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Alongside Refit 2012

Version 2, May 4, 2012

July 18- August 24
F6855 12 2126



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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. All tests are to be witnessed by the Inspection Authority, 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. The recorded test results, calibrations, measurements and readings from the entire refit specification shall be provided in 3 typewritten binded reports on 8.5" X 11" paper. The binded reports shall be tabbed as per table of contents in the refit specification. The binded reports shall be provided to the Chief Engineer prior to the end of refit.

The Contractor shall also provide reports/measurements/readings per individual specification item within the timeline indicated to the Chief Engineer.

4. WORKMANSHIP

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

5. FACILITIES

Quotation shall include all of the necessary labor and equipment required for the erection of access staging, rigging, lighting, tugs, pilotage, necessary crane 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, airborne particles from sand, grit or shot blasting, welding grinding, burning, gouging, painting or airborne particles of paint. Any damage shall be the responsibility of the contractor. Government furnished equipment and materials shall be received by the contractor and stored in a secure warehouse or storeroom having a controlled environment appropriate to the equipment as per the manufacturer's instructions.

9. LIGHTING AND VENTILATION

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

10. CLEANLINESS

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

and water residue, which accumulates in the machinery space bilges as a result of any refit work detailed in this specification.

11. ASBESTOS

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

12. ENTRY INTO ENCLOSED SPACES

The contractor shall abide by the Coast Guard Enclosed Space Entry Policy. The policy is listed in the Coast Guard's Safety Management System, section 7.D.9 and section 7.D.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.

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 Coast Guard's Safety Management System , section 7.D.11 and section 7.D.11 (N). The contractor shall be responsible to ensure the contractor's personnel including any subcontractors shall follow the policy.

15. LOCKOUT AND TAGOUT PROCEDURES

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

- electrical currents
- hydraulic
- pneumatic
- gas or 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 NQA262/NQA026 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.

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 Owner's Representative. Inspection of any item by the Owner's Representative does not substitute for any required inspection by Transport Canada Marine Safety (TC-MS) or by the Inspection Authority.

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 Dry-docking.

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

SHIP'S PARTICULARS

Length O.A. -----	83.0 Metres
Breadth Mld. -----	16.2 Metres
Depth Mld. -----	7.75 Metres
Deep Draft -----	6.06 Metres
Displacement -----	5146 MT
Gross Tonnage -----	3853 Tonnes
Year built -----	1987

Rigging Weights

- Tailshaft 24280 kg, Length 14.448 meters
- Propeller 7200 kg
- Stern tube 12,185 kg
- Anchor (Complete) 2028 kg
- Anchor Shank 549 kg
- Rudder 17381 lbs
- Rudder Stock 16958 lbs

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@dfm-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.

Part 4: Proof of Performance

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-02	SPECIFICATION	TCMSB Field # 3N0090
Fixed Fire Fighting Systems Annual Inspection/Maintenance		

Part 1: Scope

1.1 Contractor shall arrange for inspection, testing and recertification of all ship’s fixed fire extinguishing systems, as described and listed below, by an authorized service provider. Proof of credentials and certification of service provider shall be made available to Chief Officer.

Part 2: References

Guidance Drawings/Nameplate data

L1-2726365-01 Kidde Marine FM-200 System Layout

Standards

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.

- Canadian Coast Guard Fleet Safety Manual (DFO 5737)

NAMFIS



Owner Furnished Equipment

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

Part 3: Technical Description

3.1 Contractor shall have an allowance of \$12,000 for the services of a NAMFIS representative to complete **all** the work outlined and provide inspection certificates for all items listed in specification H-02. The actual amount shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.2 No components or parts shall be replaced without the prior consent of the Chief Officer. Any parts replaced shall be turned over to Chief Officer.

3.3 All certificates and service reports issued by the Contractor for this work must refer to each serviced component’s serial number and location on the vessel.

Spec item #: H-02	SPECIFICATION	TCMSB Field # 3N0090
Fixed Fire Fighting Systems Annual Inspection/Maintenance		

3.4 Contractor is responsible for arranging Transport Canada Marine Safety for all fire fighting and fire detection system inspections.

3.5 All systems shall be left in an operational condition overnight.

3.6 Contractor shall inform Chief Engineer prior to making any system inoperable due to maintenance/inspection. All bottles shall be disconnected before tests are completed.

3.7 Final inspection of completed work shall be undertaken by Contractor's charge hand in the presence of the designated Ship's Officer. All work shall be to the satisfaction of the Chief Officer and TCMSB.

FM200 SYSTEMS

3.8 Twenty one (21) independent, Kidde fixed FM-200 fire extinguishing systems shall be thoroughly examined by qualified technicians and inspection certificates issued. Systems shall be inspected to current TCMSB standards and as per current Kidde FM-200 marine maintenance manuals for "ECS Series" and "ADS Series" FM-200 systems. Service provider must be currently certified by Kidde for this inspection service and must produce documentation to verify same. Inspection and testing of all equipment shall be witnessed by a senior Ship's Officer. See FM 200 System Data Chart below.

FM-200 SYSTEM DATA						
No.	PIPE NETWORK DESCRIPTION	CYLINDER SIZE LB/KG	CYLINDER QUANTITY	CYLINDER LOCATION	ENCLOSURE LOCATION	NOZZLE QTY
1	Main Engine Room Bilge Aft	200/90.7 ECS	1	Tank Top, 70, Port	FR 70 - 85 Tank Top	4
2	Main Engine Room Bilge Fwd	200/90.7 ECS	1	Tank Top, 100, Starboard	FR 85 - 97 Tank Top	4
3	Main Winchroom	600/272.1 ECS	1	ER Flat, 109, Starboard	FR 106 - 121 E.R. Flat	2
4	Central Stores	350/158.7 ECS	1	ER Flat, 45, Starboard	FR 13 - 30 E.R. Flat	2
5	Sewage Compartment	350/158.7 ECS	1	ER Flat, 41, Starboard	FR 15 - 35 Tank Top	2
6	Aviation Fuel Cofferdam	125/56.7 ECS	1	Main Deck, 25, CL	FR 4 - 13 Main Deck	2
7	Fwd Winchroom	125/56.7 ECS	1	Main Deck, 168, Port	FR 167 - 176 Main Deck	1
8	Paint Stores	20/9.0 ECS	1	Main Deck, 167, Port	FR 167 - 176 Main Deck	1
9	Bowthruster Compartment	125/56.7 ECS	1	Main Deck, 169, Port	FR 163 - 169 Tank Top	1
10	Bosuns & Rope Stores	200/90.7 ECS	1	Main Deck, 167, Port	FR 176 - 192 Main Deck	2
11	Emergency Generator Room	70/31.7 ECS	1	Boat Deck, 60, CL	FR 60 - 70 Boat Deck	2
12	Propulsion Motor Room Bilge	395/179 ADS	1	ER Flat, 51, Port	FR 42 - 54 Tank Top	2
13	Propulsion Motor Room Lower	675/306 ADS	1	ER Flat, 50, Port	FR 42 - 54 Tank Top	2
14	Propulsion Motor Room Upper	675/306 ADS	1	ER Flat, 41, Starboard	FR 30 - 54 E.R. Flat	3
15	Main Engine Room Lower	675/306 ADS	2	Boat Deck, 64, Port	FR 70 - 96 Tank Top	4
16	Main Engine Room Upper	395/179 ADS	2	Boat Deck, 65, Port	FR 78 - 106 E.R. Flat	8
17	Engine Room Casing & Stack	675/306 ADS	2	Boat Deck, 60, CL	FR 61 - 81 Boat Deck	6
18	Steering Gear	395/179 ADS	1	Main Deck, 2, Starboard	FR (-12) - 13 Main Deck	5
19	Purifier Room	225/102 ADS	1	ER Flat, 48, Starboard	FR 54 - 70 Tank Top	2
20	Cyclo Converter Room	395/179 ADS	1	ER Flat, 48, Port	FR 53 - 70 Tank Top	4
21	Transformer Room	395/179 ADS	1	ER Flat, 46, Port	FR 45 - 70 ER Flat	2

3.9 All manual and electric pull cables shall be inspected and tested.

3.10 All gas piping shall be inspected, blown through, proven clear and pressure tested.

3.11 All sirens, horns and bells shall be inspected and tested.

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Fixed Fire Fighting Systems Annual Inspection/Maintenance		

- 3.12 All gas cylinders shall be weighed and Net weight determined and recorded.
- 3.13 All time delay functions shall be tested and proven correct.
- 3.14 All pressure activated switches for fire alarm initiation shall be tested.
- 3.15 All pressure activated switches for shutdown functions shall be tested.
- 3.16 Contractor to visually inspect all FM200 bottles at deck level for possible excessive amounts of corrosion or rust accumulation of exterior of bottles. Chief Engineer shall be advised immediately if any problems are found.
- 3.17 System shall be properly reassembled in good working order. All cylinders shall be firmly secured in their respective mountings. Inspection certificates shall be submitted to TCMSB with three (3) typewritten copies given to the Chief Engineer.

GALLEY Amerex 3.5 Gallon Wet Chemical System

- 3.18 Contractor shall service and inspect the Amerex Wet Chemical System.
- 3.19 Contractor shall test and prove clear the piping and nozzles and ensure there are no foreign materials in the piping system that could prevent these systems from working correctly. All piping support brackets shall be verified in place and correctly fastened.
- 3.20 Contractor shall inspect cylinder, cylinder valve and control head assembly. Cylinder should not show evidence of corrosion or damage. Cylinder charge shall be determined and verified correct. All functions and adjustments of control head shall be verified correct.
- 3.21 Contractor shall clean linkages, cabling and pulleys.
- 3.22 Operation of Fire-Shutter to Crew's Mess to be proven.
- 3.23 Contractor shall obtain a sample of the wet chemical in service; to be sent off to lab for testing to ascertain that wet chemical in service is in good order. Copy of lab testing shall be provided to Coast Guard.
- 3.24 Upon completion of the servicing of the above system all shall be reconnected in good order.
- 3.25 The vessel shall be given a minimum of 2 days notice prior to the commencement of this work to provide minimum disruption to the galley staff and crew.

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CO₂ FIRE SMOTHERING SYSTEM INSPECTION

3.24 Contractor shall have maintenance and testing of Cargo Hold CO₂ system performed by qualified personnel.

3.25 The CO₂ fire fighting system shall be thoroughly examined and tested

1. As per Ship Safety requirements.
2. All tests to be witnessed by Owner’s representative and attending Ship Safety Surveyor.

3.26 All bottles shall be disconnected before tests are conducted. Chief Engineer shall be advised prior to disconnecting. All hand control levers, pull handles, cables, cocks, and valves shall be checked and proven operational. The piping shall be blown through with dry compressed air or nitrogen to prove the lines are clear and that the time delays and sirens are operational. All pressure-operated switches shall be proven operational.

3.27 All CO₂ bottles are to have their levels ascertained. Any recharging shall be done by 1379 action. The contents shall be recorded. Contractor shall replace any CO₂ discharged.

3.28 List of bottles:
Cargo Hold (CO₂) 13 x 67.5 Lt. bottles located in the Forward Halon Room

3.29 Manual release systems operated from:

- a. Manually at CO₂ bottles.
- b. Outside Fwd. Halon Room.

3.30 Contractor to confirm operation of all local/remote manual releases.

3.31 Upon completion of testing CO₂ system shall be re-connected and placed in working order.

3.32 Copies of certificates shall be forwarded to Chief Engineer and Ship Safety Survey.

Helicopter Hanger Chemguard Twin Agent

3.33 Chemguard Twin Agent skid mounted unit consists of a 100L AFFF Foam Tank and a 500lb Purple K Dry Chemical Tank. Each tank is fitted with a nitrogen driver cylinder.

3.34 Contractor shall ascertain level in nitrogen tanks. Any loss of nitrogen shall be dealt with by PWGSC 1379 action and the cause of the loss rectified.

3.35 Contractor shall take a sample of the AFFF and send off to lab for analysis to determine that AFFF is within recommended guidelines.

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3.36 Contractor shall open Purple K Dry Chemical tank to inspect its content. Contractor shall thoroughly mix its content to ensure there is no caking of the agent occurring.

Fixed Foam Firefighting System – Monitors & Hose Reels

SECURIPLEX Balanced Pressure Proportioning System

Model: 1015-118

(500 litre three percent AFFF concentrate.)

