CCGS Cygnus:

Alongside Refit

2012

Contents

Preamble

1. Intent

These specifications are supplied to the shipbuilder or ship repairer, hereinafter referred to as the Contractor for the purpose of outlining the objectives, performance, standards and basic engineering requirements for the alongside refit of the CCGS Cygnus for the Canadian Coast Guard, Department of Fisheries and Oceans at the CCG Southside Base, St. John's ,NL from Sept.6th to Oct.10th,2012.

The intention is to provide sufficient information such that the Contractor, with this guidance and his own experience and knowledge of good marine practice, shall complete the work items herein by carrying out the engineering and production work, while conforming to the requirements of all applicable Regulatory Bodies.

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 Transport Canada 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.

3. Testing and Records

All test results, calibrations, measurements and readings shall be properly tabulated, compiled and two typewritten copies shall be presented to the Owner's Representative and attending surveyors in a timely manner.

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 labour and equipment required for the erection of access staging, rigging, lighting, tugs, pilotage, necessary cranage and line handling.

6. Materials & 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 in advance of utilization.

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 & 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. The contractor shall cover all deck machinery and openings into the ship to prevent ingress of grit from blasting. The contractor will remove any and all coverings after the coating operations are complete.

9. Lighting & 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 be aware that the vessel is considered to be a Federal Work Place and thereby regulated by the Canada Labour Code.
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.
In addition, the Contractor is required to keep a log of all personnel entering and leaving any enclosed space.
Chemists Certificate
The Contractor is to supply the Owner's Representative with certificates issued by a marine chemist or other qualified person, in accordance with Part IX Confined Spaces of the Canada Labour Code, Part II before any cleaning painting or hot work is commenced in confined spaces or machinery compartments. Please note the contractor is to provide proof at the pre-refit meeting that the "marine chemist" or " other qualified person" who will be issuing certificates meets the qualifications of " marine chemist or other qualified person" as defined in the Marine Occupational Safety and Health Regulations of the Canada Labour Code . Certificates are to clearly state the type of work permitted and are to be renewed as required by regulations. Copies of the certificates are to be posted in conspicuous locations for the information of the Ship's and Contractor's personnel.
The Contractor is to ensure that any work carried out in confined spaces as defined by the Canada Labour Code must comply fully with all provisions of the code.

13. Hotwork
Any item of work involving the use of heat in its execution requires that the contractor advise the owner’s representative prior to starting such heating and upon its completion. The contractor shall be responsible for maintaining a competent and properly equipped fire watch during and for one full hour after all hot work. 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 Safety Annex as section 7.D.11 and section 7.D.11 (N). The contractor shall be responsible to ensure the contractor’s personnel including any subcontractors shall follow the policy.

14. Lockout and Tagout Procedures

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

- Electrical currents
- Hydraulic
- Pneumatic
- Gas or stem pressure and vacuum
- High temperatures
- Cryogenic temperatures
- Radio frequency emissions
- Potentially reactive chemicals
- Stored mechanical energy
- Equipment actuation

The contractor, under the supervision of the Chief Engineer and his delegate, shall be responsible for the Lockout and Tagout of equipment and systems listed in the specification.
The Contractor shall supply and install all locks and tags and shall complete the Lockout Tagout Log sheet provided by the Vessel.
The Contractor shall remove all locks and tags and complete the Lockout Tagout Log sheet provided by the Vessel.

15. Painting

All new and disturbed steelwork that will not be on the underwater wetted surface of the ship's hull shall be protected with one coat of marine primer or as stated in the individual work item.
The contractor will strictly adhere to the manufacturer's instructions and will be supervised by a Coast Guard contracted National Association of Corrosion Engineers (NACE) Inspector in the preparation, application and curing of all coatings during this refit.

16. 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.

17. Smoking

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

18. Restricted Areas
The following areas are out of bounds to shipyard personnel except to perform work as required by the specifications: all cabins, offices, Wheelhouse, Control Room, Engineer's office, public washrooms, cafeteria, dining room and lounge areas.

19. Electrical Standards
Any electrical installations or renewals shall be in accordance with the latest editions of the following marine standards:
(a) TP 127E-TC Marine Safety Electrical Standards.
(b) IEEE Standard 45 - Recommended Practice for Electrical Installation on Shipboard.
If any cable installed within this contract is found to be damaged, shorted or opened as a result of the manner of installation, the entire length of cable shall be replaced and installed at no cost to the Department. Plastic tie-wraps may be used to secure wiring in panels or junction boxes only.

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

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

22. Safety Annex
The Contractor shall have in place a Safety Management System that complies with the Canada Labour Code and Provincial Regulations and deals with the contractor responsibilities for items such as Hot Work, Confined Space Entry, Diving, Diving Operations, lock out and tagout procedures and Dry-docking.
The Contractor shall be aware that the vessel is considered to be a Federal Work Place and thereby regulated by the Canada Labour Code.
The Contractor shall comply with the work requirements as outlined in the Canada Labour Code and applicable Provincial Regulations.
In addition, the Contractor is required to keep a log of all personnel entering and leaving any enclosed space.
The Contractor shall note that Canadian Coast Guard Ships are presently working under the International Safety Management System (ISM) code and each ship has a Fleet Safety manual on board. The Fleet Safety Manual shall be adhered to when contract work involves CCG personnel and any other Public Service Employee during the contract period.
An electronic copy of the Fisheries and Oceans Canada, Canadian Coast Guard Fleet Safety Manual (DFO 5737) - (Adobe Acrobat .PDF version) can be found at
http://142.130.14.20/fleet-flotte/Safety/main_e.htm

23. 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.

