INTEGRATED TECHNICAL SERVICES
MARINE ENGINEERING

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Alongside Refit, St. John's, NL

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Version 2

Alongside Refit 2012 SPECIFICATION INDEX

PREAMBLE

1. INTENT

The intent of this specification shall describe the necessary work involved in carrying out the ship's Annual Refit. 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 TC Marine Safety Inspector. 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. Three typewritten copies, in English, are to be presented to the Technical Authority and one copy to the Project Authority within three days following the completion of the applicable work item. All tests are to be witnessed by the Technical Authority and where required, Transport Canada Marine Safety. The Contractor is responsible for contacting TC-MS when their presence is required for inspections or testing. The Contractor shall advise the Technical Authority in every case when Marine Safety arrives onsite for inspection of vessel's equipments or structure.

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 of 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, welding, grinding, burning, gouging, painting or airborne articles 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. Dirt & debris generated by the spec items shall be cleaned up and removed from the vessel daily. 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. ENTRY INTO ENCLOSED SPACES
The contractor shall abide by the Coast Guard Enclosed Space Entry Policy. The policy is listed in the attached Safety Annex as section 7.0.9 and section 7.0.9 (N). Entry certificates shall clearly state the type of work permitted and shall be renewed as required by the regulations. Additional copies of these certificates shall be posted in conspicuous locations for the information of ship and contractor personnel.
A fire zone shall be established and naked lights shall not be used within this zone until "gas-free" certification has been issued.

The Contractor is to ensure that any work carried out in confined spaces as defined by the Canada Labor Code complies fully with all provisions of the code.
A number of spaces onboard the vessel are designated as Enclosed Spaces; these spaces are to be entered only under safe and controlled circumstances. The Contractor shall have in place an Enclosed Space Entry Permit system, equal to or better than the procedure contained in the Coast Guard's Safety Management System, section 7.D.9. Ship's breathing apparatus and EEBD's are not to be used except in an emergency.
The Contractor will maintain a log denoting the date, persons in the tank and times in and out.

13. 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.

14. 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 attached Safety Annex as section 7.D.ll and section 7.D.ll (N). The contractor shall be responsible to ensure the contractor's personnel including any subcontractors shall follow the policy.

15. LOCKOUT AND TAGOUT PROCEDURES
1. The Contractor shall be responsible to protect persons working on board the vessel while working on or near shipboard systems and equipment from accidental exposure to:
- electrical currents
- hydraulic
- pneumatic
- gas or steam pressure and vacuum
- high temperatures
- cryogenic temperatures
- radio frequency emissions
- potentially reactive chemicals
- stored mechanical energy
- equipment actuation

2. The contractor, under the supervision of the Chief Engineer and or the Electrical Officer, shall be responsible for the Lockout and Tagout of equipment and systems listed in the specification.

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

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

16. PAINTING

All new and disturbed steelwork 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 International Paints Interplate Zinc Silicate *NQA262INQA026* red. 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. Finish coats are to be applied as per the manufacturer's instructions on their respective product data sheets.

17. WELDING

Welding shall be in accordance with the Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
The Contractor shall be currently certified by the Canadian Welding Bureau (CWB) in accordance with CWB 47.1 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 W47.1, Division I, II or III. (latest revision)
The Contractor may be required to provide approved procedure data sheets for each type of joint and welding position that will be involved in this refit.
The Contractor may be required to supply a current Welders Ticket for each individual welder that will be involved in this refit.

18. 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.

19. 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, Control Room, Engineer's office, public washrooms, cafeteria, dining room and lounge areas.

20. 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.

21. 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.

22. 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.

23. 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.

24. Regulatory Authority Inspections

The Contractor shall confirm a schedule of inspections with the regulatory authority (TCMS) for all work described in this specification and 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 Technical Authority. Inspection of any item by the Technical Authority does not substitute for any required inspection by Transport Canada Marine Safety (TC-MS).

25. 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.

26. 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.

27. 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 Drydocking.
An electronic copy of the Fleet Safety Manual (Adobe Acrobat .PDF version) can be found at
http://142.130.14.20Ifleet-flotte/Safety/maine.htm

28. Data Book
The Contractor is to produce two Data Books which shall list products, supplies and other purchases by the yard for this refit listing supplier and contact information. This book shall also include the copies of the readings required for the completion of each specification item. The data book shall be 8 X 12" format and binded. The data book shall be indexed and tabbed in the same order as the refit specifications index. Contractor shall also provide 3 CD-ROM's of the data book. The CD ROM's and data books shall be provided to the Chief Engineer prior to the end of refit.

SHIP'S PARTICULARS
Length O.A. ---------- 88.0 Metres
Breadth MId. ---------- 17.1 Metres
Draft ---------- 6.06 Metres
Displacement ---------- 4234 MT
Power----------17,300 KW
Engines----------Stork -Werkspoor 8TM 410 (x 4)
Propulsion----------Diesel- Reducer Gearbox - CPP
Year built ---------- 1983

Spec item #: H-01	SPECIFICATION	TCMSB Field # N/A
Production Chart & Subcontractor Allowances		

Part 1: Scope

1.1 The intent is to provide a means for tracking the progress of the refit.

Part 2: References

N/A

Part 3: Technical Description

Production Chart

3.1 The successful Contractor shall supply three copies of a detailed bar chart showing the planned work schedule for the ship's refit. This bar chart shall show, for each spec. item, the start date, the manpower loading, the duration and the completion date. The chart is also to highlight any critical paths.

3.2 The production chart shall be updated weekly or for each production meeting to reflect the actual production on the refit and changes to the anticipated completion dates of each individual item.

3.3 The production chart shall clearly indicate the arrival/departure dates of any Subcontractors/Field Service Representatives.

3.4 The production chart shall include the status and production on each 1379 arising.

3.5 Three copies of the production chart shall be given to the Chief Engineer **the day prior** to each Production Meeting. A copy shall be emailed to the Project Authority, Phillip.Bingley@dfo-mpo.gc.ca the day prior as well.

3.6 A copy of the original bar chart shall be provided via email to the PWGSC contracting Officer and Project Authority before the close of business on the day on the start date of the refit.

Subcontractors with Allowances

3.7 The Contractor shall provide a weekly update of the hours billed by the subcontractors along with their hourly rates.

3.8 The results shall be tabulated in an excel spreadsheet clearly indicating the Subcontractor, date(s), hours worked and hourly rate for the hours worked.

3.9 The update is to be emailed to Technical Authority, Contracting Officer and Project Authority the day prior to the weekly scheduled Progress Meeting.

Spec item #: H-01	SPECIFICATION	TCMSB Field # N/A
Production Chart & Subcontractor Allowances		

Part 4: Proof of Peformance

N/A

Part 5: Deliverables

5.1 Contractor shall provide a weekly production chart and excel spreadsheet for subcontractor allowances every week on the timelines indicated.

Spec item #: H-2	SPECIFICATION	TCMSB Field # N/A
Liferaft Servicing		

Part 1: SCOPE

1.1 Contractor shall arrange for annual inspection and recertification of the listed life rafts by OEM certified service facility.

Part 2: References

2.1 Standards

2.1.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.

2.2 Regulations

2.3 Owner Furnished Equipment

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

List of Liferafts

a) 20 person Dunlop, serial #37622
b) 25 person Beaufort, serial #C208
c) 25 person Beaufort, serial #C180
d) 25 person Beaufort serial #C206
e) 6 person Beaufort, serial #C474

Part 3: Technical Descriptions

3.1 Contractor shall subcontract the annual inspection and recertification of the liferafts by an approved Transport Canada service facility that meets OEM certification.