Located: Halon Room- Port Side Boat Deck

3.37 Contractor shall perform the annual inspection and servicing of the ship’s fixed foam fire fighting system, as per manufacturer’s recommendations.

3.38 Any recharging/repairs to be covered by PWGSC 1379 action.

3.39 The Contractor with the ship’s Electrical Officer shall ensure lockout/tagout permits are in place and shall inform the Chief Engineer before work begins.

3.40 Pressure balancing valve to be carefully disassembled for inspection. Any deposits left by foam concentrate to be cleaned from valve internals. After inspection, valve to be reassembled in good order.

3.41 Level and contents of foam tank to be checked. Foam sample to be taken from foam tank. Sample strength to be tested and copies of results given to Chief Officer.

3.42 Hoses located on Monkey’s Island (Wheelhouse Top) hose reels to be disconnected and transported to a qualified facility for hydrostatic testing to NFPA Standard. Working Pressure is 9.16 Bar (135 PSI). Two hoses, each 1 1/2” diameter x 75 feet long. Tested and certified hoses to be transported back to vessel accompanied by their new test certificates and re-installed on

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Fixed Fire Fighting Systems Annual Inspection/Maintenance		

their hose reels in good order. The original hydrostatic test certificates are to be handed to the Ship's Captain with a copy of each certificate handed to the Chief Engineer.

3.43 Condition of nozzles, valves, gauges, piping, hoses and hose reels, monitors and pumps to be checked.

3.44 Following testing/inspection the contractor will restore the system to operational readiness.

3.45 Contractor shall provide certificates and service reports of Inspection for the system inspected.

Notifier Fire Detection System

3.48 Contractor shall perform maintenance and inspection of the Notifier Fire Detection system completed by a qualified service provider.

3.49 Contractor shall test each device in the fire detection system for operation and ensure that it sounds and displays on the main panel on the bridge deck and the mimic panels in the control room and quarter master stations.

3.50 Contractor shall test the following devices listed in Device Location Table:

Testing Legend Table

Device	Description:	Manufacturer	Model
SP	Photo Electric Smoke Detector	Notifier	FSP851A
P	Manual Pull Station	Notifier	NBG-12
H	Heat Detector-Rate of Rise fixed Temp	Notifier	FST-851RA
FH	Heat Detector-Fixed Temperature	Notifier	FST-851A
FH	Heat Detector-Fixed Temperature	Notifier	FST-851HA
FEN	Fenwal Heat Detector	Notifier	225
ISO	Monitor Module	Notifier	B224BIA
MON	Monitor Module	Notifier	Fmm-101A
REL	Relay	Notifier	
ISO	Isolation Module	Notifier	ISO-X

Device Location Table

Device Location	Device Type	Device Location	Device Type
Bridge Deck			
Wheelhouse Console Port	PAN	Wheelhouse Top of Stair, 1D6	SP
Wheelhouse Port, 1D3	SP	Wheelhouse Locker, 1D7	SP
Wheelhouse Center, 1D5	SP	Under Wheelhouse Port, 1D2	SP
Wheelhouse Stbd, 1D4	SP	Under Wheelhouse Stbd, 1D1	SP
Wheelhouse Exit, 1M1	P		
Officers Deck			
Stair Tower, 1D8	SP	Chief Officer Day Room, 1D15	SP
Passage Stbd, 1D9	SP	Chief Officer Bedroom, 1D16	SP
Passage Stbd, 1M2	P	Chief Officer Lobby, 1D17	SP
Captains Day Room, 1D10	SP	Port Passage, 1D18	SP
Captains Lobby, 1D11	SP	Port Passage, 1M4	P
Captains Bedroom, 1D12	SP	Auxiliary Electrical Rm, 1D30	SP
Comm Officer Rm 311, 1D13	SP	Auxiliary Fan Supply Rm, 1D31	SP
1 st Officer Rm 307, 1D14	SP		
Boat Deck			
Stair Tower, 1D19	SP	Port Passage, 1D28	SP
Stbd Passage, 1D20	SP	Port Passage Exit, 1M6	P
Stbd Passage, 1M3	P	Deck Locker 408, 1D29	SP
Storage Locker, 1D21	SP	FM200 Rm, 1D156	FH
Officers Lounge Port, 1D158	FH	Main E/R FM 200 LP, 1M67	LP
Officers Lounge Stbd, 1D159	FH	Helicopter Workshop, 1D152	FH
Derrick Control Room, 1D22	SP	Helicopter Hanger, 1M10	FEN
Officers Laundry, 1D157	FH	Helicopter Hanger Port, 1M9	P
2nd Officials Dayroom, 1D23	SP	AV Gas Fuel Cabinet, 1M8	FEN
2 nd Officials Bedroom, 1D24	SP	AC Fan Rm Port, 1D153	FH
Port Passage, 1D25	SP	AC Fan Rm Stbd, 1D154	FH
Elec Equipment Rm, 1D26	SP	EGen Rm, 1D155	FH
SAR Equipment Rm, 1D27	SP	EGen FM200 LP, 1M69	LP
Upper Deck			
Passage Fwd, 1D32	SP	Aft Stairs, 1D51	SP
QM Station Port, 1D33	SP	Aft Passage, 1D52	SP

QM Stn Port Indicator Unit		Ice Observer Cabin, 1D53	SP
Officers Mess Port, 1D150	FH	Passage Port, 1M17	P
Officers Mess Stbd, 1D151	FH	Bosun Cabin, 1D54	SP
Officers Pantry, 1D149	FH	Flight Engineer Cabin, 1D55	SP
Fwd Passage Stbd, 1D36	SP	Port Exit, 1M11	P
Sick Bay, 1D38	SP	Stationary Locker, 1D34	SP
QM Station Stbd, 1D37	SP	Helicopter Pilot Cabin, 1D56	SP
QM Stn Stbd Indicator Unit		Passage Port, 1D57	SP
Fwd Stairs, 1D35	SP	Exercise Rm, 1D58	SP
Chief Engineer Bedroom, 1D39	SP	Exercise Rm, 1D59	SP
CE Dayroom, 1D41	SP	Cadets Cabin, 1D60	SP
Stbd Passage, 1D40	SP	Logistics Officer Cabin, 1D62	SP
SE Bedroom, 1D42	SP	Port Passage, 1D63	SP
Senior Engineer Dayroom, 1D43	SP	Ships Office, 1D65	SP
Stbd Passage, 1D44	SP	Photocopy Rm, 1D66	SP
Stbd Passage, 1M14	P	3 rd Officer Cabin, 1D67	SP
Engineers Office, 1D61	SP	2 nd Officer Cabin, 1D68	SP
Engineers Office, 1D64	SP	Medical Officer, 1D69	SP
2 nd Engineers Bedroom, 1D45	SP	Port Passage, 1D70	SP
3 rd Engineer Bedroom, 1D46	SP		
Stbd Passage, 1M15	P		
EO Bedroom, 1D47	SP		
Smoking Rm, 1D48	SP		
Center Aft Passage, 1D49	SP		
Stbd Passage, 1M16	P		
Cleaning Locker, 1D50	SP		
Lower Deck			
Potatoe Rm, 1D71	SP	Passage Mud Rm, 1D74	SP
Lobby Cold Storage, 1D72	SP	Passage Mud Rm, 1M18	P
Fruit/Veg Cold Storage, 1D73	SP	Dry Stores, 1D76	SP
Passage Fwd Mud Rm, 1D75	SP	SG Locker P Aft, 1D137	FH
Fwd Stair to Engine Rm, 1D77	SP	Steering Gear FM 200 Low Pressure, 1M61	LP
Fwd Stair Stbd, 1D79	SP	Canteen, 1D94	SP

Passage Stbd, 1D148	FH	Seaman Rm 642, 1D89	SP
Galley Aft, 1D147	FH	Seaman Rm 609, 1D95	SP
Galley Fwd, 1M30	MON	Port Passage, 1D96	SP
Galley Hood System, 1M20	P	Port Passage, 1M28	P
Stbd Passage, 1D144	FH	Aft Stair, 1D97	SP
Crew Mess Aft, 1D145	FH	Linen Locker, 1D98	SP
Incinerator Rm, 1D146	FH	Seaman Room 612, 1D99	SP
WT Door Power Locker, 1D106	SP	Seaman Rm 615, 1D100	SP
Chief Cook Cabin RM 657, 1D80	SP	Crew Lounge Aft, 1D140	FH
Cook/Steward RM 655, 1D81	SP	Crew Lounge FWD, 1D139	FH
Stbd Passage, 1D82	SP	Seaman Rm 617, 1D101	SP
Stbd Passage, 1M23	P	Lead Seaman Room 620, 1D102	SP
Stair at Frame 70, 1D83	SP	Lead Seaman Room 622, 1D103	SP
Oiler Rm 652, 1D84	SP	Port Passage, 1D104	SP
Oiler Rm 650, 1D85	SP	Clean Locker, 1D105	SP
Ships Clerk Rm 647, 1D86	SP	Crew Laundry Rm, 1D138	FH
Stbd Passage, 1D87	SP	Linen Locker, 1D107	SP
Stbd Passage, 1M24	P	Boatswains Mate Cabin, 1D108	SP
Steward Rm 644, 1D88	SP	Passage Port, 1D109	SP
Clothing Store, 1D90	SP	Locker Room, 1D110	SP
Bonded Store, 1D91	SP	Passage Port, 1D111	SP
Stores Main Deck Rm 603, 1D93	SP	Main Deck FWD	
Stores Handling, 1D92	SP	CO2/FM 200 Room, 2D14	FH
Stores Handling, 1M26	P	Winch Rm FWD FM 200 LP, 2M68	LP
Steering Gear Fwd, 1D141	FH	On Deck FWD, 2M32	P
Steering Gear Stbd, 1D142	FH	Winch Rm Stbd, 2D115	SP
Steering Gear Port, 1D143	FH	Winch Rm Port, 2D114	SP
SG Locker P Fwd, 1D136	FH	Rope Stores Port, 2D15	FH
		Rope Stores Center, 2D16	FH
Rope Stores Stbd, 2D17	FH	Upper Hold Stbd Fwd, 2D9	FH
Paint Locker, 2M33	FEN	Upper Hold Port Fwd, 2D10	FH
Upper Bowthruster, 2D112	SP	Lower Hold Port, 2D11	FH
Lower Bowthruster, 2D113	SP	Lower Hold Cent Fwd, 2D12	FH

Upper Hold Port Aft, 2D7	FH	Lower Hold Stbd, 2D13	FH
Upper Hold Stbd Aft, 2D8	FH		
Engine Room Deck			
Winch Room Port Aft, 2D1	FH	AT Transformer Rm, 2M38	P
Winch Room Stbd Aft, 2D2	FH	Transformer Rm Stbd Fwd. 2D121	SP
Winch RM Port, 2D3	FH	Transformer Rm Port Fwd, 2D122	SP
Winch RM Port FWD, 2D4	FH	Transformer Rm Port Aft, 2D123	SP
Winch RM Stbd FWD, 2D5	FH	Transformer Rm Stbd Aft, 2D124	SP
Winch RM Stbd, 2D6	FH	Lower ER Center Aft, 2D31	FH
Winch RM FM 200 LP, 2M62	LP	Lower ER Port AFT, 2D32	FH
Upper ER at MCC, 2D19	FH	Lower ER Port Center, 2D33	FH
Upper ER at Workshop, 2D20	FH	Lower ER Port FWD, 2D34	FH
Outside Workshop, 2M34	P	Lower ER Center FWD, 2D35	FH
Upper ER Electrical Workshop, 2D21	FH	Lower ER Center FWD, 2D36	FH
Upper ER Stbd FWD, 2D23	FH	Lower ER Stbd FWD, 2D37	FH
Upper ER Stbd AFT, 2D24	FH	Lower ER Stbd Center, 2D38	FH
Upper ER Stbd AFT, 2D25	FH	Lower ER Stbd Aft, 2D39	FH
Upper ER @ Boiler, 2D26	FH	FM 200 ER Bilge Stbd LP, 2M63	LP
Upper ER Port Fwd, 2D27	FH	FM 200 ER Bilge Port LP, 2M64	LP
Upper ER Port AFT, 2D28	FH	Cycloconverter Rm Cent Port, 2D118	SP
Upper ER @ MCR, 2D29	FH	Cycloconverter Rm Cent Fwd, 2D119	SP
Upper ER @ Boiler, 2D30	FH	Cycloconverter Rm Stbd Fwd, 2D120	SP
ER Control RM Aft , 2D116	SP	Lower Prop Mot Rm Stbd Aft, 2D49	FH
ER Control RM Fwd, 2D117	SP	Upper Prop Mot Rm Stbd Aft, 2D45	FH
ER Control RM Exit, 2M35	P	FM200 LP Prop Motor Rm Port, 2M65	LP
Purifier Rm Aft, 2D53	FH	FM200 LP Prop Motor Rm Stbd, 2M66	LP
Purifier Rm Fwd, 2D54	FH	Sewage Compt Aft, 2D46	FH

Lower Prop Mot Rm Aft Cent, 2D52	FH	Sewage Compt Port, 2D47	FH
Lower Prop Mot Rm Fwd Cent, 2D51	FH	Sewage Compt Stbd, 2D48	FH
Lower Prop Mot Rm Port Aft, 2D50	FH	Central Stores Port, 2D125	SP
Upper Prop Mot Rm Stbd Aft, 2D44	FH	Central Stores Center, 2D126	SP
Upper Prop Mot Rm Cent Fwd, 2D43	FH	Central Stores Stbd, 2D127	SP
Upper Prop Mot Rm Port Fwd, 2D42	FH	General Alarm Interface, 2M44	REL
Upper Prop Mot Rm Port Aft, 2D41	FH	Fire Door Release Interface, 2M49	REL
Upper Prop Mot Rm Port Cent, 2D40	FH		
Prop Motor Rm Exit, 2M40	P		

3.51 Contractor shall provide Fire Alarm device test and inspection record for all devices noted showing that they operated correctly or corrective action that was taken.