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.

25. Vessel Security
There will be a Visitor Log at each main vessel access. Contractor shall ensure that all his employees and sub-contractor personnel sign-in when entering vessel and sign out when departing vessel. This requirement pertains to all visitors to the vessel including any Inspectors or vendors. These Visitor Logs will be available to the Shipyard's Security Personnel in the event of any emergency.

26. WHMIS
Any WHMIS-controlled products used onboard shall 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.

27. Cranes
The contractor shall notify the CCG Supervisor of Shops and Yards @ 772-5194 prior to the arrangement of any contractor designated crane services that are intended to be used at the Southside Base during the refit.

Ship's Particulars

Length ----------	63 Metres
Breadth ----------	14.6 Metres
Draft ----------	3.8 Metres
Gross Tonnage ----------	1210.5 grt
Net Tonnage ----------	302 nrt
Year built ----------	1982

Spec item #: H-1	**SPECIFICATION**	TCMS Field #: N/A
H-1 Production Chart		

Part 1: SCOPE:

1.1 The intent of this specification shall be to develop a production chart using MS Project encompassing all work specifications detailed in this project.

1.2 All refit specification items and shall be updated by the contractor prior to all production meetings.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data:

2.2 Standards:

2.3 Regulations:

2.4 Owner Furnished Equipment:

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

Part 3: TECHNICAL DESCRIPTION:

General

3.1 The successful contractor shall supply three hard copies and forward one electronic copy to the vessel's Project Engineer

i. Joseph.Earles@dfo-mpo.gc.ca
ii. The contractor shall forward a copy of the Production Chart to the Contracting Authority

3.2 The chart shall show for each specification item, the start date, the duration, and the completion date.

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

3.4 If work arises that affects the critical path, it shall be immediately brought to the attention of the Chief Engineer, Project Engineer and PWGSC. Every effort shall be made to prevent completion delay.

Part 4: PROOF OF PERFORMANCE:

4.1 The Production Charts shall be done to the satisfaction of the Chief Engineer and PWGSC.

Part 5: DELIVERABLES:

5.1 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 specification item, the start date, the duration and the completion date.

5.2 Three copies of the original and three copies of each weekly update shall be given to the Chief Engineer one day prior to each weekly Production Meeting.

5.3 The bar 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. The Contractor shall include on the updates to the production chart any Work Arising from PWGSC 1379 action and indicate how the additional work will impact the completion schedule for the vessel.

Spec item #: H-2	**SPECIFICATION**	TCMS Field #: N/A
H-2 Services		

Part 1: SCOPE:

1.1 The following services shall be scheduled and carried out in consultation with the Chief Engineer.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data:

2.2 Standards:

2.3 Regulations:

2.4 Owner Furnished Equipment:

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

Part 3: TECHNICAL DESCRIPTION:

3.1 Oily Bilge Water:

Contractor to quote on removing from ship's bilges approximately twenty cubic meters of oil/water mixture. Quotation to include cranage, pumping, trucking and disposal of waste mixture. Contractor to provide identity of firm(s) licensed for pumping and disposal of waste oil. Contractor shall quote a unit price per cubic meter. Contractor shall quote on three visits; these visits shall be scheduled in consultation with the Chief Engineer.

3.2 Interferences:

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

Part 4: PROOF OF PERFORMANCE:

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

4.2 Certification: Waste facility disposal certificates

Part 5: DELIVERABLES:

5.1 Reports:

Three copies of disposal certificates to be provided to Chief Engineer.

Spec item #: H-3	**SPECIFICATION**	TCMSB Field #: 3LL120 / 3LL140
H-3 Anchors and Cable Inspection		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to carry out maintenance and inspection of the ship's anchors and chains.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1. The contractor shall supply all materials, equipment, and parts required to perform the specified work unless otherwise stated. The contractor is responsible for cranage and transport of the anchors and chains to and from Southside to their repair facility.

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The contractor shall remove both the port and stbd anchors and chains from the vessel and arrange on the dock. Ships' crew to assist with use of anchor windlass. Contractor to arrange crane to assist in removal. The contractor is responsible for

transport of the port and starboard anchors and chains to their facility and for flaking out the chains for inspection.

3.1.2. Contractor to release the bitter ends of the chains prior to removal. The bitter ends are located in the forward end of the bow thruster compartment. Contractor shall disconnect the chains form the anchors.

3.1.3. The port chain is approximately 190 metres long and the stbd chain is approximately 220 metres long. The chain weight is approximately 8500 kg.

3.1.4. The anchors weigh approximately 1152 kg each.

3.1.5. The contractor shall hydro blast both port and stbd anchors and chains at their facility. The contractor shall apply two coats of International anti-corrosive primer and one coat of Inter-Sheen black to each anchor. Primer and paint to be contractor supplied.