3.2 An allowance of $15,000 shall be provided for the subcontractors work. This allowance shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.3 Contractor shall remove rafts from cradles and transport to OEM service facility. Contractor shall be responsible for shore crane needed to remove/return liferafts to their cradles.

3.4 On completion of inspection and recertification, contractor shall transport rafts back to vessel and reinstall in cradles as per original arrangement.

3.5 All inspection certificates shall be handed over to the Chief Engineer.

Part 4: Proof of Performance

4.1 Inspection

4.2 Testing

4.3 Certification

4.3.1. Contractor shall provide certificate of liferaft(s) inspection within 24 hrs of their return to the vessel.

Part 5: Deliverables

5.1 Drawings/Reports
N/A

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item #: H-3	SPECIFICATION	TCMSB Field # N/A
Galley Exhaust Cleaning		

Part 1: SCOPE:

1.1 Contractor shall arrange for cleaning of thel ship's galley exhaust ventilation to National Air Duct Cleaners Association (NADCA) Standard.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 **GAYLORD VENTILATOR:**
MODEL: BD
SIN: BF100E60B

EXHAUST CLEANING/CONTROL STATION:
MODEL: C- l00 A;
SIN: LVl284

VENTILATOR DAMPER:
MODELC-61

2.2 **Standards**

2.2.1 The HVAC system cleaning contractor shall be a certified member of the National Air Duct Cleaners Association (NADCA), or shall maintain membership in a nationally recognized non-profit industry organization dedicated to the cleaning of HV AC systems.

2.2.2 The HV AC system cleaning contractor shall have a minimum of one (1) Air System Cleaning Specialist (ASCS) certified by NADCA on a full time basis, or shall have staff certified by a nationally recognized certification program and organization dedicated to the cleaning of HV AC system.

2.2.3 A person certified as an ASCS by NADCA, or maintaining an equivalent certification by a nationally recognized program and organization, shall be responsible for the total work herein specified.

2.2.4 NADCA Standards must be followed with no modifications or deviations being allowed.

2.2.5 **Applicable Standards and Publications**
The following current standards and publications of the issues currently in effect fonn a part of this specification to the extent indicated by any reference thereto:

a) National Air Duct Cleaners Association NADCA): "Assessment, Cleaning & Restoration of HVAC Systems (ACR 2005)," 2004.

b) National Air Duct Cleaners Association NADCA): "Understanding Microbial Contamination in HVAC Systems," 1996.
c) National Air Duct Cleaners Association NADCA): "Introduction to HVAC System Cleaning Services," 2004.
d) National Air Duct Cleaners Association (NADCA): Standard 05 "Requirements for the Installation of Service Openings in HV AC Systems," 2004.
e) Underwriters' Laboratories (UL): UL Standard 181.
f) American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality".
g) Environmental Protection Agency (EPA): "Building Air Quality," December 1991.
h) Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "HVAC Duct Construction Standards - Metal and Flexible," 1985.
i) North American Insulation Manufacturers Association NAIMA): "Cleaning Fibrous Glass Insulated.

2.3 **Regulations**

N/A

2.4 **Owner Furnished Equipment**

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

Part 3: TECHNICAL DESCRIPTION:

3.1 **General**

3.1.1 The contractor shall maintain a copy of all current MSDS documentation and safety certifications at the site at all times, as well as comply with all other site documentation requirements of applicable OSHA programs and this specification.

3.1.2 Contractor shall submit to the owner all Material Safety Data Sheets (MSDS) for all chemical products proposed to be used in the cleaning process.

3.l.3 The Contractor shall be responsible for the removal of visible surface contaminants and deposits from within the HV AC system in strict accordance with these specifications.

3.l.4 The HVAC system includes any interior surface of the air distribution/exhaust systems as listed.

Spec item #: H-3	SPECIFICATION	TCMSB Field # N/A
Galley Exhaust Cleaning		

3.l.5 The HVAC system cleaning contractor shall perform a visual inspection of the HV AC system to determine appropriate methods, tools, and equipment required to satisfactorily complete this project. The cleanliness inspection should include air handling units and representative areas of the HVAC system components and ductwork. In HV AC systems that include multiple air handling units, a representative sample of the units should be inspected.

3.1.6 Any ships spaces entered to facilitate HV AC system cleaning shall be protected from soiling or any other damage as a result of HV AC system cleaning.

3.l.7 Any item of ships outfit disturbed to facilitate HVAC system cleaning shall be returned to an as found arrangement and condition of cleanliness on completion of HVAC system cleaning.

3.1.8 Debris removed during cleaning shall be collected and precautions must be taken to ensure that debris is not otherwise dispersed outside the HV AC system during the cleaning process.

3.1.9 Particulate Collection Equipment shall not exhaust inside the ship. Mechanical Cleaning operations shall be undertaken only with Particulate Collection Equipment in place, including adequate filtration to contain debris removed from the HV AC system. Precautions shall be taken to locate the equipment down wind and away from all air intakes and other points of entry into the vessel.

3.1.10 Contractor shall utilize the existing service openings already installed in the HV AC system.

3.1.11 Scheduling of galley exhaust system cleaning shall be coordinated with Chief Engineer and shall commence at 1800 hrs and continue through to completion.

3.1.12 All galley equipment shall be covered and protected as required to prevent any contamination of food preparation and service areas by the cleaning process. Galley shall be returned to an as found arrangement and state of cleanliness on completion of cleaning process.

3.1.13 Galley exhaust is facilitated by means of an independent fan drawing air from range hood through a "Gaylord Ventilator" grease extractor.

3.1.14 Arrangement of ventilator includes four (4) baffles located within air passage extending length of ventilator with clearance between the baffles of approx. 2-1/2".

3.1.15 Arrangement of ventilator is further described in attachment named, 'Gaylord Ventilator'.

3.l.16 Ventilator sloping grease gutters, pre-flush drain and outlet main drain pipes shall be cleaned and proven clear.

3.l.17 Ships staff, accompanied by contractor, will ensure power to above units is off at main breaker and locked out.

3.1. 18 Contractor shall assume galley exhaust ducting to be soiled with an accumulation of residual grease.

3.1.19 Access to duct work requires removal of galley deck head panels and inference items including, but not limited to, six (6) panels, one foot (1 ') wide x eleven (11 ') long, 3 electrical fixtures, two (2) vent outlets and two (2) speakers.

3.1.20 Further access is via ventilation compartment manhole on port side of house front.

3.1.21 Access to ducting internal areas is through existing cut outs.

3.1.22 Remaining ductwork consists of section 22" diameter x 10 foot in length (fan inlet) and section 10" x IS" x IS" (fan discharge).

3.1.23 Exhaust fan shall be electrically isolated (this will be done by Ships Electrical Officer) before work on the duct work begins. Flanges and duct work of the motor casing to be cleaned and new gaskets installed.

3.1.24 Damaged system components found during the inspection shall be documented and brought to the attention of the Chief Engineer.

3.2 Interferences

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

Spec item #: H-3	SPECIFICATION	TCMSB Field # N/A
Ventilation System Cleaning		

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1 Verification of HV AC System cleanliness shall be detennined after mechanical cleaning.

4.1.2 The HV AC system shall be inspected visually to ensure that no visible contaminants are present.

4.1.3 If no contaminants are evident through visual inspection, the HV AC system shall be considered clean; however, the owner reserves tile right to further verify system cleanliness through Surface Comparison Testing or the NADCA vacuum test specified in the NADCA standards.