3.52 Any defects shall be addressed by 1379 action.

Part 4: Proof of Performance

4.1 Contractor shall provide proof of performance of the all of the above noted systems as indicated throughout.

Part 5: Deliverables

5.1 Contractor shall provide annual inspection certificates for all fire fighting systems .

5.2 Contractor shall provide foam analysis reports from labs to Coast Guard.

5.3 Contractor shall provide service reports indicating all inspections/work carried out.

Spec item #: H-03	SPECIFICATION	TCMSB Field # N/A
LIFERAFT SERVICING		

Part 1: SCOPE

1.1 The intent of this specification is to perform annual servicing and certification of the vessel's life rafts and hydrostatic releases.

Part 2: REFERENCES

Guidance Drawings/Nameplate data

DESCRIPTION	LOCATION	SERIAL #
Zodiac 25 Persons	Officers Deck Port	XDC88Z24E010
Zodiac 25 Persons	Officers Deck Port	XDC2FA68G011
Zodiac 10 Persons	Officers Deck Port	XDC4E213C010
Zodiac 6 Persons	Barge	XDCAA540K001
Viking 10 Persons	Officers Deck Port	10DKV051092

Manufacturers Rep

Newfoundland Marine Safety Systems

Ken White

709-747-2175

Standards

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.

- Canadian Coast Guard Fleet Safety Manual (DFO 5737)

Owner Furnished Equipment

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

Spec item #: H-03	SPECIFICATION	TCMSB Field # N/A
LIFERAFT SERVICING		

Part 3: TECHNICAL DESCRIPTION

- 3.1 The contractor shall remove the liferafts and their hydrostatic releases from their stowed positions on the vessel and transport them to and from the contractor’s premises, when designated by the vessel, for servicing.

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

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

- 3.4 The liferafts shall be removed and sent for servicing within 3 business days of the contractor being advised they are ready for removal. The liferafts are to be returned to the vessel within 15 working days after being removed.

- 3.5 The contractor is responsible for ensuring the liferafts are witnessed by TCMS as required and for providing certificates for the life rafts as appropriate.

- 3.6 The contractor will return the liferafts and their hydrostatic releases to the stowed position on the vessel.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

- 4.1 All liferafts are back aboard the vessel in their stowed positions.

- 4.2 All of the above work is completed to the satisfaction of the Commanding Officer.

Spec item #: H-03	SPECIFICATION	TCMSB Field # N/A
LIFERAFT SERVICING		

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

- 5.1 The contractor will provide a listing of the work that was performed including ‘as found and as left condition’.
- 5.2 Certificates and work description are provided to the Commanding Officer.

Spec item #: H-04	SPECIFICATION	TCMSB Fields # 3L010, 3L011, 3L014, 3L015, 3L018, 3L021, 3L022, 3L023
Fuel Tanks Survey		

Part 1: SCOPE

1.1 The intent of this specification is to inspect and test the following fuel tanks for TCMSB 5 year survey credit:

Tank	Location	Capacity
No. 1 Fuel Oil Port	Fr. 163 – 175	54.8 M ³
No. 2 Fuel Oil Stbd	Fr 163 – 175	56.9 M ³
No. 5 Fuel Oil Port	Fr. 106 – 121	119.5 M ³
No. 6 Fuel Oil Stbd	Fr. 106 – 121	119.5 M ³
No 9 Fuel Oil Port	Fr. 70 - 96	81.5 M ³
Fuel Oil Settling Tk Stbd	Fr. 63 – 70	33.5 M ³
Fuel Oil Overflow	Fr. 106 – 110	10.4 M ³
Fuel Oil Spillage	Fr. 93 – 96	3.0 M ³

Part 2: REFERENCES

2.1 Reference drawing 72-405 "Capacity Plan"

2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

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

Part 3: TECHNICAL DESCRIPTION

3.1 The ship's crew will pump the tanks down to the suction levels. Contractor shall lockout the fill and discharge valves for all tanks being opened for cleaning/inspection. Ships crew will advise of valve locations.

Spec item #: H-04	SPECIFICATION	TCMSB Fields # 3L010, 3L011, 3L014, 3L015, 3L018, 3L021, 3L022, 3L023
Fuel Tanks Survey		

3.2 The contractor shall remove the manhole covers from the tanks and dispose of the residual oil for disposal ashore. The contractor shall quote the cost of removing and disposing 4 Cubic Meters total volume of diesel fuel dregs from all the listed tanks combined. The quote shall also include a unit cost per additional 1 m³ and the total will be adjusted up or down by 1379 action on proof of disposal invoice.

3.3 The contractor shall ventilate each tank and provide mechanical ventilation to all areas of the tank. Each tank is to be gas freed, and certified Gas Free. Each tank is to be safe for personnel to enter. Certificates shall be handed to the Chief Engineer prior to any personnel commencing work in each tank and a copy of these certificates shall be posted in a conspicuous area near the entrance to each tank.

3.4 The contractor shall thoroughly clean the internal surfaces of the tanks from debris, scale and sludge. All material and liquids remaining in the tank resulting from the cleaning shall be removed from the vessel and disposed of ashore on the same day as it is generated by the Contractor. All rusty areas are to be power tool cleaned and areas wiped down with mineral oil. Contractor shall quote on power tool cleaning 2 m² of rusty areas as well as provide a unit cost per additional 1 m² to be adjusted up or down via PWGSC 1379 action. Contractor shall wipe down the internals of the tanks with lint free rags.

3.5 Following the cleaning of the tanks, the tanks shall be inspected by the Chief Engineer and a Marine Safety Inspector. Contractor shall provide a qualified Manhole lookout during these inspections.

3.6 The contractor shall clean the sealing surfaces around the manhole and cover and install the cover using new ¼ inch thick neoprene gaskets. The vents, sounding pipes and overflow pipes shall be proven clear. The level transmitter openings shall be proven clear of sludge and the sounding pipe striker plates shall be checked for acceptable depth of pitting.

3.7 Contractor shall quote on replacing 4 manhole cover studs. Contractor shall provide a unit cost to changeout additional cover stud(s) which shall be adjusted up or down via PWGSC 1379 action.

3.8 The contractor shall pneumatically test to no more than 3.5 psi each tank to the satisfaction of the attending Marine Safety Hull Inspector with a manometer. All tests shall be witnessed by the Chief Engineer as well as the Transport Canada Marine Safety Inspector.

Spec item #: H-04	SPECIFICATION	TCMSB Fields # 3L010, 3L011, 3L014, 3L015, 3L018, 3L021, 3L022, 3L023
Fuel Tanks Survey		

3.9 The quote shall include the installation and removal of blanks/balloons for suction, sounding pipes, overflow pipes and vent head removals, additional tank entries for subsequent balloon adjustment or removal and then **final inspection by Chief Engineer which will be carried out immediately prior to final closing of successfully tested tanks.** All testing is to be done as per the requirements of the attending Marine Safety Inspector. Contractor shall advise Chief Engineer in a timely manner when tanks are available for final inspection complete with a qualified Manhole Watch. Note: That the quote is to include multiple tank entries for any tank where the contractor has improperly ballooned or blanked the tank openings on the initial attempts.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have tank inspected and pressure test witnessed by TCMS for survey credit.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of the waste oil disposal receipts and all relevant Safety Management System completed forms and checklists to the Chief Engineer.

Spec item #: H-05	SPECIFICATION	TCMSB Fields # 3L050
Aux Lube Oil Storage Tank		

Part 1: SCOPE

1.1 The intent of this specification is to inspect and test the following lube oil tank for TCMSB 5 year survey credit:

Tank	Location	Capacity
Aux LO Storage Tank	Fr. 56-58	3.6 m3

Part 2: REFERENCES

- 2.1 Reference drawing 72-405 "Capacity Plan"
- 2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.3 Coast Guard ISM Confined Space Entry 7.D.9

Part 3: TECHNICAL DESCRIPTION

- 3.1 Contractor shall lockout the fill and discharge valve for the tank being opened for cleaning/inspection. Ship's crew will advise of valve locations. The manhole cover is on the side of the tank at about the 600 liters level.
- 3.2 The contractor shall pump out 2100 liters of the lube oil into a certified clean portable plastic tank then remove the manhole cover from the tank and dispose of the residual oil for disposal ashore. Contractor shall use a clean/new hose for this pumping. The contractor shall quote the cost of the portable tank and the cost of the removing and disposing of 500 liters total volume of lube oil from the tank. The quote shall also include a unit cost per additional 500 liters of oil. The total cost will be adjusted up or down by 1379 action on proof of disposal invoice. The cost of pumping the clean oil into the clean portable tank is to include the cost of pumping the clean oil back into the cleaned Auxiliary Lube Oil Tank upon completion of tank seal-up after satisfactory inspection and testing.
- 3.3 The contractor shall ventilate each tank and provide mechanical ventilation to all areas of the tank. Each tank is to be gas freed, and certified Gas Free. Each tank is to be safe for personnel to enter. Certificates shall be handed to the Chief Engineer prior to any personnel commencing work in each tank and a copy of these certificates shall be posted in a conspicuous area near the entrance to each tank.

Spec item #: H-05	SPECIFICATION	TCMSB Fields # 3L050
Aux Lube Oil Storage Tank		

3.4 The contractor shall thoroughly clean the internal surfaces of the tanks from debris, scale and sludge. All material and liquids remaining in the tank resulting from the cleaning shall be removed from the vessel and disposed of ashore on the same day as it is generated by the Contractor. The Contractor shall clean with particular attention the openings to the sight glass, level transmitter, suction pipe and drain. Contractor shall wipe down the internals of the tanks with lint free rags.

3.5 Following the cleaning of the tank it shall be inspected by the Chief Engineer and Marine Safety Inspector. Contractor shall provide a qualified Manhole lookout.

3.6 The contractor shall clean the sealing surfaces around the manhole and cover and install the cover using new ¼ inch thick neoprene gaskets.

3.7 The contractor shall include in his bid the price on pneumatically testing to no more than 3.5 psi the tank to the satisfaction of the attending Marine Safety Hull Inspector. All tests shall be witnessed by the Chief Engineer as well as the Transport Canada Marine Safety Inspector. The bid price is needed should the Marine Safety Inspector waive the pressure test for adjustment purposes by PWGSC 1379 action.

3.8 The quote shall include the installation and removal of blanks/balloons for suction, sounding pipe and vent head removals, additional tank entries for subsequent balloon adjustment or removal and then **final inspection by Chief Engineer which will be carried out immediately prior to final closing of successfully tested tanks.** All testing is to be done as per the requirements of the attending Marine Safety Inspector. Contractor shall advise Chief Engineer in a timely manner when the tank is available for final inspection complete with a qualified Manhole Watch. Note: That the quote is to include multiple tank entries for any tank where the contractor has improperly ballooned or blanked the tank openings on the initial attempts.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have tank inspected and any pressure test shall be witnessed by TCMS for survey credit.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of the waste oil disposal receipts and all relevant Safety Management System completed forms and checklists to the Chief Engineer.

