Welding shall be completed to prevent any warping or distorting of the hull.

5.5.5.5 All disturbed paint shall be repair to match surrounding.

5.5.6 Notes

5.5.6.1 The term monument is the same as benchmark.

5.5.6.2 References are provided as sources for providing guidance only. The government cannot guarantee accuracy.

5.5.6.3 Item 5.9, EK80 38 kHz Transducer installation must be completed prior to execution of this work item.

5.5.6.4 Item 3.29, Replace EM304 Transmit Array, if awarded must be completed prior to execution of this work item.

5.5.6.5 Ship’s force is expected to upgrade both port and starboard POS MV antennas prior to shipyard work. COR shall supply antenna specification sheets to surveyor if upgrade has been completed.

5.5.6.6 Ensure both ADCP tanks are filled correctly, all bubbles removed and not leaking.

5.5.6.7 Suggested source for a marine surveyor;

Bob Blair <CBlair@westlakeconsultants.com>
WESTLAKE CONSULTANTS
15115 SW Sequoia Parkway, Suite 150
Tigard, OR 97224
503.684.0652

5.5.6.8 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.6 ROV STAIRWELL PRESERVATION

5.6.1 Intent

5.6.1.1 Prepare and Paint the ROV stairwell to include stairs, deck, platforms, overhead and bulkheads

5.6.2 References

5.6.2.1 Drawing 631-623-3576 – Paint Schedule

5.6.2.2 Drawing OE-601-101, Rev. C, General Arrangement

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

5.6.2.4 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

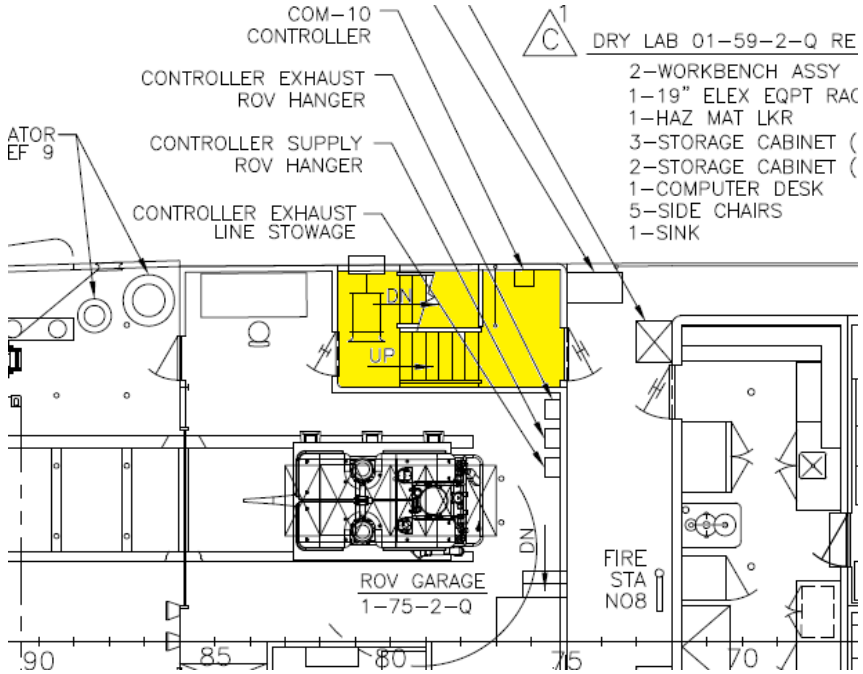
5.6.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

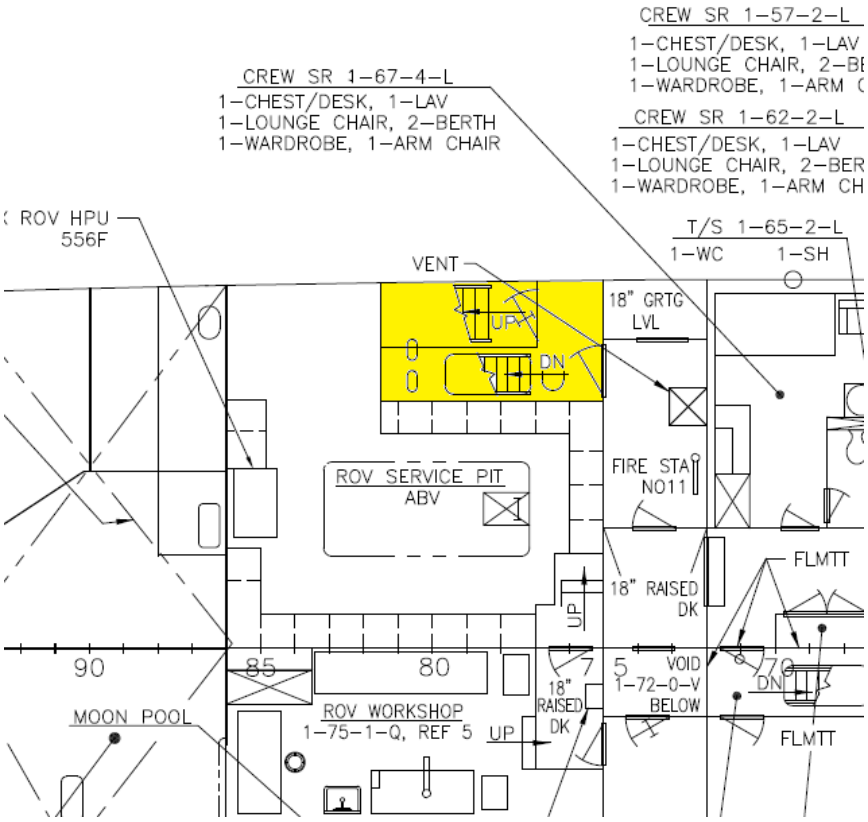
5.6.3 Government Furnished Equipment

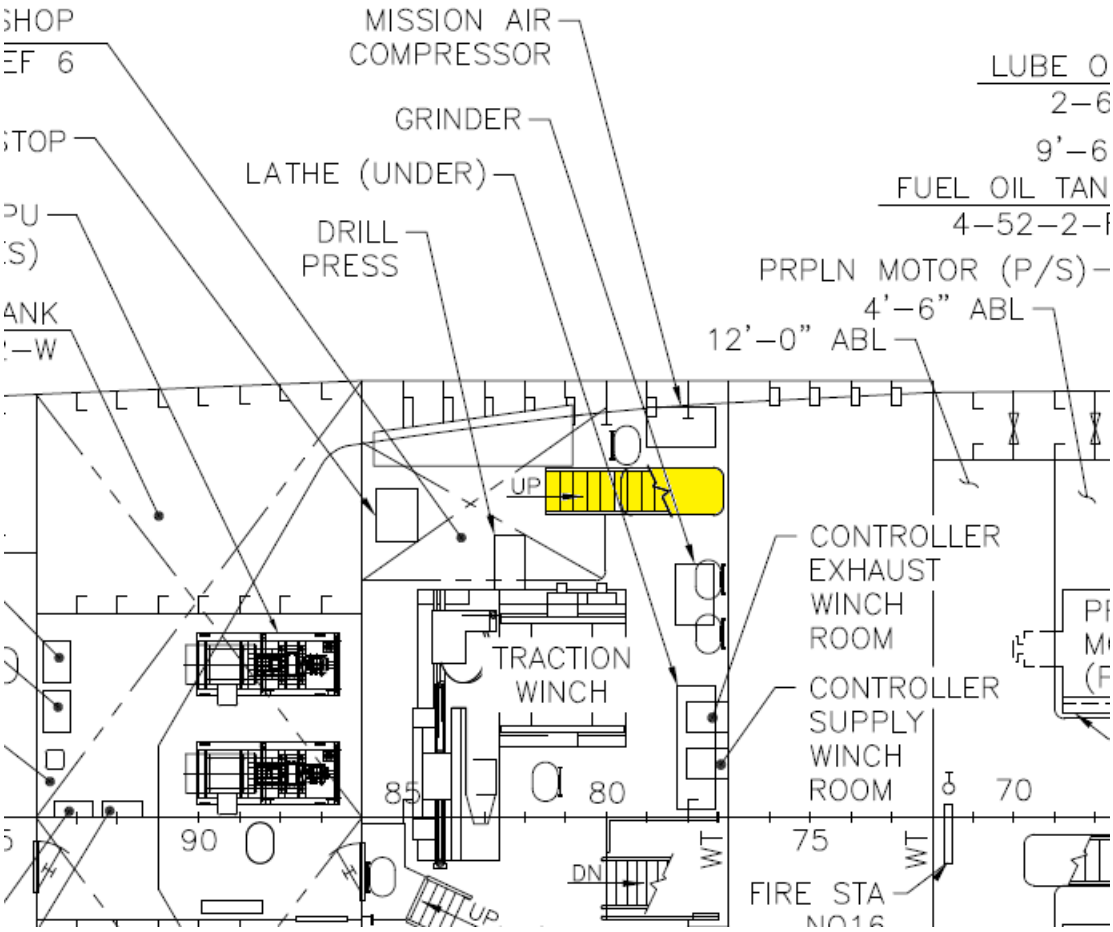
5.6.3.1 None

5.6.4 Requirements

5.6.4.1 Clean ROV stairwell deck, bulkheads, ladderways, platforms, and structures of dirt, grime, oil, grease and debris. The following images show the ROV stairwell highlighted in yellow taken from reference 5.6.2.2. Perform inspection with COR following cleaning.


COM-10
CONTROLLER
CONTROLLER EXHAUST
ROV HANGER
CONTROLLER SUPPLY
ROV HANGER
CONTROLLER EXHAUST
LINE STOWAGE
ATOR
EF 9
C 1
DRY LAB 01-59-2-Q RE
2-WORKBENCH ASSY
1-19" ELEX EQPT RAC
1-HAZ MAT LKR
3-STORAGE CABINET (
2-STORAGE CABINET (
1-COMPUTER DESK
5-SIDE CHAIRS
1-SINK
DN
UP
DN
ROV GARAGE
1-75-2-Q
FIRE
STA
NO8
90
85
80
75
70


CREW SR 1-57-2-L
1-CHEST/DESK, 1-LAV
1-LOUNGE CHAIR, 2-BE
1-WARDROBE, 1-ARM C
CREW SR 1-67-4-L
1-CHEST/DESK, 1-LAV
1-LOUNGE CHAIR, 2-BERTH
1-WARDROBE, 1-ARM CHAIR
CREW SR 1-62-2-L
1-CHEST/DESK, 1-LAV
1-LOUNGE CHAIR, 2-BER
1-WARDROBE, 1-ARM CH
ROV HPU
556F
T/S 1-65-2-L
1-WC
1-SH
VENT
UP
DN
18" GRTG
LVL
ROV SERVICE PIT
ABV
FIRE STA
NO11
FLMTT
18" RAISED
DK
UP
90
85
80
7
5
VOID
1-72-0-V
BELOW
70
DN
18"
RAISED
DK
MOON POOL
ROV WORKSHOP
1-75-1-Q, REF 5
UP
FLMTT



5.6.4.2 Cover and protect all equipment including (but not limited to) switchboards, transformers, HPU's, Control Valves, and control panels. Protection shall keep dust, water and debris from entering the equipment during paint preparation.

5.6.4.3 Powerwash all decks, platforms and bulkheads twice with a soap/degreasing compound similar to simple green or ZEP Industrial Purple Cleaner and Degreaser. Contractor shall control all water from cleaning process. The COR will approve the soap/degreasing compound prior to use and inspect following cleaning.

5.6.4.3.1 Area of preparation and painting shall include under the 01 level deck platform and the topside of the anti-roll tank in the stairwell - approximately 80 square feet.

5.6.4.4 Powertool all surfaces to near-white metal in accordance with NACE 2/SSPC-SP11. Use caution to prevent dust and material from entering other areas of the ship.

5.6.4.5 Apply the following (or equivalent) paint system to the entire deck area including walkways, under equipment, equipment foundation structures, pipes, drip pans, bulkheads, and shipboard frames.

(a) One full coat of International Intershield 300V, 6 mils DFT (Color – bronze)
(b) One full coat of International Intertuf 262, 6 mills DFT (color - red)
(c) (one full coat of International Intergard 263, 5 mills DFT (color – grey)

5.6.4.6 Use dehumidification (DH) equipment and maintain temperature and humidity within the prepared surface and bilge area to the paint manufacturer’s specifications throughout the entire surface preparation and painting process.

5.6.4.7 Remove all masking and protective coverings

5.6.4.8 Nonskid up to 30 square feet of paths shall be painted on the deck in all transited areas currently outlined and be of a darker color than the rest of the deck

5.6.5 Quality Assurance

5.6.5.1 In accordance with References 5.6.2.3, 5.6.2.4 and 5.6.2.5

5.6.5.2 COR to be formally notified of inspection of cleaned areas after each step of the cleaning process, preparation process and after each coat of paint.

5.6.6 Notes

5.6.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.6.6.2 This work item, if awarded, shall be completed after the replacement of the water tight door on the 01 level in the ROV stairwell

END OF ITEM

5.7 GALLEY 3-WAY VALVE

5.7.1 Intent

5.7.1.1 This work item is intended to accomplish the replacement of the galley grey water 3-way valve to an updated ball valve model and modify the reach rod to include a position indicator and a gear box.

5.7.2 References

5.7.2.1 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.7.2.2 Galley 3-Way Valve Replacement Pictures (PDF)

5.7.3 Government Furnished Equipment

5.7.3.1 None

5.7.4 Requirements

5.7.4.1 Lockout and tagout galley overboard drain and associated systems with COR and Chief engineer. Open STBD engine room void.

5.7.4.2 Disconnect and remove 3-way Galley drain valve shown in reference 5.7.2.2. Valve is located inside STBD engine room void

5.7.4.3 Procure two (2) 3-inch bronze 3-way diverter valves with stainless steel ball and stem – Type PBM DPB-K1L-A10 or equivalent. COR shall verify valve selected by contractor prior to procurement. Install 1 valve, modifying flanges as needed. Turn 1 valve over to COR as spare.