4.1.4 If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be recleaned and subjected to re-inspection for cleanliness.

4.1.5 NADCA vacuum test analysis shall be performed by a qualified third party experienced in testing of this nature.

4.2 Testing

N/A

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

At the conclusion of the project, the Contractor shall provide a report to Chief Engineer indicating the following:

- Success of the cleaning project, as verified through visual inspection.
- Areas of the system found to be damaged and/or in need of repair.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: H-4	SPECIFICATION	TCMSB Field # N/A
Winch Room Soft Patch Modifications		

Part 1: SCOPE:

1.1 The intent of this specification shall be to move the shore power receptacle to a fixed portion of the winch room bulkhead. The soft patch hatch shall be made smaller to allow the receptacle to be fixed and remove it from the soft patch.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Guidance Sketch of Modified Soft Patch Cover
2.1.2. Guidance Sketch of Modified Soft Patch Bulkhead

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

2.3 Regulations

2.3.1. Hull Construction Regulations

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.

Spec item #: H-4	SPECIFICATION	TCMSB Field # N/A
Winch Room Soft Patch Modifications		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. Shore Power shall be disconnected and the plug removed from the cable. The cable shall be temporally connected direct to the transformer.

3.1.2. The soft patch cover shall be removed and laid aside. A section approximately 19.25 inches shall be cropped from the outboard side of the cover. The corners shall have a 6 inch radius. A new column of bolt holes shall be drilled at a position 1.5 inches inboard from the outboard edge. This should give a dimension of 70.5 inches from the center to center bolts on each side of the hatch. The hole diameters shall be ¾ inch. The 5 inch x 3/8 inch horizontal flat bar at the top and bottom of the hatch cover shall be cropped from the vertical flat bar starboard of the hinged door and outboard. The two upper lifting pads shall be removed and repositioned to suit the center of gravity of the modified hatch cover. The hole back hook for the exterior hinged door shall be reinstalled on the bulkhead.

3.1.3. A 2 inch wide section of the bulkhead opening shall be cropped to remove the bolt holes IWO of new insert. The section shall be at the top inboard 19.25 inches from the edge of the existing opening, down along the outboard edge and inboard at the bottom 19.25 inches from the edge of the existing opening. A new section of 3/8 inch thick plate shall be installed from the edge of the cropped 2 inch section and inboard approximately 21.25 inches. The top and bottom corners shall have a 3 inch radius. A new 3 inch x 5 inch x 3/8 inch vertical angle frame shall be installed at approximately 3 inches outboard from the center of the bolt holes. This shall extend from the top horizontal angle frame to the bottom horizontal angle frame of the opening.

3.1.4. The shore power receptacle flange mounted on the exterior is a 15 inch square plate bolted to the bulkhead. The shore power cable penetration is a 3 inch pipe nipple welded in and extends into the shore power receptacle. The pipe penetration shall align with the penetration in the shore power transformer casing inside the winch room. The shore power receptacle shall be reinstalled on the bulkhead with bolts. The bulkhead shall be drilled and tapped.

3.1.5. The soft patch cover shall be fitted to the bulkhead and the new holes in the cover shall be used to mark the hole pattern on the new section of the bulkhead. Holes shall be drilled to ¾ inch diameter. 5/8 inch nuts shall be welded on the interior of the bulkhead to allow the bolts to be removed and installed from the exterior.

3.1.6. All cutout edges shall be dressed and beveled to prepare for welding. New steel shall be abrasive blasted and coated with weldable primer before installation. New steel shall be Lloyds Grade A or equivalent.

3.1.7. The hatch cover shall be reinstalled on completion with new ¼ inch thick neoprene rubber gasket and new bolts.

Spec item #: H-4	SPECIFICATION	TCMSB Field # N/A
Winch Room Soft Patch Modifications		

3.2 Location

3.2.1. Frame 72 Main Deck and Winch Room Starboard Side

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 TCMSB Inspector.

4.2 Testing

New welded seam for the new insert shall be 100 % UT tested. The installed hatch shall be hose tested at a pressure of 80 PSI and witnessed by TCMSB Inspector.

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 Drawing Bulkhead Main Deck To Foc'sle Deck Fame-72; # 21-00-01 Rev 3 shall be revised to show modified soft patch.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: H-5	SPECIFICATION	TCMSB Field # N/A
Accommodation Washroom Refurbishment		

Part 1: SCOPE:

1.1 The intent of this specification shall be to refurbish four washrooms with bulkhead panels, deck covering system, shower stall kits, vanities, and vanity cabinets.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Shared Washroom Cabin 313 and 312
Electronic Tech and Ice Observer
Deck Area: 3.4 Meter^2; Perimeter: 7.3 Meters

2.1.2. Washroom Cabin 407
Chief Engineer
Deck Area: 3.0 Meter^2; Perimeter: 7.2 Meters

2.1.3. Washroom Cabin 401
Commanding Officer
Deck Area: 3.0 Meter^2; Perimeter: 7.2 Meters

2.1.4. Shared Washroom Cabin 207 and 208
Storekeeper and Chief Cook
Deck Area: 3.5 Meter^2; Perimeter: 7.5 Meters

2.1.5. Shower Stalls Area: 0.71 Meter^2; Perimeter: 3.4 Meters

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.

2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)

2.2.3. Coast Guard ISM Confined Space Entry 7.D.9

2.2.4. Coast Guard ISM Hotwork procedures

2.2.5. Coast Guard ISM Fall Protection procedures

2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)

2.2.7. CWB CSA 47.1 latest revision Division I, II or III

2.2.8. SSPC-SPT

2.3 Regulations

2.3.1.

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 four washrooms shall be dealt with in the same manner for clarity purposes unless otherwise stated.

3.1.2. All electrical power sources shall be for the four washrooms locked out and recorded in the ships lockout log.

3.1.3. The shower stalls are corner units with two open sides.

3.1.4. The Commanding Officer's and Chief Engineer's washroom are fitted with vanities. The vanities including sink shall be removed and laid aside for reuse. The sinks in other washrooms shall be removed and discarded.

3.1.5. Vanity wall cabinets shall be removed and discarded. Wall mounted heaters shall be disconnected and removed. Receptacles and switches shall be disconnected, removed or pushed back for reuse. Vanity lights shall be removed and laid aside for reuse.

3.1.6. The contractor shall remove the deck head panels and trim from the washroom area to gain access to the work. There is a vertical drain pipe in cabin 401 and 407 adjacent to the vanity that extends from the deck to the deck head panel. The drain from the vanity sinks are branched into the vertical pipe. The pipe is encased in sheet metal. The deck head panels are fitted with light, heat lamp, and exhaust fan louver. The shower plumbing fixtures, hand rails, paper holder, soap dish, curtain rod shall be removed and reinstalled following the work. All other wall mounted fittings shall be removed and laid aside for reuse. The hot and cold water pipes penetrate the bulkhead panel to the shower valve. The toilet shall be removed; pipes blanked off and reinstalled following the work. The deck scuppers shall be plugged to prevent any debris from entering the drainage system. The bulkhead panels shall be removed from the perimeter of the washroom. The deck tiles, boarder tiles, and underlayment shall be removed to expose the steel deck. This includes washroom area, shower area and the raised lip approximately 12 inches high that encloses the shower stall.

3.1.7. The deck shall be power tooled cleaned and all debris shall be removed. The steel deck shall be coated with 2 coats of Amercoat Primer 5105.