Spec item #: H-06	SPECIFICATION	TCMSB Fields # # 3L034, 3L036
Waste Oil Tank and Purifier Sludge Tank		

Part 1: SCOPE

1.1 The intent of this specification is to inspect and test the following lube oil tank for TCMSB 5 year survey credit:

Tank	Location	Capacity
Waste Oil Tank	Fr. 30-37	4.9 M3
Purifier Sludge Tank	Fr 55-64	2.5 M3

Part 2: REFERENCES

- 2.1 Reference drawing 72-405 "Capacity Plan"
- 2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.3 Coast Guard ISM Confined Space Entry 7.D.9

Part 3: TECHNICAL DESCRIPTION

- 3.1 Contractor shall remove contents of Waste Oil and Purifier Sludge tanks ashore via vacuum truck through sounding pipes located in directly above each tank in their respective spaces. The contractor is to quote on disposal of 5 m³ of oily/water mixture. (70% oily water and 30% waste oil). Contractor shall provide unit cost per additional cubic meter to be adjusted up or down via PWGSC 1379 action upon proof of invoice.
- 3.2 Ship's Crew will advise of location of suction and discharge valves for lockouts.
- 3.3 Contractor shall open manhole covers for inspection of tanks upon completion of removing their contents.
- 3.4 Contractor shall gas free the tanks and certify the tanks safe for entry.
- 3.5 Contractor shall pressure wash the waste oil tank only at 3000psi and then rag down this tank with lint free rags.
- 3.6 Contractor shall arrange Transport Canada Marine Safety and the Chief Engineer for inspection upon completion of cleaning the tanks.
- 3.7 Contractor shall prove the tank level alarms in the Waste Oil and Purifier Sludge tank and prove sounding and vent lines clear.
- 3.8 The manhole cover is to be installed on the Waste Oil Tank in the presence of the Chief Engineer using a new gasket approved for use with oil and anti-seizing compound applied to the fastener threads.
- 3.9 Contractor shall remove tank vent head and hydrostat test the waste oil tank to the satisfaction of the TC surveyor. Note: Due to the tank top penetrations atop of the purifier sludge tank this tank will not be pressure tested unless requested by TC at which point it will be dealt with by PWGSC 1379 action.

Spec item #: H-06	SPECIFICATION	TCMSB Fields # # 3L034, 3L036
Waste Oil Tank and Purifier Sludge Tank		

3.10 Upon completion of successful pressure test on the waste oil tank, the contractor shall dispose of the water and re-install tank vent head with new stainless steel fasteners.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have tank inspected and any pressure test shall be witnessed by TCMS for survey credit.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of the waste oil disposal receipts and all relevant Safety Management System completed forms and checklists to the Chief Engineer.

Spec item #: H-07	SPECIFICATION	TCMSB Fields # 3L037, 3L038, 3L039, 3L040, 3L041, 3L042, 3L043, 3L044
Void Tanks Survey		

Part 1: SCOPE

1.1 The intent of this specification is to inspect and test the following tanks for TCMSB 5 year survey credit:

Tank	Location	Capacity
No. 1 Void Tank Port	Fr 117-126	30.1 m3
No. 1 Void Tank Stbd	Fr 117-126	30.1 m3
No. 2 Void Tank Port	Fr 106-117	38.3 m3
No. 2 Void Tank Stbd	Fr 106-117	38.6 m3
No. 3 Void Tank Port	Fr 102-106	7.2 m3
No. 3 Void Tank Stbd	Fr 102-106	5.4 m3
No. 4 Void Tank Port	Fr 54-70	19.1 m3
No. 4 Void Tank Stbd	Fr 54-70	19.1 m3

Part 2: REFERENCES

2.1 Reference drawing 72-405 "Capacity Plan"

2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

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

Manhole Cover Locations

#1 Void Port – In fwd bulkhead inside #2 Void Port

#1 Void Stbd – In fwd bulkhead inside # 2 Void Stbd

#2 Void Port – In Winch Room Port Fwd of Refrigeration Plant on Outboard Bulkhead

#2 Void Stbd – In Winch Room stbd fwd corner on longitudinal bulkhead

3 Void Port – In tanktop Main Engineerroom to port of Pipe Tunnel Manhole

#3 Void Stbd – In tanktop Main Engineerroom to stbd of Pipe Tunnel Manhole

#4 Void Port – Outboard aft of Boiler Feed Tank on E/R Flat on transverse bulkhead

#4 Void Stbd- Outboard aft of Fuel Day Tank on E/R Flat on transverse bulkhead

Note: # 2 Void Port and Stbd covers must remain off until surveys of #1 Void Port & Stbd are completed.

Spec item #: H-07	SPECIFICATION	TCMSB Fields # 3L037, 3L038, 3L039, 3L040, 3L041, 3L042, 3L043, 3L044
Void Tanks Survey		

Note: # 3 Void Stbd Tank must remain open until completion of the survey of Fuel Overflow Tank which is accessed via No 3 Void Tank Stbd.

Part 3: TECHNICAL DESCRIPTION

3.1 Contractor shall remove the manhole covers from the tanks. The contractor shall ventilate each tank and provide mechanical ventilation to all areas of the tank. Each tank is to be gas freed, and certified Gas Free. Each tank is to be safe for personnel to enter. Certificates shall be handed to the Chief Engineer prior to any personnel commencing work in each tank and a copy of these certificates shall be posted in a conspicuous area near the entrance to each tank.

3.2 The void spaces shall be damp-wiped clean as required with lint free rags. Care must be taken so as not to wet any piping insulation. All residues shall be disposed of ashore. Tank internals are then to be inspected by the Chief Engineer and a Marine Safety Inspector. Contractor shall have a qualified manhole lookout present during this inspection.

3.3 Sounding pipes, suction pipes and vents shall be proven clear. Alarm float switches shall be proven operational. Contractor shall arrange with C/E prior to testing alarm float switches to ensure personnel are available to accept sounded alarm. The tank shall be closed up using new 1/4" neoprene rubber manhole gaskets. The Chief Engineer shall inspect each tank prior to final closing.

3.4 Contractor shall quote on replacing 4 manhole cover studs. Contractor shall provide a unit cost to changeout additional cover stud(s) which shall be adjusted up or down via PWGSC 1379 action.

3.5 The contractor shall pneumatically test to no more than 3.5 psi **one** tank to the satisfaction of the attending Marine Safety Hull Inspector. The tank will be determined by Transport Canada. The Contractor shall also provide a unit cost to pneumatically test as per 3.6 additional tanks. This cost shall be adjusted up or down via PWGSC 1379 action. All tests shall be witnessed by the Chief Engineer as well as the Transport Canada Marine Safety Inspector.

3.6 The quote shall include the installation and removal of blanks/balloons for suctions, sounding pipes and vent head removals, additional tank entries for subsequent balloon adjustment or removal and then **final inspection by Chief Engineer which will be carried out immediately prior to final closing of successfully tested tanks.** All testing is to be done as per the requirements of the attending Marine Safety Inspector. Contractor shall advise Chief Engineer in a timely manner when tanks are available for final inspection complete with a qualified Manhole Watch. Note: That the quote is to include multiple tank entries for any tank where the contractor has improperly ballooned or blanked the tank openings on the initial attempts.

Spec item #: H-07	SPECIFICATION	TCMSB Fields # 3L037, 3L038, 3L039, 3L040, 3L041, 3L042, 3L043, 3L044
Void Tanks Survey		

3.7 Vent heads requiring removal for this testing shall be installed in good order with new gaskets upon completion of all work. Vent heads shall be remounted as original using contractor supplied stainless steel fasteners.

3.8 Contractor shall quote a unit cost to pneumatically test the void tanks as per 3.5, 3.6 and 3.7 to be adjusted up or down via PWGSC 1379 action.

**Part 4: PROOF OF PERFORMANCE
Inspection, Testing & Certification**

4.1 Contractor shall have tank(s) inspected and pressure test where required by TCMS for survey credit.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of the Safety Management System completed forms and checklists to the Chief Engineer.

Spec item #: H-08	SPECIFICATION	TCMSB Fields # 3L001
Forepeak Tank Survey and Tank Level Transducer Installation		

Part 1: SCOPE

1.1 The intent of this specification is to clean, inspect and test the forepeak tank for TCMSB 5 year survey credit. A tank level transducer shall be fitted during the tank survey.

Tank	Location	Capacity
Forepeak Tank	Fr. 175 -Stem	84 M ³ depth 6.25 Meters

Part 2: REFERENCES

- 2.1 Capacity Plan – Drg. # 72-405
- 2.2 List of Manholes – Drg. # 72-60A
- 2.3 Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.4 Coast Guard ISM Confined Space Entry 7.D.9

Part 3: TECHNICAL DESCRIPTION

3.1 The ship’s crew will pump the tanks down to the suction levels. Contractor shall lockout the fill and discharge valves prior to opening the tank for cleaning/inspection. Ships crew will advise of valve locations.

3.2 Contractor shall install a tank level transducer adapter in conjunction with tank cleaning/inspection/ testing. See 3.13.

3.3 The contractor shall remove the manhole cover from the tank and dispose of the remaining water. The contractor shall quote the cost of removing and disposing 2 m³ total volume of water from the forepeak tank. The quote shall also include a unit cost per additional 1 m³ and the total will be adjusted up or down by 1379 action on proof of disposal invoice.

3.4 The contractor shall ventilate the tank and provide mechanical ventilation to all areas of the tank. The tank is to be certified Gas Free. The tank is to be safe for personnel to enter and Hot Work. Certificates shall be handed to the Chief Engineer prior to any personnel commencing work in the tank and a copy of these certificates shall be posted in a conspicuous area near the entrance to the tank.

Spec item #: H-08	SPECIFICATION	TCMSB Fields # 3L001
Forepeak Tank Survey and Tank Level Transducer Installation		

3.5 The contractor shall thoroughly clean the internal surfaces of the tank from scale, debris and sludge. Contractor shall pressure wash the tanks at 3000psi at a minimum. All material and liquids remaining in the tank resulting from the cleaning shall be removed from the vessel and disposed of ashore on the same day as it is generated by the Contractor. The suction/discharge valve bay in the bottom of the tank is to be completely dry and free of scale. The Contractor shall unbolt the support bracket and move aside the extended spindle valve wheel yoke. The valve bonnet shall be dismantled and the valve opened for cleaning, inspection by TCMS and Chief Engineer. The contractor shall lap the valve seat to ensure a good seat/fit. The Contractor shall also remove and replace with new the valve stem gland packing (3 turns). The packing gland shall be re-secured with sufficient tension to provide an air tight seal without causing undue resistance to valve stem operation.

3.6 Following the cleaning of the tank, the tank shall be inspected by the Chief Engineer and a Marine Safety Inspector. Contractor shall provide a qualified Manhole lookout during these inspections.

3.7 Contractor shall quote on powertool cleaning rusty areas to bright metal (SSPC 3) and feathering into surrounding sound coating. The contractor shall quote on touching up 20 M² of tank coating and include the unit cost of touch up per additional square meter. The total touch up area cost shall then be adjusted up or down by 1379 action based on unit cost per meter. The repair coating will be Intertuf Epoxy Black with overcoat of Intertuf Epoxy Aluminium applied in accordance with Coating Manufacturers Touch-up Application directions. Mechanical forced tank ventilation shall be maintained until the new coating areas are cured.

3.8 The contractor shall clean the sealing surfaces around the manhole and cover and install the cover using new ¼ inch thick neoprene gaskets.

3.9 Contractor shall quote on renewing 3 manhole cover studs. Contractor shall provide a unit cost to change additional manhole cover studs. The actual cost shall be adjusted up or down via PWGSC 1379 action.

3.10 The Forepeak Tank Valve extended spindle linkages and knuckles shall be cleaned and greased with water repellent grease for optimum freedom of movement. Contractor shall bid on cleaning and regreasing 2 knuckles. Contractor shall operate extended spindle to prove ease of operation with Chief Engineer present. Any defects noted shall be addressed by PWGSC 1379 action.