5.7.4.4 Procure and install a bronze gear box inside the void and connect to existing reach rod and new valve installed in 5.7.4.3, modifying the reach rod to accommodate the new valve and gearbox. Gear box shall be supported by new steel supports to ensure there is no stress on the valve or reach rod.

5.7.4.5 Procure and provide a mechanically operated remote valve position indicator and install in the SSDG room to show the position of the valve installed in 5.7.4.3. The valve shall show the position of the valve relative to the flow of the drain either overboard to a

holding tank. Indicator positions shall be labeled with aluminum or stainless steel signage. Wording shall be at least 1 inch.

5.7.4.6 Following installations, all grease hoses from previous valve shall be removed.

5.7.4.7 Test all affected piping to the satisfaction of the ABS surveyor (minimum 10 PSI). Repair all paint to match surrounding.

5.7.4.8 Close void with new gasket and inspect with Chief Engineer and COR

5.7.5 Quality Assurance

5.7.5.1 All welders shall be certified in the weld process and filler material for the process used.

5.7.5.2 The contractor shall prove successful operation of the newly installed valve, reach rod and indicator to the COR and Chief Engineer.

5.7.5.3 All piping, machinery, equipment and penetrations affected by the installation shall be tested to the satisfaction of the attending ABS surveyor. New piping shall be hydrostatically tested by filling the piping with water to the point of overflowing and holding for a minimum of 30 minutes prior to the inspection of joints. There shall be no sign of leakage at any joint

5.7.6 Notes

5.7.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.7.6.2 All valves, gear boxes and indicators shall be ordered by the contractor within 7 days following the item being awarded. A copy of the invoice shall be provided to the COR.

5.7.6.3 A possible source for the valve is as follows:

Tork Systems
BP Peterson
BP@torksystems.com
510-891-9675

END OF ITEM

5.8 DYNACON OEM ONSITE TECHNICAL SUPPORT

5.8.1 Intent

5.8.1.1 Provide DYNACON OEM technical support onsite for inspection, maintenance and grooming of the traction winch and A-Frame.

5.8.2 References

5.8.2.1 Job973.Drawings (PDF)

5.8.2.2 Job973.ManualText (PDF)

5.8.2.3 967 TW Assembly (PNG) – Traction Winch General Assembly

5.8.2.4 967 Stub shaft weldment (PNG)

5.8.2.5 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.8.3 Government Furnished Equipment

5.8.3.1 None

5.8.4 Requirements

5.8.4.1 Provide the services of a DYNACON OEM technical representative for at least 24 hours (over 3 days) onsite (not including travel time) to inspect and service the following:

5.8.4.2 Traction Winch – Full inspection and operational groom of the traction winch system to include:

5.8.4.2.1 Inspect upper stubb shaft and pillow block bearing including feeler gauge that bearing is properly locked

5.8.4.2.2 Inspect all weld joints for cracking

5.8.4.2.3 Pull, inspect and clean upper sheave bolts. Reinstall and torque to 235 ft lbs

2.8.4.2.4 Drain and replace oil in upper and lower TW gear boxes with 1.9 gal of Royal Purple 8090.

2.8.4.2.5 Open and inspect high and low voltage enclosures

5.8.4.2.4 Remove and replace the following filters

5.8.4.2.4.1 Zinga (LE-10) filter on HPU (QTY – 2)
5.8.4.2.4.2 Hydac 0240 filters (QTY – 2)
5.8.4.2.4.3 Donaldson P167183 filter on Traction Winch (QTY – 1)
5.8.4.2.4.4 Hydac 0160 filter on storage winch (QTY – 10)

5.8.4.2.5 Calibrate dual axis load with hanging weights

5.8.4.2.6 Inspect pillow block bearing, stubb shaft, stubb shaft mounting plate, shave, bear box gland and face of the gear box motor

5.8.4.2.7 Inspect and adjust level wind guide fingers/guide rods and Acme Screw as needed for optimal operation

5.8.4.2.8 Provide and install new external brake pads on the storage winch.

5.8.4.2.9 Adjust HPU charge pressure as needed to spec

5.8.4.2.10 Provide CFR to COR within 48 hours of OEM tech rep completion with findings, work completed and any additional work that should be completed on the traction winch and supporting systems.

5.8.4.3 A-Frame

5.8.4.3.1 Perform an operational groom of the A-Frame.

5.8.4.3.2 Inspect operational groom system for smooth and even operation of A-Frame cylinders.

5.8.4.3.3 Provide CFR to COR within 48 hours of OEM tech rep completion with findings, work completed and any additional work that should be completed on the A-Frame and supporting systems.

5.8.5 Quality Assurance

5.8.5.1 Operated traction winch in the presence of COR, OER Rep and GFOE. Pay out and haul in system at least 2 times.

5.8.5.2 Operate the A-Frame in the presence of the COR, OER Rep and CME for up to 2 hours to prove smooth operation with various load configurations

5.8.6 Notes

5.8.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.8.6.2 DYNACON is also known as Forum Energy Technologies

5.8.6.3 DYNACON suggested source:

Forum Energy Technologies
831 Industrial Blvd
Bryan, TX 77803
Attn: Steve Boyd
Email: Steven.boyd@f-e-t.com
Telephone: (979) 213-5037

END OF ITEM

5.9 EK80 38KHZ TRANSDUCER INSTALLATION

5.9.1 Intent:

5.9.1.1 Replace EK-60 38 kHz Transducer with newer model

5.9.2 References

5.9.2.1 OE-601-101_Rev - (General Arrangement)

5.9.2.2 Fairing and Sonar Tranducers (rev 6)

5.9.2.3 es38_7_ds_en_a4 Transducer Data Sheet

5.9.2.4 ES38-7 mounting ring C__EXPORT_074076af Model (1)

5.9.2.5 ES38-7 Transducer drawing 393820

5.9.2.6 Simrad ES38-7 Installation manual

5.9.3 Government Furnished Equipment

5.9.3.1 ES38-7 Split Beam 7° x 7° (p/n 321842) Transducer with 30 meters of cable; $18,640.00

5.9.3.2 Kongsberg approved anti-fouling paint and primer, one quart each;

Primer: Safeguard Universal ES (or equivalent) $50

Paint: SeaQuantum Ultra S (or equivalent) $50

5.9.4 Requirements

5.9.4.1 **This work item must be completed prior to item 5.5 Transducer and BenchMark Survey, if executed.**

5.9.4.2 In conjunction with the ship’s ET, follow log out and tag out procedures to secure power to the EK60 38kHz WBT (Wide Band Transceiver).

5.9.4.3 Ship’s ET will disconnect the EK60 38 kHz transducer from WBT and remove the connector.

5.9.4.4 Open the Starboard fairing hatch to gain access inside the fairing. Exercise caution when inside the fairing not to damage cables from other systems during the removal and installation process, References 5.9.2.1 and 5.9.2.2.

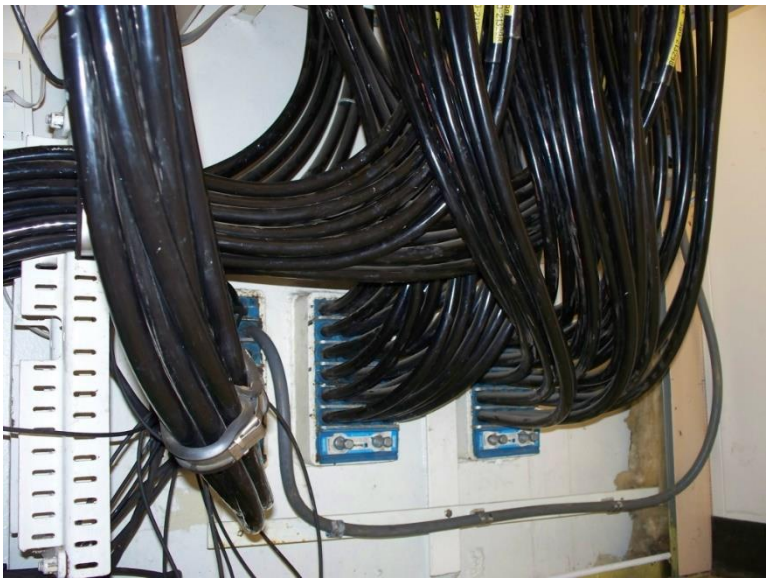
5.9.4.5 The 38 kHz Transducer cable runs from the transducer through an open moon pipe near frame 28, inside the conduit cable cover in the ship's Hospital (1-28-0-L), and through a MCT into the Sonar Closet in the ship's Lounge (1-34-0-L). Remove the aluminum cable tags, pull back the cable into the fairing, References 5.9.2.1 and 5.9.2.2.



Moon pipes as seen inside fairing.

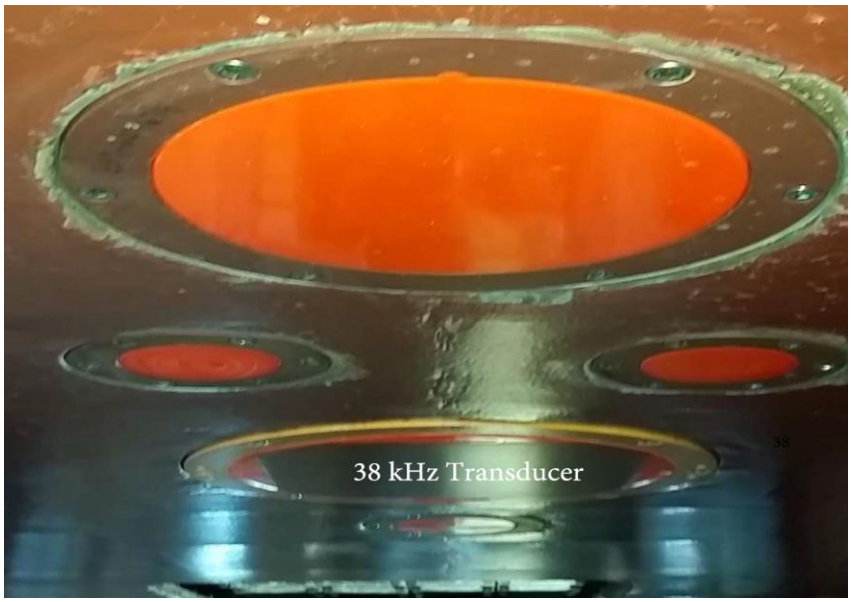


Conduit cable cover as seen in ship's Hospital.



MCTs as seen from the Sonar Closet.

5.9.4.6 Remove the existing 38 kHz Transducer and cable from the mounting ring/fairing and dispose, Reference 5.9.2.2.



38 kHz Transducer as seen from the fairing bottom.

5.9.4.7 Install the GFE 38 kHz transducer in the same mounting ring and orientation as the removed unit. Installation must be smooth to the hull. Apply never seize to bolts prior to installation. Apply filler around the transducer and in bolt heads as directed by the COR. References, 5.9.2.2, 5.9.2.3, 5.9.2.4, 5.9.2.5, and 5.9.2.6.

5.9.4.8 Run the new transducer cable using the same path and moon pipe

as the removed transducer. Leave slack in the Sonar Closet as directed by the COR. Reattach removed cable tags to the cable.

5.9.4.9 Re-pack the disturbed MCT and close the conduit cover junction box in ship’s hospital.

5.9.4.10 Reinstall the fairing access plate. Apply never seize to bolts prior to installation.

5.9.4.11 In the presence of the COR, apply anti-fouling primer and paint. Apply strictly following technique and thickness as outlined in reference 5.9.2.6.

5.9.5 Quality Assurance

5.9.5.1 COR to review transducer handling and installation orientation with shipyard prior to installation.

5.9.5.2 Path of cable run shall be reviewed and approved by COR prior to running the cable.

5.9.5.3 All MCT’s shall be closed and pass flashlight test.

5.9.5.4 Antifouling paint shall be properly applicated in accordance with manufacturers specification and be applied in correct conditions with ample cure time prior re-floated.

5.9.6 Notes

5.9.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.10 SUPERSTRUCTURE PAINTING

5.10.1 Intent:

5.10.1.1 Blast and paint the entire ship's exterior superstructure (main deck, 01 – Level, 02 Level, 03 Level and flying bridge level to include all pipes, hangers, stanchions, bulkheads, frames, masts, handrails, equipment foundations, stacks, grating and structures.

5.10.2 References

5.10.2.1 Drawing OE-601-101, Rev. C, General Arrangement

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

5.10.2.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

5.10.2.4 Steel Structures Painting Council Surface Preparation Specification No. 10 (SSPC-SP 10/NACE No. 2), Near White Blast Cleaning

5.10.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

5.10.2.6 Steel Structures Painting Council Surface Preparation Specification No. 3 (SSPC-SP 3), Hand Tool Cleaning to Bare Metal

5.10.2.7 Structures Painting Council Surface Preparation Specification No. 12 (SSPC-SP 12), High Pressure Water Jetting

5.10.2.8 Drawing 101-623-3544 - Scantlings: Main Deck and Below

5.10.2.9 Drawing 101-623-3545 – Scantlings Focsle Deck and Above

5.10.2.10 Drawing 101-623-3546 – Scantlings: Inboard – Profile

5.10.2.11 – Drawing 101-623-3543 - Molded Lines

5.10.2.12 – Drawing 101-623-3544 - Shell Expansion

5.10.2.13 Drawing 631-623-3576 – Paint Schedule

5.10.3 Government Furnished Equipment

3.10.3.1 None.

5.10.4. Requirements

5.10.4.1 All surface preparation and painting to be completed by an industry certified paint contractor. Certifications shall be presented to and approved by COR prior to commencement of work.

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

5.10.4.3 The existing coating system is an International System applied during ship's construction; all new paint shall be International brand only for compatibility and in conformity with ship's Paint Schedule.

5.10.4.3 All preparations and painting to be accomplished in accordance with the paragraphs for "General Requirements" and "Quality Assurance" in reference 5.10.2.3. Use reference 5.10.2.13 for International product to use in a specific area, along with coating details such as number of coats and DFT. Use reference drawings to determine approximate area to be coated

5.10.4.4 Surface Preparation to be accomplished using water jetting, in accordance with reference 5.10.2.7 ; grit blasting is not acceptable. The contractor shall be responsible for all water leaks into the ship and shall clean and dry spaces thoroughly after a leak is found and corrected.