3.1.6. The contractor shall change the anchor chains end for end. Chains to be marked at every shot (27.5 metres) with stainless wire and white anti-corrosive paint, paint to be contractor supplied. The number of shots will be indicated by the number of painted links either side of the wire, starting at the anchor to the bitter end. Chief Officer to be consulted before marking commences. The contractor shall paint the joining shackles red.

3.1.7. Contractor to arrange TCMS for inspection. After inspection is complete the contractor shall arrange for transport of the anchors and chains to the vessel and for cranage for installation on the vessel.

3.1.8. Contractor shall re-connect anchor to chain, with new contractor supplied shackles and ensuring pin on shackle is secured with lead plug. Bitter ends to be re-secured at respective locations. Special care to be taken to ensure the longer chain (220 metres) is placed on the stbd side. The contractor shall supply new Kentor 1 and 1/4 inch joining shackles and certificates. Three random links per shot shall be measured to check for wastage and wear.

3.1.9. Ships' crew will assist in retrieving the anchor chains via the anchor windlass. Contractor to arrange crane to assist in retrieving the anchors and chains back onboard the vessel. Contractor to ensure chains are properly stowed in the respective chain locker.

3.1 Location

3.2 Interferences

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

3.3.2. All coatings are to be applied as per manufacturer's specifications.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.2 Testing

4.3 Certification

4.3.1 Certification to be provided to the Chief Officer upon completion of work.

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 The Contractor shall provide the Chief Engineer with three typewritten reports in both electronic and hardcopy formats outlining the details of the inspection and any alterations / repairs made prior to the acceptance of this item.

5.2 Spares

5.3 Training

5.4 Manuals

Spec item #: H-4	**SPECIFICATION**	TCMSB Field #: 3L003
H-4 Chain Locker		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to clean and touch up the Chain Locker for inspection.

1.2 This item shall be carried out in conjunction with Anchors and Cables Inspection.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

a. Ship's drawing 30-21037 "Bitter End Details"

2.2 Standards

a. **2.2.1** Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

a. **2.3.1** Canada Shipping Act 2001

2.4 Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. Once the chains have been removed the contractor shall open up and ventilate the chain locker. The internal atmosphere is to be tested by a marine Chemist and certified safe for entry.

3.1.2. The chain locker internals including perforated plates, shall be cleaned of all rust, scale and debris.

3.1.3. The chain locker is to be water washed and the residual water to be removed from the vessel

3.1.4. The contractor shall ensure that the bilge suction box is clean of all debris and mud at the end of cleaning.

3.1.5. The contractor shall be responsible for contacting TCMS to carry out an inspection for survey credit.

3.1.6. The bitter end connection is to be cleaned, inspected and measured. The original size of the bolt is 5 ½ inches x 1 ½ inches diameter. The bolt is slotted to take a 1/8 inch thick wedge. A 1/8 inch washer is located between wedge and support frame.

3.1.7. Any Defects are to be reported to the Owner's Representative immediately.

3.1.8. After cleaning all disturbed interior surfaces, including centerline division plate, are to be painted with 2 coats of Amercoat Oxide Red 5105 primer to achieve a 5.0 mil DFT. Surface preparation is as follows; Power Tool Clean all bare/rusted areas to SSPC-SP-11 (power tool clean to bare metal). Feather back all "intact" existing coating. Residue or debris from surface preparation shall be completely cleaned from the Chain Lockers. The Contractor shall quote on five square metres.

3.1.9. After completion the contractor shall reinstall the chain locker covers using a new contractor supplied gasket

Location

3.2 Interferences

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

3.2.2. All coatings are to be applied as per manufacturer's specifications.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.3 Testing

4.4 Certification.

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.2 Spares

5.3 Training

5.4 Manual

Spec item #: H-5	**SPECIFICATION**	TCMSB Field #:
H-5 Tank Inspections		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to open up the listed tanks for cleaning, inspection and 4 year survey by TCMS.

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

1.2.1 Fuel Oil Settling Tank Starboard
1.2.2 Fuel Oil Deep Tank Port
1.2.3 Fuel Oil Deep Tank Starboard
1.2.4 No. 4 Double Bottom Fuel Oil Tank Port
1.2.5 No. 4 Double Bottom Fuel Oil Tank Starboard
1.2.6 Flume Dump Tank Port
1.2.7 Flume Dump Tank Starboard

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 Dwg. CYG-E-046 (97037-61A) Tank Plan

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The intent of this item shall be to open up tanks listed below for cleaning, inspection and testing in conjunction with the 5 year survey. The ship's crew will pump/transfer the tanks contents down to the suction levels of the pumps; there will still be residual fuel present in the tanks. The contractor shall quote the cost of removing 1500 liters of residual fuel for disposal ashore. The quote shall also include the cost per liter for disposal above and below quoted value so that adjustments can be made. The total value will be adjusted by 1379 action.

3.1.2. When the tanks are empty they are to be locked out in accordance with the agreed upon procedure. The contractor shall remove the manhole covers from the tanks.

3.1.3. On opening the tanks, they are to be mechanically ventilated for 24 hours. The contractor shall obtain safe for entry and safe for hot work certificates issued by a Marine Chemist and certificates are to be posted at the tank for the duration of opening. Copies of these certificates shall be given to the Chief Engineer prior to any personnel commencing work in each tank. It is the Contractors responsibility to obtain and maintain these certificates.