3.11 The contractor shall hydrostatically test the tank using fresh water upon completion of all inspection, repair and installation work. Upon Marine Safety Inspector's satisfied witnessing of the tank test and inspection of the tank vent heads the vent heads shall be re-

Spec item #: H-08	SPECIFICATION	TCMSB Fields # 3L001
Forepeak Tank Survey and Tank Level Transducer Installation		

installed with new gasket and stainless steel fasteners.

3.12 All tests shall be witnessed by the Chief Engineer as well as the Transport Canada Marine Safety Inspector.

3.13 Contractor shall fabricate and install a top mount tank level transducer adapter as per sketch found below.

3.14 Contractor shall clean the tank top to bare steel by mechanical means in the location indicated by the Chief Engineer for installation of the tank top level transducer.

3.15 Contractor shall cut a 2” opening in the tank to accept the fabricated tank level transducer.

3.16 Contractor shall weld on a 1/2” doubler plate that is 6” in diameter in this location by continuous multipass weld. The doubler plate shall have a 2” opening to accept the tank level transducer.

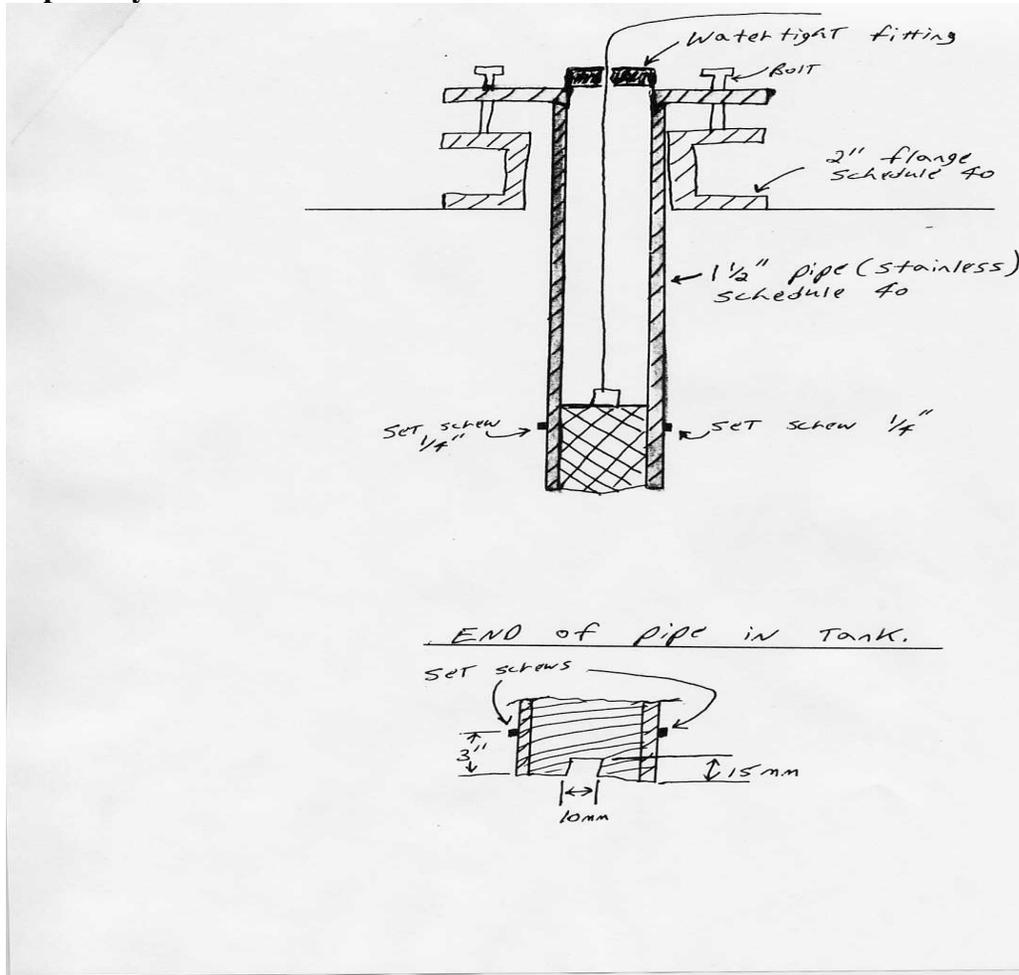
3.17 Contractor shall fabricate and mount the tank level transducer adapter as indicated in the ‘Top Entry Tank Level Transducer’ sketch seen below.

3.18 The tank level transducer includes a 2” flanged adaptor spool (Schedule 40), 1 ½” stainless steel pipe (Schedule 40) and mounting flange with watertight gland. The Contractor will need to supply approximately 11 Meters of 1 ½” stainless steel pipe, 2 of 90 degree stainless steel pipe elbows and one ss 45 degree pipe elbow and one ss pipe coupling and 3 pipe support brackets.

3.19 Contractor shall weld with continuous multipass weld the 1 ½” stainless steel pipe cut to length for tank depth to the mounting flange. The Contractor shall fabricate and install mounting tubes/guides for the top entry tank level transducer adaptors. The top-entry transducer adaptors shall be glanded for water-tight. The mounting flange shall be equipped with a watertight gland and bolt holes to match the 2” flanged adaptor spool. Note: The length of transducer cable pipe conduit will be limited by fitting it through the manhole cover. It will need to be assembled within the tank.

Forepeak Tank Survey and Tank Level Transducer Installation

Top Entry Tank Level Transducer



3.20 The 1 1/2" pipe shall be fitted with 2 threaded holes to accept 1/4" stainless steel set screws at a distance 3" from the bottom. The bottom of the pipe shall be notched 10mm wide and 15mm high. See attached sketch at bottom.

3.21 Contractor shall by continuous multipass weld mount the flanged adaptor spool to the doubler plate. The top flange of the 2" flanged adaptor shall be fitted with 4 bolt holes of a standard bolt hole configuration. The mounting flange shall be bolted on to the flanged adaptor by Contractor supplied bolts, nuts and lock washers along with gasket suitable for water/oil applications.

3.22 Contractor shall notify Chief Engineer upon completion of tank level transducer adapter. Vessels EO will install the level transducer.

Spec item #: H-08	SPECIFICATION	TCMSB Fields # 3L001
Forepeak Tank Survey and Tank Level Transducer Installation		

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have tank inspected and pressure test witnessed by TCMS for survey credit.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of all relevant Safety Management System completed forms including MSDS and checklists to and any materials invoices arising to the Chief Engineer.

Spec item #: H-09	SPECIFICATION	TCMSB Field # 3LL060 MSN 2011-20-PLJ-100
Cabin 304 Steel Renewal		

Part 1: SCOPE

1.1 The intent of this specification is to access, crop and renew wasted section of deck steel port forward and outboard sections to ‘as new’ condition to satisfaction of TCMS Hull Surveyor and Owner. Subsequent re-installations of furnishings and fittings to include installation of Owner-supplied renewal bulkhead lining panels and tracks.

1.2 The area for steel & stiffener renewal is forward and outboard for an approximate area of 3.25 m2 as per sketch, “Steel Area Rm 304 found in Appendix A.

Part 2: REFERENCES

2.1 Reference drawing 72-07 "Superstructure Scantlings Sheets 1 & 2 "

2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

Part 3: TECHNICAL DESCRIPTION

3.1 Removals in Cabin 304 on Officers Deck Frames 105 – 112.5 include the following: curtains window boxes, bulkhead mounted fixtures (electrical heaters, television screen, fan & light); desk, computer, monitor, sofa, chairs and bookcases. All the above shall be dismantled with care and moved to nearby cabins and spaces for safe storage as directed by Owners Rep. The bulkhead linings in the affected area shall be dismantled. The damaged bulkhead panels shall be taken ashore for disposal. The undamaged bulkhead lining panels shall be laid aside in safe dry storage.

3.2 The Contractor shall tape an impervious dust barrier over the openings to the night cabin and washroom in Cabin 304 prior to removal of the deck covering, underlay, bottom bulkhead tracks and bulkhead insulation in the area for steel renewal. The Contractor shall provide efficient dust extraction to the exterior of the ship for the duration of dust generation and subsequently until the dust has cleared.

3.3 Removals in Cabin 411 under (Boat Deck Frames 105 to 112.5 include the following: mattresses, bunkframes, ceiling panels, ceiling panel tracks and supports, light fixtures, and ceiling mounted smoke detector and base, PA Speaker and ventilation duct and outlet fixture. The carpet in the cabin shall be protected by a temporary fire and scuff proof barrier provided, secured and maintained in good condition by the Contractor. The removed and laid aside furnishings and fixtures shall be carefully moved by the Contractor to adjacent cabin(s)/rooms for safe and protected storage as directed by Owners Rep.

3.4 The contractor shall take careful note of the positions of all attachments to the existing deckhead prior to the cropping of the condemned L-shaped forward/outboard section.

Spec item #: H-09	SPECIFICATION	TCMSB Field # 3LL060 MSN 2011-20-PLJ-100
Cabin 304 Steel Renewal		

3.5 The contractor shall remove and retain, for reuse, the blocks of mineral fibre insulation. The insulation blocks in good condition may be re-used by the Contractor to lessen the quantity of block insulation the Contractor is required to supply and install on the new steel deck and stiffeners.

3.6 The contractor shall supply and apply an impervious fire barrier atop the cabin bulhead linings and dismount all the bulkhead linings for fire watch and subsequent re-installation in good order.

Steelwork

3.7 The contractor shall crop the indicated section of wasted deck steel c/w attached stiffeners; fair the edges and supply and install replacement steel deckhead plate c/w stiffeners as original. The contractor shall maintain the original deck camber. Contractor shall take great care in transport of steel plate and sections to avoid damaging existing doorframes and bulkhead linings.

3.8 Contractor shall quote on replacing sections of grade A steel 7/16" thick in a sideways 'L' shape from forward outboard corner of space thwartships a section 1 Meter wide by 2 Meters long with an outboard extension 0.5 Meters wide by 2.5 Meters Long plate c/w stiffeners as original. The frame spacing is 400 mm, the deck beam spacing is 800 mm; the deck beams are 5" x 3" x 5/16" grade G40.21 44W or equivalent. Contractor shall quote on replacing 9.45 M of deck beam plus 6 corner gussets.

3.9 The contractor shall provide effective atmospheric exhaust to the exterior of the ship for the duration of all fume/dust generation and an effective fire watch in the cabin below (Officials Cabin).

3.10 The Contractor shall advise TCMS Hull Surveyor and Owner's Representative to inspect new steel and stiffener installation when completed.

3.11 Contractor shall allow \$1000.00 for any NDT of the new welds which may be required by TCMS and this allowance shall be adjusted by 1379 action on proof of invoice.

3.12 Upon acceptance of the steel work the Contractor shall re-install the deckhead insulation and acoustic ceiling in cabin 411 and cabin 304 as original. Contractor will need to install approx 50 insulation pins/spikes (tack-welded) and 10 ceiling track hangers (threaded rod).

3.13 Contractor shall install new Owner-supplied bulkhead lining bottom track in line with existing bulkhead lining top track.

Spec item #: H-09	SPECIFICATION	TCMSB Field # 3LL060 MSN 2011-20-PLJ-100
Cabin 304 Steel Renewal		

3.14 The contractor shall apply new underlay, to manufactures specifications, in Cabin 304 around attachments for furnishings as original to the perimeter of the bulkhead lining outline.

3.15 The Contractor shall supply and apply good quality seamless vinyl flooring, pattern to be pre-approved by Commanding Officer. The new vinyl flooring shall be applied to Manufactures specifications. The new flooring shall be protected from damage. Contractor shall have an allowance of \$800 to be adjusted up or down for the new flooring.

3.16 The contractor shall install the new owner-supplied bulkhead lining panels and joiners. Upon completion of bulkhead installation the Contractor shall supply and install black vinyl coving strip around the periphery of the room.

3.17 The Contractor shall re-install the Owner's furniture and furnishings in good order as original.

3.18 The Contractor shall remove all debris including the temporary protection for the new flooring arising from all the preceding work from the vessel and dispose of debris ashore.

3.19 All work shall be in accordance with Manufactures specification and good Marine Practice, to the Owner's satisfaction. All structural work shall meet or exceed the requirements of the TCMS Hull Surveyor and the Owner's representative.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have deck inspected by TCMS for survey credit prior to installation of new primer, insulation and or deck covering underlay as appropriate.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of all relevant Safety Management System completed forms and checklists to the Chief Engineer as well as the NDT reports and the vinyl flooring specification including Manufacturer and color/pattern code.