5.10.4.4.1 Cover and protect surfaces to ensure no paint, paint chips, blast media, rust, steel, dirt or grimes enter the water

5.10.4.4.2 Protective covering shall be installed to ensure that no overspray of paint can be blown on to adjacent ships, buildings, cars or other areas of the ship

5.10.4.5 Accomplish Low- Pressure Water Cleaning and/ or High- Pressure Water Cleaning, as required, to obtain a minimum WJ-4 surface condition, in order to apply a "maintenance system" to all surfaces. Abraid aged epoxy if needed prior to applying topcoats.

5.10.4.6 Use Ultrahigh-Pressure Water Jetting, to a WJ-2 condition, to all areas having loose paint, not tightly adhered to substrate. Apply a "complete" coating system to these areas. For bidding purposes, estimate 4,500 square feet of miscellaneous superstructure locations will require a "complete system". If locations requiring a "complete system" exceed these amounts, the contractor shall submit a CFR and it will be the topic of additional work. The locations receiving "complete systems" shall be pro-rated for the top-coats applied.

5.10.4.7 Areas not able to be reached using water jetting shall be prepared with power tool cleaning to an SSPC-SP11 condition.

5.10.4.8 Surface preparation to include feathering back edges of remaining paint in all areas where Ultrahigh Pressure Water Jetting or abraiding of aged epoxy is carried out.

5.10.4.9 After surface preparation and immediately prior to application of paint, accomplish chloride checks at a total of 100 different locations on the superstructure; locations to be selected by 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

5.10.4.10 Rewash the affected areas of the superstructure with a 3000 psi fresh water wash after all surface preparation has been carried out and all chloride measurements are acceptable

5.10.4.11 Prepare and coat the following areas of the superstructure with a “maintenance system”, to include areas receiving a “complete system”, if required.

5.10.4.11.1 All exterior ladders and handrails at the Main Deck Level, 01 Level, 02 Level, 03 Level and Flying bridge level.

5.10.4.11.2 The Foremast, the Forward Master and the Main Master, and all connect platforms, handrails, platforms and appendages

5.10.4.11.2.1 The Contractor shall adequately cover all cables, equipment and electronics to prevent damage during the preservation process

5.10.4.11.3 The underside of the Pilot House wings on the port and starboard sides.

5.10.4.11.4 The inboard bulkheads and overheads/underside of the Port and STBD exterior walkways on the 01 Level

5.10.4.11.5 Superstructure: All exterior surfaces of the superstructure from the main deck to the flying bridge from Frame 15 to Frame 85

5.10.5 Quality Assurance

5.10.5.1 All existing stripes, markings, wording, designs, colors and instructions shall be painted to match the existing color, size, and font of the existing paint

5.10.5.2 Remove all locker and interferences to accomplish painting

5.10.5.3 All handrails, doors, foundations, pipes, coaming, conduit, MCT foundations, window frames and other expenditures shall be includes in painting of superstructure

5.10.5.4 All Overspray shall be removed by the contractor

5.10.5.5 Conduct joint inspection of hull with Paint representative and COR after hull has been high-pressure water-washed. Provide detailed “Paint Plan” to CORR, in accordance with Reference 5.10.2.13, prior to start of surface preparation.

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

5.10.5.7 Perform a joint inspection of Dry Film Thickness gage with COR after each coat of paint is applied.

5.10.6 Notes

5.10.5.1 A “maintenance system” for the Superstructure consists of one coat of paint per 5.10.2.13, 4-6 mils DFT

5.10.5.2 A “complete system” for the Superstructure consists of a multi-coat system identified in reference 3.10.2.3.

5.10.6.3 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.11 ANTI-ROLL AND ANTI-ROLL DUMP TANKS PRESERVATION

5.11.1 References

5.11.1.1 Drawing OE-601-101, Rev. C, General Arrangement

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

5.11.1.3 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

5.11.1.4 Steel Structures Painting Council Surface Preparation Specification No. 10 (SSPC-SP 10/NACE No. 2), Near White Blast Cleaning

5.11.1.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

5.11.1.6 Drawing 631-623-3576 – Paint Schedule

5.11.2 Government Furnished Equipment

5.11.2.1 None.

5.11.3 Requirements

5.11.3.1 All surface preparation and painting work required by this specification shall be done in accordance with Reference 5.11.1.2 and shall be performed by an industry recognized certified paint contractor. Certification shall be made available to COR for review and approval prior to the commencement of work.

5.11.3.2 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.

5.11.3.3 Powerwash Anti-roll (2-72-0-W) tank and Anti-Roll Dump (4-40-0-W) tank twice with COR inspecting between washing. Following second powerwash, solvent clean tanks to SSPC-SP1 Standard. Take and record profiles and perform surface chloride checks (in at least 30 locations in each tank, actual locations to be selected by COR). Maximum chloride measurements shall not exceed 5 ug/cm2 or 50 mg/m2. If chloride measurements exceed this level, fresh water wash the tank at 3000 psi and repeat surface cleaning, if necessary, and testing until satisfactory measurements are achieved. COR to inspect tank following solvent cleaning. Blast the interior of the tanks 2-72-0-W and 4-40-0-

W 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.

5.11.3.3.1 Crop out and replace two steel inserts (3 feet by 5 feet) as directed by the COR. For bidding purposes, assume steel thickness is 3/8 inch. Provide material certificate of new steel to COR and inspect with onsite ABS surveyor.

5.11.3.4 Clean the tanks of all traces of blast products and dust, then coat the tanks with the following system in accordance with Reference 5.11.1.2.

(a) 1st coat: Formula 150 epoxy applied at 3-5 mils DFT (color: green).

(b) Stripe coat: Formula 156 applied at 3-5 mils DFT (color: red).

(5) 2nd coat: Formula 156 applied at 3-5 mils DFT (color: red).

(5) Stripe coat: Formula 152 applied at 3-5 mils DFT (color: white).

(5) Final coat: Formula 152 applied at 3-5 mils DFT (color: white).

5.11.3.5 Provide and install 3 new type ZHC-23 zinc anodes conforming to MIL-A-18001K in each tank (6 total)

5.11.3.6 The new finished zinc plates shall weigh twenty-three (23) pounds each. Provide certification to the COTR 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 to frames in the ballast tanks. COR will designate exact locations

5.11.3.6.1 All zincs currently installed in the tanks shall be removed for the blasting and painting process and reinstalled prior to final closure

5.11.3.7 Following the cure time per Reference 5.11.1.2, close up the tanks using new rubber gaskets and hardware for manholes, same material and thickness as existing. Conduct a 2 psi air pressure test of each tank to ensure air tight seal of manhole covers.

5.11.3.8 Inform American Bureau of Shipping (ABS) of progress and arrange for inspection of the tanks and steel inserts as required by the local ABS office.

5.11.4 Quality Assurance

5.11.4.1 As required by References 5.11.1.2 through 5.11.1.5

5.11.4.2 All zincs shall be removed for the blasting and painting process and reinstalled following the curing of the final coat of paint.

5.11.5 Notes

5.11.5.1 Anti-Roll Tank (2-72-0-W) capacity is approximately 9,750 gallons

5.11.5.2 Anti-Roll Dump Tank (4-40-0-W) capacity is approximately 9,600 gallons

5.11.5.3 Stripe Coats shall be painted on all tank weld seams, penetrations, frame structure edges, longitudinal structure edges, girder edges, lighting hole edges and drain hole edges.

5.11.5.4 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.11.5.5 After blasting and prior to painting, the contractor shall give the COR 24 hours to conduct a material assessment inspection of the ballast tank steel.

END OF ITEM

5.12 CHT V2 TANK REPLACEMENT

5.12.1 Intent

5.12.1.1 Remove old CHT System V2 tank and install a new V2 tank.

5.12.2 References

5.12.2.1 750-0003 OMNIPURE Manual September 2015

5.12.2.2 Okeanos Explorer Drawing 528-623-3872 – "Sewage Treatment System Arrangement"

5.12.2.3 Technical Manual T9593-BV-MM0-010 - Operations and Maintenance Instructions for Marine Sanitation Device"

5.12.2.4 Drawing OE-601-101 – General Arrangement

5.12.2.5 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.12.3 Government Furnished Equipment

5.12.3.1 None

5.12.4 Requirements

5.12.4.1 Working with the Chief Engineer and COR, lockout and tagout the OMNIPURE 12 MC MSD system. Drain System and dispose. Remove all affluent from V1 and V2 tank and clean and gas free. Repair up to 10 square feet of paint in V1 tank.

5.12.4.2 Disconnect all pipes and cables necessary for removal and remove DeNora OmniPure V2 tank and discard.

5.12.4.3 Procure and install a new painted 12 MC V2 tank from DeNora Water Technologies of Texas:

5.12.4.3.1 P/N SA12MCTNK-V2-05 (painted)

5.12.4.4 After installation, repair all damaged paint and reconnect all pipes and cables. Pipe connections shall have new gaskets. Cover of tank shall be installed with new gasket.

5.12.4.5 In the presence of the COR and CME, recommission the system

and check for leaks. Test operation during dock and sea trials.

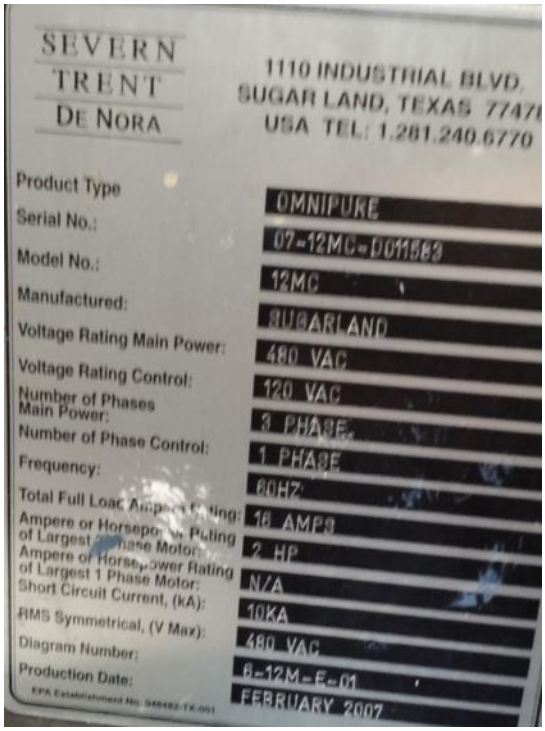
5.12.5 Quality Assurance

5.12.5.1 Test Operation during dock trial and sea trials

5.12.6 Notes:

5.12.6.1 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.12.6.2 The Okeanos Explorer has a Severn Trent DeNora Omnipure MSD Systems (Model 12C).



5.12.6.3 The MSD V1 and V2 tanks are located in the Sewage Machinery Room. Ship's force will pump down the V1 and V2 tanks to the extent

possible. The Contractor is responsible for removing all residual black water prior to commencing inspections, surface preparation and painting.

5.12.6.4 The contractor shall order the tank listed in 5.12.4.3.1. within 7 days following this item being awarded. A copy of the invoice shall be provided to the COR.

END OF ITEM

5.13 BALLAST AND MISC. VENT REPLACEMENT

5.13.1 Intent

5.13.1.1 Remove and replace ballast tank vents to include air escapes, piping and deck inserts.

5.13.2 References

5.13.2.1 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.13.2.2 Drawing 631-623-3576 – Paint Schedule

5.13.2.3 Drawing OE-506-101 – "NOAA Ship Okeanos Explorer Air Escapes, Sounding Tubes & Overflows PP MOD"

5.13.2.4 Drawing 506-623-3845 – "Overflow, Air Escape and Sounding Tubes Arrangement"

5.13.2.5 Ballast Tank Air Escapes and Vents – Supplemental Pictures (PDF)

5.13.2.6 EX Weather Deck Penetration Survey (Excel)

5.13.2.7 EX Weather Deck Penetration List (PDF)

5.13.3 Government Furnished Equipment

5.13.3.1 None

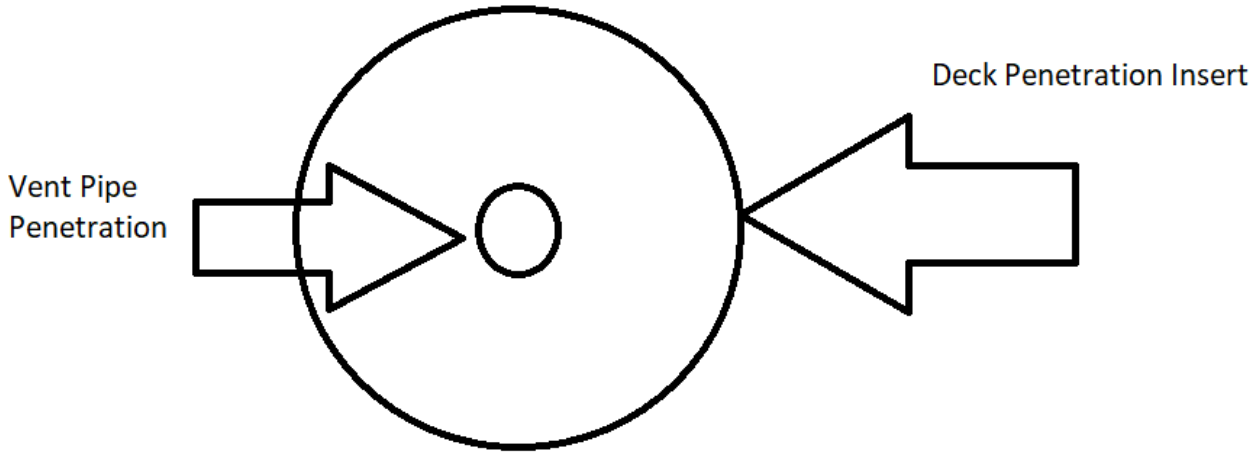
5.13.4 Requirements

5.13.4.1 Unbolt and remove the air escapes on the top of the following tank vents on the exterior of the ship and retain (see 5.13.2.5 for additional pictures):

2-72-0 Void
4-B-0 Forepeak Tanks (Ballast Tank) (QTY – 2)
4-23-0 (Ballast Tank) (QTY – 2: Port and STBD)
4-23-2 (Ballast Tank) (QTY – 2: Port and STBD)
4-23-3 (Ballast Tank) (QTY – 2: Port and STBD)
4-34-0 (Void)(QTY -2)
4-34-01 (Void)
4-40-0 (Ballast Tank)- Anti-Roll (QTY – 2: Port and STBD)

4-52-0 (Ballast Tank)
4-86-1 (Ballast Tank)
4-86-2 (Ballast Tank)
3-94-1 (Ballast Tank)
3-94-2 (Ballast Tank)
Anti-Roll Dump (Ballast Tank)
4-32-1 (Speed Log/Transducer Trunk)
3-23-1 (Sewage)

5.13.4.2 Crop out and remove vent piping to include all above deck piping to include flanges and 36 inches of piping below the deck of each vent. Crop out a steel penetration insert around each vent pipe penetration in the deck no smaller than 18 inches in diameter



View of Pipe and Steel Replacement looking down

5.13.4.3 Renew removed vent piping to include all above deck piping, flanged and 36 inches below the exterior deck piping. New piping shall be schedule 80 – 316L stainless steel and be the same size, shape, length as existing.