3.1.4. Once the tank is safe for entry, the contractor shall thoroughly clean the internal surfaces of the tanks from debris, rust, and scale. All material and liquids remaining in the tank resulting from the cleaning shall be removed to the contractor's premises. Rusty areas shall be wire brushed clean.

3.1.5 Following the cleaning of the tanks, the tanks shall be inspected by the Chief Engineer and a TCMS Inspector.

3.1.6 The contractor shall quote a price on pneumatically testing each tank with a manometer. The quote shall include the installation and removal of blanks for suctions, sounding pipes, overflow pipes and vent head removals. All testing is to be done as per the requirements of the Chief Engineer and attending TCMS Inspector.

3.1.7 Upon completion of all work and testing of tanks, the contractor shall clean tanks of all fluids and debris and wipe dry, as required. Chief Engineer to carry out final inspection prior to manhole covers being fitted.

3.1.8 The contractor shall clean the sealing surfaces around the manhole and cover and install the cover using new contractor supplied ¼ inch thick reinforced neoprene gaskets. Contractor to bid on renewal of six manhole studs. A per stud cost is to be supplied in the bid for adjustment purposes.

3.1.9 All work is to be to the satisfaction of Chief Engineer and TCMS Inspector.

3.2. Location of tanks

3.2.1. Fuel Tanks

Tank	Frames	Other Specs.
Fuel Oil Settling Tank Starboard	39-50	
Fuel Oil Deep Tank Port	39-49	
Fuel Oil Deep Tank Starboard	39-49	
No. 2 Fuel Oil Double Bottom Port	57-67	
No. 2 Fuel Oil Double Bottom Starboard	57-67	
No. 4 Fuel Oil Double Bottom Port	39-50	
No. 4 F/O DB Starboard	39-50	
Flume Dump Tank Port	39-50	
Flume Dump Tank Starboard	39-50	

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.2 Testing

4.2.1 Pneumatic test pressure not to exceed 3 psi and shall be held for a period of 1 hour.

4.2.2 Test to be witnessed by TCMS inspector and Chief Engineer.

4.3 Certification

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.2 Spares

5.3 Training

5.4 Manuals

Spec item #: H-6	**SPECIFICATION**	TCMSB Field #:
H-6: Rope Stores Door		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to replace the door located in the Rope Stores forward with a new owner supplied door.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1. The Owner shall supply a door complete with weld in door frame.

2.4.2. The owner will be responsible for cranage and placement of the door and frame on foc'sle deck adjacent to the rope store hatch.

2.4.3. The door shall be inspected prior to installation to ensure it is undamaged and functionally tested after installation to ensure it is not damaged or warped.

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

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. All precautions shall be taken to protect all areas from hot work damage. Any hot work shall be carried out as per the vessel's hot work authorization system with all necessary precautions being taken. Forced portable ventilation with flexible ducting shall be used during any hot work or grinding operations to lead any dirt, dust, smoke and fumes to the outside of the ship. The contractor is responsible for maintaining an adequate fire watch during the course of all hot work.

3.1.2. The contractor shall remove the existing door from the bulkhead. The contractor shall take care to ensure that the opening cut in the bulkhead is of the size that will fit the new door. The contractor is responsible for disposal of the old door and frame.

3.1.3. The contractor shall prepare the opening to accept the new door in accordance with manufacturer's recommendations..

3.1.4. A Hotwork permit shall be issued, as per the agreed upon procedure, prior to any hot work being carried out.

3.1.5. The contractor shall weld in the door into the prepared opening taking care not to warp the door. The weld procedure shall be as the existing intermittent welds.

3.1.6. The contractor shall protect all equipment and items in the area while carrying out hotwork.

3.1.7. The contractor shall provide additional ventilation during welding and cutting operations.

3.1.8. Any new and disturbed steel work shall be given 2 coats of Amercoat 5105 red oxide primer.

3.2 Location

3.3 Interferences

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

3.3.2. All coatings are to be applied as per manufacturer's specifications.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.2 Testing

4.3 Certification.

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.2 Spares

5.3 Training

5.4 Manuals

Spec item #: E-1	**SPECIFICATION**	TCMSB Field #: 3KK180
E-1 Boiler Internal External Test		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to provide the services of a qualified contractor to clean, inspect and certify the ships heating boiler.

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

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Model: 40-LSLO-15
Manufacturer: Martin Oakwood Ltd
Serial No.: 5549703
Pressure: 15 psi

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The ships heating boiler is to be opened for cleaning and inspection.

3.1.2. Contractor is responsible for any transportation of any boiler components to from any shore facilities. All operating lockouts are to be carried out as per the Fleet Safety Manual. All debris and garbage is to be removed from the work site daily. The boiler water is to be pumped ashore, and NOT to be pumped into the bilge.

3.1.3. The smoke side of the boiler is to be cleaned of all soot and carbon. Tubes are to be proven clear with an appropriately sized wire brush.

3.1.4. The following boiler mountings are to be removed for overhaul, testing, and certification where applicable:

i. main steam stop valve
ii. boiler safety valve (15 psi)
iii. blow down valve
iv. gauge glass cocks

3.1.5. The burner assembly is to be cleaned. Operation of feed water pumps float control to be verified.

3.1.6. A hydrostatic test of 22.5 psi is to be applied to the boiler for 1 hour. On completion of the test, the smoke side is to be boxed up using new gasket material (contractor supplied).

