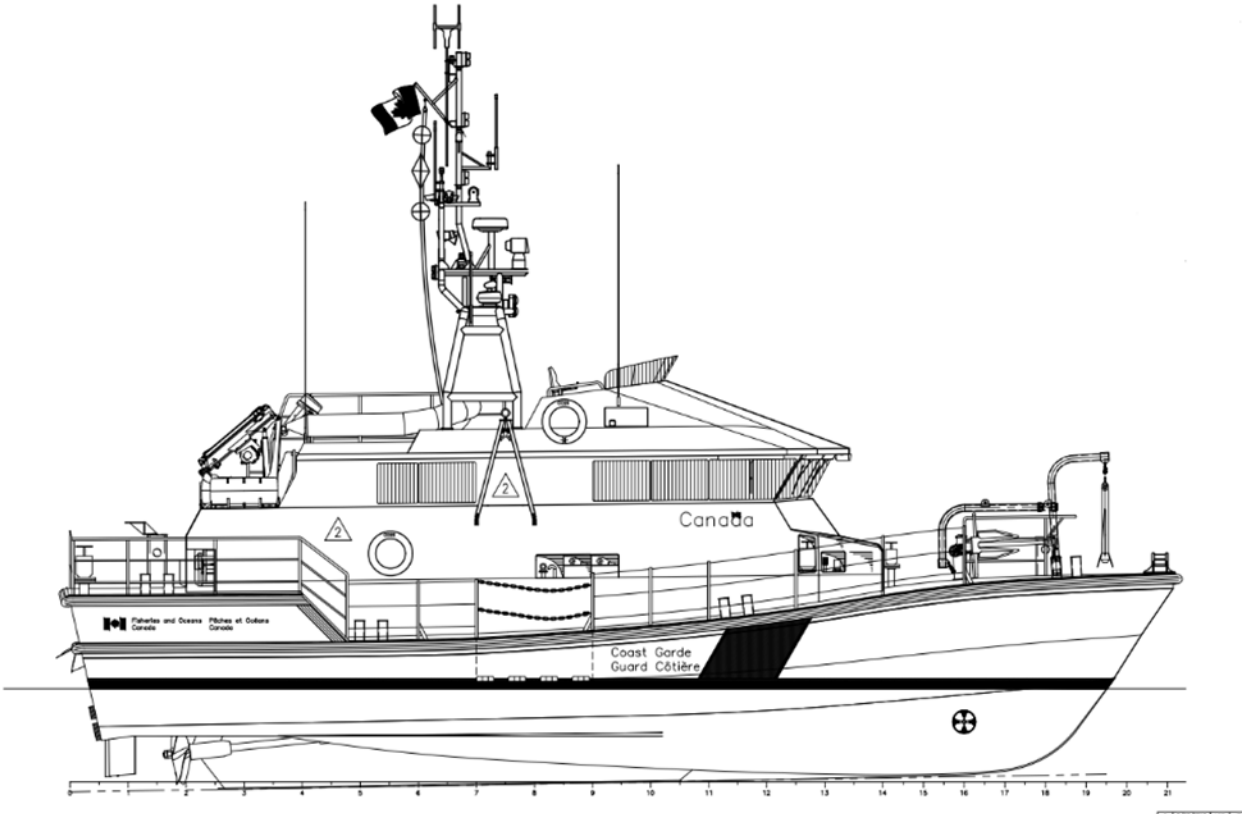
CCGS Pennant Bay

Drydocking 2020



January 6, 2020 – February 10, 2020

F6855-191374

Contents

PREAMBLE

1. INTENT

The intent of this specification shall describe the necessary work involved in carrying out the ship's Refit Drydocking from December XX, 2019 – January XX, 2020. All work specified herein and all repairs, inspections and renewals shall be carried out to the satisfaction of the Owner's Representative and, where applicable, the attending ABS Class Surveyor. Unless otherwise specifically stated, the Owner's Representative is the Chief Engineer.

2. MANUFACTURER'S RECOMMENDATIONS

The overhaul and installation of all machinery and equipment specified herein shall be as per the manufacturer's applicable instructions, drawings and specifications. The surface preparation, ambient limitations and coating applications shall be as per the manufacturer's instructions and specifications.

3. TESTING AND RECORDS

All test results, calibrations, measurements and readings are to be recorded. All tests are to be witnessed by the Inspection Authority, Technical Authority and ABS Class Surveyor. The recorded test results, calibrations, measurements and readings from the entire refit specification shall be provided in 1 typewritten bound report on 8.5" X 11" paper. The bound report shall be tabbed as per table of contents in the refit specification. The contractor shall also provide 3 electronic copies of all recorded test results, calibrations, measurements and readings from the entire refit spec. The bound report and electronic reports shall be provided to the Chief Engineer prior to the end of refit.
The Contractor shall also provide reports/measurements/readings per individual specification item within the timeline indicated to the Chief Engineer.

4. WORKMANSHIP

The Contractor shall use fully qualified, certified and competent tradesmen and supervision to ensure a uniform high level of workmanship as judged by normally accepted shipbuilding standards and to the Owner's satisfaction.

5. FACILITIES

Quotation shall include all of the necessary labor and equipment required for the erection of access staging, rigging, lighting, tugs, pilotage, necessary cranage and line handling.

6. MATERIALS AND SUBSTITUTIONS

All material shall be supplied by the contractor and all materials shall be new and unused unless otherwise specified. All replacement material in the form of jointing, packing, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints, coatings, etc., shall be in accordance with the equipment manufacturer's drawings, manuals or instructions. Where no particular item is specified, or where substitution must be made, the Owner's representative must approve all material offered.

7. REMOVALS

Any items or equipment to be removed and subsequently reinstalled in order to carry out work specified or for access to carry out the work specified, shall be jointly inspected for damages prior to removal by both the Contractor and Owner's representative.

8. EXPOSURE AND PROTECTION OF EQUIPMENT

The Contractor shall provide adequate temporary protection for any equipment or areas affected by this refit. The Contractor shall take proper precautions to maintain in a proper state of preservation any machinery, equipment, fittings, stores or items of outfit which might become damaged by exposure, movement of materials, sand grit or shot blasting, airborne particles from sand, grit or shot blasting, welding grinding, burning, gouging, painting or airborne particles of paint. Any damage shall be the responsibility of the contractor. Government furnished equipment and materials shall be received by the contractor and stored in a secure warehouse or storeroom having a controlled environment appropriate to the equipment as per the manufacturer's instructions.

9. LIGHTING AND VENTILATION

Temporary lighting and/or temporary ventilation required by the contractor to carry out any item of this specification shall be supplied, installed and maintained in a safe working condition by the contractor and removed upon the completion of work.

10. CLEANLINESS

The Contractor shall at all times, maintain the work areas in which his personnel have access in a clean condition and free from debris. Upon completion of this refit, the Contractor shall ensure that the vessel is in a clean condition, free from all foreign material in any system or location placed there as a result of this refit. The Contractor shall provide adequate temporary protection for any equipment or areas affected by this refit. The Contractor shall dispose of any and all oil and water residue, which accumulates in the machinery space bilges as a result of any refit work detailed in this specification.

11. ASBESTOS

Any and all insulation materials shall be asbestos free and approved for the required application.

12. Suspension Of Work

The Technical Authority reserves the right to suspend work immediately when that work is being performed in contravention of the Coast Guard's Safety Management System. Work shall be allowed to resume when the Technical Authority, in consultation with the Contractor and PWGSC, is satisfied that the agreed-upon procedures are in place and being adhered to.

