CCGS Coast Guard 03

Requisition F3032-18N212

Drydocking Specification

Winter 2018-2019

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LIST OF ACRONYMS

BFG	Government Supplied Materials
CCG	Canadian Coast Guard
CLC	Canada Labour Code
CPM	Contractor provided material
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
DFO	Fisheries and Oceans Canada
FSR	Field Service Representative
FSSM	Fleet Safety and Security Manual (CCG)
GSE	Government-supplied equipment
HC	Health Canada
HQ	Contracting authority (PWGSC)
IEEE	Institute of Electrical and Electronics Engineers
MSDS	Material Safety Data Sheet
NACE	National Association of Corrosion Engineers
OHS	Occupational Safety and Health
OL	Overall length
PWGSC	Public Works and Government Services Canada
SSMS	Safety and Security Management System
TA	Technical Authority – Owner's Representative (CCG)
TBS	Treasury Board of Canada Secretariat
TCMS	Transport Canada Marine Safety
WHMIS	Workplace Hazardous Materials Information System

SHIP CHARACTERISTICS

Type	
Construction	Steel
Overall length:	60 ft. 8 in.
Moulded length:	20 ft. 0 in.
Moulded width (each hull):	7 ft. 0 in.
Distance between hulls:	6 ft. 0 in.
Moulded hollow:	6 ft. 9 in.
Draught (freshwater):	5 ft. 11 in.
Load displacement	75 metric tonnes

Attached drawings and documents:

Machinery Space Arrangement	05508-03
Location of speed log transducer unit	05508-04
General Arrangement - Elevation and top view of the wheelhouse	05513-01
General Arrangement - Main deck, lower deck	05513-02
General arrangement of machinery space	05513M01
Shafting & rudder stock plans	05513M02
Rudder stock, rudder trunk & post	109-13
Docking plan	Docking plan
PSS Seal	Seal
Detail of arms	HD-1700

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1 GENERAL COMMENTS

1.1 Scope

These general remarks describe the Canadian Coast Guard (CCG) requirements applicable to all the attached technical specifications.

1.2 Reference Material

Canadian Coast Guard Fleet Safety and Security Manual:

Fleet Safety and Security Manual (FSSM) Procedures	Title
7. A. 1	Risk prevention program
7. B. 1	Diving operation
7. B. 2	Fall protection
7. B. 3	Access to confined spaces
7. B. 4	Hot work
7. B. 5	Lockout/tagout
7. B. 6	Electrical work on live circuits
10. A. 2	Contractor's safety and security

Referenced publications:

TP3177E	Standard for the Control of Gas Hazards in Vessels to be Repaired or Altered
TP127E	Electrical Standards of Transport Canada Marine Safety
IEEE 45	Recommended Practice for Electrical Installations on Shipboard
CSA W47.1	Certification of Companies for Fusion Welding of Steel, Section 2 (Certification)
CSA W47.2	Certification of Companies for Fusion Welding of Aluminium
CSA W59	Welded Steel Construction (Metal Arc Welding)
CSA W59.2	Welded Aluminium Construction

Referenced legislation and regulations:

NR467.A1 DT R09E	Bureau Veritas – Steel vessel classification regulations
NR 216 DT R04 E	Bureau Veritas – Rules on Materials and Welding for the classification of Marine Units
CLC	Canada Labour Code
MOHS	Maritime Occupational Health and Safety

1.3 Occupational Health and Safety

1.3.1 The Contractor and all sub-contractors must comply with occupational health and safety (OHS) instructions in accordance with relevant federal and provincial regulations and ensure that the Contractor’s activities are conducted safely and without compromising the safety of a staff member.

1.3.2 The Contractor and its employees, including sub-contractors, must participate in an orientation session on safety on board the vessel prior to commencing work in order to fully understand the risks specific to a vessel and the work protocol permit systems, as well as the procedures for safety, risk prevention, hazard response and assessment of safety prior to working. The Contractor will have access to an uncontrolled copy of the Fleet Safety and Security Manual.

1.3.3 The Contractor must comply with the Fleet Safety and Security Manual (DFO/5737) and with the work instructions on board the vessel, in addition to the relevant *Canada Labour Code* regulations, while performing tasks that include the following:

- Diving operation
- Hot work;
- Work at heights;
- Access to confined spaces;
- Lockout/tagout;
- Electrical work on live circuits
- Electrical hazard assessment

1.3.4 For lockout/tagout needs, the Contractor must provide its employees with locks and locking devices in addition to those supplied by the vessel’s Chief Engineer.

1.3.5 The Contractor must provide a copy of the gas free certificate from a certified marine chemist or other qualified person with technical authority when performing work in tanks and bilges, prior to beginning work. The certificates must specify “No danger for persons” or “No danger for hot work,” as

applicable. The certificates are to be displayed in full view near the compartment entrance. All tanks and pipe tunnels open for inspections and tests shall be cleaned and undergo a final inspection by the technical authority before they are closed.

1.3.6 The Contractor and its employees will not have access to crew stations or to the vessel’s sanitary facilities. The Contractor shall provide the necessary amenities for its employees and sub-contractors.

1.4 Access to the workplace

1.4.1 The Contractor must ensure that the technical authority and CCG staff have free access at all times to the workplace throughout the term of the contract.

1.5 Workplace Hazardous Materials Information System (WHMIS)

1.5.1 The Contractor must provide the TA with the Material Safety Data Sheets (MSDS) for all the products it supplies that are controlled under WHMIS.

1.5.2 The TA will give the Contractor access to the MSDS for all controlled products on board the vessel for all work items specified.

1.6 Tobacco in the workplace

1.6.1 The Contractor must ensure compliance with the Non-smokers’ Health Act. The Contractor shall ensure that each employer and any person acting on behalf of an employer ensures that they refrain from smoking in work spaces under the employer’s control. The Contractor shall ensure that absolutely no person smokes on board the vessel.

1.7 Healthy and safe workplace

1.7.1 Before the Contractor begins work on the vessel, the TA and the Contractor’s quality assurance representative must inspect the areas where the work will take place, including access routes. The Contractor’s quality assurance representative shall take digital photographs of each area in order to demonstrate that it has complied with the requirements of this document. He then transfers these photographs by e-mail. Each photo shall be dated and indicate where on the vessel it was taken. The photos shall be provided to the TA for reference purposes within 48 hours of the start of the contract period.

1.7.2 During the work period, the Contractor must ensure the upkeep of areas of the vessel that its staff use to access the work areas. The areas shall be clean and free of debris, and waste must be removed every day.

1.7.3 Areas that present a danger due to the work being performed as per this specification must be secured and clearly marked by the Contractor. Signage shall be installed to inform and protect all staff members in accordance with the applicable requirements of the Canada Labour Code.

1.7.4 At the end of this contract, the Contractor must ensure that all waste produced during the performance of work under this specification is disposed of and that the vessel is as clean as it was before the beginning of the contract period.

1.7.5 Once all known work has been completed and the final cleaning has been performed, the Contractor’s quality assurance representative must inspect all areas of the vessel where work was performed by the Contractor. Any observed deficiency or damage shall be noted and compared to the photographs in order to determine whether the deficiency or damage stems from the work performed by the Contractor. If this is the case, the damage must be repaired by the Contractor, at no cost to the CCG.