3.1.7. On completion of the work, the boiler is to test run for one hour. Pressures and temperatures to be monitored.

3.1.8. All work to be carried out to the satisfaction of the Owner's Representative.

3.2 Location

3.2.1. Forward starboard engine room

3.3 Interferences

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.2 Testing

4.2.1. Testing to be carried out to the satisfaction of TCMS and the Chief Engineer.

4.3 Certification

4.3.1. Test certificates are to be delivered to the Chief Engineer.

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 The Contractor shall provide the Chief Engineer with three typewritten reports in both electronic and hardcopy formats outlining the details of the inspection and any alterations / repairs made prior to the acceptance of this item.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-2	**SPECIFICATION**	TCMSB Field #: 3G007 / 3G008
E-2 Port & Stbd Main Engine Clutches		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to supply the services of a FSR to supervise the overhaul and testing of the vessels main engine port and stbd clutches for 5 year survey by TCMS. The contractor shall provide labour under the direction of the FSR.

1.2 This work shall be carried out in conjunction with the overhaul / inspection of the Stbd main engine by the ship's crew.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 Pneumaflex
Type & Size: KAE260 SHD/1299-1300
Hardness Degree of Rubber Elements "SHD"
Input Speed 750 rpm
Order No. 14/321 017-1
Weight: approx. 880 kg

2.1.2 Lohmann and Stolterfoht Installation-Operation-Maintenance-Including Parts and Drawings Manual
Installation Drawing No. 3/1637/5020/0

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The contractor shall supply the services of a Factory Service Representative (FSR) to carry out overhaul, testing and survey of the vessels main engine port and stbd clutches.

3.1.2. Bosch Rexroth is Representative for Pneumaflex. Contact information is as follows:

3.1.3. Kevin Sanford
Field Services Representative
Bosch Rexroth
Dartmouth, NS
Tel: 902 468 4500

3.1.4. The Contractor shall include in their bid an allowance of $11000.00 for the services of the FSR. The actual cost shall be adjusted by 1379.

3.1.5. Ships' crew will isolate and lockout electrical control and air supply to both port and stbd clutches.

3.1.6. Contractor shall remove the guard housings that cover each clutch, any piping, wiring, etc. deemed necessary to facilitate the removal of the clutch assemblies.

3.1.7. Prior to commencing the work in this specification, the contractor shall record the axial and radial run out with the each clutch disengaged and engaged. Contractor shall compare readings with the manufactures tolerances to see if current readings are still within spec. Contractor shall check condition of all pickups and measure and record distances between pickups and pins.

3.1.8. Prior to clutches being uncoupled the contractor shall measure and record the thickness of the friction pad linings on the input and output sides of the clutch. Contractor shall measure and record the torsional angle of twist on the Pneumaflex elements. Contractor shall ensure all faces and flanges are properly marked for subsequent reassembly and correct orientation. Contractor to

reference to the service manual on the proper procedure to carry out all task. Any items found outside manufactures recommended values are to be replaced.

3.1.9. All fitted bolts and bolt holes shall be marked to ensure they are reinstalled in their original locations

3.1.10. Contractor shall remove clutches from engines and gearbox and lay out for inspection. All components shall be cleaned and inspected for wear and damage. All components to be inspected by TCMS. All measurements and clearances, shall be taken and recorded in accordance with manufacturers specifications.

3.1.11. All magnetic pins on the input and output sides of the clutches shall be inspected and replaced if damaged.

3.1.12. Contractor shall rebuild the clutches with all new seals, o-rings, gaskets and clutch linings, if required.

3.1.13. Owner to supply all required replacement parts.

3.1.14. Upon completion of reassembly of clutch pack, contractor to perform air pressure test of 100 psi on the clutch assembly to prove all seals properly aligned and tight and operating properly, Chief Engineer to witness.

3.1.15. Contractor shall re-install clutches using new nylock nuts for the fitted bolts; care is to be taken to ensure the fitted bolts are installed in original bolt holes. After installation radial and axial alignment of the clutch to be measured and recorded with both the clutch disengaged and engaged. Contractor shall measure and record the torsional angle of twist on the Pneumaflex elements. Contractor to adjust working pressure and check engagement time and adjust as required as per manufactures specifications. Contractor to ensure line-up bolts are removed upon completion of fastening of forward flange to crankshaft flange.

3.1.16. Contractor shall reinstall the guard housings that cover each clutch, any piping, wiring, etc. that was prior removed.

3.1.17. Upon completion of work, Contractor to test operation of clutch with engine running, ship alongside dock. Slippage to be adjusted if required. Contractor to monitor temperature of clutch assembly for a period of one hour, with use of infrared hand held temperature gun.

3.1.18. Upon completion of dock trials, vessel to carry out 2 hours of sea trials with the contractor in attendance. During sea trials the clutch will be subjected to various load conditions. Contractor to monitor clutch assembly temperature throughout the sea trials.