13. HOTWORK

Any item of work involving the use of heat in its execution requires that the Contractor advise the owner's representative prior to starting such heating and upon its completion. The Contractor shall be responsible for maintaining a competent and properly equipped fire watch during and for one full hour after all hotwork. The fire watch shall be arranged such that all sides of surfaces being worked on are visible and accessible. The Contractor shall provide sufficient suitable fire extinguishers and a fire watch during any such heating and until the work has cooled. Ship's extinguishers shall not be used except in an emergency. The Contractor shall abide by the Coast Guard Hotwork Policy. The policy is listed in the Coast Guard's Safety Management System , section 7.D.11 and section 7.D.11 (N). The Contractor shall be responsible to ensure the Contractor's personnel including any subcontractors shall follow the policy.

14. LOCKOUT AND TAGOUT PROCEDURES

15.1 The Contractor shall be responsible to protect persons working onboard the vessel while working on or near shipboard systems and equipment from accidental exposure to:

- electrical currents
- hydraulic
- pneumatic
- gas or stem pressure and vacuum
- high temperatures
- cryogenic temperatures
- radio frequency emissions
- potentially reactive chemicals
- stored mechanical energy
- equipment actuation

15.2 The Contractor, under the supervision of the Chief Engineer shall be responsible for the Lockout and Tagout of equipment and systems listed in the specification.

15.3 The Contractor shall supply and install all locks and tags and shall complete the Lockout Tagout Log sheet provided by the Vessel.

15.4 The Contractor shall remove all locks and tags and complete the Lockout Tagout Log sheet provided by the Vessel.

15. PAINTING

All new and disturbed metalwork that will not be on the underwater wetted surface of the ship's hull is to be protected with two coats of Contractor supplied primer. Unless otherwise stated in the individual specification item, the primer is to be as per the vessel paint schedule. The paint is to be applied as per the manufacturer's instructions on their respective product data sheets. Finish coats are described in individual specification items.

16. WELDING

Welding shall be in accordance with the Canadian Coast Guard Welding Specifications. (TP6151 E)
The Contractor shall be currently certified by the Canadian Welding Bureau (CWB) in accordance with CWB 47.2 latest revision Division I, II or III at the time of bid closing.
The Contractor shall provide a current letter of validation from the CWB indicating compliance with standard CSA W47.2, Division I or II. (latest revision)
The Contractor must submit CWB stamped welding specifications and weld procedure data sheets to ABS as requested by ABS Class Surveyor.
The Contractor must provide copies of all welding certificates at the start of contract work.
The Contractor may be required to supply a current Welders Ticket for each individual welder that will be involved in this refit.

17. SMOKING

The Public Service Smoking Policy forbids smoking in all Government ships in areas inside the ship where shipyard personnel will be working. The Contractor shall inform shipyard workers of this policy and ensure that it is complied with.

18. RESTRICTED AREAS

The following areas are out of bounds to shipyard personnel except to perform work as required by the specifications: all cabins, offices, Wheelhouse, public washrooms, cafeteria, dining room, lab spaces and any other area identified by the Owners Representative at time of refit.

19. ELECTRICAL STANDARDS

Any electrical installations or renewals shall be in accordance with the latest editions of the following

marine standards:

(a) TP 127E-TC Marine Safety Electrical Standards.

(b) IEEE Standard 45 - Recommended Practice for Electrical Installation on Shipboard.

If any cable installed within this contract is found to be damaged, shorted or opened as a result of the manner of installation, the entire length of cable shall be replaced and installed at no cost to the Department. Plastic tie-wraps may be used to secure wiring in panels or junction boxes only.

20. DRAWINGS

All drawings and drawing revisions that the contractor is requested to do in the execution of this contract shall be of a quality equal to that of the drawings that are requested to be updated. For example, drawings that have been lettered and dimensioned in a professional manner shall not be updated using freehand. Prints and reproductions that a contractor is required to provide shall be made on one piece of paper.

Sign off and acceptance of jobs will not occur until any and all drawings are updated to the satisfaction of the Owner's representative.

21. TRANSDUCERS

The Contractor shall not paint the transducers and all transducers shall be afforded the necessary protection during hull cleaning, blasting, burning, welding and coating operations.

22. OWNER'S REPRESENTATIVE

Throughout this document, there is made reference to the Owner's Representative. For the purpose of this document, the Owner's representative is defined as the Chief Engineer of the Vessel.

23. Regulatory Authority Inspections

The Contractor shall confirm a schedule of inspections with the Chief Engineer for all work described in this specification at time of bid closing. The Contractor shall be responsible for calling them when inspections are required and for ensuring the work is credited by the regulatory authority in the Chief Engineer's 'Hull and Machinery Survey Book'.

The Contractor shall ensure the Chief Engineer is informed when the regulating authority is onsite such that the Chief Engineer can witness the inspections by the regulating authority.

Notwithstanding any errors, omissions, discrepancies, duplication or lack of clarity in these project requirements, it shall be the responsibility of the Contractor to ensure that the execution of the work specified herein is to the satisfaction of the Chief Engineer, VMM, PWGSC and Class Inspector.

24. Waste Oil Products

Disposal of waste oil products shall be carried out by the Contractor, or subcontractor, who has been licensed by provincial authorities for the disposal of petroleum products. Copies of certificates must be produced upon request. This must be in accordance with the Coast Guard Policy for Handling Fuel, Oil, and Waste Oil Products, which is part of the Fleet Safety Manual, section 7.C.3. A copy of which is in the attached safety annex.

25. WHMIS

The Contractor shall provide current MSDS sheets for any WHMIS-controlled products used onboard or around the vessel at the start of the work period before the products are used. This includes at the minimum MSDS sheets for any solvents, cleaners, chemicals, coatings and blasting grits to be used. Any neutralizing chemicals or specialized protective equipment required shall be provided by the Contractor at all times these WHMIS-controlled products are onboard the vessel.

26. SAFETY ANNEX

The Contractor shall follow the Coast Guard Policies as outlined in the attached Safety Annex. This Annex contains excerpts from the Fisheries and Oceans Canada, Canadian Coast Guard Fleet Safety Manual (DFO 5737) and deals with contractor responsibilities for items such as Hot Work, Confined Space Entry, Diving, Diving Operations and Dry-docking.

SHIP'S PARTICULARS

Ship's Number	841103
Length	19.02 Meters
Breadth	6.29 Meters
Navigational draft	1.67 Meters
Full Load Displacement	61.5 MT
Lightship Displacement	53.4 MT
Year Built	2017
Place Built	Wheatley ON

HD-01 Production Chart

Part 1 - Intent

1.1 The intent of this specification shall be to give the owner's representatives an accurate timeline on production and completion dates for Coast Guard Operational Services.

Part 2 - References

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The Contractor shall supply all materials, equipment and parts required to perform the specified work unless otherwise stated.

Part 3 – Technical Description

3.1 General

3.1.1 The successful Contractor shall supply the Chief Engineer with three (3) bound hard copies of a detailed bar chart showing the planned work schedule for the ship's refit. This bar chart shall show each specification item, the planned and actual start date, the duration and the completion date. An electronic version shall be forwarded to the Vessel Maintenance Manager (VMM) – Chris.Woolfrey@dfo-mpo.gc.ca. The Contractor shall also forward an electronic copy of the Production Chart to the Contracting Authority.

3.1.2 A critical path of work shall be identified, which shows the critical tasks that may delay the completion of the refit and if they shall not be completed within the estimated time frame. The critical path may exist due to labor constraints or tasks which cannot be completed concurrently with other tasks.

3.1.3 If work arises that affects the critical path, it shall be immediately brought to the attention of the Chief Engineer, VMM and PWGSC. Every effort shall be made to prevent the vessel from delay in completing the refit in the time frame provided. Regular QA procedures shall apply.