1.8 Fire protection

1.8.1 The Contractor must ensure that the isolation, removal and installation of fire detection and extinguishing systems and related components are performed by a qualified technician. When fire detection or extinguishing systems are deactivated or put out of service by the Contractor during the term of the contract, a qualified technician shall certify that they are fully functional again. The original signed and dated certificate shall be given to the Technical Authority (TA) and to Technical Inspection before the end of the contract.

1.8.2 The Contractor must inform Technical Inspection and the TA and obtain written approval before disturbing, removing, isolating, deactivating, putting out of service or locking out any element of the fire detection and extinguishing systems, including heat and smoke detectors.

1.8.3 The Contractor must provide fire protection at all times, including while work is being performed on the vessel’s fire detection and extinguishing systems. This can be done in the manner proposed below, only after having obtained written approval from the TA:

- Put only one part of the system out of service at a time;
- Keep the system functional by using spare parts while the work is underway;
- Employ other methods accepted and approved by the TA.

1.8.4 The Contractor must know that if all the necessary precautions are not taken during work on the vessel’s fire extinguishing systems, accidental discharge of extinguishing agent may occur. The Contractor shall then fill and certify, at its expense, any containers or systems that are depleted due to such work.

1.9 Damaged paint and retouching

1.9.1 Unless otherwise indicated, the Contractor must provide and apply two coats of marine primer paint compatible with the vessel’s paint system on all new metal surfaces and surfaces requiring retouching. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

1.9.2 Before applying the first coat, the Contractor shall prepare all new aluminium structures and those that require retouching in accordance with the paint manufacturer’s directions.

1.10 CCG and other employees on board the vessel

1.10.1 CCG and DFO employees, as well as other employees such as manufacturer representatives, TCMS or classification investigators, may perform other work on board the vessel, including work not mentioned in this specification, during the work period. The TA will do its utmost to ensure that other work, related inspections and investigations do not interfere with the Contractor’s work. The Contractor should not coordinate the related inspections or pay the inspection costs for such work.

1.11 Ship Safety Office

1.11.1 The vessel is subject to regulations of Transport Canada. It is the Contractor's responsibility to ensure that all the work meets the requirements of the Transport Canada regulations.

1.12 Regulatory inspections and/or classification review

1.12.1 The Contractor must schedule and coordinate all regulatory inspections and classification surveys in collaboration with the authority concerned, e.g., Transport Canada Marine Safety, Classification Society, Health Canada, Environment Canada and others, on the basis of this specification.

1.12.2 All documents produced in the context of the inspections and surveys referred to above and substantiating that they have taken place (e.g., original signed and dated certificates) must be submitted to the TA at the end of the contract.

1.12.3 The Contractor must not substitute the TA’s inspection for regulatory inspections by the TCMS or classification surveys.

1.12.4 The Contractor must give prior notice (of at least 24 hours) to the TA before the planned TCMS regulatory inspections or classification surveys so that the TA can be present for the inspection.

1.13 Test results and data collection

1.13.1 The Contractor must develop a testing and trial plan including at least all of the tests and trials mentioned in the specification. This plan must be submitted to the TA for review purposes one week before the start of the originally planned work period.

1.13.2 Any data specific to the trials, measurements, calibration, or readings must be recorded, dated, accompanied by the signature of the person who took the measurements, and forwarded to the technical authority and to Marine Safety as a report in hard copy and electronic format at the end of the contract.

1.13.3 The recorded data must be accurate to three decimal places (unless otherwise specified) and comply with the measurement system in place on the vessel.

1.13.4 The Contractor must provide the TA with valid calibration certificates for all instruments used within the framework of the testing and trial plan to prove that the instruments have been calibrated in accordance with the manufacturer’s instructions prior to starting the work.

1.13.5 The Contractor shall provide three hard copies and one electronic copy of all reports. Hard copies of reports must be placed in standard three-ring binders, typewritten on letter-size paper and

classified by specification number. Electronic copies shall be in unprotected Adobe PDF format and sent by email.

1.13.6 All documents produced during the contract must be placed in a data collection then submitted to the TA at the end of the contract.

1.13.7 All requested drawings must be produced on ANSI format B (11 in. x 17 in.) paper or smaller. Three copies must be provided. Drawings shall also be sent by email in DWG format (AutoCAD 2000 or more recent version) and are not to be password protected.

1.14 Material and tools provided by the Contractor

1.14.1 Unless otherwise indicated, the Contractor shall supply all the material, equipment and parts necessary to perform the work in the specifications.

1.14.2 The Contractor must ensure that all material is new and has never been used.

1.14.3 The Contractor must ensure that all replacement products such as sealing components, gaskets, insulation, small hardware items, oils, lubricants, degreasing solvents, preservation agents, paints, coatings, bolts and fastening materials, among others, comply with the drawings, manuals and instructions of the equipment’s manufacturer.

1.14.4 When no particular item is specified or when a replacement must be made, the TA must approve the replacement item in writing. The Contractor shall give the TA details on the material used and the grade and quality certificate of the various materials before use.

1.14.5 The Contractor must provide all equipment, devices, tools and machinery, such as welders, cranes, scaffolding and fixtures required to perform the work indicated in this specification.

1.14.6 The Contractor must ensure services for the disposal of waste oil, hydrocarbons and any other hazardous waste or controlled products as part of the work planned under this specification. The Contractor shall provide certificates of disposal for all waste listed above.

1.14.7 Such certificates of disposal must show that the disposal has been completed in accordance with federal, provincial and municipal regulations in force.

1.15 Material and tools provided by the government

1.15.1 All material and tools must be provided by the Contractor unless otherwise specified in the technical specification.

1.15.2 If the TA provides tools, the Contractor must return them in the condition in which they were borrowed. Borrowed tools must be inventoried. The Contractor shall affix its signature on the inventory statement upon receipt of the tools and when they are returned to the TA.

1.15.3 The Contractor must keep all goods supplied by the government in a warehouse or secure storage in a controlled atmosphere, in accordance with the manufacturer’s instructions.

1.16 Restricted access areas

1.16.1 The Contractor must not enter the following areas (except to perform work in accordance with the specification): cabins, offices, workshops, engineer’s office, bridge, control room, toilets, kitchen, crew stations, recreation areas or other areas where restricted access is posted.

1.16.2 The Contractor must give 24 hours' prior notice to the TA when it needs to work in occupied spaces or offices. The CCG will then have sufficient time to move staff and secure the areas.

1.17 Contractor inspections and protection of equipment and the workplace

1.17.1 In collaboration with the TA, the Contractor must coordinate an inspection of the condition and location of items to be removed before performing the specified work or accessing a location to work on it.

1.17.2 Any damage resulting from the Contractor’s work and attributable to its performance of the work must be repaired by the Contractor at its own expense. Material used for replacements or repairs shall comply with the criteria for material supplied by the Contractor, indicated in the "Material and tools provided by the Contractor" section.

1.17.3 The Contractor must protect adjacent equipment and areas from damage. Workplaces shall be protected against water infiltration, sanding and welding particles, etc. Temporary covers shall be installed on workplaces.

1.17.4 The Contractor must protect the vessel from infestation by vermin (insects, mammals). If an infestation occurs during the contract period, the Contractor shall ensure, at its expense, extermination of the vermin prior to the vessel’s departure and the end of the contract.