3.1.8. New owner supplied beige bulkhead panels and trim shall be installed on the perimeter of the entire washroom area including the shower area. The top and bottom channels shall be installed to support the panels. Penetrations holes shall be cut in the panels to allow for electrical boxes, pipes etc. Exposed pipe shall be encased in sheet metal skin from one of the bulkhead panels. Deck head panels shall be reinstalled. Allow for time to complete trim work as required.

3.1.9. Contractor shall have an allowance of $8000 for the ceramic tiles, shower stalls and vanities for material only. The actual amount shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.1.10. The deck covering system shall be installed with 7mm dexotex underlayment and leveler. Outside the shower stall ceramic tile system including a baseboard shall be installed. The style and color shall be determined from samples provided by the contractor and agreed upon by the Chief Engineer. The shower stall deck covering including both sides of the raised lip, shall be installed with seamless epoxy system specifically used for showers areas. The color scheme shall be determined from samples provided by the contractor and agreed upon by the Chief Engineer. The ceramic tile grout seams shall be sealed following the set time of the grout.

3.1.11. Decorative fiberglass shower stall enclosures shall be installed. The enclosures shall be fitted with pre-molded ledges/shelves with retainer rods for storing soaps, shampoo bottles etc. The style of the shower stalls shall be determined by samples from the contractor and agreed upon by the Chief Engineer. The new enclosures shall extend the full height of the shower stall. The edges of the enclosures shall have decorative edges. The enclosures shall be thoroughly sealed to prevent water from leaking out; the sealing method shall be decorative. The enclosures shall have penetrations to allow for piping.

3.1.12. New vanities shall be manufactured for the shared washrooms. The units shall be made from ¾ inch marine grade wood and laminated. The units shall have a counter top with decorative drop-in porcelain sinks. The sinks shall be fitted with decorative chrome finish faucets. The vanities shall be 36 inches wide and 18 inches deep. The outer corners shall be chamfered 45º at starting at12 inches from the back of the vanity. Exposed edges shall be fitted with decorative rubber edging recessed in the wood. The units shall have a raised bottom, two doors with center support, concealed hinges, and marine latches. The bottom shall be notched for pipe work under the vanity. A standard recessed toe space at 4 inches from the deck shall be fitted. The color of the counter top and wood grain laminate shall be determined by samples provided by the contractor and agreed upon by the Chief Engineer. The vanities shall be fastened to the bulkhead, the bottom edge shall be sealed to prevent water from entering under the vanity. This may be done with a ceramic tile border.

3.1.13. New surface mount vanity cabinets shall be manufactured for the four washrooms. The units shall be made from ¾ inch marine grade wood and laminated. Exposed edges shall be fitted with decorative rubber edging recessed in the wood. The cabinets shall be 30 inches wide x 30 inches high x 4 inches deep. The cabinets shall have two intermediate shelves space evenly. The units shall be fitted with a door 24 inches x 24 inches with concealed hinges and marine latches. The door shall be fitted with a mirror the full dimension of the door. . The color of the counter top and wood grain laminate shall be determined by samples provided by the contractor and agreed upon by the Chief Engineer.

3.1.14. All removed items shall be reinstalled unless otherwise directed by the Chief Engineer as towels racks and hooks maybe replaced by the crew with decorative finish items. All plumbing fixtures shall be reinstalled and connected.

3.2 Location

3.2.1. "B" Deck port and Starboard Cabin 407 and 402
3.2.2. "A" Deck Port Cabin 312 and 313
3.2.3. Foc'sle Deck Port Cabin 207 and 208

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

All plumbing shall be tested for leaks.

4.3 Certification

N/A

Spec item #: H-5	SPECIFICATION	TCMSB Field # N/A
Accommodation Washroom Refurbishment		

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item #: H-6	SPECIFICATION	TCMSB Field # 3L003 & 3L004
Survey of Port and Starboard Aft Peak Tanks		

Part 1: SCOPE:

1.1 The intent of this specification shall be to open the aft peak tanks for cleaning and inspection.

1.2 Coast Guard will be retaining the services of a Marine Engineering Consultant on a separate contract to survey the aft peaks IWO corrosion areas and submit a report of the findings and subsequent repair for the next dry-docking.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Aft Unit Port & Starboard 07-12-03/04
Aft Unit Port and Starboard 07-12-05/06
Capacity Plan 00-00-14

2.1.2. Volume – 72 M^3 each

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.

2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)

2.2.3. Coast Guard ISM Confined Space Entry 7.D.9

2.2.4. Coast Guard ISM Hotwork procedures

2.2.5. Coast Guard ISM Fall Protection procedures

2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)

2.2.7. CWB CSA 47.1 latest revision Division I, II or III

2.2.8. SSPC-SPT

2.3 Regulations

2.3.1. Hull Construction Regulations

2.4 Owner Furnished Equipment

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

Spec item #: H-6	SPECIFICATION	TCMSB Field # 3L003 & 3L004
Survey of Port and Starboard Aft Peak Tanks		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The tanks are accessed from the steering flat through manhole covers. The covers shall be removed and laid aside. The tanks shall be gas freed for entry before personal are permitted to enter. Certificates shall be posted at the entry point. The tanks shall be certified gas free every morning during the entire period of the tank work.

3.1.2. The tanks will be pumped down to the suction levels by the ships crew. The remaining water and sludge shall be removed ashore by tank truck, allow 1 M^3 to be pumped from each tank. Quote unit cost per cubic meter of sludge to be removed and the total shall be adjusted up or down by PWGSC 1379 action. Proof of the quantity of disposed fluid shall be provided.

3.1.3. The tanks shall be thoroughly cleaned using pressurized water spray at a minimum pressure of 2500 PSI. All debris and water resulting from the cleaning shall be removed from the tanks and pumped ashore to a tank truck.

3.1.4. Contractor shall notify Chief Engineer when tanks are ready for inspection.

3.1.5. Coast Guard shall than have an engineering consultant conduct a survey on a separate contract. Contractor shall provide a tank watch for 8 hours while the Marine Engineering Consultant completes his survey. The survey will include ultra-sonic thickness testing and Coast Guard will be obtaining drawings and a report of the damaged area inorder to provide a specification for the next drydocking which will be submitted to the Chief Engineer and TCMSB.

3.1.6. Following the completion of the survey, the tanks shall be closed up using ¼ inch thick neoprene gaskets on the manhole covers by the Contractor. The Chief Engineer shall inspect the tank internals before the manhole covers are installed.

3.2 Location

3.2.1. Steering Flat Frames -3 to 9

3.3 Interferences

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

Spec item #: H-6	SPECIFICATION	TCMSB Field # 3L003 & 3L004
Survey of Port and Starboard Aft Peak Tanks		

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
N/A

4.3 Certification
N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 Detailed report of the findings and subsequent repair if required.

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item #: H-7	SPECIFICATION	TCMSB Field # N/A
Crews Changeroom Refurbishment		

Part 1: SCOPE:

1.1 The intent of this specification shall be to refurbish the crews change room on the main deck port side. Replace bulkhead panels, deck covering system, and fabricate new vanity for sinks.

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

3 Fuel Oil Wing Tank Port

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. General Arrangement Main Deck T13-1051
2.1.2. Area of Space: 37 M^2
2.1.3. Perimeter: 15.6 meters

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

2.3 Regulations

2.3.1.

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.

Spec item #: H-7	SPECIFICATION	TCMSB Field # N/A
Crews Changeroom Refurbishment		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The contractor shall lockout all electrical sources required for the work. The ships Electrical Officer will inform of the location of the sources.