3.1.4 The bar chart shall be updated weekly and for each production meeting to reflect all changes to the actual production of the refit and changes to the anticipated completion dates of each individual item. The Contractor shall include on the updates to the production chart any work arising from PWGSC 1379 action that indicates the additional work shall impact the completion schedule for the vessel.

Part 4 – Proof of Performance

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer, SVMM, PWGSC, TC Inspector and if required the ABS Class Inspector.

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5 - Deliverables

5.1 Drawings/Reports

5.1.1 The successful Contractor shall supply the Chief Engineer with three (3) bound hard copies of a detailed bar chart showing the planned work schedule for the ship's refit. This bar chart shall show each specification item, the planned and actual start date, the duration and the completion date. An electronic version shall be forwarded to the Vessel Maintenance Manager (VMM) – Chris. Woolfrey@dfo-mpo.gc.ca. The Contractor shall also forward an electronic copy of the Production Chart to the Contracting Authority.

5.1.2 Three copies of the original and three copies of each weekly update shall be given to the Chief Engineer one day prior to each weekly Production Meeting. The VMM shall also be forwarded an electronic copy of the weekly update prior to the Production Meeting.

HD-02 Dry-Docking

Part 1 - Scope

1.1 The intent of this specification shall be for the contractor to dry dock the vessel in its facility.

Part 2 - References

2.1 Guidance Drawings/Nameplate Data

2.1.1 16081-140-A-007 Docking Plan

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The contractor shall supply all materials, equipment, and parts required to perform the specified work unless otherwise stated.

Part 3 – Technical Description

3.1 General

3.1.1 Docking shall be undertaken during the first day of the contract period. If necessary, Contractor is to prepare the dock in advance of the ship's arrival and the official start of the contract.

3.1.2 If the vessel will not be docked on the first day of the contract period, the Contractor is to state this in his bid package, and include in the project schedule.

3.1.3 The vessel is not to be docked with any other ship for any part of the contract period in such a way that will interfere with its scheduled refloating.

3.1.4 A Guidance Docking Plan is available through the vessel VMM and will be provided to the successful contractor.

3.1.5 The Contractor must prepare blocks/stands and necessary shoring to maintain true alignment of the vessel's hull and machinery throughout the dry-docking period. Contractor to dock and undock vessel and allow sufficient lay days to complete both the work described in this specification as well as a margin of time to cover work arising. Contractor to include unit cost/lay day for adjustment.

3.1.6 The vessel is to be docked so that all docking plugs, transducers, and sea inlet grids are clear and accessible. If any hull fittings are covered, the Contractor is responsible for all labour and materials required for making alternative arrangements to move blocks to gain access to areas of specified work.

3.1.7 During docking of the vessel, radio contact is to be maintained between the vessel's Commanding Officer and the Contractor's Docking Officer. Contractors are to include, but show separately, the price of any tug and/or pilot services required.

3.1.8 Within two hours of docking, the underwater hull is to be cleaned by high-pressure fresh water washing (1500-2000psi) to remove all marine growth and allow preliminary inspection of the hull. The Contractor must be responsible for the removal of grates to gain access to the port and starboard sea chests. The Contractor must clean each sea chest by high-pressure fresh water washing (1500-2000psi) minimum to remove all marine growth and allow preliminary inspection of each sea chest. Total underwater hull area is approximately 93 square meters.

3.1.9 The following information is to be recorded in a Ship Condition Report that is to be prepared by the Contractor with a typeface copy provided to the Chief Engineer:

3.1.9.1 Prior to docking, all tanks on vessel to be sounded and contents recorded. A copy of the Tank Condition Report is to be signed by the Commanding Officer, Chief Engineer and Contractor's Docking Officer.

3.1.9.3 At undocking, all tanks to be refilled to obtain same draft and trim as at docking, and condition agreed by Contractor and Chief Engineer or his representative.

3.2 Location

3.2.1 N/A

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage and refitting to vessel.

Part 4 – Proof of Performance

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer.

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5 - Deliverables

5.1 Drawings/Reports

5.1.1 Contractor shall deliver one (1) hard copies of all checklists and reports to the Chief Engineer outlining any work and/or modifications required. Contractor shall deliver one (1) electronic copy of all reports to vessel VMM.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

HD-03 Services

Part 1 - Scope

1.1 The intent of this specification shall be for the contractor to supply the listed services to the vessel for the entire refit period.

Part 2 - References

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The contractor shall supply all materials, equipment, and parts required to perform the specified work unless otherwise stated.

Part 3 – Technical Description

3.1 General

3.1.1 The following services must be supplied and connected upon arrival at the Contractor's facilities. The services must maintain throughout the contract period and removed from the vessel on completion of the work period. The Contractor is to be responsible for any additional connections and disconnection required when the ship is moved between the dry-dock and alongside a berth at contractor's premises

3.1.2 The Contractor is to quote a global price, daily rates and /or unit rates for all services supplied to the vessel during the dry-dock period.

3.1.3 Garbage Removal: One garbage container of 6m^3 (215 ft^3) minimum capacity shall be provided for the ship's use. The Contractor is to remove garbage from the container on a weekly basis. Cost of cranage and disposal to be included in

quotation. The garbage container is to be placed in a suitable location agreed upon by the contractor and the Owner's Representative.

3.1.4 Fire Main: Water must be supplied to the vessel's fire main system at a continuous pressure of 3 bar (43.5psi) 24 hours a day. The hose must be connected to the ship's shore connection. The Contractor must be responsible to provide and install any fittings necessary to make connection to the ship's shore connection. A leak off connection must be installed to prevent freezing.

3.1.5 Gangways: The contractor must supply and erect two separate and independent gangways, one port side and one starboard side, with safety nets and hand rails to the satisfaction of the Commanding Officer. One gangway is to be considered as an alternate escape route in case of emergency. Access to both gangways is to be constantly maintained in a safe and secure manner and clear of all obstacles. Both gangways are to be illuminated for use at night.

3.1.6 Electrical Power: The contractor must supply manpower and material to connect one electrical cable to the ship's electrical system. Power required is 240VAC, 1 phase, 150 amp and must be supplied for the entire refit period. Any changes to the shipyard cable arrangement to accommodate vessel shore power plug arrangements shall be included in the bid. Any connection/disconnection required for known work to be included in the bid. Actual power consumption to be prorated up or down as per power used, as indicated by Shipyard's meter. The meter must be read and recorded by the Chief Engineer and Contractor at the beginning and end of the refit period. A kWh unit price to be quoted (separately) for adjustment purposes. Cost adjustments to be made up or down as PSPC 1379. The Contractor shall quote on 36000 kWh for the refit period. Unit price for connect/disconnect of power to be quoted separately.

3.1.7 Cleaning: The Contractor is to ensure all spaces, compartments and areas of the ship where work was done are left in an "as clean as found condition" The cost of clean up is to be included in each specification item.

3.1.8 Crane: The Contractor must provide a quote on 40 hours of use for the services of a crane, an operator, and a rigger to load/unload stores and parts. The Contractor shall quote an hourly rate for crane services.

3.1.9 Berthing: During the contract period, while not on dock, the vessel is to be secured alongside the Contractor's wharf to the satisfaction of the Commanding Officer.

3.1.10 The berth must have adequate depth of water at all conditions of tide, for which the Commanding Officer shall be the sole judge.

3.1.11 The Contractor must include in the quote all costs for initial tying up, any movements of the vessel during the refit, including letting go of lines from contractors wharf of departure after completion of contract.