1.18 Records of work in progress

1.18.1 The TA may record work in progress by various methods, including photos, digital videos and film.

1.19 List of confined spaces

1.19.1 The Contractor may request a list of confined spaces in the vessel at the meeting prior to the refit.

1.20 Hazardous materials

1.20.1 The Contractor must not use any material containing asbestos.

1.20.2 Handling of materials containing asbestos must be performed by personnel trained and certified in the removal of material containing asbestos in accordance with the federal, provincial and municipal regulations in force as well as the Fleet Safety and Security Manual. The Contractor shall provide the TA with certificates of disposal for all asbestos-containing materials removed from the vessel so as to demonstrate that the disposal has been performed in accordance with federal, provincial and municipal regulations in force.

1.20.3 The Contractor must not use paint containing lead.

1.20.4 In the past, paint containing lead was used to paint CCG vessels. Consequently, some of the Contractor’s processes, such as grinding, welding and burning, may release the lead content of the paint. The Contractor shall ensure that analyses are conducted in the work areas to test for the presence of lead in the paint and ensure that the work is performed in accordance with applicable federal and provincial regulations.

1.20.5 The Contractor must obtain Health Canada approval for paint applied to the surface of hulls subject to regulations of Health Canada and the Pest Management Regulatory Agency.

1.21 Removed material and equipment

1.21.1 All equipment removed under this specification remains the property of the CCG unless otherwise noted in certain sections of the specification.

1.22 Welding certification

1.22.1 For any work requiring fusion welding of steel, the Contractor or its sub-contractors shall hold certification from the Canadian Welding Bureau in accordance with subsection 2.1 of the most recent version of standard W47.1-03 of the Canadian Standards Association.

1.22.2 For any work requiring fusion welding of steel, the Contractor or its sub-contractors must hold certification from the Canadian Welding Bureau in accordance with subsection 16 of the most recent version of standard CSA\ACNOR AWS of the Canadian Standards Association.

1.22.3 For any work requiring fusion welding of aluminium structures, the Contractor or its sub-contractors must hold certification from the Canadian Welding Bureau in accordance with subsection 2.1 of the most recent version of standard W47.2 of the Canadian Standards Association.

1.22.4 The Contractor shall provide the technical authority with documents clearly indicating the welding certification for all the employees who will perform all the welding work indicated in this specification.

1.23 Electrical installations

1.23.1 All electrical installations and repairs shall be performed in accordance with the most recent version of Standard TP17E (Transport Canada’s Marine Safety Electrical Standards) and Standard 45 of the Institute of Electrical and Electronic Engineers (Recommended Practice for Electrical Installations on Shipboard).

1.23.2 All electronic equipment installations and repairs shall be performed in accordance with the Canadian Coast Guard publication on telecommunications and electronics entitled “General Specification for the Installation of Shipboard Electronic Equipment.”

1.24 Refrigeration and air conditioning systems

1.24.1 Any work on refrigeration and air conditioning systems shall be performed in accordance with Sections 2.7 and 2.8 of the Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

1.25 Tradespeople’s competence

1.25.1 The Contractor shall use qualified, certified (if applicable) and competent tradespeople and supervise them to ensure a high and consistent quality of performance.

1.25.2 The head of inspection may ask to consult and record details of the certification or competencies of the Contractor’s tradespeople. This request must not be made unduly, and is only intended to ensure that qualified tradespersons are performing the necessary work.

1.26 Electric power and compressed air supply

1.26.1 120 VAC electricity will be provided by the contractor.

1.27 Obstructions

1.27.1 The Contractor is responsible for identifying items causing an obstruction, temporarily removing and storing them, and then reinstalling them on the vessel.

1.28 Reports

1.28.1 For each task of the specification for which a report is requested, the Contractor shall produce a report in PDF format recording the work done, parts replaced and all records (measurements, photos, readings, imaging, etc.) taken during the inspection and all readings (pressure, temperature, speed, position, etc.) taken during the tests and trials.

2 SERVICES

2.1 Scope

2.1.1 The purpose of this specification is to provide and connect the required services to the vessel as of the start of the refit and to disconnect them at the end of said refit. These services will be supervised by the Chief Engineer and will remain connected throughout the refit. The Contractor shall provide all the material and tools up to the connection points. It shall specify the cost of each service in its quote.

2.2 Technical description

The Contractor shall provide a full quotation and daily rates for all services supplied to the vessel during the contract period.

2.2.1 *Power supply* – The vessel is shore powered from a single source of 100 amperes using cables and connections provided by the Contractor. The shore power supply transformer of the vessel requires a one-phase, 600 VAC, 60 Hz, 25 KVA supply. The contractor provides a price for 400 kwh per day for the period November 5, 2018 to November 23, 2018. Also the Contractor provides a unit price in kilowatt/hours. Throughout the construction period, the vessel (accommodations, the two (2) engine rooms and the bridge) shall be heated according the requirements of the Coast Guard. The Contractor shall provide the meter for taking consumption readings in kWh. Meter readings shall be recorded by the Contractor and the Chief Engineer during connection and disconnection.

2.2.2 *Firemain* -The vessel’s firemain is emptied during overwintering so the Contractor must provide installation of a non-pressurized fire hose ready for use at all times with the necessary hose lengths.

2.2.3 *Gangway*s– The Contractor must provide and erect two gangways with safety nets, handrails and adequate lighting to the satisfaction of the Commanding Officer. Gangways are to be secured, well-lit and suitable for shipyard workers and crew to pass over them. The Contractor shall ensure that gangways remain in good condition throughout drydocking. The vessel's gangways must not be used during the refit/drydocking period unless authorized by the Commanding Officer. The CCG disclaims all liability. Any costs incurred from moving gangways for the execution of the Contractor's work shall be at the Contractor's expense.

2.2.4 *Bathrooms* – Supply and install piping under the vessel deck to collect sewage and waste water. The Contractor shall make a bathroom available to the crew in its facilities; this bathroom shall be cleaned once a week.

2.2.5 *Waste container* – A waste container with cover is to be provided throughout the duration of the refit. Contractor staff and Coast Guard crew members may use the waste container, which shall be emptied, when necessary, at the Contractor's expense.

2.2.6 *Docking* – Docking and berthing facilities must be appropriate for a vessel of this size and must satisfy the Commanding Officer. Throughout the contract, if the vessel is not in dry-dock, it can be docked at the Contractor's wharf in a safe position where the water level is sufficient even at the lowest tides to prevent the ship from touching the bottom. The Contractor is responsible for all vessel movements throughout the contract. It must manage the services of lines handlers, tug operators, pilots, etc., and assume these costs.

2.2.7 *Crane services* – The Contractor provides the hourly rate for the service of a crane including all equipment and personnel necessary for transfer of components on board the vessel for the needs of the Coast Guard; this hourly rate will be used to correct the final amount on Form 1379. Include 8 hours of work in the contract. Obtain permission (signature, email or other) from the CCG representative for each request and record it in a log that will be submitted to the CCG at the end of the contract, along with supporting documents. Also, the contractor shall provide the services of a nacelle for hull or other inspections.

2.2.8 *Telephone, Internet* – Provide a telephone line and a high-speed Internet access line connected to the vessel's existing system. Provide an office for the CCG representative, with a telephone line and high-speed Internet access.

2.2.9 *Parking* – The Contractor shall provide three (3) parking spaces reserved for the Technical Authority and the project team for the duration of the contract. The Contractor shall also provide snow clearing service in order to maintain access to the vessel for Coast Guard personnel and various contractors.