5.13.4.4 Replace removed 18 inch deck insert with stainless steel insert to be same shape and thickness as existing. Steel plating shall be stainless 316L. For bidding purposes, assume thickness of steel plating is ½ inch.

5.13.4.5 All welding shall be either MIG or TIG welding using 309L

filler material.

5.13.4.6 Paint all new and disturbed areas to match surrounding using reference 5.13.2.3 as a guide. Stencil name of tanks on side of air escape in 1 ½ inch black lettering

5.13.4.6 Transport all air escape vents (unbolted from pipes and shown in the picture below) and transport to an indoor facility. Air escapes shall be tagged with shipboard location prior to removal from ship to ensure they are reinstalled in the correct location.



5.13.4.7 Disassemble, overhaul and clean all air escape vent components. Wire wheel clean all fastener and hardware and clean all interior and exterior surfaces and interfaces. Remove all scale, rust, paint, dirt, grim and marine growth. Exterior paint shall be removed to an SSPC-10 or SSPC-11 standard. Perform joint inspection cleaned components (which still disassembled) with Project Manager and COR. Submit a CFR with any notable findings.

5.13.4.8 Repaint and re-preserve interior and exterior of the air escapes.

5.13.4.8 Reassemble air escapes using Anti-seize (or equivalent) compound on all air escape and vent hardware. Reinstall overhauled air escape and renew gasket material.

5.13.4.9 Prove all pipes and air escapes are clear of obstruction following all repairs.

5.13.5 Quality Assurance

5.23.5.1 All welders shall be certified in the weld process and filler material used. Weld certificates shall be provided to the COR upon request.

5.13.5.2 In accordance with 5.13.2.1

5.13.5.3 All repairs shall be completed, tested and inspected in accordance with the onsite ABS surveyor

5.13.5.4 Provide all material certifications to COR

5.13.5.5 Repair all paint and affected non-skid

5.13.6 Notes

5.13.6.1 Additional pictures and information of air escapes/vents can be seen in reference 5.13.2.5, 5.13.2.6 and 5.13.2.7

5.13.6.2 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.14 CCTV SYSTEM UPGRADES

5.14.1 Intent:

5.14.1.1 Includes labor, material, and equipment to remove the existing Closed Circuit Television system (CCTV) and install a new CCTV system.

5.14.2 References

5.14.2.1 OE-439-001 - Rev B - Closed Circuit TV System

5.14.2.2 OE-601-101_Rev - (General Arrangement)

5.14.2.3 NOAA Standard Specification No. S6900, “General Requirements for Electrical/Electronic Items”

5.14.2.4 IEEE Std 45 IEEE “Recommended Practice for Electric Installations on Shipboard"

5.14.2.5 Pelco Component Specification Sheets R-1

5.14.2.6 EXPLORER Camera locations and styles - rev D-1

5.14.2.7 CCTV Switch locations and CAT6 cable runs-K-1 D-4

5.14.2.8 OE-601-101_Rev - CCTV Component locations D-2

5.14.3 Government Furnished Material

5.14.3.1 FLIR camera and mount

5.14.4 Requirements

5.14.4.1 Prior to component removals or installations, the Contractor shall supply the on ship services of a qualified, certified Pelco Engineer. The Pelco Engineer shall be on site to review specific components/circuits from the old system that can be preserved for reuse as well as to review and provide guidance on the new CCTV system installation. . The Pelco Engineer shall return to certify the contractor installation, commission, configure and provide informal operational training.

5.14.4.2 In conjunction with the Pelco Engineer, the ship’s ET, MSE and the COR, perform a walk through to identify the installed CCTV system components/circuits and cables that can be preserved for re-use with the new system, references 5.14.2.1 and 5.14.2.2. Note that Reference

4.14.2.2 should only be used as a guide as other cameras, components and cables are installed but not documented.

5.14.4.3 In conjunction with the Pelco Engineer, the ship’s ET, MSE and the COR, perform a walk through to review the installation details of the new CCTV system., references 5.14.2.1 through 5.14.2.8. The review shall include but not limited to;

5.14.4.3.1 Cabling path and install direction for CAT6 cables.

5.14.4.3.2 Termination review for CAT6 cables.

5.14.4.3.3 Existing locations, relocated and camera mounting positions with defined pointing angles.

5.14.4.3.4 Grounding instructions.

5.14.4.3.5 CAT6 testing requirements.

5.14.4.3.6 Mounting instructions for all components.

5.14.4.3.7 Power requirements and power plan.

5.14.4.4 As directed by the Pelco Engineer, contractor shall remove the old CCTV system components, mounting hardware, cabling, and power circuits, but retain all items identified to be reused. Supply material and properly seal any unused cable transits.

5.14.4.5 Install all new wiring and components in accordance with references 5.14.2.3 and 5.14.2.4.

5.14.4.6 Prime and paint new and disturbed surfaces to match existing, adjacent colors.

5.14.4.7 Contractor shall supply and install the following Pelco and non Pelco CCTV components, Reference 5.14.2.5;

Okeanos Explorer (6-10) - Pelco related items		
Qty	Model	Item
1	VXP-P2-72-5-D	VXP 2nd Gen Power Series 72TB RAID5 Mirrored OS
4	VX-WKS	VX Workstation for D11S platform
4	3DX-600-3DMOUSE	Camera controller mouse
26	VXP-1C-3Y	VideoXpert™ Professional 1CH LICENSE + 3YR SUP For 1CH
3	S7230L-EW1	Spectra 7 environmental
3	POE90U1BT-US	Spectra 7 Power injector
3	IWM24-SR	Pendent Dome Mount (light gray)
1	CM400 (might not need)	Corner mount adapter
1	PA402 (might not need)	Pole mount adapter
3	IMM12027-1EP	Optera 270 environmental
3	WMVE-SR	Environmental Wall Mount
1	IMM-CM	Corner mount adapter
2	IMP531-1ERS (2.8-12mm)	Sarix Enhanced IR (5MP) environment
4	IMP531-1IS (2.8-12mm)	Sarix Enhanced (5MP) indoor
6	WMVE-SR	Environmental Wall Mount
6	IMP3PM-1E	Pendant mount
14	IWP532-1ERS	Sarix IWP wedge 2.4 @
9	IMP3PMB-1I	Sarix Pro 3 Dome Wall Mount (indoor)
Non- Pelco items		
Qty	Model	Item
3	CBS350-16FP-2G	Cisco 16 port 240W POE
1	C6AXR-1167BK	CAT6A 1000ft Indoor/Outdoor UV Resistant, Shielded CMX/CMR, Black, Spool
1	C6APS-1089BK	CAT6A Plenum Bulk Ethernet Cable, CMP, Shielded Solid Copper Conductors, 23AWG 1000FT
10	568:10 PK (100 each)	RJ45 Cat6a Shielded Connector 10 pack

5.14.4.8 The contractor shall also supply all other installation components; cables, connectors, terminations, hardware, mounts, installation customizations and equipment required to fully complete the installation to manufacturer standards. All cables shall be rated as low smoke, plenum and rated for shipboard use.

5.14.4.9 Prior to camera installation, the contractor shall supply a list of make/model and serial numbers for all cameras and deliver to the COR.

5.14.4.10 As directed by the Pelco Engineer in 5.14.4.1, Reference 5.14.2.6, 5.14.2.7, 5.14.2.8 and device installation manuals, install the new contractor furnished Pelco Cameras and mounts in the same existing locations (R) as the cameras removed, relocated from existing locations (M) and in new locations (N). Exact locations for all and pointing orientation shall be specified by the COR.

5.14.4.11 Mount the contractor furnished Work Stations (WS), Server (SV) and Switches (SW) in the locations per References 5.14.2.6, 5.14.2.7, and 5.14.2.8 and as directed by the COR.

5.14.4.12 Reuse and connect the existing CCTV displays in the Bridge, Rack Room, ET Shop, Mission Control and EOS/ECC as directed by the Pelco Engineer.

5.14.4.13 Under advise of the Pelco Engineer, pull and terminate all of the required cabling to all installed components, References 5.14.2.6, 5.14.2.7, and 5.14.2.8. Use existing cable paths, wireways and cable penetrations. After terminating, CAT6 cables shall be tested using a CAT6 cable certifier. Re-use and connect preserved power circuits as directed by the Pelco Engineer.

5.14.4.14 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 5.14.2.3 and 5.14.2.4. Cable tag labels shall be as follows (XX = sequential number beginning with 01);

5.14.4.14.1 Power cable code – CCTV PWR-XX
5.14.4.14.2 Video Cable code – CCTV CAMERA-XX
5.14.4.14.3 Work Station code –CCTV WS-XX

5.14.4.15 Contractor shall provide the COR with a red line update to Reference 5.14.2.7 that includes all changes to the wiring, power and workstation runs as well as cable tag information correlating to the actual cable runs. Delivery shall be prior to the Pelco Engineer’s commissioning of the system.

5.14.4.16 Pelco Engineer shall confirm the contractor installation is to manufacturer standards, power, commission, configure/test the new system servers, work stations, load client workstations software, and configure all new cameras per COR. The Pelco engineer shall ensure that all components software and firmware are at the latest revisions and configure the new work stations with full permissions or as directed by the COR. Set PTZ views as directed by the COR for each camera and configure a “home” setting menu button to reset to a default view. Install the client software on up to 20 different ship workstations, configure as directed by the COR. 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 ty the COR. Configure the main DVR

to record all cameras for 30 days with the frame resolution and as directed by the COR.

5.14.4.17 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. The ship's ET shall be trained on downloading and installing software and firmware revisions for all components subject to upgrades.

5.14.4.18 The contractor shall provide hard copies and digital copies of all hardware and software manuals in .pdf format to the COR.

5.14.4.19 The Contractor shall deliver to the COR a complete system wiring diagram that shall include a parts list, system wiring block diagram, cable tag information, and all connection details to the individual pin level in AUTOCAD .dwg and .pdf formats.

5.14.5 Quality Assurance

5.14.5.1 If requested part numbers in section 5.14.4.7 are not available, the Contractor shall provide a specification sheet to the COR for review and approval prior to purchase and installation.

5.14.5.2 Cable tagsp place no longer than 10 feet apart and coded and installed correctly at each cable end at on either side of each MCT..

5.14.5.3 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.

5.14.5.4 Proper blocks installed and closure of all MCTs and unused penetrations.

5.14.6 Notes

5.14.6.1 Possible sources for Pelco and Non-Pelco components;

Survillance-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
115 Chesterfield Industrial Blvd
Chesterfield, Missouri 63005
Toll free: 1-844-519-2601
Showmecables.com

BALTIC NETWORKS
2200 Ogden Avenue, Suite 240
Lisle, IL 60532
+1-630-929-3610
balticnetworks.com

Newegg www.newegg.com
18045 Rowland Street
Industry, CA 91748

5.14.6.2 Possible Source of Pelco Engineer;

Raymond Palatta <raymond.palatta@pelco.com >
Business Development Manager - New York – New England
Phone: +1-559-292-1981
Mobile: +1-718-840-9193

5.14.6.3 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.15 SEPARATION OF CHAIN LOCKER DRAIN FROM BOW THRUSTER HYDRAULIC COOLER OVERBOARD

5.15.1 Intent

5.15.1.1 Separate chain locker drain from the bow thruster hydraulic cooler overboard. Add second penetration.

5.15.2 References

5.15.2.1 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.15.2.2 Drawing OE-601-101_Rev - (General Arrangement)

5.15.2.3 Drawing 581-623-3594 – Anchor Handling Arrangement and Details

5.15.2.4 Drawing 568-623-3884 – Bow Thruster Arrangement

5.15.2.5 Chain Locker Drain-Cooler Drain Pictures (PDF)

5.15.3 Government Furnished Equipment

5.15.3.1 None

5.15.4 Requirements

5.15.4.1 Design and draft a method to separate hydraulic cooler overboard and chain locker drain from each other. Provide a second overboard for separated drain locker which includes a check valve and a sea valve. Obtain ABS approval.

5.15.4.2 Cut out and separate the interconnected 1 ½ inch bow thruster ASW cooler and chain locker drain piping. Cap bow thruster cooler ASW piping where section was removed.

5.15.4.3 Install a second overboard designed in 5.15.4.1. Install new 1 ½ inch CUNI piping from chain locker overboard piping disconnected from the ASW bow thruster cooler piping and pipe overboard. Install a bronze check valve, steel waster piece and a bronze sea valve designed in 5.15.4.1. New piping shall be same material, diameter as existing except where ABS requirements dictate a change. Install reach rod to newly installed sea valve accessible from bow thruster room. For bidding purposes, assume 40 linear feet of new 1 ½ inch piping and 3 penetrations not including the side shell penetration.

5.15.4.4 Insulate ASW and paint all piping to match surrounding.

5.15.5 Quality Assurance

5.15.5.1 In accordance with 5.15.2.1

5.15.5.2 Contractor shall be responsible for provided plan and drawings to ABS and receiving expedited ABS approval for design and production drawings.