3.1.12 Maneuvering of the vessel into and out of the Contractor's docking facilities shall be the responsibility of the Contractor. Costs for tugs and pilots required for any movements of the vessel during the contract period are to be included in the bid price quoted on, but shown separately.

3.1.13 One gangway is required while alongside the Contractor's jetty. It is to be rigged as directed by vessel's Commanding Officer, complete with safety net. This gangway is to be safe, well-lit and structurally sufficient to support passage of the Contractor's workers and ships' crew.

3.1.14 Parking: The Contractor is requested to provide 2 parking spaces for ship's personnel and Coast Guard personnel for the duration of the contract.

3.1.15 Dock and Sea Trials:

3.1.15.1 On completion of all specification items, dock trials and sea trials will be carried out as a functional test of the ships propulsion system and maneuvering systems.

3.1.15.2 Dock trials will last a minimum of one (1) hour.

3.1.15.3 Sea trials will last a minimum of four (4) hours.

3.1.15.4 Trials will include ahead and astern movements at various power levels.

3.1.15.5 Trials will be carried out to the satisfaction of the Chief Engineer, PWGSC Inspector and ABS Class Surveyor.

3.1.15.6 The Contractor is to have sufficient supervisory staff on board during these trials to witness the operation of machinery and systems that were worked on during the refit.

3.2 Location

3.2.1 N/A

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage and refitting to vessel.

Part 4 – Proof of Performance

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer, PWGSC Inspector, VMM and ABS Class Surveyor.

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5 - Deliverables

5.1 Drawings/Reports

5.1.1 N/A

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

HD-04 Hull Inspection and Survey

Part 1 - Scope

1.1 The intent of this specification shall be for the Contractor to carry out a hull inspection and survey of the vessel's hull.

1.2 This work shall be carried out in Conjunction with the following:

1.2.1 HD-05 Hull Painting

Part 2 - References

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The Contractor must supply all materials, equipment, and parts required to perform the specified work unless otherwise stated.

Part 3 – Technical Description

3.1 General

3.1.1 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the hull inspection and survey as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 After docking and hull cleaning the Contractor, along with the Chief Engineer, VMM and ABS Class Surveyor shall carry out a visual inspection of the underwater hull of the vessel. This item is to be carried out prior to the hull painting.

3.2 Location

3.2.1 N/A

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage and refitting to vessel.

Part 4 – Proof of Performance

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer.

4.1.2 The Contractor shall ensure that ABS Class credit is obtained for these items prior to acceptance.

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5 - Deliverables

5.1 Drawings/Reports

5.1.1 Contractor shall deliver one (1) hard copy and one(1) electronic copy of the final Hull Condition Survey report to the Chief Engineer outlining all work performed and all findings and readings. Contractor shall deliver one (1) electronic copy of all reports to VMM.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

HD-05 Hull Painting

Part 1 - Scope

1.1 The intent of this specification shall be for the Contractor to prepare the exterior hull of the vessel below the water line in areas of disturbed or damaged coating and to apply the specified coating as per the Vessel's Coating Schedule.

1.2 This work shall be carried out in Conjunction with the following:

1.2.1 HD-04 Hull Inspection and Survey

1.2.2 HD-06 Replacement of Zinc Anodes

Part 2 – References

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The Contractor must supply all materials, equipment, and parts required to perform the specified work unless otherwise stated.

Part 3 – Technical Description

3.1 General

3.1.1 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the hull painting as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 Underwater hull from the waterline to the keel is to be cleaned for inspection by the Chief Engineer, VMM and ABS Class Surveyor. Port and starboard sea chests are also to be cleaned for inspection by the Chief Engineer, VMM and ABS Class Surveyor. Painting is to be carried out only after hull inspection is complete and prior to new zinc anodes being installed. Contractor is to arrange for ABS Class survey of the external hull prior to any repair of the coating to the underwater hull or sea chests.

3.1.3 Total area of the underwater hull is approximately 93 square meters.

3.1.4 All hull mounted equipment such as anodes, reference electrodes, echo sounders, speed log, transducers, etc. are to be suitably protected against damage during the cleaning of the hull and application of the new coatings. The Contractor will be responsible for repair/replacement of any damaged items to the satisfaction of the Chief Engineer. On completion of cleaning and coating, Contractor is responsible for the removal of any such protective coverings.

3.1.5 Measures must be taken to ensure that application of coatings does not take place on surfaces or equipment other than those areas specified, and that the coating shall not block any inlets or discharges in the shell.

3.1.6 The Contractor must plug deck scuppers and discharges, or take any necessary measures to prevent water or other liquids from contaminating the areas of plating being coated or prepared for coating.

3.1.7 The Contractor must be responsible and liable for ensuring that the hull is clear and clean, prior to, during and immediately after the application of the coating and that the coating is applied as per manufacturers instructions.

3.1.8 All staging, craneage, screens, heaters, any other environmental control equipment, lighting and any other support services, equipment and material necessary to perform the tasks set out in this specification shall be supplied by the Contractor.

3.1.9 Water Blasting:

Immediately following the docking, the entire hull area is to be high pressure washed (1500-2000-PSI hydro blast). Blasting to include the hull, rudder, Bow Thruster outlet pipe, Sea chests, and overboard outlets.

All loose scale and marine growth is to be removed by the water blasting. See dry-Docking (HD-02)

3.1.10 The Contractor must take measures to ensure that no damage, unnecessary cleaning or repairs, accrue from the sand or grit blasting and/or the application of the coating. Sand or grit used for the blast cleaning shall not be permitted into any part of the vessel. The Contractor is to ensure that each and every opening into the vessel where sand and grit may gain ingress and cause damage shall be suitably protected. All deck equipment is to be completely wrapped to prevent any entry of grit. Contractor is to supply all coverings.

3.1.11 The Contractor is to ensure all navigation equipment (radar, etc.) are suitably protected from any ingress or contamination from the sand or grit utilized in the blasting process.

3.1.12 Surface Preparation Underwater Hull:

Areas of the underwater hull and sea chests showing damaged or disturbed coating are to be prepped as per coating manufacturers recommendations by low pressure grit blasting using aluminum oxide abrasive, or suitable alternative approved by the coating manufacturer, or by power discing. Power wire brushing is not permitted.. Edges of prepped areas to be feathered back 6" to provide for good overlap and adhesion of new coating. Area to be dealt with to be 20 square meters for bidding purposes. The Contractor must also provide square meter unit pricing for adjustment purposes. Cost adjustment up or down will be made as PSPC 1379.

3.1.13 Coating Underwater Hull:

The underwater hull is to be coated to the following schedule (coating product information and surface prep specifications below):

First Coat: International Intergard 264, to be applied, according to manufacturer's directions, to the power tooled areas (20 square meters). NOTE: Overspray of underwater coatings onto the area above the waterline must be avoided.

Second Coat: International Intergard 263 as a tar free tie coat, to be applied, according to manufacturer's directions, to the affected areas.

Third Coat: International Trilux II, to be applied, according to manufacturer's directions.

Fourth Coat: International Trilux II, to be applied, according to manufacturer's directions.

International. Interspec

Underwater Hull and Rudder [1,000ft²]

An Intergard 264 universal epoxy anticorrosive scheme using Intergard 263 as a tar free tie coat to the subsequent Tri-Lux II antifouling scheme.

Surface Preparations

Where necessary remove all weld splatter, smooth weld seams and sharp edges. Fresh water wash to remove all dirt and contamination, as necessary. Degrease according to SSPC-SP1 solvent cleaning. Ensure area is clean and dry prior to application.Aluminium vessels, underwater areas and above water areas, low pressure grit blasting using aluminium oxide abrasive or suitable alternative abrasive (not copper slag) or power discing (power wire brushing is not permitted).