2.2.10 *Vessel security* – The shipyard shall be responsible for conducting daily onboard security rounds at the end of the day throughout the entire drydocking period in addition to responding to monitoring system alarms. For each alarm that was the subject of a response, the shipyard shall submit a report to the Coast Guard representative. The shipyard shall record all occurrences in a log, to be given to the CCG representative when the vessel is returned. Include five (5) alarm visits in the contract.

2.2.11 *Responsibility for the vessel* – The Contractor shall be responsible for the vessel during the shipyard period. Throughout the shipyard period, the vessel (accommodations, the two (2) engine rooms and the bridge) shall be heated according the requirements of the Coast Guard. When the work has been completed, the Contractor shall ensure that the vessel is delivered to the Coast Guard representative in a clean, dust-free condition, both inside and outside.

2.2.12 The Contractor is responsible for communicating with the TSB inspectors in order to plan the inspection visits required for the work. The contractor shall ensure that visits by the MSO inspector are optimized. Inspection costs will be covered by the Coast Guard.

2.2.13 To avoid damage to the floors of the passageways, the Contractor shall supply and install 1/16" thick cardboard to the surface of the interior decks, both the main deck (bridge and data acquisition room) and the lower decks located in the two hulls. The surface area to be covered is 342 ft^2; the installation shall be done as soon as the vessel enters dry dock. Replace the cardboard as needed when it is damaged.

2.2.14 The vessel shall be delivered on completion of the work in the same state of cleanliness in which it entered dry dock.

2.2.15 The Contractor shall provide a potable water supply for the needs of the vessel in dry dock. (Water container) the price of the water shall be included in your bid.

2.2.16 During the dry-dock work period, the shipyard shall provide and install a temporary shelter covering all hulls of the ship from the main deck. This shelter must be ventilated, heated and weatherproof with the hull. Heated and ventilated shelter is mandatory regardless of weather conditions.

2.3 Acceptance of work

Inspection

All work must be approved by the TA.

Deliverable documents

The Contractor shall take readings and correct them, along with its reports in a book form. It shall submit two (2) hard copies and an electronic copy of the books to the TA before the end of the refit.

3 PRODUCTION CHART

3.1 Scope

3.1.1 This specification aims to provide the Owner's representatives with an exact schedule of the work and the work completion for the needs of the Coast Guard.

3.2 Technical description

3.2.1 The Contractor shall provide three bound copies of a detailed bar chart (*Gantt chart*) illustrating the planned schedule of work to refit the vessel. The chart shall show each task of the specification with its start date, duration, and planned and actual completion dates. An electronic version must also be sent to the TA. The Contractor shall also send a copy of the production chart to the contracting authority.

3.2.2 Any critical work path must be indicated, with the critical tasks that risk delaying the refit work if they do not comply with the planned work schedule. These may include problems with manpower or tasks that are unable to be carried out in parallel to other tasks.

3.2.3 All inspections, tests and trials shall be recorded in the production Gantt chart.

3.2.4 In case of work affecting the critical workflow, the TA is to be notified immediately. Every effort shall be made to avoid delaying the vessel's refit. Regular quality assurance procedures shall be applied.

3.2.5 The bar chart will be updated each week and prior to each production meeting to illustrate actual progress of the refit and changes made to the completion date of each item. The Contractor includes in diagram updates, any special work requested on PWGSC Form 1379, indicating the impact that this additional work will have on the work schedule.

3.3 Acceptance of work

Inspection

3.3.1 All work must be approved by the TA.

Deliverable documents

3.3.2 The selected Contractor shall provide three hard copies and an electronic copy of the bar chart to the vessel's TA within five (5) days of the contract award.

4 DRY DOCKING

4.1 Scope

4.1.1 The purpose of this specification is to ensure that the Contractor provides all services required to dry dock and refloat the vessel. The vessel shall also be place in the shipyard for return to the water on the date specified in the call for tenders if ice conditions allow. The Contractor shall provide a safe docking location after launching for seven (7) days to permit the crew to carry out inspection, tests, certification and start-up of the vessel.

4.2 References

4.2.1 Docking plan

4.3 Technical description

4.3.1 The Contractor shall dry dock the vessel in accordance with the vessel’s docking plan drawing.

4.3.2 The Contractor's quotation shall include docking and undocking costs, including the time planned for the performance of the requested work.

4.3.3 The Contractor must dry-dock and refloat the vessel under the direct supervision of a certified docking master.

4.3.4 A copy of the docking plan will be provided to the Contractor before the drydocking date. The Contractor shall prepare the keelblocks and shoring necessary to maintain the proper alignment of the vessel's hull and machinery throughout the drydocking period. The Contractor shall align the keelblocks using a laser and submit an alignment report to the Owner's representative prior to drydocking.

4.3.5 The Contractor must record the following information in the vessel condition reports:

4.3.6 Prior to docking, all tanks on vessel must be sounded and their contents recorded. A copy of the soundings shall be signed by the vessel's Commanding Officer, Chief Engineer and the Contractor's Docking Master.

4.3.7 At docking, all drained tanks must be recorded, and copies must be kept by the Contractor and the Chief Engineer.

4.3.8 At undocking, all tanks must be refilled to obtain the same draught and trim as at the time of the drydocking and the conditions agreed to by the Harbour Pilot, the Commanding Officer and the Chief Engineer.

4.3.9 The Contractor must provide the services of a diver to confirm that the vessel rests evenly on the bilge blocks and the blocks.

4.3.10 There must be a minimum under-keel clearance of 122 cm (4 ft.).

4.3.11 The Contractor is responsible for rope handling during docking and undocking, including towing and/or piloting service charges.

4.3.12 The Contractor shall prevent the transducer and sounder plates in the port and starboard hulls from resting on the keelblocks.

4.3.13 Frame spacing shall be marked on the hull to facilitate hull inspection by the representative of the Ship Safety Office representative and the Owner's representative. Immediately after water cleaning, but before shot-blasting the underwater hull, the Contractor shall mark the frame spacing at two-frame intervals from the sternpost (Frame 0); markings shall be of opposite shades on the bilge curve, port side and starboard side. The keelblocks aligned with the frames shall be marked in the same manner, starboard side and port side. It will be the responsibility of the shipyard to maintain the numbered frames until the vessel is refloated.

4.3.14 The Contractor shall remove the two (2) drain plugs (drain holes) to drain accumulated water in the port and starboard engine rooms. All removed docking plugs must be labelled immediately after their removal, stored in an appropriate container and handed over to the Owner's Representative. The coxswain or TA must be present during the removal and reinstallation of the drain plugs. The location of the plugs is indicated on the refit plan. The opening from any removed plug must be temporarily filled with a wooden stopper during the execution of work, such as sanding and painting, that could contaminate the tanks (Work performed on the vessel and also on other vessels that are in dry dock). Provisions for the disposition of a total quantity of 40 litres of oily water at the shipyard's expense in a regulatory manner shall be provided.

4.3.15 During refloating, the Contractor must have sufficient staff to stand by all sea water outlets, stern tubes, sea water inlets, etc., that were opened during drydocking to correct any deficiencies that may arise.

4.3.16 At undocking, all tanks must be refilled to obtain the same draught and trim as at the time of the drydocking and in the conditions agreed to by the Docking Master, the Commanding Officer and the Chief Engineer.