3.1.2. The space forms a L-shape room containing a toilet area and toilet, bench, tool box, washer and dryer with wooden seating, two sinks, bulkhead mirror, wall mounted unit heater, wooden shelving and lockers, wooden strips for multiple coat hooks, dryer vent filter, eye wash station, and port hole with inset casing. There are several wall mount dispensers for soaps, paper towels etc. There are several power supplies that penetrate the bulkhead panels to receptacles and switches. Plumbing penetrations are from the deck. These items shall be removed and laid aside for possible reuse.

3.1.3. The deck head panels shall be removed to a point where the bulkhead panels are accessible for replacement. The deck head panels are fitted with lights, air diffuser, and smoke detector.

3.1.4. The ABS drain piping and domestic water piping shall be removed from under the sink area at the isolation valves and at a point above the deck for the drain pipe, to where it terminates behind the washer and dryer, approximately 5 meters of piping. This shall include the drain from the eyewash station.

3.1.5. The entire ceramic deck covering and underlayment shall be removed to the bare steel of the deck area. The underlayment may consist of cement and Dexotex.

3.1.6. There is a steel rectangular frame on the deck for mounting the washer and dryer. A section of the seating shall be cropped to suit the size of the stackable washer and dryer and new section of angle bar shall be welded to replace the cropped section. The angle is 3 inch x ¼ wall.

3.1.7. The bulkhead panels, bottom and top panel trays shall be stripped entirely from the perimeter of the space and discarded.

3.1.8. The toilet partition, door, and frame shall be removed and discarded. The toilet shall be removed but must be kept for reuse upon completion of tiling and new toilet partition.

3.1.9. The deck area and steel frame on the deck shall be power tool cleaned. All debris from the strip out and deck cleaning shall be removed and discarded. The entire deck area shall be coated with two coats of Amercoat primer 5105.

3.1.10. New owner supplied wood grain bulkhead panels shall be installed and fitted in the channels at top and bottom. The channels shall be welded to the deck. This shall include all trim work required to provide a finished look.

3.1.11. A new commercial style single toilet partition shall be installed. The deck supports shall be welded to the deck for the partition. The partition shall be Hadrian Standard Style Metal Partition, Powder Coated-Headrail Braced. Color shall be light grey, hardware shall be stainless steel. Stainless steel grab bar shall be installed. The hinge shall be non-sighted interior and exterior. Exterior side of the door shall have a deadbolt arrangement to prevent the door from swinging freely. Door shall be fitted with concealed lock, bumper, and holdback. The partition shall be 36 inches wide by 60 inches deep.

3.1.12. Contractor shall have an allowance of $5000 for the ceramic tiles and double sink vanity materials only to be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.1.13. A new deck covering system shall be installed. This shall be a layer of 7mm dexotex, floor leveler, thin set, ceramic tile, and grout. The color and style shall be determined by the vessel's Chief Officer. A 4 inch ceramic tile baseboard shall be installed. The grout shall be sealed following the set up period for the grout.

3.1.14. A new double sink vanity shall be fabricated with marine 1/8 inch thick 316 stainless steel with # 4-finish, polished one side. The vanity shall be approximately 1.4 meters long and a depth to allow access between the washer and dryer and front of vanity. The edges of vanity shall have a decorative edge with a slight raise around the perimeter top. The vanity shall have a false bottom, two doors with center support between the doors, and marine style latches. A recessed toe board shall be fitted on the front. The vanity top shall have a 4 inch backsplash. The inboard aft corner of the vanity shall be chamfered approximately 2 inches to allow a pipe to extend vertically up the bulkhead. Two new stylish stainless steel sinks shall be fitted in the vanity top. Sinks shall be fitted with stylish stainless steel faucets. New stainless steel dished soap holders shall be installed above the vanity on the bulkhead. The finished vanity shall have a decorative commercial style finish.

3.1.15. The sinks shall be plumbed with drain and trap arrangement and hot and cold domestic water piping. A branch pipe shall penetrate the forward side of the vanity and be fitted with a wall mount garden hose valve. The penetration shall be fitted with a rubber grommet. The most aft area of the front panel on the vanity, approximately 5 inches above the deck, shall have three penetrations for cold and hot water pipes and 1-1/2 drain pipe. The penetrations shall be fitted with rubber grommets. New drain pipe and hot and cold water pipes shall be plumbed from in under the sinks and to the eye wash station and washer machine. All exterior run-pipe shall be encased in panel sheet metal as used for the bulkhead panels. The drain and supply water lines for the washer shall be relocated to behind the new position of the washer and dryer. The eye wash station shall be relocated also as directed by the chief officer.

3.1.16. The steel seating shall be fitted with a 3/16 inch thick steel plate and fixed with bolts and nuts. The perimeter shall have a 1 inch high flat bar welded continuously to provide a raised lip. Mounting studs ½ inch diameter shall be

welded to the new plate to fasten the washer dryer arrangement. Material shall be 316-stainless steel. The washer and dryer door shall be facing forward as opposed to inboard as originally found.

3.1.17. A new 5 KW, 460 Volt/ 3 phase forced air unit heater shall be installed to replace the existing heater. The heater shall be a low profile unit as space is limited. A new stainless steel mounting bracket shall be fabricated to mount the new heater. The mount shall span the outboard bulkhead and the forward bulkhead to form a triangle corner bracket. The bracket shall be 3/16 inch thick stainless steel angle bar. Heater shall be rear mounted as close to the deck head as possible.

3.1.18. All other removed items shall be reinstalled unless directed otherwise by the chief officer. Some older items may not be reused.

3.2 Location

3.2.1. Main Deck Port Side Frame 78 - 87

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

N/A

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

N/A

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: H-8	SPECIFICATION	TCMSB Field # N/A
#3 Fuel Oil Wing Tank Port		

Part 1: SCOPE:

1.1 The intent of this specification shall be to clean # 3 Fuel Oil Wing Tank Port and gas free for hotwork for the welding that will take place during the crew change room refurbishment.

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

a. Crew Change Room Refurbishment

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Tank Capacity Plan 00-00-14; T131027
Capacity: 267 M^3

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

2.3 Regulations

2.3.1.

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.

Spec item #: H-8	SPECIFICATION	TCMSB Field # N/A
#3 Fuel Oil Wing Tank Port		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. Ship's crew will pump the tank down to the suction levels. The tank shall be opened up with manhole cover located in the port entrance stairway of the engine room

3.1.2. Extraction fan shall be used to ventilate the tank from the manhole to outside atmosphere. The fan shall be running continuously during the ventilation process. The tank shall be gas freed for entry. Certificates shall be posted at the entry location.

3.1.3. The remaining fuel or sludge shall be disposed of to tanker truck ashore. Quote on 1000 liters of remaining fluid for disposal and unit cost per liter. The total shall be adjusted up or down by PWGSC 1379 action.

3.1.4. Tank internals shall be cleaned with high pressure water washed using a degreaser mixture at a minimum pressure of 2500 PSI. All residue and water from the cleaning process shall be pumped ashore to tanker truck.

3.1.5. The tank shall be gas freed for hotwork and certified by a chemist. Testing shall take place everyday when hotwork is been performed.

3.1.6. Following the work, the tank shall be inspected by the owner's representative before been closed up. The manhole cover shall be installed using new ¼" thick rubber gasket that is compatible with fuel oil.