3.1.19. The Contractor shall be responsible for contacting TCMS and confirming their requirements.

3.2 Location

3.2.1 Engine room.

3.3 Interferences

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.1. All work shall be completed to the satisfaction of the Chief Engineer and the attend TCMS inspector.

4.2 Testing

4.2.1 Testing to be completed as per item 3.1.16 of this specification.

4.3 Certification

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 The contractor shall arrange for the Bosch Rexroth FSR to supply three typewritten reports in both electronic or hardcopy formats detailing all measurements taken, detailed list of work completed and list and quantity of parts used to the Chief Engineer at the completion of the work.

5.2 Spares

5.3 Training

5.4 Manuals

Spec item #: E-3	**SPECIFICATION**	TCMSB Field #: 3H037 / 3H040
E-3 Steering Gear Pumps		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to remove each of the port steering and starboard steering hydraulic pumps for inspection and overhaul. The contractor shall arrange the services of certified hydraulics contractor to carry out the inspection and overhaul. The contractor shall make an allowance of $500.00 for supply of parts required for the overhauls.

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

1.2.1 Steering Gear Motors

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1 Hydraulic Pumps (2 off)
Vickers V2010-1F7S2S-1CC-12

2.1.2 Vickers Manual M-2253-S

2.1.3 CCGS Cygnus Equipment Book # 3

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001
2.3.2 Transport Canada TP127E (2008)

2.4 Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION:

3.1 General

3.1.1. The contractor shall remove the port steering hydraulic pump and starboard steering hydraulic pump for inspection and overhaul.

3.1.2. Any oil that is spilled during dismounting will be the responsibility of the Contractor and any associated debris and waste oil shall be disposed of at Contractor expense and at the end of each day.

3.1.3. The Contractor shall ensure to sufficiently blank all hydraulic oil connections to the hydraulic system once the pump has been dismounted to maintain the cleanliness of the oil remaining in the system. All blanks and plugs to be marked so as to ensure removal upon reinstallation of the pumps.

3.1.4. The Contractor shall disassemble each pump for inspection as per the manufacturer's recommended instruction. New Contractor supplied OEM seals and required OEM parts are to be installed during reassembly.

3.1.5. The hydraulic pumps shall be inspected by TCMS inspector and Chief Engineer. The contractor shall present the overhaul report for both pumps to the attending TCMS inspector for Division III credit.

3.1.6. The contractor shall reinstall the pumps in their original locations.

3.1.7. The Contractor shall top up the hydraulic system with new hydraulic oil to replenish that which was lost during dismounting. Bleeding of air trapped in the system also to be carried out.

3.1.8. Upon installation, the operation of the pumps shall be tested under load confirming hard over to hard over operation within prescribed time limits in single unit and dual unit operation. Operation of relief valves to be confirmed at the same time.

3.1.9. The contractor shall submit three type written reports on company letterhead indicating the work done, parts replaced and overall condition of the pumps.

3.1.10. All work associated with the specification shall be coordinated with steering gear motors.

3.2 Location

Steering gear flat

3.3 Interferences

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.2 All work shall be to the satisfaction of the Chief Engineer and TCMS Inspector.

a. Testing

b. **4.2.1** As outlined in 3.1.8.

4.3 Certification

a. N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1 A completed overhaul report is to be submitted to the Chief Engineer for each of the two units detailing running currents pre-and post-overhaul, insulation resistances pre- and post-overhaul**,** details of the newly installed bearings, and all work carried out on the individual units.

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A

Spec item #: E-4	**SPECIFICATION**	TCMSB Field #: 3H024
E-4 Emergency Air Compressor Replacement		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to install a new Comp Air diesel driven air compressor.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Model: 5207
Manufacturer: Comp Air

2.1.2 Dwg. A41444 (Attached)

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001

2.4 Owner Furnished Equipment

2.4.1 The Owner shall supply the new air compressor complete with bedplate.

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

Part 3: TECHNICAL DESCRIPTION:

3.2 General

3.1.1. Removal: The old diesel air compressor will be unfastened from the angled bedplate and all piping shall be disconnected. The old unit shall be rigged and removed from the port tween deck to the engine room workshop. The owner will be responsible for cranage and transport of the old unit to CG Technical Stores.

3.1.2. The new unit to be installed is autonomous and does not require connection to the Alarm and Monitoring system of the ship. The only connections to be required are exhaust and compressed air discharge.

3.1.3. The Contractor is to modify the existing bedplate for the removed unit. The bedplate will remain in way of the control air receiver, control air station, and railing. The angled bedplate shall be removed in way of the old diesel air compressor mounts. Welds where the angled bedplate was removed are to be ground flush to the deck. The contractor shall recoat all disturbed coating areas with 2 coats of owner supplied primer and 2 coats of owner supplied topcoat.

3.1.4. The Contractor shall crop the existing fuel filling line to the compressor to a suitable location below the generator flat, thread the existing piping, and install a new ¾" ball valve. No hotwork will be permitted on the fuel piping. Contractor to ensure that no metal filings enter the fuel piping during threading.

3.1.5. Delivery of the new air compressor to the ship and onto the engine room workshop deck will be via Owner supplied means. Movement of the unit in the ship will be Contractor responsibility.

3.1.6. The final location of the unit will be decided upon during installation so as to give;

i. Best access and preserve mobility in the working area.

ii. Best positioning of doubler plates for mounting of new unit to align with deck beams under port tween deck.

iii. Best positioning for compressed air and exhaust connections.