4.4 Acceptance of work

Inspection

4.4.1 All work must be approved by the TA.

Deliverable documents

4.4.2 The Contractor shall provide two hard copies and one electronic copy of checklists and reports to the Chief Engineer and send an electronic copy to the Vessel Maintenance Manager, within five (5) days of the completion of each work item.

5 CLEANING AND PAINTING THE HULL

5.1 Scope

5.1.1 This specification concerns the cleaning and retouching of missing or cracked paint on the vessel's hull.

5.2 Reference

- Location of speed log transducer unit 05508-03
- Shafting & rudder stock plans 05513M02
- Docking plan Docking plan
  - #5513-SF

5.3 Technical description

5.3.1 The Contractor shall supply and apply a coat of marine paint compatible with the vessel's paint system using the appropriate equipment and in accordance with the paint manufacturer's recommendations. The Contractor shall choose a single paint manufacturer for all of the work.

5.3.2 The Contractor shall ensure that the entire hull surface, from the main deck to the keel, including the rudders and propellers are cleaned with high pressure fresh water (3,000 psi) within two hours after drydocking the vessel. All fouling must be removed for a preliminary inspection. Before beginning the water cleaning, all equipment mounted on the hull and all openings must be completely protected. The Owner’s Representative will inspect the entire surface of the hull.

5.3.3 The area considered is approximately 1362 $ft.^2$, including the submerged surface of the hull and rudders. A fixed price inclusive of all costs incurred for paint application shall be negotiated. Bear in mind that 30% of the underwater hull surface will need to be sandblasted to Swedish Standard SA 2.5.

5.3.4 The submerged surface and rudders that will not be exposed shall be cleaned, and sandblasted with abrasive sand (sweeping) to obtain an adequate surface roughness profile for adhesion in accordance with the paint manufacturer’s recommendations.

5.3.5 The shipyard will supply and apply the paint using the appropriate equipment and in accordance with the paint manufacturer’s recommendations.

5.3.6 All precautions shall be taken to minimize oxidation of the steel after sandblasting by applying the paint in accordance with the application standards. The area that can be prepared within the time period shall therefore be defined so that personnel can work without interruption.

5.3.7 Prior to paining and sandblasting, the Contractor shall protect all sonar transponders and sensors, depth sounders, tank plugs, propellers, seawater suctions, overboard discharges and rudder bearings and also cover with polyethylene the windlasses, fairleads, deck gear (crane, sounding arm, etc.) accommodation openings, anchor cable openings, bulwarks, and any location deemed necessary by the vessel's Chief Engineer to avoid any infiltration of sand or paint during work.

5.3.8 The Contractor shall designate a person who will inspect the vessel while it is still resting on the keel and bilge blocks after cleaning, but before blasting and applying paint. An Owner’s Representative and a Contractor's Representative will inspect the vessel and determine the hull's total surface area to be shot blasted and refurbished.

5.3.9 The Contractor must provide in its bid the price for shot blasting 400 ft² of hull surfaces, which are damaged and will be repainted. Sanding shall create a gradual feathering around each area to be treated. The Contractor shall be responsible for cleaning, gathering and disposing of all sand used for sandblasting.

5.3.10 Special attention shall be paid during paint application so that the minimum dry paint thicknesses required in the dry state are obtained over the entire surface. Paint runs and sags shall be avoided when applying this paint.

5.3.11 The manufacturer’s recommended drying time shall be respected before refloating the vessel.

5.3.12 Apply one coat of light-coloured, pure colour aluminum, abrasion-resistant epoxy coating of 6 mil thickness from the keel up to 150 mm above the maximum load line on unpainted surfaces (bare metal), which will be compatible with the existing coating, such as Intershield 300. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

5.3.13 Apply a second coating pitch-free epoxy coating that will be compatible with the existing coating, such as: Interguard 264 (red primer), (6 mils dry) over the entire surface of the hull. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

5.3.14 Apply the third and fourth coats of high-performance anti-fouling paint (red oxide) 4 mils thick per dry coat over the entire surface of the hull to the load line, without TBT, polishing and anti-fouling which will be compatible with the existing coating, such as Interspeed 640. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

5.4 Draught marks and markings – Technical description

5.4.1 Contractor shall renew freeboard discs, letters, load line and draught marks, fore and aft, port and starboard, and shall be painted with two (2) coats of white paint compatible with the paint that will coat the ship's hull and plating.

5.4.2 All signage shall also be repainted with two (2) coats of paint. This includes the name of the ship on port and starboard sides, fore and aft, as well as the port of registry. On the two (2) sides, diagonal white stripes and black stripes limiting them, the inscriptions “COAST GUARD” and “GARDE CÔTIÈRE”, the official insignia of the Canadian flag, the word “Danger” with the symbols for propellers, as well as the markings for "Fisheries and Oceans Canada" and "Pêches et océans Canada" at the aft on each side.

5.4.3 The Contractor shall supply and apply a two (2) component acrylic polyurethane topcoat of excellent durability and extended overcoating time that will be compatible with the existing coating, such as white Interthane 990 RAL 3000 for all white marks and symbols and black paint RAL9004 for

black bands. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

5.4.4 When refurbishing the draught markings, the Contractor shall ensure that they are at the correct height and correct angle, relative to the hull, in order to distinguish the true draught from the markings and from the vessel, and obtain the approval of the MSO inspector.

5.5 Acceptance of work

Inspection:

5.5.1 All work must be approved by the TA.

5.5.2 The work shall be performed to the satisfaction of the Canadian Coast Guard representative. Schedule an inspection at each step of the process. The Contractor shall notify the Coast Guard representative in sufficient time to allow him or her to reach the site.

Tests

5.5.3 Readings of paint coating thickness and environmental conditions shall be recorded. Hull temperature, air temperature and humidity level readings are to be taken, among others.

Deliverable documents

5.5.4 The Contractor shall prepare a report indicating:

- repaired surfaces of the underwater hull;
- shot blasted surfaces, with the type of grit and air pressure used;
- coated surfaces, including the type and quantity of product applied;
- thickness measurements of the various coats;
- atmospheric conditions (temperature, humidity, etc.);
- temperature of the vessel’s hull.

5.5.5 The Contractor shall provide three (3) hard copies and one electronic copy of checklists and reports to the TA prior to launching.

5.5.6 The Contractor shall provide certificates from the paint supplier prior to launching.

6 COATING ABOVE WATERLINE:

6.1 Coating above waterline

6.1.1 Scope

The purpose of this specification is to clean and repaint the surface above the load line up to the bulwark top rail and to the aft main deck.

6.2 Reference:

N/A

6.3 Technical description

6.3.1 The Contractor shall supply and apply a coat of marine paint compatible with the vessel's paint system using the appropriate equipment and in accordance with the paint manufacturer's recommendations. The Contractor shall choose a single paint manufacturer for all of the work.

6.3.2 The Contractor shall ensure that the total surface area of this portion, 973 ft^2, including the surface above the load line up to above the bulwark in the fore section and the main deck in the aft section considering that 20% of the paint will need to be sandblasted to bare metal to commercial standard (SA 2).

6.3.3 The shipyard shall provide material and labour to sandblast the remaining surfaces that are not to be taken down to bare metal. The surface shall be cleaned and lightly sandblasted to obtain an adequate surface roughness profile for adhesion in accordance with the paint manufacturer’s recommendations.

6.3.4 All precautions shall be taken to minimize the oxidation of the steel after cleaning by applying the paint in accordance with the application standards of the paint brand. The area that can be prepared within the time period shall therefore be defined so that personnel can work without interruption.