Product	Colour	Sales Code	Coats	WFT Mils	DFT Mils	PSR (ft²/US	Pot Life 68°F	Touch Dry 68°F	Hard Dry 68°F	Volume US Gal	Thinner	Cleaner
Intergard 264	Red	FPL274/FPA327	FC	7.5	6.0	152.10	5hrs	6hrs	9.5hrs	6.6	GTA220	GTA220
Intergard 263	Light Grey	FAJ034/FAA262	FC	7.0	4.0	162.56	6.5hrs	7hrs	18hrs	6.1	GTA220	GTA220, GTA822
Tri-Lux II			FC	8.0	4.0	142.60		2hrs		7.0		
Tri-Lux II			FC	8.0	4.0	142.60		2hrs		7.0		
				30.5	18.0					26.7		

3.1.14 The Contractor must apply any coating to the hull's surface only during periods of environmental conditions recommended by the coating manufacturer application instructions. Application of any coating must receive prior approval from the Chief Engineer. During the application of any coating, the Contractor is to record hourly temperature and humidity readings. The Contractor must provide a typewritten hard copy of all readings to the Chief Engineer at the end of each day any coating is applied to the vessel.

3.2 Location

3.2.1 N/A

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage and refitting to vessel.

Part 4 – Proof of Performance

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer.

4.1.2 The contractor shall be advised that an Independent coating inspector shall be present during coating application and shall provide advice to the Chief Engineer.

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5 - Deliverables

5.1 Drawings/Reports

5.1.1 Temperature and Humidity readings at time of coating applications.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

HD-06 Replacement of Zinc Anodes

Part 1 - Scope

1.1 The intent of this specification shall be for the Contractor to replace the sacrificial zinc anodes on the exterior hull and in the port and starboard sea chests with new, Owner supplied sacrificial zinc anodes. Ten(10) sacrificial zinc anodes in total to be replaced, 8 on the hull and 1 in each Seachest, port and stbd.

Part 2 - References

2.1 Guidance Drawings/Nameplate Data

2.1.1 16082-280-A-003 Anode Arrangement

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The Contractor must supply all materials, equipment, and parts required to perform the specified work unless otherwise stated

Part 3 – Technical Description

3.1 General

3.1.1 The sacrificial zinc anodes fitted on the hull and inside the port and starboard sea chests are to be replaced with new owner supplied anodes. The Contractor must be responsible for removal of grates to gain access to each sea chests.

3.1.2 Removal of all currently fitted zinc anodes is to be completed prior to the Hull Painting, Spec item HD-05. The Contractor must be responsible for the proper disposal of all zinc anodes removed as per Provincial Regulations.

3.1.3 Any damaged or disturbed metal work is to be coated as per the paint scheme in the area prior to new sacrificial zinc anodes being installed.

3.1.4 Installation of new zinc anodes is occur only after completion of the hull painting, Spec item HD-05.

3.1.5 The Contractor must be responsible to provide all hardware necessary for the installation of the new zinc anodes to the vessel. Any new hardware will be of the same type and specification as the hardware being replaced. Any substitution of hardware will be approved prior to installation by the Chief Engineer. The Contractor must bid on replacing 6 studs and nuts used to secure the anodes to the hull. The Contractor must also provide unit cost for stud and nut replacement. Final cost to be adjusted up or down as PSPC 1379 upon receipt of invoice.

3.2 Location

3.2 Vessel hull exterior and sea chests.

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage and refitting to vessel.

Part 4 – Proof of Performance

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer.

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5 - Deliverables

5.1 Drawings/Reports

5.1.1 N/A

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

HD-07 Rope Cutter Replacement

Part 1: SCOPE:

1.1 The intent of this specification shall be for the Contractor to carry out replacement of the currently installed Spurs Marine Model F2 rope cutters with new owner supplied Piranha Model PDLC 4500 rope cutters on each propeller shaft.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 Propellor Shaftline – 16081-630-A-016

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1 The Contractor shall supply all materials and equipment required to perform the specified work unless otherwise stated.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the shaft rope cutter removal and / or installation as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 The Contractor must remove the currently fitted Spurs Marine Model F2 rope cutter from each propeller shaft.

3.1.3 The Contractor must clean each propeller shaft surface between the propeller and the V-strut on each propeller shaft prior to the installation of the new, Owner supplied, rope cutters.

3.1.4 The Contractor must install the new Piranha Model PDLC 4500 rope cutters on each propeller shaft following the manufacturers installation instructions and recommendations.

3.1.5 The Contractor must return the original Spurs Marine rope cutters and associated hardware to the Chief Engineer.

3.1.6 All work to be completed to the satisfaction of the Chief Engineer.

3.2 Location

3.2.1 Propeller Shafts, forward of propeller

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage, and refitting to vessel.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and ABS Class Surveyor

4.2 Testing

4.2.1 N/A

4.3 Certification

4.3.1 N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 N/A

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

HD-08 Port and Starboard Shaft Seal Replacement

Part 1: SCOPE

1.1 The intent of this specification shall be for the contractor to replace the original Duramax shaft seals with new, Owner supplied PSS shaft seals and shaft seal flanges.

1.2 This specification to be completed in conjunction with Port Engine Replacement, spec item E-01.

1.3 Part 2: REFERENCES:

2.1 Guidance Materials

2.1.1 PSS shaft seal installation instructions

2.2 Standards

2.2.1 N/A

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1 The Contractor shall supply all materials, equipment, parts and labour required to perform the specified work unless otherwise stated.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the shaft seal removal and / or installation as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 The Contractor must remove the shaft brush gear and associated supports to facilitate the removal of the original Duramax shaft seals and the installation of the new PSS shaft seals from each shaft. The Contractor must retain, in its entirety, and store all brush gear components and associated supports for refitting after the installation of the new PSS shaft seals. All components will be stored so as to prevent damage to any of the brush gear components or associated supports. The associated aluminum brush gear supports are welded in place and will have to be cut free prior to removal of original shaft seals.

3.1.3 The Contractor must uncouple each propeller shaft from the associated gearbox at the shaft coupling located aft of the marine transmission gearbox as directed by the Chief Engineer. The Voith shaft coupling must be removed from the propeller shaft using the Owner supplied Voith Shaft Coupling Removal Tools to facilitate removal and installation of the shaft coupling. The Contractor must retain in its entirety and store the Voith shaft coupling for refitting after installation of the new PSS shaft seal. All components of the Voith shaft coupling must be stored so as to prevent damage to any component of the coupling.

3.1.4 The Contractor must pull back each propeller shaft sufficient distance to allow the removal of the original Duramax shaft seal and the installation of the new PSS shaft seal.

3.1.5 The Contractor must remove each original Duramax shaft seal, as well as the shaft seal flange and gasket fitted to each stern tube.

3.1.6 The Contractor must prepare and clean the propeller shaft in preparation for installation of the new PSS shaft seal, following the manufactures instructions for shaft preparation and cleaning prior to beginning the installation of the new PSS shaft seal components on each propeller shaft.

3.1.7 The Contractor must clean each stern tube flange prior to installation of the new gasket and bladder flange, as per manufacturers instructions. The Contractor must install the new gasket and bladder flange as per the installation instructions provided by the manufacturer. The Contractor must follow bolt pattern and torque specifications provided by the manufacturer. If new bladder flange mounting bolts are not provided by the shaft seal manufacturer, the Contractor

must use 316 stainless steel hardware appropriately sized to mount the gasket and bladder flange.

3.1.8 The Contractor must install the PSS shaft seal on each propeller shaft as per the manufacturers installation instructions.