3.2 Location

3.2.1. Port Side Frame 60-99, Main Deck And Below

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

N/A

4.3 Certification

N/A

Spec item #: H-8	SPECIFICATION	TCMSB Field # N/A
#3 Fuel Oil Wing Tank Port		

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item #: H-9	SPECIFICATION	TCMSB Field # N/A
Gobeye Installation		

Part 1: SCOPE:

1.1 The intent of this specification shall be to fabricate a gobeye and install on the towing deck of the vessel.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 Gobeye Fabrication Details-CCGS Terry Fox, 2223-01-00
2.1.2 Gobeye Install Details-CCGS Terry Fox, 2223-02-00
2.1.3 FSR, Patrick Byrne
MSI, 709-782-2700

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

2.3 Regulations

2.3.1.

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.

Spec item #: H-09	SPECIFICATION	TCMSB Field # N/A
Gobeye Installation		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1 Contractor shall have an allowance of $1500 for the services of Patrick Byrne from MSI if any clarification, assistance or changes are required inregards to the drawings provided by MSI. The actual amount shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.1.2 All fillet welds to be double continuous fillet welds or as noted in the drawings.

3.1.3 Contractor shall confirm dimensions on site prior to commencement of fabrication.

Gobeye Fabrication

3.1.4 Contractor shall fabricate the Gobeye as a self-contained unit in their shop as per drawing 223-01-00.

3.1.5 Contractor shall supply all materials to fabricate the Gobeye as per Gobeye Box Bill of Materials noted on drawing 2223-01-00. All steel to be Lloyds Grade A. The materials supplied include a Crosby Nom 2 ½" G-2140 bolt type shackle (85t W.L.L).

3.1.6 This self contained unit will be a box having four sides, bottom and top plate complete with cover.

3.1.7 Contractor shall apply 2 coats of marine primer to the fabricated gobeye box inside and out.

Gobeye Installation

3.1.8 The fabricated gobeye box will be fitted at frame 35 of the vessel as per drawing 2223-02-00. At the time of installation the deck will be cut to fit the outside dimensions of the box and the unit will rest on the deck insert plate. Note: the loading deck in way of the gobeye box installation consists of 9mm steel plate fitted over 3" of wood which is fitted atop of the main deck. Contractor shall use 3" angle bar of ¼" thickness to cover over the wood from the 9mm top plate to the main deck on all 4 sides of the gobeye box. This shall be welded continuous to provide a weather tight seal.

3.1.9 Contractor to lower unit into place. Note: The fabricated gobeye box will weigh approximately 2200lbs. The Gob Eye Box will then be secured to the under deck stiffening as per drawing 2223-02-00 tieing back to the bulkhead at frame 33. This includes forward, side and aft support members/brackets as per the installation drawing in the scantlings indicated.

3.1.10 Contractor will require scaffolding to be erected in the Cargo Compartment to reach the work area.

3.1.11 The Gob Eye Box will then be secured to the under deck stiffening and welded in place.

3.1.12 Contractor shall have a $2000 allowance for NDT testing of the new structure to the satisfaction of Transport Canada. The actual amount shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.1.13 Contractor shall than apply 2 coats of marine grade primer to the affected steel areas. Contractor shall also provide 2 top coats of Coast Guard supplied paint to the affected under deck areas in way of the installed Gobeye box.

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
N/A

4.3 Certification
N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports
N/A

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item #: E-01	SPECIFICATION	TCMSB Field # 3H047,48,49,50,51 &52
Main Engine Injector Cooling Pump (6 off)		

Part 1: SCOPE:

1.1 The intent of this specification shall be to open up six Injector cooling pumps for the cleaning, inspection, and obtain a five year credit for TCMSB survey.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Stork Pumpen – Vertical Single Stage Centrifugal Pump
Type: MCV 12.5 x 1 -3.2 A5
Capacity: 1.6 M^3/hr
Serial #s: Z510658, Z510656, Z510636, Z510635, Z510638, Z510659,
Bearings: 3304 FH 42Z3
Motor Data: Leroy Somner
Type: LS90SIRP
Volts: 255/440/3/60
Speed: 3435
Power: 2.5 HP
Serial #s: 48497, 48498, 48492, 48491, 48495, 48490,
Bearings: 6205 2RS, 6204 2RS

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT
2.2.9. TP 127 E Ships Electrical Standards

Spec item #: E-01	SPECIFICATION	TCMSB Field # 3H047,48,49,50,51 &52
Main Engine Injector Cooling Pump (6 off)		

2.3 Regulations

2.3.1. Marine Machinery Regulations

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. All pump units shall be dealt with in the same manner for purposes of clarity.

3.1.2. The pump units shall be locked out by the contractor's lockouts. The vessel's lockout book shall be recorded.

3.1.3. The motors shall be labeled for correct orientation to ensure they are reinstalled on the correct pump and in the correct position. The power supply cables shall be disconnected and labeled. The motors shall be removed from the pump housings and sent to an authorized motor refurbishment facility.

3.1.4. The suction and discharge valves shall be closed and locked out. All flanges of the pump shall be stamped with alignment marks to ensure correct orientation.

3.1.5. Discharge flange shall be disconnected. The pump shall be disconnected from the base and removed as a unit complete with bearing bracket, volute, impeller, and shaft. The unit shall be completely disassembled. The bearing shall be removed from the bearing bracket. The shaft shall be measured IWO bearing and bushing. The impeller shall be measured IWO of wear rings. The wear rings shall be measured to determine the clearance between the impeller and wear rings. The lower bushing diameter shall be measured at two locations along the length. All diameter measurements shall be at the port and starboard positions and the forward and aft positions. All parts and sealing surfaces shall be thoroughly cleaned and laid out for inspection. TCMSB shall inspect the pumps.

3.1.6. The pump units shall be reassembled in the reverse sequence. New owner supplied bearings, seals and gaskets shall be used for the reassembly. The packing gland shall be repacked with new packing rings.

3.1.7. The motor shall be completely disassembled for routine maintenance, inspection and testing. Work shall include but not limited to the following; rotor shaft measurements and run-out, flange face run-out, spigot run-out, shaft end play, bearing housing measurements and run-out, clean dip and bake, dynamic balance, resistance test, bench test run, and vibration readings. New bearings shall be installed.

3.1.8. Motors shall be return to the vessel and installed on its appropriate pump. Power cables shall be reconnected and glands to be watertight.

3.1.9. Documentation for the pump units will be available from the Chief Engineer on the vessel.

3.2 Location

3.2.1. Port and Starboard Engine Room Flat

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 TCMSB.

4.2 Testing

The pumps units shall be ran and motor bearing temperature recorded every 15 minutes for a 2 hour period. The motor current shall be recorded after the initial start, at each phase. The pump pressures shall be recorded during the test.

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 All measurements and readings shall be tabulated in type written format and given to the Chief Engineer.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-02	SPECIFICATION	TCMSB Field # 3D154
Intercooler Cleaning and Survey		

Part 1: SCOPE:

1.1 The intent of this specification shall be to remove the turbocharger intercooler from # 4 main engine for cleaning, inspection, and test the charge air cooler for TCMSB survey.

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

a. # 4 main engine overhaul by the ship's crew. The intercooler shall not be reinstalled on the engine until # 10 Main bearing inspection has been completed.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. BBC Air Cooler – HT No. 610156 – Type R 70 1G1A
Weight - 1100 kg
2.1.2. Engine Wartsila Stork 8TM -410

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

2.3 Regulations

2.3.1. CSA - Marine Machinery Regulations

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.

Spec item #: E-02	SPECIFICATION	TCMSB Field # 3D154
Intercooler Cleaning and Survey		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The inlet and outlet water piping shall be removed. The inlet and outlet air box covers and piping shall be removed.

3.1.2. The contractor shall remove the charge air cooler from the engine and transport to the contractor's facility. Covers that are removed shall be replaced with temporary cover to protect the cooler from damage during transport.