6.3.5 Starting from the maximum load line, apply one (1) coat of clear coloured abrasion-resistant, pure colour aluminum epoxy coating 6 mils in thickness on all unpainted (bare metal) surfaces and which will be compatible with the existing coating, such as Intershield 300, then apply a second coat of epoxy pitch-free bond coating and which will be compatible with the existing coating, such as Interguard 264 (red primer), (6 mils dry) over the entire surface of the hull plating. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

6.3.6 Apply two coats of a two (2) component acrylic polyurethane topcoat of excellent durability and extended overcoating time that will be compatible with the existing coating, such as Interthane 990 Coast Guard Red 509-102 of thickness 0.002” each over all the surface. The first coat shall be applied the day after application of the primer coat which is to be slightly tacky, i.e., not completely dry. The inspection authority reserves the right to require a certificate from a chemist demonstrating the compatibility of the product with the paint used on board.

6.3.7 Care is to be taken to obtain a clear and sharp separation from the maximum load line.

6.3.8 Before beginning the water cleaning, all equipment mounted on the deck and all openings must be completely protected. The Owner’s Representative will inspect the entire surface of the plating above the waterline.

6.3.9 The Contractor shall remove any trace of abrasive contaminant remaining from sandblasting and shall ensure that all lights, windows, openings, controls, antennae, identification and equipment are well covered in order to avoid any damage and incrustation of dust caused by sandblasting, in accordance with government environmental standards and also against the coating applied.

6.3.10 Blow off the surfaces with compressed air before applying paint.

6.3.11 The Contractor shall comply with the manufacturer's recommendations for paint application (type of paint, colour of paint, dry thickness, drying time, etc.).

6.4 Acceptance of work

Inspection:

6.4.1 All work must be approved by the TA.

6.4.2 Abrasive contaminants left from sanding work shall not enter any part of the vessel. The Contractor shall ensure that any opening in the vessel where the abrasive contaminant could enter is well covered. The Contractor shall remove any trace of abrasive contaminant remaining from sanding.

6.4.3 The Contractor shall block the scuppers and deck exhaust ducts and take other necessary steps to prevent liquid contamination in areas being prepared or having coating applied. It shall also take steps to ensure that surfaces and equipment other than those specified are not coated and that the coating does not block any hull inlet or outlet orifice. Deck machinery and equipment that may be damaged by shot blasting or coating must also be protected. The Contractor shall remove all protective devices before its work is verified and accepted. The Contractor shall remove any excess paint on the vessel resulting from its work.

6.4.4 The work shall be performed to the satisfaction of the Canadian Coast Guard representative. Schedule an inspection at each step of the process. The Contractor shall notify the Coast Guard representative in sufficient time to allow him or her to reach the site.

Tests

6.4.5 Readings of paint coating thickness and environmental conditions shall be recorded. Hull temperature, air temperature and humidity level readings are to be taken, among others.

Deliverable documents

6.4.6 The Contractor shall prepare a report indicating:

- repaired surfaces of the underwater hull;
- shot blasted surfaces, with the type of grit and air pressure used;
- coated surfaces, including the type and quantity of product applied;
- thickness measurements of the various coats;

- atmospheric conditions (temperature, humidity, etc.);
- temperature of the vessel’s hull.

6.4.7 The Contractor shall provide three (3) hard copies and one electronic copy of checklists and reports to the TA prior to launching.

6.4.8 The Contractor shall provide certificates from the paint supplier prior to launching.

7 SEA WATER INTAKES AND VALVES, CHECK VALVES

7.1 Sea water intakes

7.1.1 Scope

7.1.1.1 The purpose of this specification is to open sea water intakes to clean them.

7.1.2 References

N/A

7.1.3 Technical description

7.1.3.1 The Contractor shall remove the gratings at the start of work and reposition once work has been completed and the seabays have been painted. Suction gratings for sea water intakes and inside the seabays shall be cleaned with a 3000-psi water jet. Contractor shall also ream the grating’s holes to bring them back to their original diameter. The Contractor must remove all fouling, scale and rust from the water intakes and paint them.

7.1.3.2 Reinstall everything with new 316 stainless-steel bolts. Secure each bolt with a stainless steel spring pin or secure two (2) bolts with a section of stainless steel sheet metal.

7.1.3.3 Replace all of the vessel’s zinc anodes, which will be provided by the shipyard. There are 28 zinc anodes, 4 anodes per rudder: 4 weighing (1) pound and 6 weighing three (3) pounds on the 2 hulls.

7.1.4 Acceptance of work

Inspection

7.1.4.1 All work shall be approved by the TA and the MSO inspector.

7.2 Valves and storm valves

7.2.1 Scope

7.2.1.1 This specification covers opening the sea water intake valves and valve chests (sea bay piping systems) mentioned in the list below to clean, inspect and review them to obtain certification from the MSO.

7.2.2 References

Table of hull valves and valve chests

ITEM	DIAMETER	LOCATION	DESCRIPTIONS	QUANT.
#1	1 1/2"	Port sea valve	Bilge pump 220 check valve	1
#2	1 1/2"	Port sea valve	Check valve for Ford generator	1
#3	3/4"	Port sea valve	12-volt bilge pump check valve	2
#4	3/4"	Port sea valve	Check valve around emergency exit	1
#5	3"	Port sea valve	Main engine seawater inlet valve	1
#6	2”	Port sea valve	Seawater valve, Ford generator	1
#7	3/4"	Port sea valve	Ventilation seawater inlet valve	1
#8	1 1/2"	Starboard sea valve	Bilge pump 220 check valve	2
#9	2"	Starboard sea valve	Check valve for Onan generator	1
#10	3/4"	Starboard sea valve	12-volt bilge pump check valve	2
#11	3/4"	Starboard sea valve	Check valve around emergency exit	1
#12	3"	Starboard sea valve	Main engine seawater inlet valve	1
#13	2"	Starboard sea valve	Seawater valve, Onan generator	1
#14	3/4"	Starboard sea valve	Ventilation seawater inlet valve	1
#15	1 1/2"	Starboard Accommodations	Toilet outlet valve	1
#16	1 1/4"	Starboard Accommodations	Heads' seawater inlet valve	1
#17	1 1/4"	Starboard Accommodations	Washroom outlet check valve	1
#18	1 1/4"	Starboard Accommodations	Sink check valve	1
#19	3"	Port forepeak	Speed log valve	1

7.2.3 Technical description

7.2.3.1 The contractor shall provide the material and labour required to dismantle, clean, and grinding the hull valves.

7.2.3.2 All valves shall be reinstalled after inspection with new caulking and gaskets supplied by the shipyard. Material used shall be of marine grade approved by the CCG representative.

7.2.3.3 Any damaged valves shall be repaired or replaced. Costs will be adjusted on PSPC Form 1379.

7.2.3.4 In its bid, the Contractor shall include the cost for disconnection and removal of items needed to access stopcocks, flappers and valves, and to perform its work.

7.2.3.5 The Contractor shall provide all material necessary for the work under this specification.

7.2.4 Proof of performance

Inspection

7.2.4.1 The Contractor is responsible for all inspections and must consult the MSO before beginning work, in order to establish the inspection calendar. At each inspection point, the Contractor shall inform the TA in advance so that he can be present.

7.2.4.2 The Contractor shall check the sealing of the stopcocks when refloating the vessel. Any leaks shall be repaired by the Contractor.