3.1.9 The Contractor must refit the Voith shaft coupling back onto each shaft and refit each propeller shaft to the marine transmission gearbox as found originally.

3.1.10 The Contractor must complete installation, fit up and adjustment of each new PSS shaft seal as per the manufacturers instructions.

3.1.11 The Contractor must fit a new air fill line and pressure gauge to facilitate inflating the inflatable bladder similar to the installation fitted to each original Duramax shaft seal.

3.1.12 The Contractor must refit the original brush gear and associated supports in the original locations once installation of each shaft seal is complete and before all interference items are refitted.

3.1.13 The Contractor must return all interference items to the original as found state. Any interference items damaged during removal, transport, storage or refitting must be replaced at the Contractor's expense.

3.1.14 The Contractor must check each shaft seal while the vessel is being undocked. If either shaft seal has a leak detected, the Contractor will cease undocking and make adjustments to the shaft seal, as per the manufacturers instructions, necessary to stop the ingress of water into the vessel.

3.1.15 The Contractor must perform a sea trial of each newly installed PSS shaft seal to confirm each shaft seal is not leaking and there is no ingress of water into the vessel through either shaft seal. The testing will be conducted through the entire power band of the vessels propulsion system. The dock trail and sea trial to monitor the performance of each shaft seal will be for the duration specified in Specification HD-03 (Services), Section 3.1.15.

3.1.16 The Contractor must return the Voith shaft coupling removal tool to the Owner upon completion of the work in the "original" condition as delivered to the Contractor.

3.2 Location

3.2.1 Engine Room

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, storage, and refitting to vessel.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and ABS Class Surveyor.

4.1.2 The Contractor shall ensure that ABS Class credit is obtained for these items prior to acceptance.

4.2 Testing

4.2.1 All testing must be completed as recommended by the PSS shaft seal manufacturer.

4.2.2 Final tests are to be witnessed by ABS Class Surveyor and the Chief Engineer.

4.2.3 **T**he Contractor shall ensure that ABS Class credit is obtained for these items prior to acceptance.

4.3 Certification

4.3.1 N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 Contractor shall deliver one(1) hard copy of all checklists and reports to the Chief Engineer outlining any work and/or modifications required. Contractor shall deliver 1 electronic copy of all reports to the Chief Engineer and one(1) copy to the VMM.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

E-01 Port Main Engine Replacement

Part 1: SCOPE

1.1 The intent of this specification must be for the Contractor to replace the damaged port main engine with a new, owner supplied, engine. The port engine is non operable.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 Engine Type: MTU 10V2000M94

2.1.2 16081-600-A-015 Machinery Room Arrangement

2.1.3 16081-740-A-017 Main Engine Wet Exhaust

2.1.4 16081-720-M-002 Main Engine Cooling System

2.1.5 16082-520-O-008 Enclosed Bridge Floor Covering As Built

2.1.6 16082-510-O-005 Ceiling Paneling As Built

2.1.7 16082-500-O-002 Insulation Plan

2.1.8 16081-340-S-008 Mast Structure

2.1.9 16081-740-A-018 Machinery Space Ventilation

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1 The Contractor shall supply all materials, equipment, parts and labour required to perform the specified work unless otherwise stated.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the work outlined in the Port Main Engine Replacement Specification (E-01) as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 The Contractor must be responsible for and arrange suitable transportation to transport the engines to and from Wajax Power Systems, 1 Panther Place, Mt. Pearl NL to and from the Contractor's facility. The Contractor must be responsible to ensure the engines are adequately protected against any type of damage during transportation to and from the Contractor's facility as well as during storage at the Contractor's facility, until such time the original engine is delivered to Wajax Power Systems or the new engine is fitted on the vessel.

3.1.2.1 The vehicle used to transport the engine must be able to fit inside a door with a height restriction of 16 feet high and allow for the installation or removal of the engines to or from the vehicle using an overhead crane. The portion of the vehicle used to transport the engines must not be enclosed as it will not allow the engines to be placed on the vehicle at the Wajax Power Systems facility using the overhead crane. The Contractor must provide Wajax Power Systems with two (2) days notice prior to the engines being transported to and from the Wajax Power Systems facility. Contact at Wajax Power Systems will be Harry Earle, Telephone (709)747-7341.

3.1.3 The owner's representative shall assist the Contractor in identifying the isolation valves for each system to be isolated to facilitate removal of the engine and to limit loss of fuel oil, lube oil, engine coolant and to limit system contamination. Each valve that is closed by the Contractor must be secured, be marked as such and recorded by the Contractor. A list of all valves closed by the Contractor must be supplied to the Chief Engineer. All open piping or hoses must be adequately capped or blanked off to prevent system contamination.

3.1.4 The Contractor must use the services of the Hike Metal Products Representatives to oversee and advise the Contractor relating to the disconnection of the original engine, removal of all interference items necessary for the removal of the original engine, rigging requirements to remove the original engine, rigging requirements to install the new, owner supplied engine, fitting the new engine, refitting of all interference items to bring the vessel to the original state and connection of the new engine after proper alignment has been achieved. The Contractor must provide Hike Metal Products sufficient time (minimum of 14 days) to arrange travel and attendance to the vessel prior to the start of any work relating to this spec item. All open piping or hoses, including exhaust piping, fuel lines, oil lines, coolant lines, etc. must be adequately capped or blanked off to prevent system contamination.

3.1.5 Interference items to be removed/moved by the Contractor to allow the removal of the Port Engine include, but are not limited to, the main mast of the vessel, ventilation trunking, sections of exhaust piping, shafts and guards to the marine transmission gearbox and pump drive gearbox, flooring, deckhead panels and support system, cabling and piping as well as any other items identified by the Hike Metal Products Representatives.

3.1.6 The Contractor must bid an allowance of $40000.00 for the services of the Hike Metal Products Representatives. Final cost for the services of the Hike Metal Products Representative to be adjusted up or down upon receipt of final invoice as PSPC 1379.

3.1.7 The Contractor must use the services of the engine manufacturer FSR, Wajax Power Systems, to commission the new engine upon completion of the new engine installation and the refitting of all piping, hoses, electrical connections, mounting hardware, securing hardware and all interference items to the “original” condition.

3.1.8 The Contractor must bid an allowance of $40,000.00 for the Services of the Wajax Power Systems Representatives. Final cost for the services of the Wajax Power Systems Representatives to be adjusted up or down upon receipt of final invoice as PSPC 1379.

3.1.9 The Contractor must erect an adequate structure to cover the Fly Bridge to protect the vessel interior from the ingress of environmental elements through the Fly Bridge soft patch while the soft patch is open to facilitate the removal of the old engine and installation of the new engine. The structure must be maintained in good order for the duration of time the soft patch cover on the Fly Bridge is open and not secured. The Contractor must ensure the Fly Bridge soft patch cover is off a minimum amount of time.

3.1.10 If transportation of the engine from the Contractors facility is not possible as soon as the engine is removed from the vessel, The Contractor must provide a secure location, as deemed satisfactory to the Owner, at the Contractors facility to store the engine upon removal from the vessel. The storage location must be adequate to protect the engine from environmental elements, damage and unauthorized inspection or tampering. The engine must be stored by the Contractor until such time the Contractor arranges to have the engine delivered to the Wajax Power Systems facility located at 1 Panther Place, Mt. Pearl NL.

3.1.11 The Contractor must use the services of the Hike Metal Products representatives, to assist and oversee the installation the new owner supplied engine.

3.1.12 The Contractor must make ready the new, Owner supplied, engine for moving and refitting of the engine into the engine room space. The Contractor must fit the new engine in the original “as fitted” location of the engine removed.