Spec item #: H-10	SPECIFICATION	TCMSB Fields # 3L028
Boiler Feed Tank Survey and Repair		

Part 1: SCOPE

1.1 The intent of this specification is to inspect and test the following tank for TCMSB 5 year survey credit. The tank bottom has a number of pits that shall be repaired by weld buildup.

Tank	Location	Capacity
Boiler Feed Tank	Fr. 70-75	14.9 M ³ Surface Area 35 Square Meters

Part 2: REFERENCES

- 2.1 Reference drawing 72-405 "Capacity Plan"
- 2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.3 Coast Guard ISM Confined Space Entry 7.D.9

Part 3: TECHNICAL DESCRIPTION

3.1 The ship’s crew will drain the tank down. Contractor shall lockout the Boilers and Boiler Feed Pumps along with the fill and discharge valves for the tank being opened for cleaning/inspection. Ships crew will advise of valve locations. The contractor shall remove the manhole cover from the tank and dispose of the remaining sludge for disposal ashore. The Contractor shall allow for 60 litres of sludge.

3.2 The contractor shall ventilate the tank and provide mechanical ventilation to all areas of the tank. The tank is to be gas freed, and certified Gas Free and safe for hotwork. Certificate shall be handed to the Chief Engineer prior to any personnel commencing work in the tank and a copy of these certificates shall be posted in a conspicuous area near the entrance to the tank. The validity of the gas free certificate shall be maintained while work is performed.

3.3 The contractor shall thoroughly clean the internal surface of the tank from debris, scale and sludge. All material and liquids in the tank resulting from the cleaning shall be removed from the vessel and disposed of ashore on the same day as it is generated by the Contractor.

Spec item #: H-10	SPECIFICATION	TCMSB Fields # 3L028
Boiler Feed Tank Survey and Repair		

3.4 Following the cleaning of the tank, the tank shall be inspected by the Chief Engineer and a Marine Safety Inspector. Contractor shall provide a qualified Manhole lookout during these inspections.

3.5 The Contractor shall quote on powertool cleaning to SSPC 3 a total area of approximately 10 square meters where tank coating has failed and corrosion is visible. Contractor shall further quote cost per square meter for additional surface preparation and coating renewal to be adjusted by 1379 action. The total area requiring coating renewal is to be agreed upon in writing by the Contractor's Representative and the Owner's Representative in writing prior to the start of power tooling.

3.6 The contractor shall quote on preparing and filling 10 pit areas. The quote shall include surface preparation, weld build-up and grinding flush. Contractor shall assume pit areas are 1 inch x 1 inch X 2mm in depth. The quote shall include unit cost per pit area and shall be used to adjust up or down via PWGSC 1379 action dependant on the number of pits requiring repair.

3.7 The contractor shall have TCMSB inspect the welding repairs. Following the welding repairs the Chief Engineer shall inspect the tank for the final inspection.

3.8 Following the weld repairs the Contractor shall recoat the tank repaired areas with an approved epoxy coating suitable for oxygenated freshwater Contractor shall provide the epoxy product data to the Chief Engineer to confirm suitability.

3.9 The contractor shall clean the sealing surfaces around the manhole and cover and install the cover using new ¼ inch thick neoprene gaskets. The vents, sounding pipes and overflow pipes shall be proven clear.

3.10 Contractor shall quote a price on hydrostatically testing the tank to the satisfaction of the attending Marine Safety Hull Inspector. All tests shall be witnessed by the Chief Engineer as well as the Transport Canada Marine Safety Inspector.

3.11 Contractor shall dispose of fresh water used for hydrostatic test and reconnect tank vent with new stainless steel fasteners.

Part 4: PROOF OF PERFORMANCE
Inspection, Testing & Certification

4.1 Contractor shall have tank inspected and pressure test witnessed by TCMS for survey credit.

4.2 Weld repairs shall be to the satisfaction of the attending Marine Safety inspector.

Spec item #: H-10	SPECIFICATION	TCMSB Fields # 3L028
Boiler Feed Tank Survey and Repair		

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of the all relevant Safety Management System completed forms and checklists to the Chief Engineer. Contractor shall supply copies of MSDA sheets and product specifications for any cleaning and coating product used.

Spec item #: H-11	SPECIFICATION	TCMSB Field # N/A
Piping Renewals & Repairs		

Part 1: SCOPE

- 1.1 The intent of this specification is to remove, fabricate new and replace the following sections of piping.
- a) Copper, domestic hot water, supply piping.
 - b) Steel, boiler, blow down piping.
 - c) Port Hawse Pipe Wash Down Piping

Part 2: REFERENCES

Guidance Drawings/Nameplate data

N/A

Standards

- 2.1 The Contractor shall adhere to Federal and Provincial Welding Standards and the Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.2 Coast Guard ISM Lock-Out and Tag-Out 7.D.19
- 2.3 Coast Guard ISM Hot Work 7.D.11

Owner Furnished Equipment

- 2.4 The Contractor shall supply all materials, consumables and equipment required to perform the specified work.

Part 3: TECHNICAL DESCRIPTION

- 3.1 Contractor, with ship's Senior Engineer, shall lockout/tag-out the affected systems when the Contractor is ready to start the related work. The lock-outs shall be entered in the Ship's Lock-out/Tag-Out Register and the affected piping isolated and drained as appropriate.
- 3.2 Contractor shall supply and erect scaffolding in the Propulsion Motor Room to gain access to the domestic hot water piping, approximately 16 feet above the deck plates.
- 3.3 The contractor shall crop out approx 14 feet of 1 1/2 " copper pipe on the domestic hot water supply as directed by the Senior Engineer.

Spec item #: H-11	SPECIFICATION	TCMSB Field # N/A
Piping Renewals & Repairs		

- 3.4 The Contractor shall fabricate and install new K-Type copper pipe as per pipe removed. This will consist of 2 couplings, 2 – 45 degree elbow and 1 – 90 degree elbow. Contractor shall use silfoss for jointing
- 3.5 After completion and the system tested for leaks, contractor shall install re-insulate the disturbed lines. Contractor shall use 2” thick jacketed fiberglass with all joints taped. Contractor shall remove scaffolding and remove any debris from the area.
- 3.6 Located in Main Engine Room at Boiler Flat, Contractor shall remove approximately 10 feet of 1 inch steel boiler water blow down line as directed by the Senior Engineer.
- 3.7 The Contractor shall fabricate and install new Seamless Steel ASTM A53 Grade A Schedule 80 Black as per piping removed. The new pipe will consist of 2 tee’s, 1- ball valve (rated), 2 – screw lift valves (rated), 3 couplings and 2 – 90 degree elbows. One elbow will require socket weld.
- 3.8 The pipe shall be installed using new steam gaskets, nuts and bolts and pipe sealant on threaded end.
- 3.9 After completion the piping shall be tested for leaks.
- 3.10 Located in ForeCastle , Contractor shall remove approximately 12 feet of steel piping, 1 inch section is approx 9 feet and a 2” section approx 3 feet, 12 feet total. The piping is the washdown for the port hawse pipe, feed from the fire main. Contractor shall remove the section of piping by un-bolting the 4 flanges that hold the piping in place. Flanges have 4 bolt holds at 4” PCD.
- 3.11 The Contractor shall fabricate and install new Seamless Steel ASTM A53 Grade A Schedule 80 Black piping as sample removed. The new piping will consist of 2 x 2” tee’s, 3 x 1 “ elbows, 2 x 1” couplings, 2 x 2” to 1” bushings. Contractor can supply 4 new flanges as removed or Contractor can crop existing flanges and machine to fit new piping. Existing piping has some socket welds. New piping can be NPT.
- 3.12 The pipe shall be installed using new gaskets, nuts and bolts and pipe sealant on threaded end.
- 3.13 After completion the piping shall be tested for leaks.

Spec item #: H-11	SPECIFICATION	TCMSB Field # N/A
Piping Renewals & Repairs		

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

- 4.1 The Contractor with the Senior Engineer's assistance shall remove the lock-outs on the domestic hot water and steam system and pipe repairs tested for leaks.
- 4.2 All work shall be completed to the satisfaction of the Chief Engineer of his delegate.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training
N/A

Spec item #: E-01	SPECIFICATION	TCMSB Fields # 2L0010, 3JJ020,
Air Receivers Quinquennial Survey		

Part 1: SCOPE

- 1.1 The intent of this specification is to cover the quinquennial inspection, including the hydrostatic testing, of the compressed air receivers for TC/MS credit. The inspection will generally be covered in three parts as follows:
 - a) Internal cleaning & inspection
 - b) Hydrostatic testing
 - c) Disassembly, survey & reassembly of all valves & mountings
- 1.2 This work shall be carried out in conjunction with E-02, Safety Valve Recertification.

Part 2: REFERENCES

- 2.1 Reference drawing 72-758, Compressed Air Diagram
- 2.2 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

Part 3: TECHNICAL DESCRIPTION

- 3.1 The Contractor is to be responsible for all inspections and is to consult with TC/MS, prior to commencement of work, to determine an inspection schedule; at each inspection point, the Contractor is to advise the Technical Authority, in advance, to allow his/her attendance.
- 3.2 There are five air receivers to be attended to; the Main Air Receivers will not be attended to simultaneously to allow service air to be continually available for onboard use. Contractor shall Lock-out the receivers as required.
- 3.3 Listing of receivers to be tested:

<p><u>Main Air Receiver Upper</u> Located – E/R Room Flat (S) Volume – 0.75 M3 Working Pressure – 17.2 Bar Test Pressure – 32.1 Bar Connections (7 in total): Air Inlet, 1” globe Air outlets, 2 X 1-1/2” globe 1 X 1” globe Drain, 1/2” globe Pressure switch, 1/2” globe Pressure gauge, 1/4” globe</p>	<p><u>Main Air Receiver Lower</u> Located – E/R Room Flat (S) Volume – 0.75 M3 Working Pressure – 17.2 Bar Test Pressure – 32.1 Bar Connections (7 in total): Air Inlet, 1” globe Air outlet, 2 x 1-1/2” globe 1 X 1” globe Drain, 1/2” globe Pressure switch, 1/2” globe Pressure gauge, 1/4” globe</p>
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Spec item #: E-01	SPECIFICATION	TCMSB Fields # 2L0010, 3JJ020,
Air Receivers Quinquennial Survey		

<p><u>Control Air Receiver</u> Located – Lower D/G Room Volume – 0.50 M3 Working Pressure – 17.2 Bar Test Pressure – 29.3 Bar Connections (5 in total): Air inlet, 1” globe Air inlet, 1” check Air outlet, 1” globe Drain, ½” globe Pressure gauge, ¼” globe</p>	<p><u>Emergency D/G Air Receiver</u> Located – Aux Elect Room Volume – 0.95 M3 Working Pressure – 17.2 Bar Test Pressure – 29.3 Bar Connections (4 in total): Air inlet, SDNR 1” globe Air outlet, 1” globe Drain, ½” ball Pressure gauge, ¼” globe</p>
<p><u>Whistle Buffer Tank</u> Located – Engine Room Casing Volume – 0.36 M3 Working Pressure – 17.2 Bar Test Pressure – 29.3 Bar Connections (5 in total): Air inlet, 1” globe Air outlet, main - 1” globe sec – ¾” globe Drain, ½” globe Pressure gauge, ¼” globe</p>	

3.4 The Contractor is to remove the handhole doors to access the internals of each air receiver. The internals of each receiver is to be thoroughly cleaned to remove all rust, scale, and sludge, then wiped down using a suitable degreasing solvent. The landing of each handhole door shall be suitably cleaned to provide a good sealing surface for the gasket.

3.5 Any WHMIS controlled cleaners utilized will be accompanied by a current MSDS; 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.

3.6 Upon the completion of cleaning, the Contractor is to thoroughly wipe down the interior of each receiver with lint free rags. Each receiver is then to be inspected internally by the Technical Authority (or designate) and the attending TC/MS Inspector. Upon completion of inspection, each handhole door is to be reinstalled using a new gasket, suitable for compressed air service.

Spec item #: E-01	SPECIFICATION	TCMSB Fields # 2L0010, 3JJ020,
Air Receivers Quinquennial Survey		

3.7 The relief valves on the air receivers shall be coordinated with item E-02, Relief Valve Certification.

3.8 The Contractor is then to tag all valves and fittings to ensure installation in their respective original locations. The Contractor shall remove all valves and fittings associated with each air receiver to their workshop. All fasteners are to be reused; the Contractor is to bid on replacing two damaged fasteners per air receiver (total of 10) and provide a unit price per additional fastener.