Tests

7.2.4.3 The Contractor shall subject the stopcocks to performance tests to ensure that they are watertight and that they function properly, to the satisfaction of the Chief Engineer and the MSO.

Deliverable documents

7.2.4.4 The Contractor shall provide the TA with two (2) paper copies and one electronic copy of checklists and reports detailing the work done, defects and repairs made, no later than five (5) days after the work's completion.

8 FUEL TANKS

8.1 Scope

8.1.1 The purpose of this specification is for the Contractor to open and reclose the fuel tanks to clean, inspect and test them for certification by the MSO. The Contractor shall repair any defective items; the cost of repairs is to be indicated on form PSPC 1379.

8.2 References

- #1 fuel tank Port engine compartment 300 imp. gal.
- #2 fuel tank Starboard engine compartment 300 imp. gal.
- #3 fuel tank Port bow compartment 100 imp. gal.
- #4 fuel tank Starboard bow compartment 100 imp. gal.

8.3 Technical description

8.3.1 The Contractor shall have a method for degassing these spaces so that personnel can safely access them and perform hot work. It must obtain a certificate from a recognized chemist. It must provide a hard copy of the certificate to the Chief Engineer. A copy shall also be posted prominently near the entrance to each space. All work is to be done in accordance with the standards and regulations governing entry to confined spaces.

8.3.2 The Contractor shall provide the ventilation equipment required for degassing and ensure that the certificates remain valid for the duration of the refit.

8.3.3 The Contractor is to use its pumps and hoses to pump out residual hydrocarbons and water, sludge, dirt and debris from the tanks. The Contractor will need to transfer the fuel from tanks No. 1 and No. 2, with an approximate capacity of 300 gallons each, into clean tanks close to the drydocking facilities and, after cleaning work has been completed, return this fuel to each tank, through a filtration system supplied by the shipyard. It is estimated that approximately 260 gallons will remain in the vessel's tanks at the entrance of the dry docked vessel.

8.3.4 The Contractor shall remove the drain plugs and drain tanks of residual oil, water, and sludge, which shall be emptied into containers and then transported out of the dry dock by the shipyard and disposed of in accordance with environmental protection rules. The amount of fuel and oil remaining after pumping out the tanks shall be approximately 50 litres. These tanks are to be thoroughly cleaned of any deposits prior to being inspected by maritime experts.

8.3.5 The Contractor shall clean all interior surfaces of the tanks; it may use pressurized water or steam, if necessary. It must remove remnants of fuel, deposits, sludge, dirt and other debris from the surfaces. All debris and washing residue must be removed from the vessel at the contractor’s expense.

8.3.6 Any functional tank openings (vents, hoses, stopcocks, controls, transducers, etc.) and related material shall be sealed off or protected before and during the cleaning work.

8.3.7 Each tank shall be inspected by the MSO Inspector, the Chief Engineer and the Vessel Maintenance Manager after tank cleaning.

8.3.8 The Vessel Maintenance Manager, the Chief Engineer and, if necessary, the MSO Inspector shall assist with the replacement of manhole covers. The Contractor is to clean sealing surfaces around the manhole and cover and install the cover with new, 1/4 in. thick nitrile seals. Contractor is to apply anti-seize compound on all threads.

8.3.9 The Contractor is also to provide a quotation for pneumatic testing of each tank and a quotation for hydrostatic testing of a tank. The quotation is to include installation and removal of drain plugs, removal of overflow lines and vent heads, the opening of a supplementary tank and the drainage of tanks (including removing water and wiping the interior surfaces of tanks).

8.3.10 The on-site MSO Inspector alone shall determine the test method. All tests are to be conducted in the presence of the MSO Inspector on site, the Chief Engineer and the Vessel Maintenance Manager.

8.4 Acceptance of work

Inspection

8.4.1 All work shall be approved by the TA and the MSO inspector.

Tests

8.4.2 Pneumatic or hydrostatic test on each tank, depending on what the MSO Inspector decides.

Deliverable documents

8.4.3 The Contractor shall provide the TA with two paper copies and one electronic copy of test certificates and reports detailing the work, prior to launching.

9 RUDDERS

9.1 Scope

9.1.1 Inspection of port and starboard rudders and rudders stocks.

9.2 Reference

Rudder stock, rudder trunk & post #109-13

9.3 Technical description

The Contractor shall perform the following work:

9.3.1 Perform a visual inspection of the exterior of the rudders upon drydocking of the vessel; if there are any holes, repair as needed.

9.3.2 If necessary, the Contractor shall repair any defective items; the cost of repairs is to be indicated on form PSPC 1379.

9.3.3 Remove the linkages from each rudder stock in the compartments located in the aft section of the vessel.

9.3.4 Remove the crossbar connecting the two rudders.

9.3.5 Loosen the rudder locking nuts.

9.3.6 Remove the retention collars from each rudder.

9.3.7 Using a hydraulic lift, push each rudder outward, provide exterior support to prevent damage to the rudders.

9.3. Before disassembling, it will be necessary to measure the clearance between the rudder stocks and their bearings. Record this clearance in a measurement logbook.

9.3.9 Clean rudder stocks and rudder trunks and take size readings of stocks and bearings. Check keys and keyways with liquid penetrant or any other method approved for ship inspection.

9.3.10 Following inspection by representatives of Marine Safety and the Coast Guard, reinstall rudder systems following the procedure described.

9.3.11 Replenish packing boxes with packing supplied by the shipyard. There are four (4) layers of 1/2" packing per rudder trunk, and the material is made of Teflon.

9.4 Acceptance of work

Inspection

9.4.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the MSO Inspector.

Tests

9.4.2 The Contractor must conduct sea trials to demonstrate the proper functioning of the rudders. See section 13.

Deliverable documents

9.4.3 The Contractor shall provide the Chief Engineer with two hard copies of test certificates and reports prior to launching the vessel. The Contractor is also to send an electronic copy of all reports and certificates to the Vessel Maintenance Manager prior to launching the vessel, no later than five (5) days after completion of the work.

10 PROPELLER SHAFTS AND PROPELLERS

10.1 Scope

10.1.1 Inspection of port and starboard propellers and propeller shafts.

10.2 Reference

N/A

10.3 Technical description

The Contractor shall perform the following work:

10.3.1 Provide the necessary material and labour required to dismantle the port and starboard propeller and propeller shafts.

10.3.2 Remove the coupling bolts of the port and starboard shaft/V-drive. Support the propeller shaft near the V-drive coupling when taking measurements. Clean the coupling bolts and nuts, which are numbered and fitted.

10.3.3 When the vessel is dry docked, dismantle the propellers using the key provided by the shipyard and remove the propellers from the cone part of the shafts.

NOTE: Measurements must be taken of the wear down dimensions of each of the shafts after removal from the stern tubes and on each of the shaft supports near the forward propellers and near each propeller before they are dismantled.

10.3.4 All propeller shafts shall be taken to the workshop to verify their concentricity. Verify the dimensions and concentricity of each shaft, recording the data in the measurement log. Conduct a Magnaflux or other approved test method on the propeller and shaft keyways and provide a report.

10.3.5 Reinstall the propeller shafts in their respective stern tubes which will be well-cleaned.

10.3.6 Replace the two (2) propeller shaft PSS seals with new ones. The two new PSS seals are to be supplied by the shipyard. PSS Seal details are attached in an appendix.