5.15.5.3 All affected piping shall be tested to the satisfaction of the attending ABS surveyor.

5.15.4.4 Operationally test new valves in the presence of the COR

5.15.6 Notes:

5.15.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.15.6.1 Reference 5.15.2.5 provides additional pictures of the pipes in question.

END OF ITEM

5.16 LOWER BOSON STOREROOM DECK AND BULKHEAD PRESERVATION

5.16.1 Intent

5.16.1.1 Prepare and paint the deck and bulkheads (including interior side shell) of the lower boson storeroom

5.16.2 References

5.16.2.1 Drawing 631-623-3576 – Paint Schedule

5.16.2.2 Drawing OE-601-101, Rev. C, General Arrangement

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

5.16.2.4 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

5.16.2.5 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

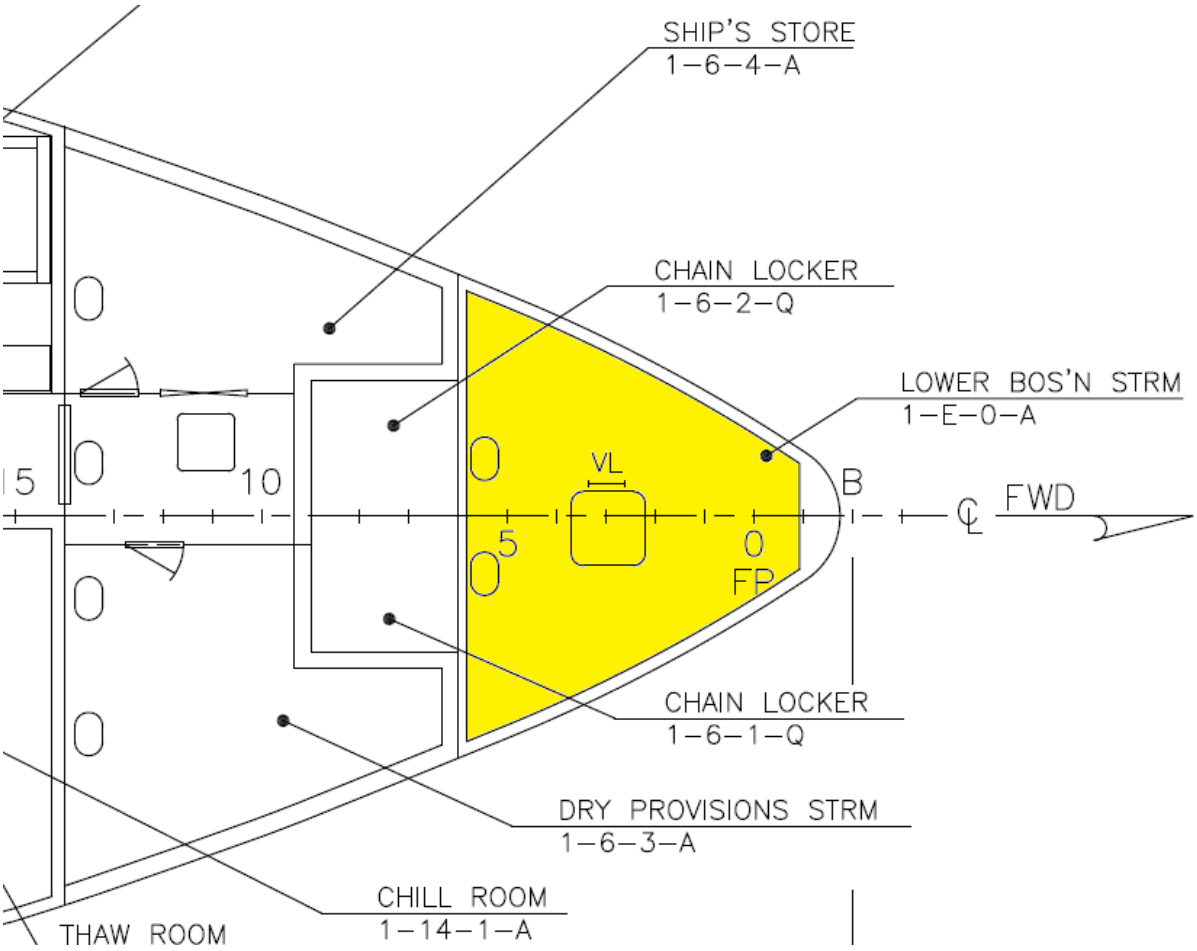
5.16.2.6 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.16.3 Government Furnished Equipment

5.16.3.1 None

5.16.4 Requirements

5.16.4.1 Clean Lower Boson Storeroom (1-E-O-A) bulkheads and deck of dirt, grime, oil, grease and debris. The following image show the Boson Storeroom highlighted in yellow taken from reference 5.16.2.2



5.16.4.2 Mask/cover and protect all equipment and perform a joint walkthrough with the paint supervisor, PM and COR prior to any preparation work commencing

5.16.4.3 Power wash the deck and all bulkheads with a soap/degreasing compound similar to simple green or ZEP Industrial Purple Cleaner and Degreaser. Contractor shall control and remove all water from cleaning process. The COR will approve the soap/degreasing compound prior to use.

5.16.4.4 Powertool bulkheads (including interior side shell) and deck to near-white metal in accordance with NACE 2/SSPC-SP11. Use caution to prevent dust and material from entering other areas of the ship. Adequate negative exhaust ventilation shall be utilized to remove dust and vapor to the vessel exterior.

5.16.4.5 Apply the following (or equivalent) paint system to the entire deck area and bulkheads (including interior side shell).

(a) One full coat of International Intershield 300V, 6 mils DFT (Color – bronze)
(b) One full coat of International Intertuf 262, 6 mills DFT (color - red)
(c) (one full coat of International Intergard 263, 5 mills DFT (color – white)

5.16.4.6 Use dehumidification (DH) equipment and maintain temperature and humidity within the prepared surface and bilge area to the paint manufacturer’s specifications throughout the entire surface preparation and painting process.

5.16.4.7 Remove all masking and protective coverings

5.16.4.8 Apply nonskid to the deck during the painting process. COR to approve small area of nonskid prior to the entire deck being painted.

5.16.5 Quality Assurance

5.16.5.1 In accordance with References 5.16.2.3, 5.16.2.4 and 5.16.2.5

5.16.5.2 COR to be formally notified of inspection of cleaned areas after each step of the cleaning process, preparation process and after each coat of paint.

5.16.6 Notes

5.16.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.17 VENT REPAIRS

5.17.1 Intent

5.17.1.1 Remove and replace several sections of corroded ventilation ducting on the mission deck and in the mission deck void.

5.17.2 References

5.17.2.1 Drawing OE-510-104 – Mission Deck and Below HVAC System Mods

5.17.2.2 Drawing OE-510-102 – HVAC Diagram and Equipment List

2.17.2.3 Drawing OE-601-101, Rev. C, General Arrangement

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

5.17.2.5 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.17.2.6 Drawing 631-623-3576 – Paint Schedule

5.17.2.7 Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP 1), Solvent Cleaning

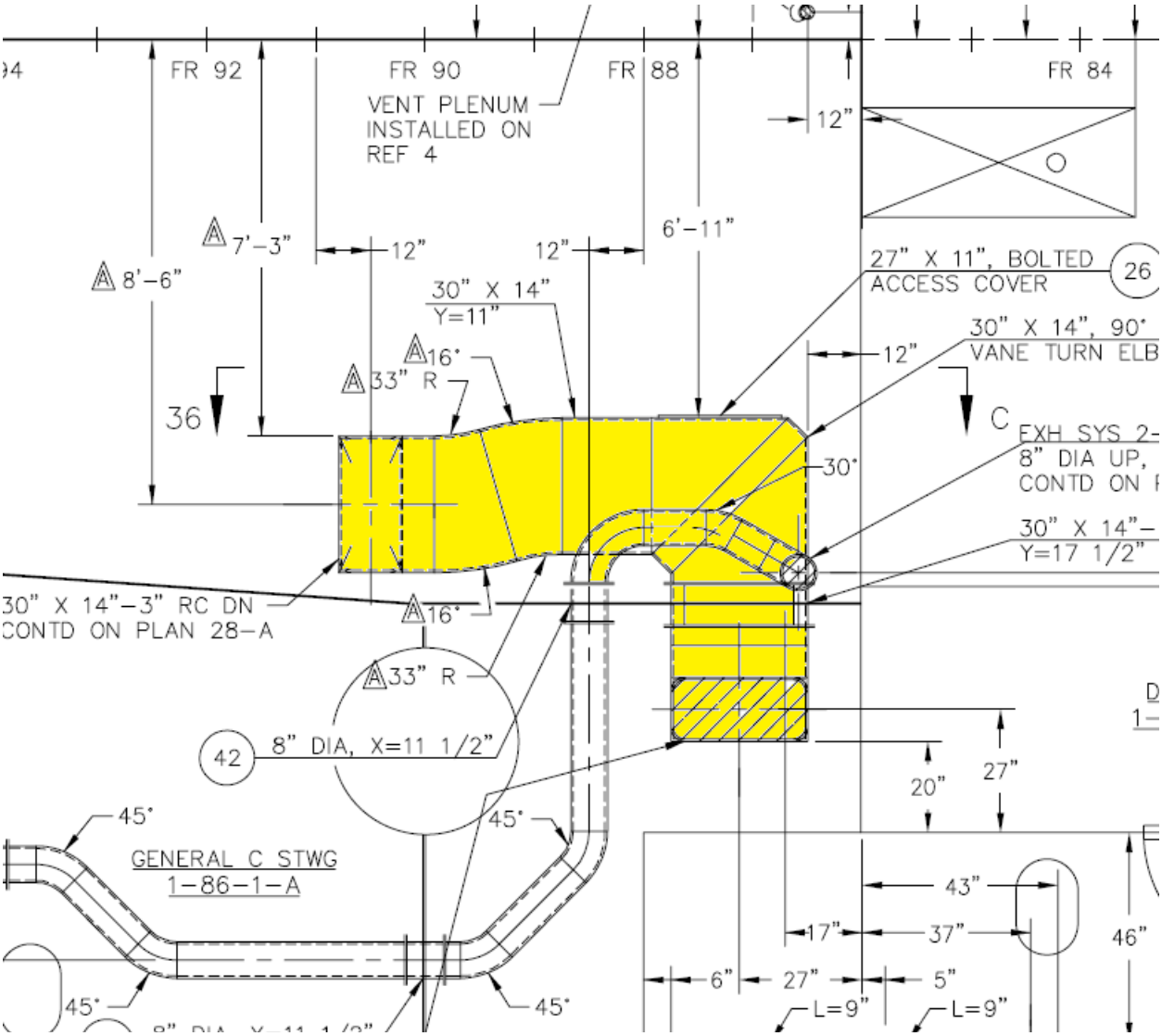
5.17.2.8 Steel Structures Painting Council Surface Preparation Specification No. 11 (SSPC-SP 11), Power Tool Cleaning to Bare Metal

5.17.3 Government Furnished Equipment

5.17.3.1 None

5.17.4 Requirements

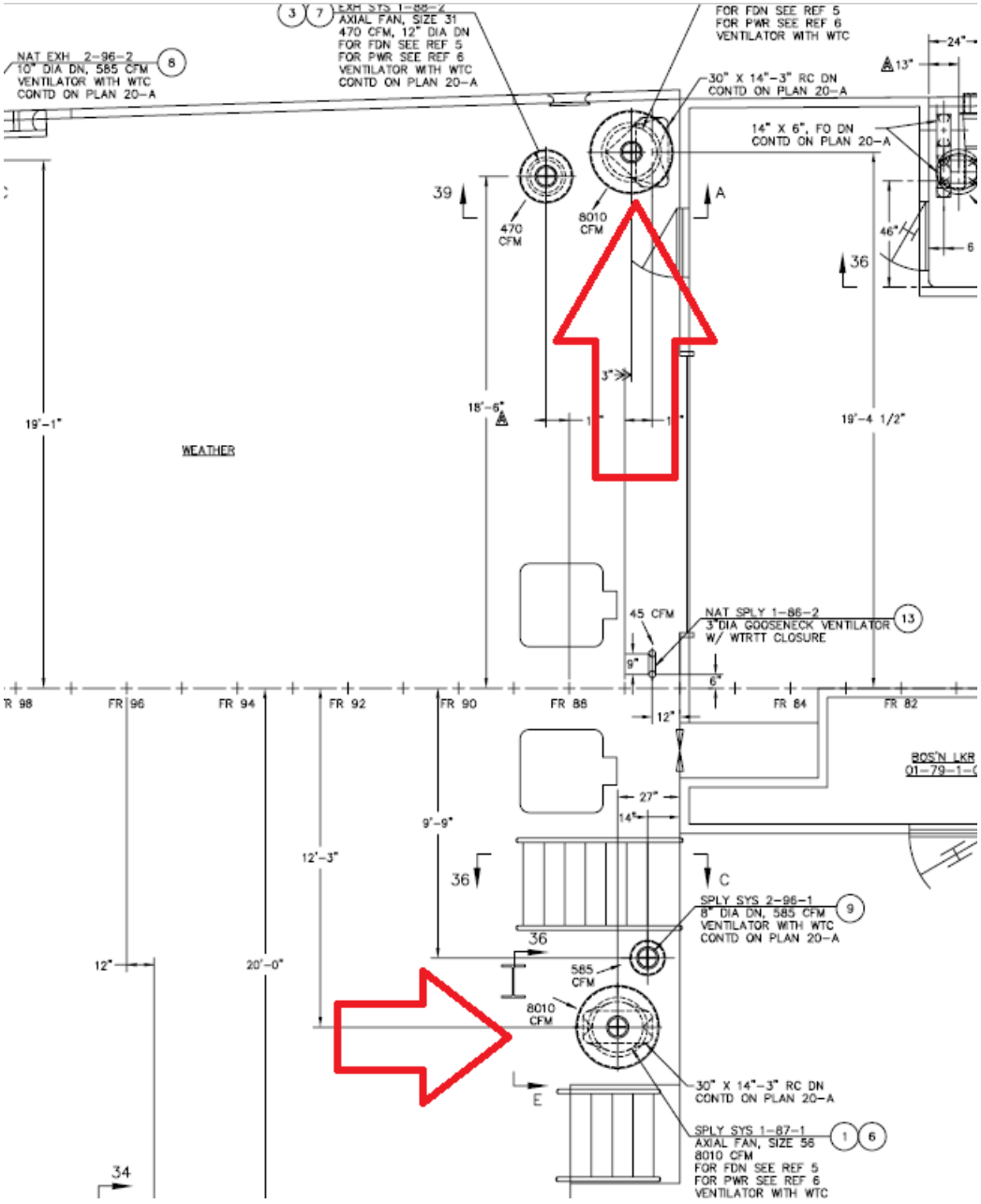
5.17.4.1 Crop out and remove rectangular ventilation duct in the following pictures (highlighted in yellow – located in mission deck void). See references 5.17.2.1 and 5.17.2.2 for additional information. Replaced in kind 14 linear feet of ventilation ducting highlighted in the following picture. Install new ducting and seal. Ducting shall 12-guage and painted to white to match surrounding.