3.9 The Contractor shall then install blanks and plugs on all flanges and tank openings; Contractor-supplied gaskets and thread sealant shall be used. Certified pressure gauges of the appropriate range for the test pressure of each receiver shall be provided; copies of the certificates shall be made available to the Technical Authority (or designate) upon request. NOTE: "As-fitted" pressure gauges shall not be used for test purposes.

3.10 Each receiver shall be filled with fresh clean water, vented of all air, and pressurized to the test pressure indicated in section 3.3 above or to a pressure acceptable to the attending TC/MS Inspector. The length of the test is to be as directed by the Inspector.

3.11 Upon the successful completion of the hydrostatic test, the Contractor is to drain and open up each receiver, remove all the blanks, plugs and appliances required for testing and wipe down of the tank internals. Water is to be drained to the bilges where possible; in the case of the Emergency D/G air receiver and the Whistle Buffer tank, the Contractor is to dispose of the waste water according to applicable provincial environmental requirements.

3.12 Each valve is to be disassembled, cleaned, and laid out for inspection; valve seats and faces are to be machined and lapped-in using a suitable grinding compound. Valve packing is to be removed and discarded.

3.13 The valves are to be inspected by the Technical Authority (or designate) and the attending TC/MS Inspector; any valve judged defective is to be repaired, or replaced, by 1379 action. All valves are to be reassembled, using new Contractor-supplied gaskets, seals and packings.

3.14 Upon completion of all testing, cleaning and inspections, all valves and fittings shall be returned to the vessel and installed in their original location, using new Contractor-supplied gaskets and thread sealant.

3.15 Lock-outs shall be removed; the air receivers are to be returned to operating pressure and proven free from leaks. All valves will be returned to their normal operating positions; this shall be confirmed in the presence of the Technical Authority (or designate).

3.16 All materials and items to perform the above work, including the pump for pressure testing, shall be Contractor-supplied.

Spec item #: E-01	SPECIFICATION	TCMSB Fields # 2L0010, 3JJ020,
Air Receivers Quinquennial Survey		

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have all receivers inspected and pressure test witnessed by TCMS for survey credit.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide copies of the all relevant Safety Management System completed forms and checklists to the Chief Engineer. Contractor shall supply copies of MSDA sheets and product specifications for any cleaning and coating product used.

Spec item #: E-02	SPECIFICATION	TCMSB Field # 3JJ030
SAFETY VALVE CERTIFICATION		

Part 1: SCOPE

The intent of this specification is to have 10 Safety Valves (pressure-relief) serviced and certified.

Part 2: REFERENCES

Guidance Drawings/Nameplate data

N/A

Standards

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.

- Canadian Coast Guard Fleet Safety Manual (DFO 5737)

Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION

3.1 Contractor shall dismount/remove the valves from their pressure vessels and label each as to origin. Ship’s crew will isolate and relieve pressure from the pressure vessels prior to valve removal. List of the valves are as follows:

<u>Valve location</u>	<u>Qty.</u>
Emergency Gen. Receiver	1
Main air receivers	2
Whistle air receiver	1
Control air receiver	1
Dead ship air compressor	1
Main air compressors	4 (2 on each compressor)

Note: Only one air compressor and one Main Air receiver to be taken out of service at a time.

Spec item #: E-02	SPECIFICATION	TCMSB Field # 3JJ030
SAFETY VALVE CERTIFICATION		

3.2 The Contractor shall transport the valves complete with their labels to a qualified local Test Facility. The Contractor shall have an allowance of \$5000 for the cost of the subcontractor to test and set the valves removed, If the valves require repair or replacement, this shall be covered under the allowance. The actual amount to be adjusted up or down via 1379 action upon proof of invoice. The lift pressure of the valves is to be set as per TCMS requirements.

3.4 The serviced and certified valves are to be returned to the ship within 4 business days after removal from the ship. The serviced and certified valves complete with their labels shall be re-fitted in place using new gaskets and proven leak free.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 The Contractor shall supply three copies of each test certificate to the Owner's Representative within two days of the certified valves being re-installed on the vessel. The valve test certificates shall clearly identify the valve, Ship's name, valve function, the test pressure and the test date.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 A service report is to be provided for any repairs and/or adjustment required.

Spec item #: E-03	SPECIFICATION	TCMSB Field #
No 2 Boiler Survey		

Part 1: Scope

1.1 The intent of this item shall be to open up the starboard boiler for cleaning, inspection and testing and to obtain a credit from the Transport Canada Marine Safety Inspection Board.

Part 2: References

Starboard Boiler – Located Engine Room Flat

Clayton Steam Generator

Model EO-100, Serial # 21956

Working Pressure – 100 PSI

Test Pressure - 125 PSI

Safety Valve – 1 1/4”, 125 PSI

Part 3: Technical Description

- 3.1 The contractor shall with the Senior Engineer lock out the boiler as required. The Contractor shall use their own locks/tags and the lock-outs shall be entered in the Ship's Lock-out/Tag-Out Register.
- 3.2 The contractor shall remove or disconnect all wiring, piping, sensors, brackets, pressure gauges, and other associated hardware and appliances to carry out the specified work. All items shall be reassembled and reconnected in good order upon completion of all testing, cleaning, and inspections.
- 3.3 Mountings on both boilers shall be tagged prior to removal for identification purposes and installed back in their respective original locations upon completion of all work.
- 3.4 The owner will supply the replacement fittings 2” nom and under for direct replacement. The contractor shall remove the above mentioned valves and install the Coast Guard supplied replacements.

<u>Item</u>	<u>Location and Size</u>
Safety Relief Valve	1 ¼ inch starboard
Separator Drain Valve	¾ inch angle globe
Burner Control Valve	¼ inch
Feed Water Pump Inlet Valve	2 inch gate
Feed Water Check Valve	2 inch angle check
Feed Water Pump Relief Valve	2 inch angle
Coil Feed Valve	2 inch globe

Spec item #: E-03	SPECIFICATION	TCMSB Field #
No. 2 Boiler Survey		

Coil Drain Valve	2 inch globe
Steam Trap Discharge Valve	1 inch globe
Soot Blowing Valve	1 ¼ Inch port, 1 inch starboard

3.6 The contractor shall remove the following valves for overhaul by a qualified shop.

Main Stop Valve	2 ½ inch starboard
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The valve shall be disassembled and thoroughly clean all parts for inspection. The metal seat shall be lapped and if the valve is not repairable or considered not cost effective to repair, shall be replaced with new valves, owner supply. Valve gland shall be repacked with new packing and all disturbed gaskets shall be replaced with new gaskets supplied by Contractor. All material shall be suitable for use with steam and rated for a minimum of 150 psi operating pressure.

3.7 Contractor shall remove the burner. They are secured via wing nuts. The fuel inlet and return lines will need to be let go.

3.8 The contractor shall thoroughly clean by wire brushing and fresh water flushing the external surfaces of the boiler coil. The internals of the boiler coil shall be thoroughly cleaned with an approved chemical for removing scale. Upon completion of chemical cleaning, the coil internals are then to be thoroughly washed out and neutralized with a suitable alkaline agent followed by a flushing. All cleaning chemicals and fluids used for cleaning and descaling shall be contained and disposed of ashore by the contractor in a manner in keeping with local environmental recommendations. Contractor shall ensure catchall under boilers is plugged to contain all contamination from cleaning. Current MSDS sheets are to be provided to the Chief Engineer before the chemicals are used. The Contractor shall quote on the removal of 500 gallons of water and residue from the internal and external cleaning of the boiler coil.

3.9 Following the cleaning procedures, the boiler coil and the associated steam separator shall be hydrostatically tested at 1.5 times the working pressure. The contractor shall provide all the equipment including blank flanges, valves, gaskets, fittings, pressure gauges, pumps, etc. necessary to perform the hydrostatic test. Provide proof of gauge and pressure relief valve calibration to the C/E before the test.

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No. 2 Boiler Survey		

- 3.10 Testing shall be witnessed by the Marine Safety Inspector and shall be to a pressure and duration to the Inspector's satisfaction. Contractor shall arrange for TCMSB and shall notify Chief Engineer prior to TCMSB attendance.
- 3.11 The combustion chamber shall be thoroughly cleaned. The refractory cement shall be inspected for cracks. Contractor shall quote \$ 5000.00 for repairs to the refractory cement. Final cost shall be adjusted up or down by 1379 action upon proof of invoice. Owners shall supply plastic refractory cement.
- 3.12 The contractor shall remove the combustion air duct and damper assembly from each boiler. Air duct and damper components shall be completely disassembled. All parts shall be cleaned and laid out for inspection by Chief Engineer. Upon completion of inspection, the damper unit and ducting shall be reassembled as per the manufacturer's specifications section 8.12 of the manufacturer's instruction manual which is located onboard the vessel and will be provided to the successful bidder.
- 3.13 The contractor shall remove the safety valve and have it sent ashore to a recognized test facility to have it set and tested. An original test certificate is to be provided to the Chief Engineer and Transport Canada Surveyor upon completion of this test.
- 3.14 Following the completion of the specified work, the boiler shall be suitably drained. All blanks, plugs, gaskets, etc. necessary for testing shall be removed. All piping, fittings, valves, brackets, burner etc. and all items disturbed to perform the cleaning and inspections shall be reconnected in good order. All new gaskets shall be supplied and installed by the contractor in place of gaskets and seals that were disturbed to perform this work. All alarms and controls shall be reconnected and proven operational. This shall be done with the assistance of the Electrical Officer.
- 3.15 **All materials, equipment, chemicals, cleaners, etc. shall be supplied by the contractor to perform the cleaning and testing of both boilers. Current MSDS sheets shall be provided to the Chief Engineer for any and all chemicals used before the chemicals are brought aboard the vessel.**

Spec item #: E-03	SPECIFICATION	TCMSB Field #
No. 2 Boiler Survey		

Part 4: Proof of Performance

4.1 Correct boiler operation shall be demonstrated and the contractor shall set the safety valves to lift at the pressure indicated by the attending Marine Safety Inspector and then tested for correct lift pressure.

Part 5: Deliverables

5.1 Contractor shall provide 3 typewritten service reports of the work carried out.

Spec item #: E-04	SPECIFICATION	TCMSB Fields # 3H024, 3H025
Port and Starboard Steering Pumps, Cylinders and Control Block Survey		

Part 1: SCOPE

- 1.1 The intent of this specification is to open the steering pumps, steering rams and control valve assemblies for a Marine Safety Inspector survey credit.
- 1.2 This work shall be carried out in conjunction with L-02, Steering Gear Motor Inspection.

Part 2: REFERENCES

- 2.1 Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.2 Vickers Manual, Located Onboard Vessel
 - Steering Pumps**
 - Power Pumps (Qty 2): Vickers, Model 35VTA-25A
 - Servo Pumps (Qty 2): Vickers, Model V10-151-11C20
- 2.2 Port and Starboard Steering Cylinders Model # L200-1047 Ref. Dwg Wagner #C-3-602 Rev.05
- 2.3 Port and Starboard Control Valve Blocks alike: No 63 Steering Manifold as Wagner Drawing D-3-455 Rev 01
- 2.4 Appendix A, Steering Gear

Part 3: TECHNICAL DESCRIPTION

- 3.1 The contractor shall lock out the power supply for the steering pumps before starting the work outlined below. Ships Electrical Officer shall advise contractor as to proper breakers for isolation.
- 3.2 The four pumps are to have all piping disconnected. The open ends of all hydraulic piping shall be capped to prevent the ingress of dirt.
- 3.3 The four pumps shall be removed ashore to the Contractor’s facilities for disassembly, cleaning, and inspection. All components shall be inspected for wear and defects. The Chief Engineer and a Marine Safety Inspector shall be present for the inspection of the internal components.

Spec item #: E-04	SPECIFICATION	TCMSB Fields # 3H024, 3H025
Port and Starboard Steering Pumps, Cylinders and Control Block Survey		

3.4 Wear plates, pressure plates, vanes, bushings, and shafts shall be measured for wear. All readings shall be recorded and given to the Chief Engineer in a type written format.