3.1.13 The Contractor must align the new engine with the other components driven by the engine by means of laser alignment. The Contractor must use the services of a Certified Laser Alignment Specialist to ensure proper alignment of the new engine with all other components driven by the engine. The Contractor will be responsible for the movement of the engine to bring the engine in proper alignment with all other components driven by the engine. Once the proper alignment has been achieved the Contractor will fix the engine in its final position as per the manufacturers recommendations. The Contractor must be responsible for the movement of any driveline components or equipment and the fixing of any driveline components or equipment in its’s final position upon proper laser alignment. The Contractor will bid an allowance of $5000.00 for the services of the Laser Alignment Specialists. Final cost for the services of the Laser Alignment Specialist to be adjusted up or down upon proof of invoice as PSPC 1379.

3.1.14 Contractor must replace all disturbed pipe, tubing or hose work with new, Contractor supplied, pipe, tubing, hose and gaskets. The Contractor must only use new gaskets, approved for the application. All valves that had been closed prior to disassembly will be reopened upon connection of the new engine and approval of the Wajax Representative, unless directed otherwise by the Chief Engineer or Wajax representative.

3.1.15 The Contractor must be responsible for the repair of any leaks caused by the removal of piping, tubing or hoses once the systems are returned to operation. Any such repairs will be made at The Contractor’s expense.

3.1.16 The Contractor must replace all disturbed or damaged deck covering in way of the soft patch in the Enclosed Bridge that was disturbed to facilitate removal of the soft patch cover in the Enclosed Bridge. The Contractor must only use the products specified in drawing 16082-520-O-008 (Enclosed Bridge Floor Covering – As Built) strictly following manufacturers installation/application instructions for each product to bring the deck covering back to the "original" condition. The Contractor must replace the vinyl top layer of deck covering in its entirety in the Enclosed Bridge, an approximate area of 22m2. The Contractor must use only Vinyl Lonseal Floor Covering Loncoin II Flecks, Color #157 Moonstone, as the vinyl flooring top layer, as stated in Drawing 16082-520-O-008.

3.1.17 The Contractor must return all interference items to the "original" condition. Any interference items damaged during removal, transport, storage or refitting must be replaced at the Contractor's expense.

3.2 Location

3.2.1 Engine Room

3.3 Interferences

3.3.1 Contractor, using the services of the representative from Hike Metal Products, is responsible for the identification of interference items, their temporary removal, storage, and refitting to vessel.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and Transport Canada (TC) Inspector and/or ABS Class Surveyor.

4.1.2 The Contractor shall ensure that ABS Class credit is obtained for this item prior to acceptance.

4.2 Testing

4.2.1 All testing must be completed as recommended by the engine manufacturer representative.

4.2.2 Final tests are to be witnessed by ABS Class Surveyor and the Chief Engineer.

4.3 Certification

4.3.1 N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 Contractor shall deliver 1 hard copy of all checklists and reports to the Chief Engineer outlining any work and/or modifications required. Contractor shall deliver 1 electronic copies of all reports to VMM.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

E-02 Starboard Main Engine Exhaust Leak Repairs

Part 1: SCOPE:

1.1 The intent of this specification shall be for the Contractor to use the services of Wajax Power Systems technician(s) to replace all exhaust o-rings and gaskets on both A-Bank and B-Bank of the starboard main engine to repair all exhaust leaks. The Contractor to include an allowance of $15,000.00 for the services of Wajax Power Systems. Final cost for the services of the Wajax Power Systems technician(s) to be adjusted up or down upon proof of invoice as PSPC 1379.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

2.2.2 CG Lockout Procedure.

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The contractor shall supply all materials, equipment, labor and parts required to perform the specified work unless otherwise stated.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 The Contractor must notify the Chief Engineer prior to the work beginning.

3.1.2 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the exhaust leak repairs as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 The Contractor must ensure the all systems relating to the engine, as well as all sources of energy, are properly isolated, locked out and tagged out prior to the work beginning and throughout the duration of the work.

3.1.3 The Owner will supply one full set of o-rings and gaskets to complete the work.

3.1.4 The Wajax technician(s) must drain the engine of all coolant.

3.1.5 The Contractor must cap or blank off all piping, hoses, tubing or lines that will be opened to facilitate the work in order to prevent contamination.

3.1.6 The Wajax technician(s) must remove the exhaust manifold from both A Bank and B Bank of the starboard engine.

3.1.7 The Wajax technician(s) must replace all o-rings and gaskets with Owner supplied o-rings and gaskets.

3.1.8 The Wajax technician(s) must refit all items removed from the engine to facilitate the replacement of the o-rings and gaskets to the “original” state.

3.1.9 The Wajax technician(s) must only use new gaskets and o-rings to replace all piping, hoses, tubing and lines to the original state.

3.1.10 Upon completion of the work, the engine must be filled with coolant, the system bled of air and run up to test for exhaust leaks.

3.1.11 All work to be completed to the satisfaction of the Chief Engineer.

3.1.12 Upon completion of the work the Contractor must clean the work area and leave the work area in the “original” condition.

3.6 Location

3.6.1 Main Engine Room

3.7 Interferences

3.7.1 The Contractor shall be responsible for the identification of all interference items, their temporary removal, and storage and refitting to vessel.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and ABS Class Surveyor.

4.2 Testing

4.2.1 Starboard main engine must be run up and checked for exhaust leaks upon replacement of all o-rings and gaskets.

4.3 Certification

4.3.1 N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 The Contractor shall provide a report from Wajax Power Systems outlining all work performed, cylinders found to have exhaust leaks initially and other relevant information and findings. Contractor to provide one (1) hard copy and one (1) electronic copy to the Chief Engineer and one (1) electronic copy to the VMM.

5.1.2 All reports from the work specified must be given to the Chief Engineer and VMM.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

E-03 Replacement of Port and Stbd. Hydronic Heating Circulation Pumps

Part 1: SCOPE:

1.1 Replace two (2) hydronic heating circulation pumps with two (2) new style, Owner supplied, hydronic heating circulation pumps. The new pumps to be installed are: MP Pumps Model 35323, 24 VDC, 6 amp. Reworking the current piping/hose and electrical connection configuration will be necessary for installation of the new style Hydronic Heating Recovery Pumps. The installation of the new style Hydronic Heating Circulation Pumps is to only begin once the installation of the new Port Main Engine is completed. Each pump is located aft of each main engine.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

2.2.3 ISM hot work procedures are to be strictly enforced.

2.2.4 All welding shall be as per specification preamble.

2.2.5 CG Lockout Procedure.

2.2.6 TP 127E - Marine Electrical Standard

2.2.7 IEEE45:2002 – Recommended Practice for Electrical Installation on Ships

2.3 Regulations

2.3.1 N/A

2.4 Owner Furnished Equipment

2.4.1 The contractor shall supply all materials, equipment, labor and parts required to perform the specified work unless otherwise stated.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 The Contractor must notify the Chief Engineer prior to the work beginning.

3.1.2 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the shaft seal removal and / or installation as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.3 The Contractor must isolate and secure, all fluid lines connected to the currently installed Hydronic Heating Circulation Pumps to prevent the loss of fluid from the system. The Contractor must cap or blank off all fluid lines opened to facilitate the installation of the new pumps.

3.1.4 The Contractor must electrically isolate, lockout and tag out each pump before any work to remove the currently fitted pumps begins.

3.1.5 The Contractor must remove the currently fitted Hydronic Heating Circulation Pumps from the current location.

3.1.6 The Contractor must be responsible to properly dispose of the original pumps once removed from their original location as per all applicable Provincial Regulations.