3.1.7. Contractor shall fabricate and install a new exhaust connection to the unit. The new exhaust shall be flexible enough to permit movement of the air compressor on its mounts.

3.1.8. Contractor shall modify the existing compressed air piping to allow for connection to the unit. Flexible sections to be used to permit movement of the air compressor on its mounts.

3.1.9. Subsequent to establishing the final location of the new diesel air compressor the contractor shall fabricate and weld four doubler plates to the port tween deck. The doubler plates shall correspond with the dimensions of the anti-vibration mounts. The material for the doublers shall be ½ inch steel plate ASTM A36. The weld procedure shall be continuous fillet weld. NDE shall be performed on all welds.

3.1.10. The doubler plates and tween deck shall be drilled to correspond with the 11mm holes in the anti-vibration mounts. The hold down bolts and lock nuts for fastening the diesel air compressor frame to the deck shall be shall be contractor supply.

3.1.11. Any disturbed control air lines will be rerouted as necessary and reconnected to their original locations at Contractor expense.

3.1.12. The removed fuel filling line will be rerouted through a new penetration in the deck and terminated using the existing flanged valve. Final position and arrangement to be determined during installation.

3.2 Location

3.2.1. Main Engine Room Port

3.3 Interferences

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

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

4.2 Testing

4.2.1. Testing to be carried on new installation for a minimum of one hour of running time and with the compressor loaded to fill one receiver from empty to working pressure as designed.

4.2.2 Testing to be carried out to satisfy TCMS.

4.3 Certification

4.3.1. Test certificates are to be delivered to the Chief Engineer.

Part 5: DELIVERABLES:

5.1 Drawings/Reports

N/A

5.2 Spares
N/A

5.3 Training
N/A

5.4 Manuals
N/A

Spec item :E-5	**SPECIFICATION**	TCMS Field #:
E-5 Engine Room Bilge Cleaning		

Part 1: SCOPE:

1.1 The intent of this shall be to carry out cleaning of the engine room bilges The intent of this specification item shall be to clean the tank top, bilges, piping, machinery seats, and frames below the engine room . The contractor is to physically clean the vessel's engine room bilges of all debris and fluids.

1.2 This work shall be carried out in Conjunction with the following:
Other contractor and ship's crew work in progress.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data:

2.2 Standards:

2.3 Regulations:

2.4 Owner Furnished Equipment:

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

Part 3: TECHNICAL DESCRIPTION:

General

3.1 This will involve lifting and replacing deck plates and gratings as required. All debris and liquids shall be removed by means of high pressure water spray , degreasing solvent, and vacuum hose service. Areas that are hard to access with a vacuum hose shall be thoroughly washed out with high pressure spray to an area that is accessible. The above areas shall be thoroughly cleaned to the finished surface. Any debris taken up from the bilges is to be removed ashore daily.

3.2 Any chemicals used for cleaning are to be nonflammable and the vapours non-toxic. The chemicals shall be OWS compatible. A copy of the WHMIS MSDS is to be provided to the Chief Engineer before the work commences. A copy of documentation verifying OWS compatibility shall be provided to the Chief Engineer before the work commences.

3.3 Care is to be taken to keep overspray to a minimum from areas and equipment above the deck plates. Such overspray shall be wiped clean upon completion of all work to the satisfaction of the Chief Engineer.

3.4 All liquid and debris remaining as a result from the cleaning shall be removed from the vessel. Ship's systems and equipment shall not be used to dispose of any liquids and sludge. All bilge wells shall be shown to be clean upon completion of all work. Bilge float alarms in the wells shall be proven operational.

3.5 The contractor shall supply all material and equipment to perform the specified work, including the services of the vacuum truck.
3.6 All bilge cleaning shall be done with the Chief Engineer's designate present.

3.7 All work is to be to the satisfaction of the Chief Engineer.

Location:

i. Suction well; port forward engine room
ii. Suction well; stbd forward engine room
iii. Suction well; centre aft engine room

Interferences:

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection:
4.2 All work shall be completed to the satisfaction of the Chief Engineer.
4.3 Testing:
4.4 Certification:

Part 5: DELIVERABLES:

5.1 Drawings/Reports:

5.2 Spares:

5.3 Training:

Spec item #: L-1	**SPECIFICATION**	TCMSB Field #: 3H037 / 3H040
L-1 Steering Gear Motors		

Part 1: SCOPE:

1.1 The intent of this specification shall be for the contractor to remove each of the port steering electro-motor and starboard steering electro-motor for inspection and overhaul.

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

1.2.1 Steering Gear Pumps

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data

2.1.1. Port steering electro-motor:
Baldor 10 HP 460/3/60

Starboard steering electro-motor:

Baldor 10 HP 460/3/60

2.1.2 CCGS Cygnus Equipment Book # 3

2.2 Standards

2.2.1 Fleet Safety and Security Manual (DFO/5737)

2.3 Regulations

2.3.1 Canada Shipping Act 2001
2.3.2 Transport Canada TP127E (2008)

2.4 Owner Furnished Equipment

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

Part 3: TECHNICAL DESCRIPTION:

3.1General

3.1.1. The contractor shall remove each of the port steering electro-motor and starboard steering electro-motor for inspection / overhaul.