10.3.7 Propellers shall be dismantled and checked for cracks or other anomalies. Even if they are the same type of propellers, the Contractor shall perform twelve (12) propeller fits using prussian blue on each propeller, for a total of twenty-four (24). A price for each fit shall be attached in an appendix. The fits may be done on-site or in the workshop at the contractor's discretion with the TCMS representative and the Coast Guard representatives present.

10.3.9 Reinstall the propellers and the nuts, which shall be locked in place in accordance with the manufacturer's recommendations.

10.3.10 Once all the work on the two shaftlines has been completed, they shall be realigned between the stern tubes and the V-drives.

10.3.11 If necessary, the Contractor shall repair any defective items; the cost of repairs is to be indicated on form PSPC 1379.

10.4 Acceptance of work

Inspection

10.4.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the MSO Inspector.

Tests

10.4.2 The Contractor must conduct sea trials to demonstrate the proper functioning of the rudders. See section 13.

Deliverable documents

10.4.3 The Contractor shall provide the Chief Engineer with two hard copies of test certificates and reports prior to launching the vessel. The Contractor is also to send an electronic copy of all reports and certificates to the Vessel Maintenance Manager prior to launching the vessel, no later than five (5) days after completion of the work.

11 ANCHOR, CHAIN, AND CABLE (optional work)

11.1 Scope

11.1.1 The purpose of this specification is to remove the anchor and the cable which will be inspected by the MSO and repaired if necessary.

11.2 Reference

N/A

11.3 Technical description

The Contractor shall perform the following work:

11.3.1 Lower the anchor and cable to the bottom of the dry dock. (cable length: 370 ft.).

11.3.2 Visually inspect the anchor and the cable as well as the fasteners.

11.3.3 Clean the anchor by lightly sandblasting.

11.3.4 Paint the anchor with two coats of a single-component alkyd gloss enamel that is compatible with Interlac 665, in compliance with the manufacturer’s recommendations.

11.3.5 If necessary, the Contractor shall repair any defective items; the cost of repairs is to be indicated on form PSPC 1379.

11.4 Acceptance of work

Inspection

11.4.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the MSO Inspector.

Tests

11.4.2 The Contractor must conduct dry dock trials to demonstrate the proper functioning of the anchor windlass or raise the anchor.

Deliverable documents

11.4.3 The Contractor shall provide the Chief Engineer with two hard copies of test certificates and reports prior to launching the vessel. The Contractor is also to send an electronic copy of all reports and certificates to the Vessel Maintenance Manager prior to launching the vessel, no later than five (5) days after completion of the work.

12 HULL AND STRUCTURE (optional work)

12.1 Underwater hull repair and plating seam welding

12.1.1 Scope

12.1.1.1 Replacement of 3/16'' plating over a surface of 30 ft^2 and check 100 linear feet of butt weld. plating seam welding.

12.1.2 References

12.1.2.1 Docking plan Docking plan

12.1.3 Technical description

The Contractor shall perform the following work:

12.1.3.1 Replacement of 3/16'' plating over a surface of 30 ft^2 .or three (3) 10 sq. ft. plates (one 10 sq.ft sheet without curvature, one 10 sq.ft. sheet single square bend and 10 sq.ft. sheet double curvature). The work shall include preparation of the surfaces to be changed, preparation and installation of the plate, welding, and grinding of joints. Also, the contractor will have to plan to remove and replace 30 ft. insulation square on the inside of the ship This provision may be adjusted *pro rata* following the PSPC 1379 process after inspection of the vessel's underwater shell by representatives from DFO and Marine Safety.

12.1.3.2 Supply the material, steel 3/16 in. thick; cut and form the section, then weld it in place according to a procedure approved by the MSO.

12.1.3.3 Personnel performing the work shall be certified to CSA Standard W47.1 for all positions. Perform a penetration test to check the integrity of each repair.

12.1.3.4 The Contractor shall meet the ideal conditions for carrying out the work in accordance with recommendations from the Canadian Welding Bureau.

12.1.3.5 Allow for grinding of soldered welds that need to be filled (three passes) per 100 linear feet.

12.1.3.6 All welds shall be tested with liquid penetrant to ensure they are watertight.

12.1.3.7 The Contractor shall supply and apply the paint system using the appropriate equipment and in accordance with the paint manufacturer's recommendations to paint the plates that were replaced.

12.1.4 Acceptance of work

Inspection

12.1.4.1 All work must be completed to the satisfaction of the Chief Engineer, the Vessel Maintenance Manager and the Transport Canada inspector.

Trials

12.1.4.2 The Contractor shall conduct a penetration test of the integrity of the weld.

Deliverable documents

12.1.4.3 The Contractor must provide the TA with two hard copies and one electronic copy of test certificates and reports as well as material certificates no later than five (5) days after the work's completion.

12.2 Ultrasonic Hull Thickness Test

12.2.1 Scope

The purpose of this specification is to verify the thickness of the hull under the water line in order to obtain MSO certification.

12.2.2 Reference

- structural arrangement
- shell expansion
- Paints and coatings – Paints spec.

12.2.3 Technical description

12.2.3.1 Provide the services of an MSO-certified specialized firm to conduct an ultrasonic examination of the thickness of hull plates located below the water line.

12.2.3.2 Take 150 readings of the thickness of the shell plate, i.e., 3 horizontal strips, including the water line, and 3 vertical strips at the front, middle and rear of the hull. (Provide a unit price for additional readings). Additional measurements shall be recorded on PSPC Form 1379.

12.2.3.3 As indicated in the RFP, each thickness measurement must be recorded in the area indicated in the RFP.

12.2.3.4 In the areas selected for thickness tests, surfaces must be ground with bare iron to obtain a uniform contact surface. All ultrasonic thickness tests shall be conducted in the presence and to the satisfaction of the authorities concerned. Each surface that has been ground shall be coated with the paint system as identified in section 5.3.

12.2.3.5 The method used to take the ultrasound is standard Z10.2. "Hull surveys of bulk carriers."

12.2.4 Proof of performance

Inspection:

12.2.4.1 All work shall be approved by the TA and the MSO Inspector.

Deliverable documents

12.2.4.2 The Contractor shall provide three (3) paper copies and one electronic copy of readings and reports to the Vessel Maintenance Manager of Fisheries and Oceans/Coast Guard before the vessel is launched.

13 SEA TRIALS

13.1 Scope

13.1.1 This specification covers the conducting of operational tests of the propulsion and other vessel systems at sea.

13.2 Technical description

13.2.1 Once all items of the specification have been completed, operational tests of the propulsion and other vessel systems will be conducted at sea.

13.2.2 Sea trials must last at least four hours, as indicated in the specification. Additional time and costs required due to non-conformities in the work related to this quotation will be at the contractor's expense.

13.2.3 Unless otherwise indicated by the TA official, the Contractor shall ensure that the sub-contractors and FSRs who have participated in the refit attend the sea trials.

13.2.5 During the trials, the Contractor shall have a sufficient number of supervisory staff on board the vessel to monitor the operation of equipment affected by the refit. Two (2) persons (plus one supervisor) will be required during the trials).

13.3 Acceptance of work

Inspection:

13.3.1 All work must be approved by the TA and the MSO.

Tests:

13.3.2

Deliverable documents:

13.3.3 The Contractor shall provide two (2) hard copies and one electronic copy of FSR reports to the TA prior to launching.