3.1.3. All the cooler covers shall be removed prior to cleaning cooler.

3.1.4. The cooler shall be thoroughly cleaned by having the unit immersed in a chemical solution that will remove all carbon deposits and scale from the unit. The chemical shall be compatible with Copper cooling pipe ribs, Alumbro pipes, Muntz metal pipe bases, and Iron frame. The contractor shall provide an MSDS and product data for the cleaning agent used. The Chief Engineer shall inspect the cooler after cleaning.

3.1.5. Following cleaning the waterside of the cooler shall be hydrostatically tested to a pressure of 4.5 bar for 30 minutes. The test shall be witnessed by TCMSB and the Chief Engineer or delegate.

3.1.6. The unit shall be assembled with owner supplied gaskets and returned to the vessel. The intercooler shall be mounted on the engine. And the piping replaced with new gaskets.

3.1.7. All work shall be to the satisfaction of the Chief Engineer.

3.2 Location

3.2.1.

3.3 Interferences

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

Spec item #: E-02	SPECIFICATION	TCMSB Field # 3D154
Intercooler Cleaning and Survey		

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1. The Chief Engineer shall inspect the cooler after cleaning with all the covers removed.

4.2 Testing

To be hydrostatically tested to 4.5 bar for 30 minutes.

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-03	SPECIFICATION	TCMSB Field # 3H056, 57 & 58
Main Engine Fuel Oil Booster Pump (3 off)		

Part 1: SCOPE:

1.1 The intent of this specification shall be to open up the three main engine fuel oil pumps for inspection, overhaul and to obtain survey credit for TCMSB. The three electric motors shall be refurbished.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Make: ZAHNRADPUMPE, Gear Pump
Type: IFL 6/80 GDGLMS
Capacity: 6M³/Hr
Serial #s: 81117833, 81117834, 81117835,

Motor Data: Leroy Somer
Type: LS 132 SORP
Volts: 440/3/60
Speed: 865 RPM
Power: 3KW
Serial #s: 488067, 488070, 488071,

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT
2.2.9. P127E Ships Electrical Standards

Spec item #: E-03	SPECIFICATION	TCMSB Field # 3H056, 57 & 58
Main Engine Fuel Oil Booster Pump (3 off)		

2.3 Regulations

2.3.1. Marine Machinery Regulations

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. All pump units shall be dealt with in the same manner for purposes of clarity.
3.1.2. The pump units shall be locked out by the contractor's lockouts. The vessel's lockout book shall be recorded.
3.1.3. The motors shall be labeled for correct orientation to ensure they are reinstalled on the correct pump and in the correct position. The power supply cables shall be disconnected and labeled. The motors shall be removed from the pump housings and sent to an authorized motor refurbishment facility.
3.1.4. The suction and discharge valves shall be closed and locked out. The pump housing shall be drained of oil into containers and dumped in the vessels lube oil sludge tank. All flanges of the pump shall be stamped with alignment marks to ensure correct orientation. The motor bracket shall be removed and laid aside. The pump shall be disassembled, cleaned, and laid out for inspection. All sealing surfaces shall be thoroughly cleaned before reassembly. TCMSB shall inspect the pump units. The shafts shall be measured IWO bushings and recorded. The four bushings shall be replaced with owner supplied bushings. The mechanical seal shall be replaced with new owner supplied seals. There is a small spring loaded ball check valve in the base/bushing-housing; this shall be removed for inspection.
3.1.5. The relief valve shall be removed for disassembly. The height of the adjustment screw shall be measured at a reference point and recorded. The valves shall be disassembled, cleaned, and laid out for inspection. Parts required shall be supplied by the owner.
3.1.6. All removed or disturbed seals shall be replaced with new owner supplied seals.
3.1.7. The pump assembly shall be reassembled in the reverse sequence as per manufacturer instructions. New owner supplied seals, gaskets, and bearings shall be used for the reassembly.

3.1.8. Motor bracket shall be installed and a measurement of the radial run-out shall be taken for the shaft to motor landing on the bracket to ensure the motor to pump alignment is correct.

3.1.9. The motor shall be completely disassembled for routine maintenance, inspection and testing. Work shall include but not limited to the following; rotor shaft measurements and run-out, flange face run-out, spigot run-out, shaft end play, bearing housing measurements and run-out, clean dip and bake, dynamic balance, resistance test, bench test run, and vibration readings. New bearings shall be installed.

3.1.10. Motors shall be return to the vessel and installed on its appropriate pump. Power cables shall be reconnected and glands to be watertight.

3.2 Location

3.2.1. Engine Room Flat on the centerline.

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 TCMSB.

4.2 Testing

The pumps units shall be ran and motor bearing temperature recorded every 15 minutes for a 2 hour period. The motor current shall be recorded after the initial start, at each phase.

4.3 Certification

N/A

Spec item #: E-03	SPECIFICATION	TCMSB Field # 3H056, 57 & 58
Main Engine Fuel Oil Booster Pump (3 off)		

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 All measurements and readings shall be tabulated in type written format and given to the Chief Engineer.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-04	SPECIFICATION	TCMSB Field # 3H038,39,40,41,42,43 & 44
Main Engine Lube Oil Pumps (8 off)		

Part 1: SCOPE:

1.1 The intent of this specification shall be to open up the eight main engine lube oil pumps for inspection, overhaul and to obtain survey credit for TCMSB. The eight electric motors shall be refurbished.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Pump: Allweiller Houtuin
Type: Double screw pump 211-118/058.600.10.1
Capacity: 85 M^3/Hr
Speed: 1740 RPM
Serial #s: 31352, 31351, 31362, 31356, 31358, 31350, 31353, 31361
Max working press: 16 Bar
Motor: ASYN-ROTO
Type: LS200L
Volts: 440/3/60
Speed: 1740
KW: 34.5; Amp 58.5
Serial #s: 25392/24, 25392/17, 25392/19, 25392/2, 25392/20, 25392/8, 25392/22, 25392/24,
Bearings: 6312C3 and 6214C3

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT
2.2.9. TP127E Ships Electrical Standards

Spec item #: E-04	SPECIFICATION	TCMSB Field # 3H038,39,40,41,42,43 & 44
Main Engine Lube Oil Pumps (8 off)		

2.3 Regulations

2.3.1. Marine Machinery Regulations

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. All pump units shall be dealt with in the same manner for purposes of clarity.

3.1.2. The pump units shall be locked out by the contractor's lockouts. The vessel's lockout book shall be recorded.

3.1.3. The motors shall be labeled for correct orientation to ensure they are reinstalled on the correct pump and in the correct position. The power supply cables shall be disconnected and labeled. The motors shall be removed from the pump housings and sent to an authorized motor refurbishment facility.

3.1.4. The suction and discharge valves shall be closed and locked out. The pump housing shall be drained of oil into containers and dumped in the vessels lube oil sludge tank. All flanges of the pump shall be stamped with alignment marks to ensure correct orientation. The motor bracket shall be removed and laid aside. By means of jacking screws force the DF cover complete with screws and shafts away from the pump casing and then lift the unit with suitable lifting tool to a location for overhaul. Do not lift the unit by the shaft. Ensure the lower ball bearings come out with the screw shafts.

3.1.5. Before disassembly of the screw shaft assembly measure the location of the coupling half on the shaft and the shaft extension from the seal housing. The vessel will provide documentation for the pump unit upon request. Disassemble the seal housing, gearbox housing and bearings as specified in the manufacturer instructions. The gears, keys, shims shall be labeled for their location. There are shims between the upper bearings and bearing housing. The screw shafts shall have the shaft diameters measured IWO bearings, upper and lower. Reading shall be recorded. All parts shall be thoroughly cleaned, including sealing surfaces and laid out for inspection by the Chief Engineer and TCMSB Inspector.