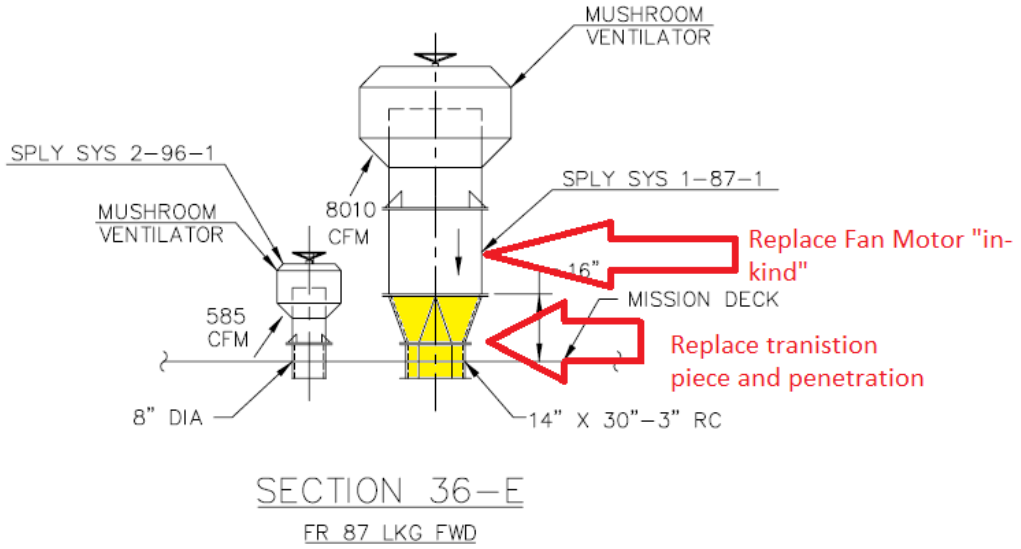


5.17.4.1.1 Crop out and replace in kind the ventilation duct penetration associated with 5.17.4.1(located on the mission deck and shown in the following picture.) New vent shall be 4-gauge thickness and painted to match surrounding.



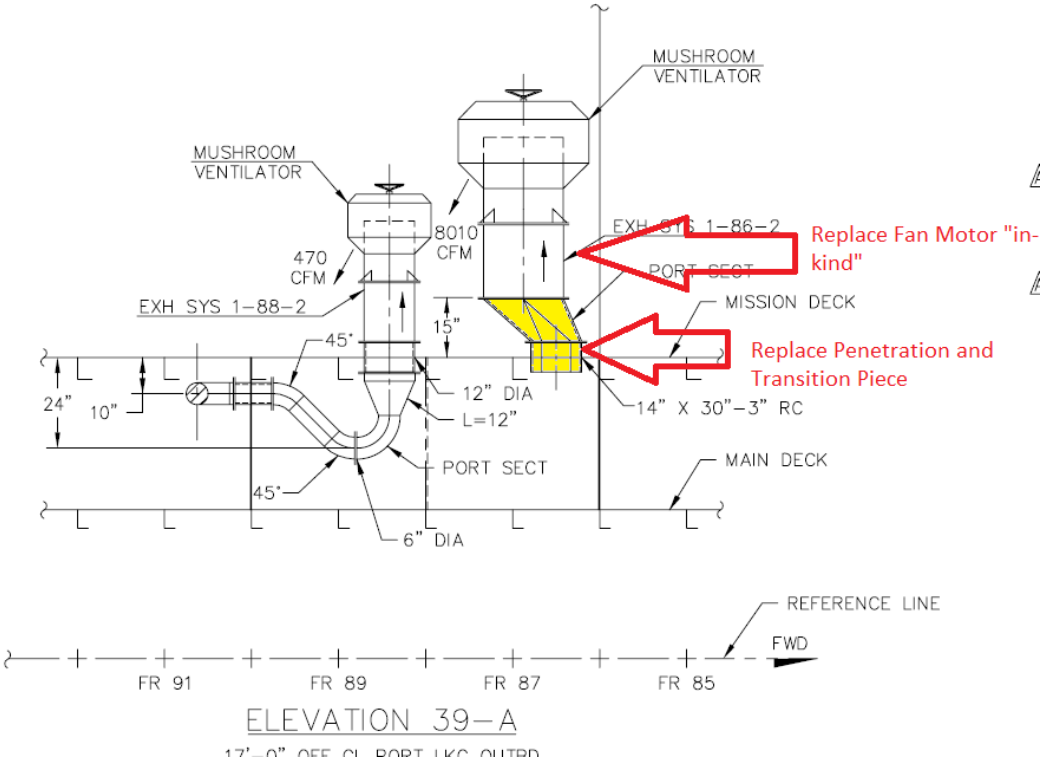
5.17.4.2 Remove transition pieces and penetrations for the two circular vents (located on the mission deck) shown in the following images and highlighted in yellow. Manufacture replacement transition pieces to replace old with 8-gauge steel. Paint and install new transition pieces. Manufacture penetrations from 4 gauge steel and install. Paint new penetration pieces.


NAT EXH 2-96-2
10" DIA DN, 585 CFM
VENTILATOR WITH WTC
CONTD ON PLAN 20-A
8
EXH SYS 1-86-2
AXIAL FAN, SIZE 31
470 CFM, 12" DIA DN
FOR FDN SEE REF 5
FOR PWR SEE REF 6
VENTILATOR WITH WTC
CONTD ON PLAN 20-A
FOR FDN SEE REF 5
FOR PWR SEE REF 6
VENTILATOR WITH WTC
30" X 14"-3" RC DN
CONTD ON PLAN 20-A
14" X 6", FD DN
CONTD ON PLAN 20-A
39
470 CFM
8010 CFM
A
36
46"
19'-1"
WEATHER
18'-6"
19'-4 1/2"
3"
45 CFM
NAT SPLY 1-86-2
3"DIA GOOSENECK VENTILATOR
W/ WTRTT CLOSURE
13
FR 98
FR 96
FR 94
FR 92
FR 90
FR 88
FR 84
FR 82
12"
27"
14"
9'-9"
12'-3"
C
SPLY SYS 2-96-1
8" DIA DN, 585 CFM
VENTILATOR WITH WTC
CONTD ON PLAN 20-A
9
585 CFM
8010 CFM
E
30" X 14"-3" RC DN
CONTD ON PLAN 20-A
SPLY SYS 1-87-1
AXIAL FAN, SIZE 58
8010 CFM
FOR FDN SEE REF 5
FOR PWR SEE REF 6
VENTILATOR WITH WTC
1
6
20'-0"
34



SECTION 36-E

FR 87 LKG FWD



ELEVATION 39-A

5.17.4.3 Crop out and replace (in kind) an additional rectangular ventilation duct transition piece as shown in the follow picture. Thickness shall be the same as existing (assume 4-gauge). For bidding purposes, assume duct dimensions are 30 inch x 14 inch and 16 inches

long. Paint to match surrounding.

5.17.4.3.1 Procure and install two (2) 5.0 HP 460 volt, 3 PH Axial Fan motors (Model # 56JM/20/2/3 or equivalent) as identified as Part Number #3 in the Equipment List (Page 1) of Reference 5.17.2.2.

5.17.4.3.2 Overhaul old fan motors. Replace end bearings and seals. Inspect and turn down shafts as required. Clean, dip and bake windings. Test insulation readings following dip and bake. Blast and repaint motor housing. Provide CFR to COR with all work complete and findings to include type and part number of bearings installed.

5.17.4.4 Prepare and paint 1,200 square feet inside the mission deck void to an SSPC-11 standard and solvent wipe in accordance with SSPC-1.



5.17.4.5 Apply the following (or equivalent) paint system to the entire

prepared

(d) One full coat of International Intershield 300V, 6 mils DFT (Color – bronze)
(e) One full coat of International Intertuf 262, 6 mills DFT (color - red)
(f) (one full coat of International Intergard 263, 5 mills DFT (color – white)

5.17.4.6 Inside Vent Trunk S-2-68-2 (see reference 5.17.2.2), crop out and replace four (4) 3 feet by 3 feet sections of ducting. Crop out and replace 24 non-continuous linear feet of ¼ inch x 2 inch flatbar. Additionally, crop out and replace the bottom side and lower 3 feet of all four sides of the trunk and replace in kind. For bidding purposes, assume thickness of all steel is ¼ inch. Repair all paint in accordance with 5.17.4.5.

5.17.4.6.1 In addition to 5.17.4.6, remove and replace the vent transition/penetration piece between the Vent Trunk S-2-68-2 and the motor propulsion room. For estimating purposes, assume piece is rectangular 30 inches by 46 inches, 8-gauge thickness. Repair all paint in accordance with 5.17.4.5.

5.17.5 Quality Assurance

5.17.5.1 In accordance with References 5.17.2.1 through 5.17.2.6

5.17.5.2 Reinstall all vents with new gasket material

5.17.5.3 Repair all non-skid damaged by work

5.17.6 Notes

5.17.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.18 TRANSDUCER MOON PIPES REPLACEMENT

5.18.1 Intent

5.18.1.1 Crop out, remove and replace three transducer moon pipes running from the hospital to transducer fairing.

5.18.2 References:

5.18.2.1 Drawing OE-601-101 – General Arrangement

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

5.18.2.3 NOAA Standard Specification MOC-000-1G, General Requirements for Ship Repair

5.18.2.4 Drawing 631-623-3576 – Paint Schedule

5.18.2.5 Drawing OE-165-101 Rev B – Transducer Fairing Structural Mods

5.18.2.6 Drawing OE-303-101 Rev C – Transducer Array Moon Pipes Installation

5.18.3 Government Furnished Equipment

5.18.3.1 None

5.18.4.9.1 Working with the COR, Mission Systems Engineer (MSE) and ship’s force, disconnect and remove all transducer cables going through the transducer pipes (referred to as moon pipes) running from the hospital to the transducer fairing and protect (approximately 77 total) These are the same transducer cable pipes referenced in 3.19.4.9. See Reference 5.18.2.6 for additional information on transducer pipes (moon pipes). This is not the same moon pipe referenced in 3.11 (Picture below is of moon pipes taken from inside the transducer fairing).



5.18.4.9.2 Crop out and remove existing moon pipes (3 total) and replace with same size schedule 160 seamless pipes. Replacement of pipes shall be from hospital cable plenum to transducer fairing. Ends of pipes shall be rounded smooth similar to what is shown in previous picture prior to installation to prevent chaffing of cables. COR shall inspect rounded ends prior to installation. Grinding will not be an acceptable method of providing rounded ends on pipes.

5.18.4.9.3 Pipes shall be internally painted with primer and anti-corrosive paint prior to installation. All burned paint shall be repaired including pipe internals

5.18.4.9.4 Crop out and replace in kind transducer junction box and access box (shown in the picture below) – dimensions are approximately 3ft x 3ftx 2 feet. Assume thickness is 1/4 inch. Crop out and replace deck below access panel around each of the three transducer moon pipes. Fir bidding purposes, assume thickness is 3/8 inch. Paint all surfaces to match existing.



5.18.4.9.4.1 Contractor shall use care when working inside the transducer trunk to prevent damage to any transducer or component. Contractor shall inspect transducer trunk prior to commencing work and submit a CFR to document any issues found prior to the commencement of work.

5.18.4.9.5 Contractor shall reinstall all removed and rolled back cables and reconnect with the oversight of the COR and MSE. Perform inspection of connections and finalized work with MSE. Test Transducers during dock trials and sea trials.

5.18.4.9.6 Repairs shall be completed before engine room void painting is completed

5.18.5 Quality Assurance

5.18.5.1 In accordance with 5.18.2.3

5.18.5.2 Contractor shall provide all welder certification and material certifications to ABS and COR upon completion of the repairs.