3.5 Upon completion of all work and inspections, the four pumps shall be assembled in good order and returned to the vessel. The pumps shall be installed in their respective locations in good alignment. Alignment shall be checked and recorded and measurements of this shall be presented to the Chief Engineer.

3.6 The steering gear rams and control valve assemblies shall be opened up for Marine Safety Survey. Work includes cleaning, inspection, measurement, re-assembly to manufacturer's spec., re-installation and subsequent operational demonstration and run-in.

3.7 The contractor shall tag, disconnect, drain and cap hydraulic hoses to steering cylinders and control valve blocks. Hoses shall all be inspected and any defects in same drawn to the attention of the Chief Engineer on the same day as discovered. All hydraulic oil drained to be collected into containers cleaned up by the contractor and disposed of ashore. Ram cylinder weight shall be supported and tiller pins to be unsecured and removed aside. Supported cylinders shall be swung aside to provide clearance for withdrawal of steering piston and rod assembly. Each cylinder to be opened in place for inspection. Measurements to be taken and recorded for cylinder wear top/bottom port/stbd at fully extended, fully retracted and mid-travel positions for both P & S cylinders. On completion of inspection by Chief Engineer and the Marine Safety Inspector, the Contractor is to re-assemble both cylinders using new owner supplied U-Cups and V-packing. Steering cylinders spherical bearings at tiller end shall be cleaned and inspected for wear.

3.8 Contractor shall refill with Owner supplied oil and bleed the system.

3.9 Upon completion of all work the steering gear is to be test run for 1 hour -to prove operation; to check for leaks, to vent air pockets, to run in new packing, to confirm that stops are set correctly (42 degrees port and stbd) and to the satisfaction of Marine Safety Inspector, Chief Engineer and Commanding Officer. The Contractor is to adjust tension as required on packing gland rings after initial run-in.

3.10 Upon completion of the test run, the filters shall be opened, cleaned, inspected by Contractor and Owner for debris and re-installed in good order and proven leak-free.

3.11 All new parts required for overhaul will be owner supplied as required.

Spec item #: E-04	SPECIFICATION	TCMSB Fields # 3H024, 3H025
Port and Starboard Steering Pump, Cylinders and Control Block Survey		

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

- 4.1 Contractor shall have Chief Engineer and Marine Safety Inspector present upon complete disassembly and cleaning for inspection for Marine Safety survey credit.
- 4.2 Contractor shall test run each pump for 1 hour upon reassembly.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

- 5.1 Contractor shall provide a detailed report of the readings measured and parts changed c/w manufacturers Part Number designations during steering gear overhaul.

Spec item #: L-01	SPECIFICATION	TCMSB Fields #
Breaker Replacement		

Part 1: SCOPE

1.1 The intent of this specification is to replace the six Federal Pioneer breakers listed under ‘References’ with new Merlin Gerin breakers owner supplied.

Part 2: REFERENCES

- 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 Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.3 Transport Canada Ship’s Electrical Standards TP127E.

Breaker Listing

- 1. Auxiliary Generator, Serial # BH28717-84, Type 30H-3
- 2. Main Bus Tie, Serial # BH28716-84, Type 30H-3
- 3. Emergency Switchboard Bus Tie, Serial # BH28739-84, Type 30H-3
- 4. Emergency Tie, Serial # BH28719-84, Type 30H-3
- 5. Shore Power Breaker, Serial #....., Type.....
- 6. Emergency Generator, Serial # BH28741-84, Type 30H-3

FSR

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Spec item #: L-01	SPECIFICATION	TCMSB Fields #
Breaker Replacement		

Part 3: TECHNICAL DESCRIPTION

- 3.1 Contractor shall have an allowance of \$70,000 for the services of the Field Service Representative (FSR) to be adjusted up or down via 1379 action upon proof of invoice for the removal the 6 existing breakers and the installation of the six new Merlin Gerin breakers including testing.
- 3.2 Contractor shall only be responsible for the transporting of the breakers on and off the vessel. The FSR **shall be solely responsible** for all other items in this specification under the allowance provided.
- 3.3 Contractor shall remove and crate up the six Federal Pioneer breakers listed above and transport them ashore to be picked up by Coast Guard Technical Stores.
- 3.4 Contractor shall transport five new Merlin Gerin breakers from Coast Guard Tech Stores to their respective locations.

LOW VOLTAGE BREAKER RETROFITS in Emergency Switchboard

- 3.5 Contractor shall shut down and isolate the Emergency switchboard main and control power circuits for LV breaker retrofits. If necessary / possible – Isolate the Distribution Section bus. Install temporary jumper cables between the Auxiliary Switchboard Tie breaker cables and the distribution section.
- 3.6 Contractor shall remove existing Federal Pioneer Emergency Generator and Emergency Switchboard Bus Tie breakers and cradles.
- 3.7 Contractor shall relocate control wiring to a terminal block at the rear of each section of switchboard. The control blocks, mounted on DIN rail, will be supplied by Eaton.
- 3.8 Contractor shall install new Masterpact breakers and cradles for the Emergency Generator and Emergency Switchboard Bus Tie. These are to be supplied by Coast Guard.
- 3.9 Contractor shall supply and install custom bussing to go between the new breakers and cradles and the existing bus bars in the switchboard.
- 3.10 Contractor shall supply and install insulated barriers / bus bracing as required for the new breakers installation.
- 3.11 Contractor shall supply / install control wiring as required for the new breakers installation.
- 3.12 Contractor shall replace the existing doors with new manufactured ones in order to accept the new breaker profile. If necessary supply new breaker mounting pans.
- 3.13 Contractor shall set and test the breakers overload protection relay to similar settings from existing breakers, perform contact resistance and megger, electrical and mechanical functions etc. Submit detailed test report to the Chief Engineer / Electrical Officer.
- 3.14 Contractor shall test the breakers to ensure they operate as designed for close / open, indications, interlocks etc to the satisfaction of the Chief Engineer / Electrical Officer.
- 3.15 Contractor shall modify electrical drawings showing the changes that have been made.

Spec item #: L-01	SPECIFICATION	TCMSB Fields #
Breaker Replacement		

LOW VOLTAGE BREAKER RETROFITS IN AUXILIARY SWITCHBOARD

- 3.16 Contractor shall shut down and isolate the Auxiliary switchboard main and control power circuits for LV breaker retrofits. Isolate the Distribution Section bus. Install temporary jumper cables between the incoming Shore Power breaker cables and the distribution section.
- 3.17 Contractor shall remove existing Federal Pioneer Auxiliary Generator, Shore Power, Main Tie and Emergency Tie breakers and cradles.
- 3.18 Contractor shall relocate control wiring to a terminal block at the rear of each section of switchboard. The control blocks, mounted on DIN rail, will be supplied by Eaton as required.
- 3.19 Contractor shall install new Masterpact breakers and cradles for the Auxiliary Generator, Shore Power, Main Tie and Emergency Tie. These are to be supplied by Coast Guard.
- 3.20 Contractor shall supply and install custom bussing to go between the new breakers and cradles and the existing bus bars in the switchboard.
- 3.21 Contractor shall supply and install insulated barriers / bus bracing as required for the new breakers installation.
- 3.22 Contractor shall supply / install control wiring as required for the new breakers installation
- 3.23 Contractor shall replace the existing doors with new manufactured ones in order to accept the new breaker profile. If necessary supply new breaker mounting pans.
- 3.24 Contractor shall set and test the breakers overload protection relay to similar settings from existing breakers, perform contact resistance and megger, electrical and mechanical functions etc. Submit detailed test report to the Chief Engineer / Electrical Officer.
- 3.25 Contractor shall test the breakers to ensure they operate as designed for close / open, indications, interlocks etc to the satisfaction of the Chief Engineer / Electrical Officer.
- 3.26 Contractor shall modify electrical drawings showing the changes that have been made.
- 3.27 Contractor shall be responsible for supply the following parts required for the breaker retrofits:
 - 600 / 120 control transformers rated 150 VA
 - Fuse blocks and fuses for control transformers, 24 VDC power supplies, control relays
 - 120 VAC control relays (required for breaker status)
 - 120 VAC adjustable time delay module for breaker U/V coils
 - 24 VDC power supply modules for Micrologic relays
 - Cradle position switches for breakers interlock defeat circuits
 - New switchgear doors for each breaker

Spec item #: L-01	SPECIFICATION	TCMSB Fields #
Breaker Replacement		

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

- 4.1 Upon completion of installation of new breakers, FSR to notify Chief Engineer prior to testing new breakers.
- 4.2 The newly installed breakers to be tested to manufacturer's recommendations in consultation with ship's Electrical Officer and 2 typewritten reports are to be provided to Chief Engineer.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

- 5.1 FSR to provide 2 copies of breaker installation and electrical drawings.

Spec item #: L-02	SPECIFICATION	TCMSB Fields # 3H026, 3H029
Port and Starboard Steering Pump Motor Survey		

Part 1: SCOPE

1.1 The intent of this spec shall be to service both steering pump motors for cleaning, inspection, and overhaul as per Transport Canada Marine Safety requirements.

1.2 All service work shall be performed at the Contractor's workshop. Contractor work includes also both the pre-service testing, disconnecting, dismounting, transporting, re-installation and connection and post-service testing of both motors.

Part 2: REFERENCES

2.1 Canadian Coast Guard Fleet Safety Manual (DFO 5737)

2.2

Port & Starboard Steering Pump Motors

Located: Main deck aft, Steering Gear Compartment

Baldor Industrial Motor

Frame 324TC 40 HP, 575 VAC, 3 PH, 39 A, 50C 1760 RPM

Bearings sealed both sides. DE: NTN (6)312Z NDE: NSK 6311Z

2.3 Baldor Industrial Motor Manual (Onboard Vessel)

Part 3: TECHNICAL DESCRIPTION

3.1 The Contractor shall measure and record the Start and Running Currents along with vibration measurements of the motors. Megger readings of windings shall be taken and recorded by the contractor before motor dismounting to prove the integrity of the motor windings. Owner's representative and Contractor's Representative must both witness and sign the measurement recorded. All power connections shall be tagged for identification and reconnected as original by the contractor after the completion of motor servicing.

3.2 The Contractor is responsible to ensure that the circuits are isolated and locked-out prior to commencing any work. Contractor shall remove motors ashore to complete the work listed within specification.

3.3 Both motors shall be disassembled. All components shall be cleaned then inspected for wear and defects. Both motors shall be re-assembled in good order with new contractor supplied bearings. These bearings shall be SKF or equivalent sealed bearings as per original. Contractor to take care to ensure bearing spring washers are re-installed as original.

Spec item #: L-02	SPECIFICATION	TCMSB Fields # 3H026, 3H029
Port and Starboard Steering Pump Motor Survey		

3.4 Both motors shall be balanced at 1760 RPM to ensure they are free of vibration at running speed. A copy of the balancing report shall be given to the Chief Engineer. Complete service report with test results shall be submitted to the Chief Engineer.

3.5 The contractor shall supply all parts and material to perform the specified work including new flexible elements for both motor couplings. The contractor shall supply to Chief Engineer one additional new flexible element for Ship's Spares. Contractor shall have an allowance of \$500 to provide the 3 new couplings. The actual amount shall be adjusted up or down via PWGSC 1379 action upon proof of invoice.

3.6 After servicing, re-assembly and balancing the motors shall be transported back to the vessel and re-installed in good alignment as original. Coupling run-out shall be measured and recorded; Owner's Representative to witness. Motor shall subsequently be test run to satisfaction of Owner for 4 hours ; current reading per phase shall be measured and recorded. Post-service measurement and recording of motors Start and Running Currents and vibration measurements shall be measured and recorded. Owner's representative and Contractor's Representative must both witness and sign the measurement records.

3.7 Contractor to note that the Steering Pump assemblies and steering gear ram assemblies will be undergoing service and inspection concurrently with the pump motors. The motors are to be transported back to the vessel as soon as the shop work has been satisfactorily completed. The Owner shall advise the Contractor should there be a delay in opportunity to demonstrate motor operation.

Part 4: PROOF OF PERFORMANCE

Inspection, Testing & Certification

4.1 Contractor shall have Chief Engineer and Marine Safety Inspector present upon complete disassembly and cleaning for inspection for Marine Safety survey credit.

4.2 Contractor shall test run each pump for 4 hours upon reassembly.

Part 5: Deliverables

Reports, Drawings, Manuals, Spares & Training

5.1 Contractor shall provide a detailed report of the readings measured and parts changed during steering pump overhaul.