3.1.7 The Contractor must fabricate a suitable base plate to mount the new style Hydronic Heating Circulation Pumps, approved by the Chief Engineer, and fit the new style Hydronic Heating Recovery Pumps in the location of the original pumps.

3.1.8 The Contractor must connect the inlet and outlet fluid line connections to the new style pumps by reworking the piping/hoses to suit the new style Hydronic Heating Recovery Pumps.

3.1.9 The Contractor must connect the electrical connection to the new style pump using the existing electrical feed. The existing electrical feed will be reworked to suit the new Hydronic Heating Recovery Pump.

3.1.10 The Contractor must be responsible to supply all piping, tubing, fittings, hoses, gaskets, hardware, and components required to complete the installation of the new pumps. The Contractor must only use new gaskets to fit the fluid lines and complete the installation.

3.1.11 The Contractor must open all valves necessary to check all disturbed piping, tubing, hoses and fittings for leaks.

3.1.12 The Contractor must be responsible for any materials or labour necessary to repair any leaks found in any piping, hoses, tubing, fitting and gaskets disturbed for the installation of the new Hydronic Heating Recovery Pumps once the system is charged and tested. All materials and labour necessary to repair any leaks will be at The Contractors expense.

3.1.13 All work to be completed to the satisfaction of the Chief Engineer.

3.5 Location

3.5.1 Engine Room

3.6 Interferences

3.6.1 The Contractor shall be responsible for the identification of all interference items, their temporary removal, and storage and refitting to vessel.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and ABS Class Surveyor.

4.2 Testing

4.2.1 The system will be charged to normal operating pressure and the pumps run for 30 minutes for the purposes of testing and detecting any leaks.

4.3 Certification

4.3.1 All electrical work to be carried out by Certified Electrician(s).

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 N/A

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

E-04 Port Sea Strainer Inlet Valve Replacement

Part 1 – SCOPE

1.1 The intent of this specification shall be for the Contractor to replace the Port Sea Strainer Inlet Valve with a new, Owner supplied, Sea Strainer Inlet Valve.

Part 2 – REFERENCES

2.1 Guidance Drawings/Nameplate Data

2.1.1 16082-720-M-002 Main Engine Cooling System

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1 The Contractor shall supply all materials, equipment and parts required to perform the specified work unless otherwise stated.

Part 3 – TECHNICAL DESCRIPTION

3.1 General

3.1.1 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the work outlined in the Port Sea Strainer Inlet Valve Replacement, Spec item E-04, as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.2 The Contractor must notify the Chief Engineer prior to the work beginning.

3.1.2 The Contractor shall remove all deck screws, deck plates, lift and secure in order to gain access to tank top and engine room bilge to facilitate the removal of the existing sea valve and installation of the new sea valve.

3.1.3 The Contractor must remove the currently fitted port sea strainer inlet valve.

3.1.4 The Contractor must clean all flange surfaces prior to installation of the new sea strainer inlet valve.

3.1.5 The Contractor must install the new valve using new gaskets. The Contractor must install isolation sleeves on each bolt when installing the new valve as per the original valve installation. The new valve must be installed in the same orientation as the valve which was removed.

3.1.6 The Contractor must install the new sea strainer inlet valve following all installation instructions and recommendations of the valve manufacturer.

3.1.7 The Contractor must replace all deck plates and associated hardware to the "original" condition.

3.2 Location

3.2.1 Main Engine Room

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, and storage and refitting to vessel.

Part 4 – PROOF OF PERFORMANCE

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and ABS Inspector.

4.1.2 The Contractor shall ensure that ABS Class credit is obtained for these items prior to acceptance.

4.2 Testing

4.2.1 On completion of the work the valve operating mechanism must be shown to be operational and the valve checked to be operating correctly when the vessel is undocked.

4.3 Certification

4.3.1 N/A

Part 5 – DELIVERABLES

5.1 Drawings/Reports

5.1.1 N/A

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A

H-01 Bilge Cleaning – Steering Gear Compartment and Engine Room.

Part 1 – SCOPE

1.1 The intent of this specification shall be for the Contractor to high pressure power wash (3000psi minimum) the bilges of the Steering Gear Compartment and Main Engine Room with hot water, degreaser and cleaning agents suitable for use on aluminum. The bilge cleaning is only to begin upon completion of Spec items: HD-08, E-01, E-02, E-03 and E-04.

Part 2 – REFERENCES

2.1 Guidance Drawings/Nameplate Data

2.1.1 N/A

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1 The Contractor shall supply all materials, equipment and parts required to perform the specified work unless otherwise stated.

Part 3 – TECHNICAL DESCRIPTION

3.1 General

3.1.1 The Contractor must notify the Chief Engineer prior to the work beginning.

3.1.2 The Contractor must be responsible for contacting and arranging the ABS Class Surveyor to witness any portion of the bilge cleaning as requested by the ABS Surveyor. The Contractor must provide minimum two(2) days notice to ABS Surveyor to arrange attendance to the vessel.

3.1.3 The Contractor must test and verify the operation of all float alarms in the Steering Gear Compartment and Engine Room prior to the work beginning. The Chief Engineer to witness the testing of all float alarms in the Steering Gear Compartment and Engine Room.

3.1.4 The Contractor shall remove all deck screws, deck plates, lift and secure in order to gain access to the Engine Room bilge and Steering Gear Compartment bilge.

3.1.5 The Contractor must remove all loose debris from the bilges in the Steering Gear Compartment and Engine Room prior to beginning the power wash of the bilges.

3.1.6 Following the removal of all loose debris, the Contractor is to power wash the Steering Gear Compartment and Engine Room bilge. All areas shall be high pressure (3000 psi minimum) hot water washed, degreased and cleaned.

3.1.7 During this work, all accumulated water and cleaning fluids and debris are to be removed manually or by a vacuum truck.

3.1.8 The Contractor shall take all necessary precautions to protect electrical machinery and equipment, junction boxes and all other machinery and equipment from ingress of water during the washing process. Any ingress of water or damage to any equipment caused thereby will be corrected by the Contractor at the Contractor's expense.

3.1.9 Any splashing of dirt, debris, oily sludge or other substance onto any area above or beyond areas dealt with shall be contained and limited to as great a degree as is reasonably practical. Any areas so affected are to be cleaned by the Contractor. All areas are to be left in a clean condition.

3.1.10 On completion of the work, all bilges shall be shown to be clean and all float alarms in these spaces shall be proven operational. The contractor is to refit all deck plates back in their original position and secure them with deck screws in "original" condition. The Contractor must be responsible to repair or replace all float alarms found not to be operational after bilge cleaning is completed. The repair or replacement of non operational float alarm components must be at the Contractors expense.

3.2 Location

3.2.1 Main Engine Room Bilges

3.2.2 Steering Compartment Bilges

3.3 Interferences

3.3.1 Contractor is responsible for the identification of interference items, their temporary removal, and storage and refitting to vessel.

Part 4 – PROOF OF PERFORMANCE

4.1 Inspection

4.1.1 All work shall be completed to the satisfaction of the Chief Engineer and ABS Inspector.

4.2 Testing

4.2.1 On completion of the work all bilges shall be shown to be clean and float alarms shall be proven operational

4.3 Certification

4.3.1 N/A

Part 5 – DELIVERABLES

5.1 Drawings/Reports

5.1.1 Contractor shall deliver two (2) hard copies of all checklists and reports to the Chief Engineer outlining any work and/or modifications required. Contractor shall deliver one (1) electronic copy of all reports to SVMM.

5.2 Spares

5.2.1 N/A

5.3 Training

5.3.1 N/A

5.4 Manuals

5.4.1 N/A