5.18.5.3 All repairs shall be surveyed, inspected and be to the satisfaction of the onsite ABS surveyor.

5.18.6 Notes

5.18.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.19 INVERTED TANK VENT REPLACEMENT

5.19.1 Intent

5.19.1.1 Remove damaged/corroded inverted tank vents and air escape pipes and replace in kind

5.19.2 References

5.19.2.1 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.19.2.2 Drawing 631-623-3576 – Paint Schedule

5.19.2.3 Drawing OE-506-101 – "NOAA Ship Okeanos Explorer Air Escapes, Sounding Tubes & Overflows PP MOD"

5.19.2.4 Drawing 506-623-3845 – "Overflow, Air Escape and Sounding Tubes Arrangement"

5.19.2.5 Inverted Vent Replacement Supplemental Photos (PDF)

5.19.2.6 EX Weather Deck Penetration Survey (Excel)

5.19.2.7 EX Weather Deck Penetration List (PDF)

5.19.3 Government Furnished Equipment

5.19.3.1 None

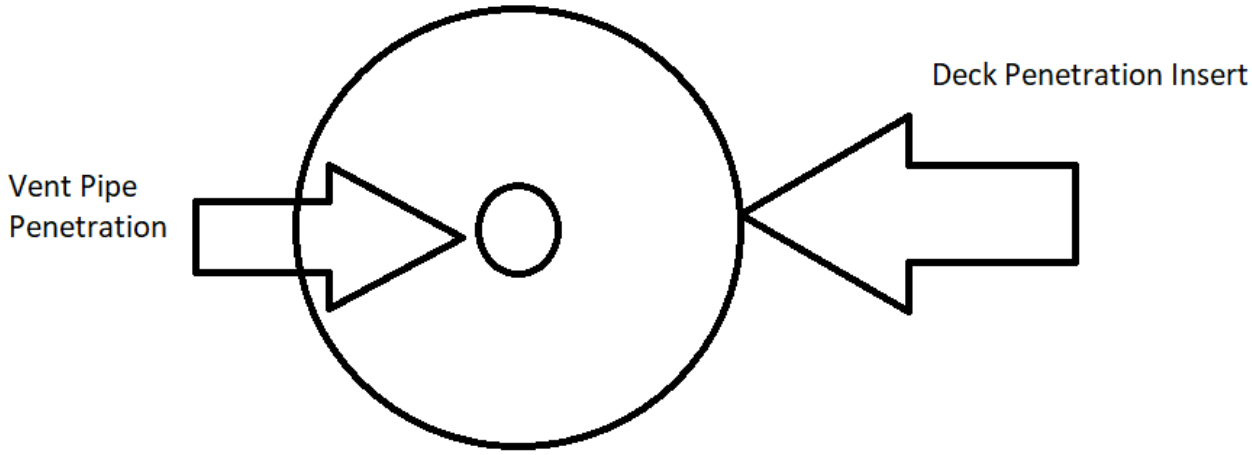
5.19.4 Requirements

5.19.4.1 Remove the Air Escapes on the end of the following tank vents and retain:

4-6-1 (Fuel Oil) QTY-2
4-6-2 (Fuel Oil) QTY-2
4-14-1 (Fuel Oil) QTY-2
4-14-2 (Fuel Oil) QTY-2
4-52-1 (Fuel Oil) QTY-2
4-52-2 (Fuel Oil) QTY-2
4-52-3 (Fuel Oil)
4-52-4 (Fuel Oil)
4-72-1 (Fuel Oil) QTY-2
4-72-2 (Fuel Oil)

4-72-1/2 (Fuel Oil)
4-72-3 (Fuel Oil)
4-72-4 (Fuel Oil)
2-60-1 (Lube Oil Storage)
2-60-2 (Lube Oil Storage)
3-34-2 (Lube Oil Settling)
4-60-3 (Oily Waste)
4-60-4 (Oily Waste)
4-6-0 (Void)
4-34-0 (Void)
4-34-01 (Void)
3-23-1 (Waste Water)
Sewage Tank
3.5-52-1 (Potable Water)
3.5-52-2 (Potable Water)
EDG Fuel Tank

5.19.4.2 Crop out and remove vent piping to each vent to include all above deck piping to include threaded end and flanges and 36 inches below the exterior deck of each vent. Crop out a steel penetration insert around each vent pipe penetration in the deck no smaller than 18 inches in diameter



View of Pipe and Steel Replacement looking down

5.19.4.3 Renew removed vent piping to include all above deck piping, flange and 36 inches below the exterior deck. New piping shall be

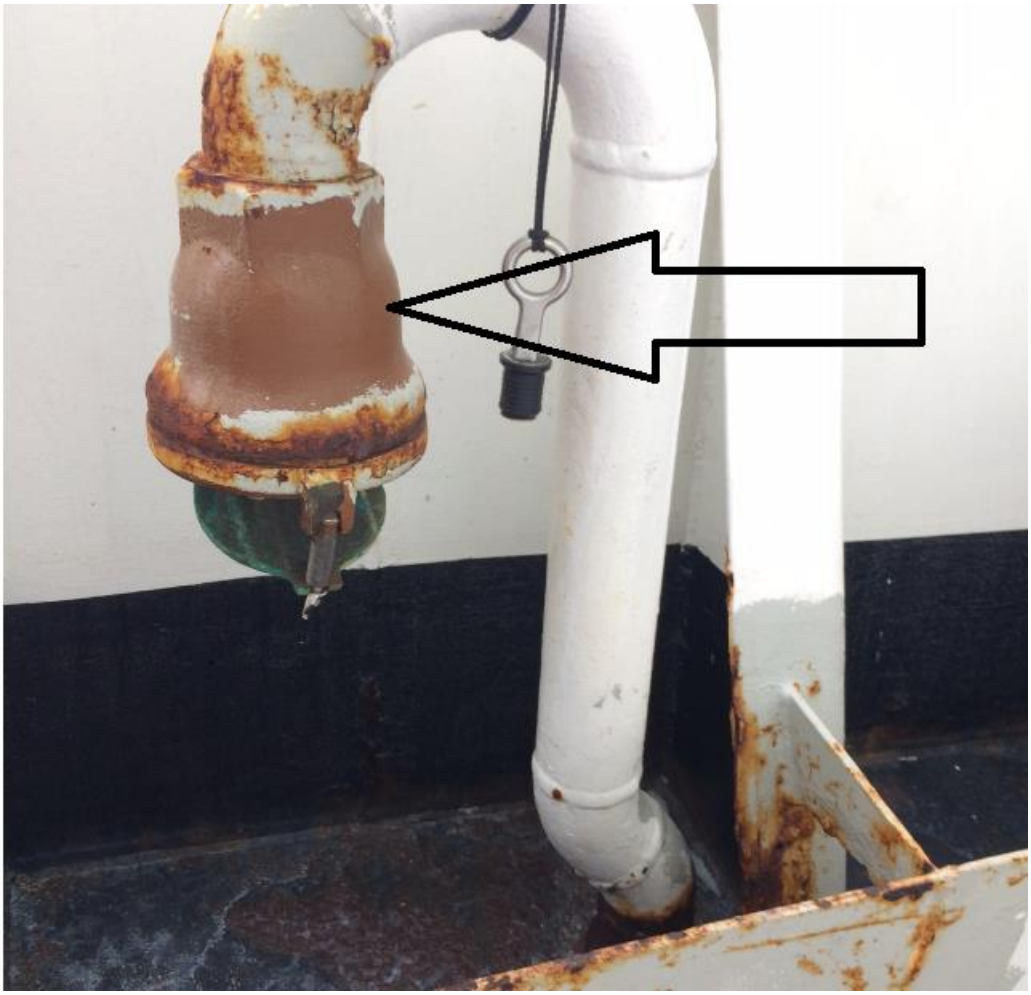
schedule 80 – 316L stainless steel and be the same size, shape, length as existing.

5.19.4.4 Replace removed 18 inch deck insert with stainless steel insert to be same shape and thickness as existing. Steel plating shall be stainless 316L. Assume ½ inch thickness for bidding purposes.

5.19.4.5 All welding shall be either MIG or TIG welding using 309L filler material.

5.19.4.6 Paint all new and disturbed areas to match surrounding using reference 5.23.2.2 as a guide.

5.19.4.7 Remove all removed vents (example shown in the picture below) and transport to an indoor facility. Vents shall be tagged with shipboard location prior to removal from ship to ensure they are reinstalled in the correct location.



5.19.4.8 Disassemble, overhaul and clean all vent components. Wire wheel clean all hardware and clean all interior and exterior surfaces and interfaces. Remove all scale, rust, paint, dirt, grime and marine growth. Exterior paint shall be removed to an SSPC-10 or SSPC-11 standard. Perform joint inspection of cleaned components (while still disassembled) with Project Manager and COR. Submit a CFR with any notable findings.

5.19.4.9 Repaint and re-preserve exterior of vent to match existing color (Fuel/Brown; L.O.-Yellow; Potable Water/Blue; etc).

5.19.4.10 Reassemble vents using anti-sieze (or equivalent) compound on all hardware and reinstall aboard ship with new gasket material.

5.19.4.11 Prove all pipes and air escapes are clear of obstruction following all repairs.

5.19.5 Quality Assurance

5.19.5.1 All welders shall be certified in the weld process and filler material used. Weld certificates shall be provided to the COR upon request.

5.19.5.2 In accordance with 5.19.2.1

5.19.5.3 All repairs shall be completed, tested and inspected in accordance with the onsite ABS surveyor

5.19.5.4 Provide all material certificates to COR

5.19.5.5 Repair all paint and non-skid affected by this work item.

5.19.5 Quality Assurance

5.19.5.1 All repairs shall be completed, tested and inspected in accordance with the onsite ABS surveyor

5.19.5.2 In accordance with Reference 5.19.2.1

5.19.5.3 All welds shall be completed by a welder who is certified to weld in the process and filler material used

5.19.6 Notes

5.19.6.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

5.19.6.2 Reference 5.19.2.3 shows updates that occurred to reference 5.19.2.4 during the conversion in 2008.

5.19.6.3 References 5.19.2.5, 5.19.2.6 and 5.19.2.7 show additional information and pictures of vents

END OF ITEM

5.20 UPGRADE IMO SOUNDER

5.20.1 Intent

5.20..1.1 Provide all labor, material, equipment and sub-contractors to upgrade the Furuno FE700 sounder to the FE800.

5.20.2 References

5.20.2.1 OE-426-101 - Rev G - Ship Electronics Systems BWD)

5.20.2.2 OE-601-101_Rev - (General Arrangement)

5.20.2.3 FE800 Installation Manual

5.20.2.4 FE800 Brochure

5.20.3 Government-Furnished Material

5.20.3.1 None

5.20.4 Requirements

5.20.4.1 Supply the services of a qualified, certified Furuno Engineer experienced with the installation of a FE800 system. The Engineer shall be on site to verify the operation of the existing system, prior to removal of old system, review the installation plan with the contractor, and after the installation of the system components to complete the cable connections and commission. The Furuno Engineer shall also provide up to four hours of informal operational and maintenance training on the certified system with up to eight NOAA staff members.

5.20.4.2 Prior to drydocking the vessel and the removal of any equipment, the Furuno Engineer in conjunction with the Ship’s ET, shall verify the dockside operation of the existing FE700, the data output is properly received by the vessel’s SCS (Scientific Collection System), ancillary systems, ECDIS, and all remote displays, Reference 5.20.2.2.

5.20.4.3 In conjunction with the Ship’s ET, follow log out and tag out procedures to secure power to the FE700.

5.20.4.4 Prior to any removals of equipment, accurately label all cables so they can be reused with the new installation.

5.20.4.5 Under the direction of the Furuno Engineer, disconnect and remove the FE700 display unit (Bridge). The contractor shall supply and

install a new Furuno FE810 display (P/N FE800DISP) and Bracket Assembly with Knobs (P/N OP26-8, Code no.: 000-016-313-00) in the same location as directed by the COR. Supply materials (aluminum) for, construct and install a new mounting bracket similar to the existing, to accept the new display/bracket assembly and mount to the bulkhead in the same location of the existing mount. Prime and paint to match surrounding color, references 5.20.2.1, 5.20.2.2, 5.20.2.3, 5.20.2.4.

5.20.4.6 Under the direction of the Furuno Engineer, disconnect and remove the FE700 Transceiver unit (Bridge). Contractor shall supply and install a new Furuno FE8020 Transciever unit (FE-8020)in the same location as directed by the COR, referencing 5.20.2.1, 5.20.2.2, 5.20.2.3, 5.20.2.4.

5.20.4.7 The contractor shall supply and install all required new cables between the Display, Transceiver unit, and ancillary devices as specified by the Furuno Engineer. Cables shall be rated for use in a Marine environment (plenum).

5.20.4.8 The Furuno Engineer shall provide all connectors and terminations and make all wiring connections the new and existing system components per reference 5.20.2.3, and 5.20.2.4., and also provide to the COR a complete, accurate redline markup of reference 5.20.2.2 for the new installation.

5.20.4.9 The Furuno engineer shall verify the installation, wiring, connections, grounding, initially power, upload the latest firmware, configure all menu settings, dockside commission the system as outlined in reference 5.20.2.3, and 5.20.2.4.

5.20.4.10 Repair all insulation and paint to match surrounding.

5.20.4.11 All affected MCT’s shall be repacked and pass a light test

5.20.5 Quality Assurance

5.20.5.1 Demonstrate proper operation to the COR of the newly installed system at the dock and that all remote displays, ship’s SCS system, and ancillary systems are properly receiving and displaying data.

5.20.5.2 Provide the COR a fully updated and accurate red line mark up of Reference 5.20.1.2 showing the complete system installation details including but not limited to, component part numbers, all wiring connection points, connectors and pins.

5.20.5.3 Provide the COR a written table of all menu setting of the

fully certified system.

5.20.6 Notes

5.20.6.1 Drawings are provided as sources for providing information. The government cannot guarantee the accuracy of these drawings.

5.20.6.2 Warranty start date shall be the date of system acceptance.

5.20.6.3 The existing transducer and interface will be re-used.

5.20.6.4 Possible sources for a certified Furuno Engineer;

Drew Linzey; Furuno East Coast Regional Manager
dlinzey@furuno.com
(410) 479-4420 Office
(443) 366-7547 Cell

Bart Disher; Furuno South and West Coast Regional Manager
bdisher@furuno.com
Direct (360) 833-5005
Cell (503) 490-8232

5.20.6.5 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.21 HVAC DCUCT CLEANING

5.21.1 Intent

5.21.1.1 Clean all exhaust and supply heating, ventilation and air-condition ducting on the ship

5.21.2 Reference

5.21.2.1 NOAA Standard Specification MOC-510-1B, HVAC Cleaning

5.21.2.2 Drawing No. OE-512-6233792, Rev D, "Heating Ventilation & Air Conditioning Diagram"

5.21.2.3 Drawing No.OE-5123-6233797, Rev K, “HVAC Lower Platform”

5.21.2.4 Drawing No. OE-512-6233799, Rev C, “HVAC Standard Notes & Details”

5.21.2.5 Drawing No. OE-512-6233800, Rev E, “HVAC Upper Deck and Above”

5.21.2.6 Drawing No. OE-512-6233801, Rev G, “HVAC Main Deck”

5.21.2.7 Drawing No. OE-512-6233802, Rev D, “HVAC Forecastle Deck”

5.21.2.8 Drawing No. OE-512-6233805, Rev B, “HVAC Operating Placard”

5.21.2.9 Drawing No. OE-510-002, “HVAC Diagram & Equipment List”

5.21.2.10 Drawing No. OE-510-102, “HVAC Diagram and Equipment List”

5.21.2.11 Drawing No. OE-510-103, Rev A, “HVAC Sys Mods – ROV Garage& Workshop AFT FR 72”

5.21.2.12 Drawing No. OE-510-104, Rev B, “Mission Deck & Below HVAC SYS Mods”

5.21.3 Government Furnished Equipment

5.21.3.1 None

5.21.4 Requirements

5.21.4.1 Clean all HVAC systems in their entirety, from inlet trunk or duct, to fan, and from fan through entire duct distribution system in

accordance with Reference 5.21.2.1 with the following additional requirements. Use References 5.21.2.1 through 5.21.2.12 as guides.