3.1.6. In the event that the lower bearings remain in the casing and cannot be removed through the top of the pump casing, the contractor shall provide a separate quote to the lift the pump casing from its seating on the tank top enough to remove the bottom bearing housing. The suction and discharge flanges shall be disconnected and the ring of bolts on the seating shall be removed. The bearing housing can then be unbolted from the casing to allow removal of the bearings. The gasket between the bearing housing and casing shall be replaced.

3.1.7. The pump assembly shall be reassembled in the reverse sequence as per manufacturer instructions. New owner supplied seals, gaskets, and bearings shall be used for the reassembly.

3.1.8. The relief valves shall be removed from the pumps and sent to a valve testing and calibration facility. The testing shall include the fabrication of flange assembly for the testing to take place. The valves shall be overhauled and set to a pressure of 10% above the normal operating pressure. Calibration certificates shall be provided and given to the Chief Engineer. Any parts required for the overhaul will be supplied by the owner. Valves shall be reinstalled using new owner supplied O-ring seals.

3.1.9. Motor bracket shall be installed and a measurement of the radial run-out shall be taken for the shaft to motor landing on the bracket to ensure the motor to pump alignment is correct.

3.1.10. The motor shall be completely disassembled for routine maintenance, inspection and testing. Work shall include but not limited to the following; rotor shaft measurements and run-out, flange face run-out, spigot run-out, shaft end play, bearing housing measurements and run-out, clean dip and bake, dynamic balance, resistance test, bench test run, and vibration readings. New bearings shall be installed.

3.1.11. Motors shall be return to the vessel and installed on its appropriate pump. Power cables shall be reconnected and glands to be watertight.

3.2 Location

3.2.1. Under Deck Plates at Tank Top Level forward of Main Engines

3.3 Interferences

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

Spec item #: E-04	SPECIFICATION	TCMSB Field # 3H038,39,40,41,42,43 & 44
Main Engine Lube Oil Pumps (8 off)		

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.2 Testing

The pumps units shall be ran and motor bearing temperature recorded every 15 minutes for a 2 hour period. The motor current shall be recorded after the initial start, at each phase.

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 All measurements and readings shall be tabulated in type written format and given to the Chief Engineer.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-05	SPECIFICATION	TCMSB Field # 3D153
#4 Main Engine Turbocharger		

Part 1: SCOPE:

1.1 The intent of this specification shall be to have an authorized service representative for Brown Broveri Turbocharger to come onboard and service the turbocharger on # 4 Main Engine.

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

- **a.** Crew will be overhauling the # 4 main engine.
- **b.** Lube Oil Pumps will be overhauled in the area forward of the main engine.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Brown Boveri
Type: VTR-501-2P
Max Speed: 14300 RPM
Temp: 640˚C
Serial #: HT356450
Spec: GB4T 39,4
IVLAQ303A2
W 14 Z

Field Service Representative
Knickle, Fraser
Bus: 1 902 634 4626
Mobile: 902-634-4675

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

Spec item #: E-05	SPECIFICATION	TCMSB Field # 3D153
#4 Main Engine Turbocharger		

2.3 Regulations

2.3.1. Marine Machinery Regulations

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. Contractor shall have an allowance of $6000 for the services of the Brown Boveri technician to open and inspect the turbocharger. The actual amount shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.1.2. All piping, covers, brackets and wiring shall be removed to gain access for the removal of the rotor assembly. All parts shall be laid out and thoroughly cleaned for inspection by the Chief Engineer and TCMSB Inspector.

3.1.3. The service representative shall bring all parts required for the overhaul and exchange for onboard spares, which shall be used for the overhaul.

3.1.4. Following the inspection and cleaning the turbocharger shall be reassembled as originally found.

3.2 Location

3.2.1. Main Engine #4 Starboard Outboard, Lower 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 TCMSB Inspector.

4.2 Testing

To be completed during sea trials.

4.3 Certification
N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 The service representative shall provide a signed report detailing the overhaul. Report shall be given to the Chief Engineer.

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item #: E-06	SPECIFICATION	TCMSB Field # 3G001, 3G009
Port and Starboard Propulsion Gearboxes		

Part 1: SCOPE:

1.1 The intent of this specification shall be to conduct a survey of the port and starboard propulsion gearboxes for TCMSB inspector and obtain a five year survey credit for the items. The contractor shall arrange for inspections by TCMSB.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Gearbox Data: Lohmann & Stoltrfoht
Type: GVA 1500
Input: 2 x 4040 KW @ 600 RPM
Reduction: 4.625:1
Serial # Port: GVA 1500 A/1261
Serial # Stbd: GVA 1500 A/1260

2.2 Standards

2.2.1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
2.2.4. Coast Guard ISM Hotwork procedures
2.2.5. Coast Guard ISM Fall Protection procedures
2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
2.2.7. CWB CSA 47.1 latest revision Division I, II or III
2.2.8. SSPC-SPT

2.3 Regulations

2.3.1. Marine Machinery Regulations

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.

Spec item #: E-06	SPECIFICATION	TCMSB Field # 3G001, 3G009
Port and Starboard Propulsion Gearboxes		

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The port and starboard gearboxes shall be dealt with in the same manner for clarity in the work description.

3.1.2. Wear down readings shall be taken at eight bearing locations on each gearbox. The locations are output shaft forward, output shaft aft at thrust block, input shaft forward outboard, input shaft aft outboard, input shaft forward inboard, input shaft aft inboard, PTO shaft forward, PTO shaft aft. The Owner will supply special tools for measuring the wear down readings. Readings shall be clearly tabulated in type written format and given to the Chief Engineer and the TCMSB Inspector.

3.1.3. The thermometers and temperatures sensors shall be labeled and removed from the thrust bearing cover and laid aside in a protective case to prevent damage to the units. The rear seal cover on the thrust bearing shall be removed and replaced with a new owner supplied seal during reassembly. The thrust bearing cover shall be removed and lifted aside. The cover is fastened with tapered pins and bolts. The upper thrust pads shall be removed along with the supporting ring and labeled for correct orientation. The lower thrust pads shall be removed along with the supporting ring by means of holes in the circumference. There are a set of 11 pads forward of the collar and a set of 11 pads aft of the collar. The pads and the collar shall be inspected by TCMSB. Following the inspection of the pads and collar the reverse sequence shall be carried out for the reassembly.

3.1.4. The sealing surfaces of the thrust bearing cover and bearing casing shall be thoroughly cleaned prior to pre assembly of the cover. All sensors and thermometers shall be reinstalled in there correct location.

3.1.5. Inspection covers on the gearbox casing shall be removed from the casing. Backlash readings shall be measured between the main gearwheel and inboard input pinion, main gearwheel and outboard input pinion, main gearwheel and PTO, lube oil pump gearwheel and turning gear. Readings shall be clearly tabulated in type written format and given to the Chief Engineer and the TCMSB Inspector.

3.1.6. The entire gear train shall be turned to fully inspect the gear teeth of the gearboxes. TCMSB Inspector shall witness the gear train.

3.1.7. All inspection covers shall be reinstalled with new oil gasket material.

3.1.8. All items removed or disturbed for the work shall be replaced as originally found.

3.2 Location

3.2.1.

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

Sea trials shall be carried out for the testing of the thrust bearings. Sea trials shall be a two hour test under full load following a 1 hour warm up period.

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A