5.21.4.1.1 Use of a skipper hose, per paragraph 3.2.4.a. of Reference 5.21.2.1, is not required in round ducts, provided a system using single, round brushes, each matched to various duct diameters, is used to clean the entire inside of the ducts

5.21.4.1.2 The system using dry ice for duct cleaning is not authorized in this contract.

5.21.4.1.3 Ship's fans cannot be used to facilitate duct cleaning.

5.21.4.1.4 Remove grease and debris from all inside surfaces of Galley Exhaust System, E01-48-3.

5.21.4.1.5 Accomplish joint inspection with COR of all HVAC Return and Recirculation systems. Inspect all ducts, along with all items installed in each system, to include fans, dampers, and heaters. Conduct visual inspections. Provide condition report identifying findings using a spreadsheet or table, with columns in which each system, and system components, are identified, along with an associated row for findings and recommendations.

5.21.4.1.6 Remove all existing inspection and access covers inducts for inspection. Remove all existing registers and terminals for inspection. Reinstall covers, registers, and terminals upon completion of inspection.

5.21.5 Quality Assurance

5.21.5.1 In accordance with 5.21.2.1

5.21.6 Notes

5.21.6.1 References depict modifications accomplished during conversion to NOAA Ship *OKEANOS EXPLORER* to original as-built system drawings from 1988. Original drawings are not red-lined.

5.21.6.2 Contractors are encouraged to review ship's drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of

contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.22 JOINER BUNK BED REPLACEMENT

5.22.1 Intent

5.22.1.1 Replace several joiner bunk beds throughout the ship with larger 42-inch wide bunk beds to match the rest of the shipboard berthing. Current bunk beds are 36 inches wide.

5.22.2 References

5.22.2.1 Drawing OE-601-101_Rev - (General Arrangement)

5.22.2.2 NOAA Standard Specification No. AMC-000-1G, "General Requirements for Ship Repair Work on NOAA Ships."

5.22.3 Government Furnished Equipment

5.22.3.1 None

5.22.4 Requirements

5.22.4.1 Disconnect, detach and remove the bunk beds in the following spaces and discard:

01-42-2: (QTY - 1) double bunk bed
01-24-2: (QTY – 1) double bunk bed
01-14-3: (QTY – 2) double bunk beds

5.22.4.2 Purchase and install new bunk beds of the same type and quality as existing that are 42 inches wide (see pictures under section 5.22.6.1). New beds shall have 3 drawers under bottom bunk and a single ladder. New beds shall be installed in same location as existing with final location approval provided by COR.

5.22.4.3 Remove black-out curtains and curtain holdbacks from exiting bunk beds and install on new bunk beds.

5.22.4.4 Bed color shall be same as existing

5.22.4.5 Repair all affective base trim, flooring, paint and insulation.

5.22.4.6 New bunk beds shall be the same approximate height as existing.

5.22.4.7 New bunk beds shall be approved by COR prior to installation

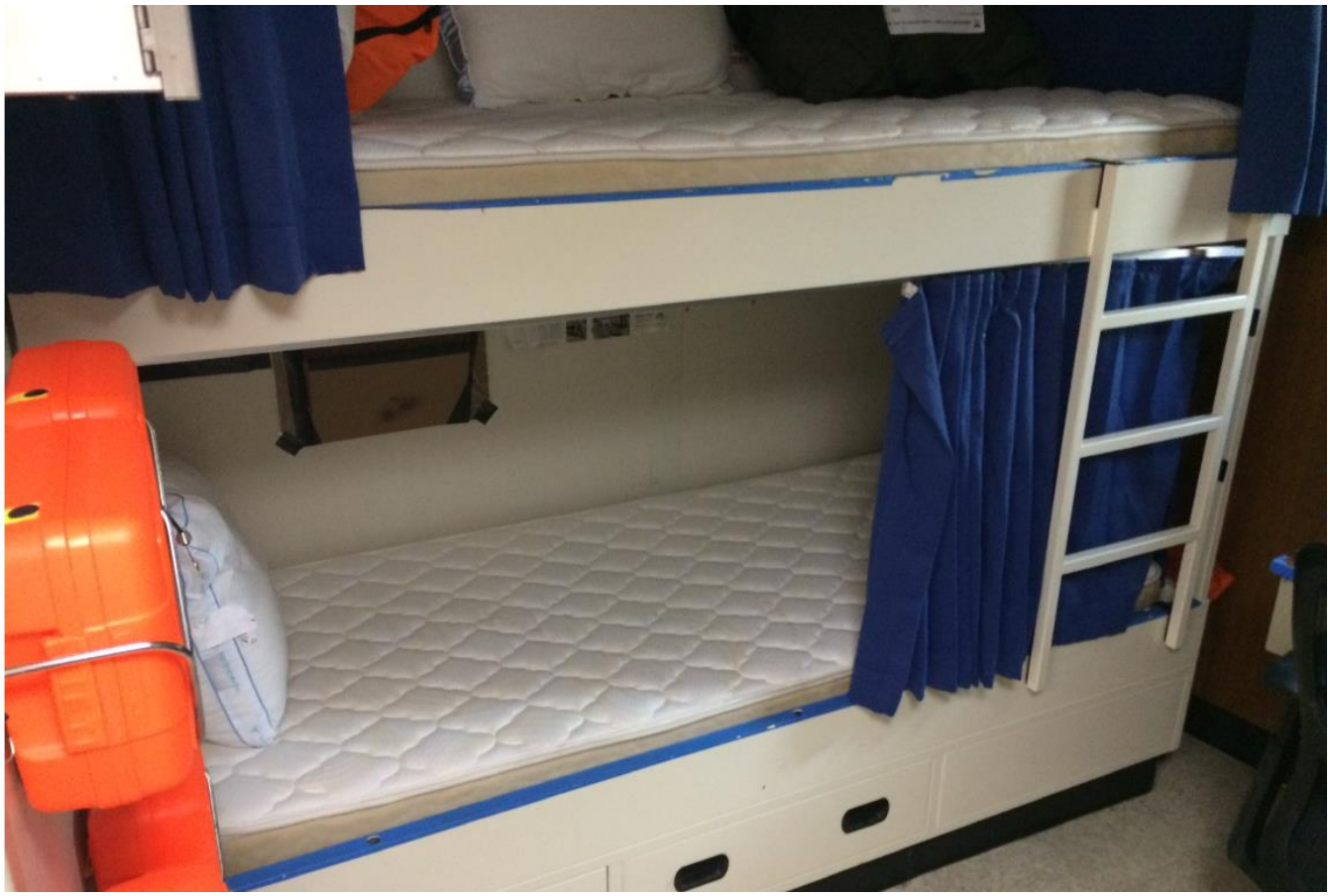
5.22.5 Quality Assurance

5.22.5.1 Contractor shall perform joint inspection of new bunk beds after installation to ensure all drawers work, areas are cleaned, curtains installed and no sharp edges exist.

5.22.5.2 In accordance with 5.22.2.2

5.22.6 Notes

5.22.6.1 Pictures of Current Bunk Beds:





5.22.6.2 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.23 HULL LASER SCAN

5.23.1 Intent:

5.23.1.1 Perform a 3D laser scan of the Okeanos Explorer's exterior hull shell and decks and dock floor and sidewalls and provide the results in the 3D CAD format.

5.23.2 References

5.23.2.1 Drawing OE-601-101 General Arrangement

5.23.2.2 Drawing No. OE-085-001 Rev F, "Docking Plan

5.23.3 Government Furnished Equipment

5.23.3.1 None

5.23.4 Requirements

5.23.4.1 Item 5.5 Resurvey Scientific Equipment must be completed prior to execution of this work item.

5.23.4.2 The contractor shall use references 5.23.2.1 and 5.23.2.2 to conduct the 3D laser scan of the vessel.

5.23.4.3 The Contractor shall provide the services of qualified, certified marine 3D surveyor with the experience and knowledge to conduct a three-dimensional (3D) laser scan model identifying hull and deck deformations in 3D CAD format.

5.23.4.4 The contractor shall perform a 3D laser scan of the vessel's hull (sides, bottom, and transom), deck, shaft struts and shafts, and the dock floor to obtain the 3D point cloud and provide a registered, reduced point cloud data set.

5.23.4.5 The 3D laser scan point cloud accuracy shall be within +/- 2mm local scans and 5mm global scan alignment for the hull and deck surfaces. A point cloud reduction process shall be conducted to determine the shell plating deformations including an average of the deck non-skid covering to show the underlying plate deformations by averaging points over a 20mm grid on the hull. The point cloud of hull appendages shall be reduced over a 1mm grid.

5.23.4.6 The contractor shall convert the 3D point cloud to a format that can be used to generate a 3D model of the vessel in 3D AutoCAD software. The contractor shall digitally remove staging interferences located around the hull of the vessel.

5.23.4.7 All data, regardless of form or medium shall be the sole property of the National Oceanic and Atmospheric Administration and shall not be released without written consent from the Government.

5.23.4.8 The contractor shall provide a neatly organized model of the vessel using layers and color contour images of the surface comparisons. The contractor shall provide the 3D Point Cloud in AutoCAD format files and deliver them in electronic format to the Port Engineer within three weeks after conducting the Laser Scan. Include all photographs, illustrations, charts, graphs, tables, algorithms, recommendations, etc.

5.23.4.9 Survey must be done while the ship is in drydock and when weather conditions are optimal for the most accurate measurements. Survey may not be performed in rain or fog.

5.23.5 Quality Assurance

5.23.5.1 If suggested surveyor is not available, the COR shall certify the credentials of an alternate source prior to shipyard commitment.

5.23.5.2 Report delivered to the COR with all data requested.

5.23.6 Notes:

5.23.6.1 References are provided as sources for providing guidance only.

5.23.6.2 Suggested source for a 3D marine surveyor;

Bob Blair <CBlair@westlakeconsultants.com>
WESTLAKE CONSULTANTS
15115 SW Sequoia Parkway, Suite 150
Tigard, OR 97224
503.684.0652

5.23.6.3 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

5.24 MAIN SWITCHBOARDS, EMERGENCY GENERATOR SWITCHBOARD AND STEP-DOWN TRANSFORMERS; CLEAN, INSPECT, AND TORQUE

5.24.1 Intent

5.24.1.1 Open and clean shipboard switchboard and transformer. Clean, inspect and torque bolts.

5.24.2 References

5.24.2.1 Drawing 301-623-3694 – General Arrangement of Misc. Electrical Equipment Lower Platform

5.24.2.2 Drawing 301-623-3699 – General Arrangement of Misc. Electrical Equipment Hold Level

5.24.2.3 Drawing 301-623-3709 – General Arrangement of Misc. Electrical Equipment Main Deck

5.24.2.4 Drawing 301-623-3710 – General Arrangement of Misc. Electrical Equipment Focsle Deck

5.24.2.5 Drawing 301-623-3711 – General Arrangement of Misc. Electrical Equipment Upper Deck & Above

5.24.2.6 Drawing OE-320-001 – Electrical One-Line Diagram

5.24.2.7 Drawing OE-320-103 – Electrical Load Analysis

5.24.2.8 Drawing 320-623-3663 – Electrical One-Line Diagram

5.24.2.9 Drawing 320-623-3681 – Load Analysis

5.24.2.10 Drawing 320-623-3714 – Power List of Feeders and Mains

5.24.2.11 Drawing 320-623-3719 – Protective Device Coordination and Circuit Breakers

5.24.3 Government Furnished Material

5.24.3.1 None.

5.24.4 Requirements

5.24.4.1 Clean and inspect the 600 volt switchboard, the 450 volt

ships service switchboard, the Emergency 450 VAC switchboard, and the 600/450 volt step-down transformers as follows. Torque all panel and bus connections.

5.24.4.2 Comply with all requirements of the ship's Tag-Out Program. The ship's Chief Engineer is to administer the Tag-Out Program. Prior to the start of work, the contractor shall contact the NOAA Port Engineer and/or the Chief Engineer to coordinate the implementation of the Tag-Out Program for the entire performance period of this item.

5.24.4.3 Provide the services of a Field Engineer that is familiar with and has worked onboard ships with this type of General Electric plant. Also, provide two (2) first-class shipyard electricians who will work as directed by the Field Engineer to clean, inspect, and re-tighten fasteners and perform corrective maintenance in this specification. It is anticipated that five (5) working days will be required for this work.

5.24.4.4 Rack out, remove arc chutes, inspect contacts, clean, lubricate and adjust the following circuit breakers:

(a) Four (4) SSDG Breakers

(b) One (1) EDG breaker.

(c) Three (3) ships service transformer feeder breakers.

(d) All other 600 VAC and 450 VAC power breakers shall be cleaned and inspected.

(e) One Emergency Generator Switchboard

5.24.4.5 Open, clean, inspect, and provide primary and secondary megger readings on the 600V/450V transformers located in the aft stbd corner of the Main Generator Room.

5.24.5 Quality Assurance

5.24.5.1 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.

5.24.5.2 All switchboard, breakers, panels and transformers will be jointly inspected by the contractor and COR prior to acceptance.

5.24.6 Notes

5.24.5.1 Contractors are encouraged to review ship’s drawings, reference documents and submit written questions requesting any needed additional details, photos, or measurements necessary to provide an accurate bid package prior to submitting a bid proposal. These questions should satisfy potential contractors regarding all general and local conditions, compatibility, locations, material sizes and types, components, and accessibility that may affect the cost of contract performance, to the extent that the information is reasonably obtainable. In no event shall failure to submit questions constitute grounds for growth work, a change order or claim after contract award.

END OF ITEM

END OF OPTION ITEMS SPECIFICATION