3.1.2. Prior to removal, the Contractor shall determine running direction of rotation, unloaded phase currents, and electrical insulation values for both units. These

values are to be recorded and submitted with the overhaul report upon completion of work.

3.1.3. The contractor shall disassemble each electro-motor for inspection as per the manufacturer's recommended instruction. New Contractor supplied bearings are to be installed during reassembly and are to be of the same make, model and design as those currently fitted. Details of each bearing are to be included in the overhaul report.

3.1.4. Upon reassembly, the Contractor shall once again measure the insulation resistance and values to be included in the overhaul report.

3.1.5. The electro-motor shall be inspected by TCMS inspector and Chief Engineer. The contractor shall present the overhaul report for both electro-motors to the attending TCMS inspector for Division III credit.

3.1.6. The contractor shall reinstall the electro-motors. There is no requirement for alignment as each pump mounts directly on the motor.

3.1.7. The contractor shall submit three type written reports on company letterhead indicating the work done, megger readings, running currents, and confirmation of rotation after the electro-motors are reinstalled.

3.1.8. All work associated with the specification shall be coordinated with steering gear pumps.

3.2 Location

a. Steering gear flat

3.3 Interferences

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

4.1.2. All work shall be to the satisfaction of the Chief Engineer and TCMS Inspector.

4.2 Testing

N/A

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

i. Three typewritten copies of the completed overhaul report is to be submitted to the Chief Engineer for each of the three units detailing running currents pre-and post-overhaul, insulation resistances pre- and post-overhaul**,** details of the newly installed bearings, and all work carried out on the individual units.

5.2 Spares

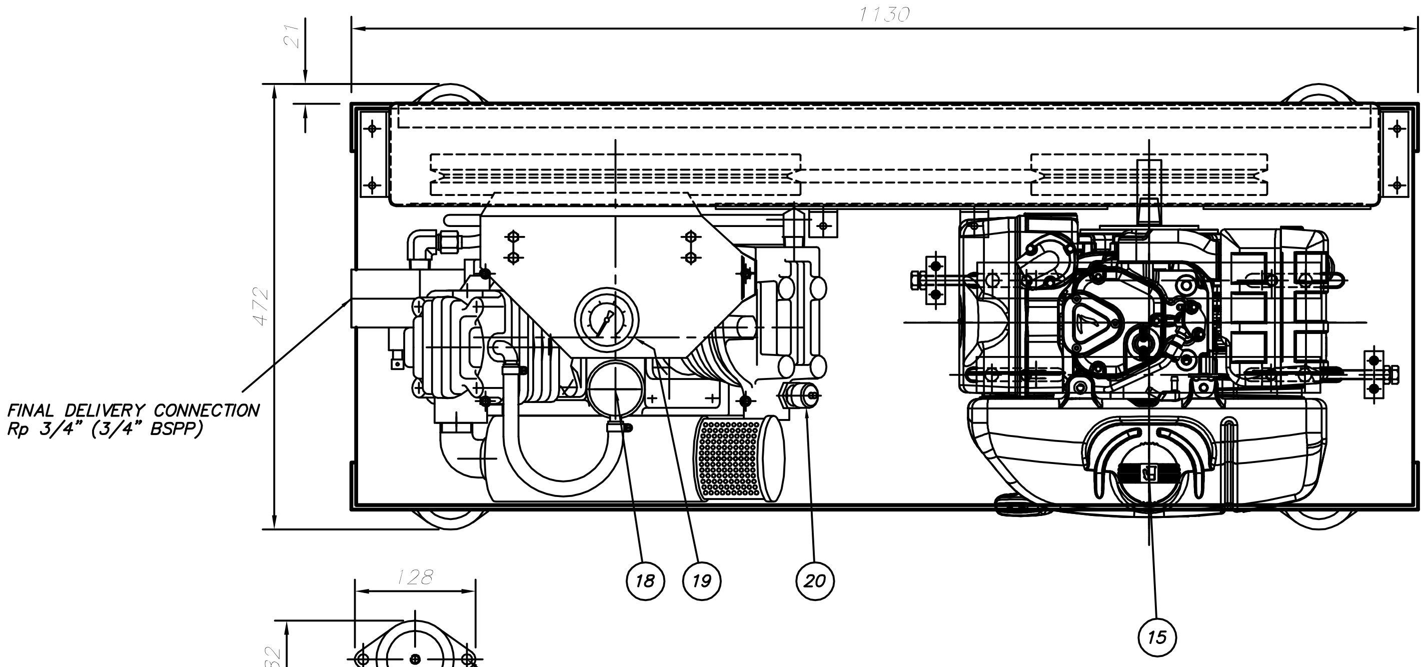
5.3 Training

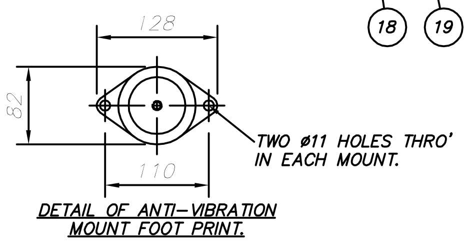
5.4 Manuals

Comp Air drawing A141444

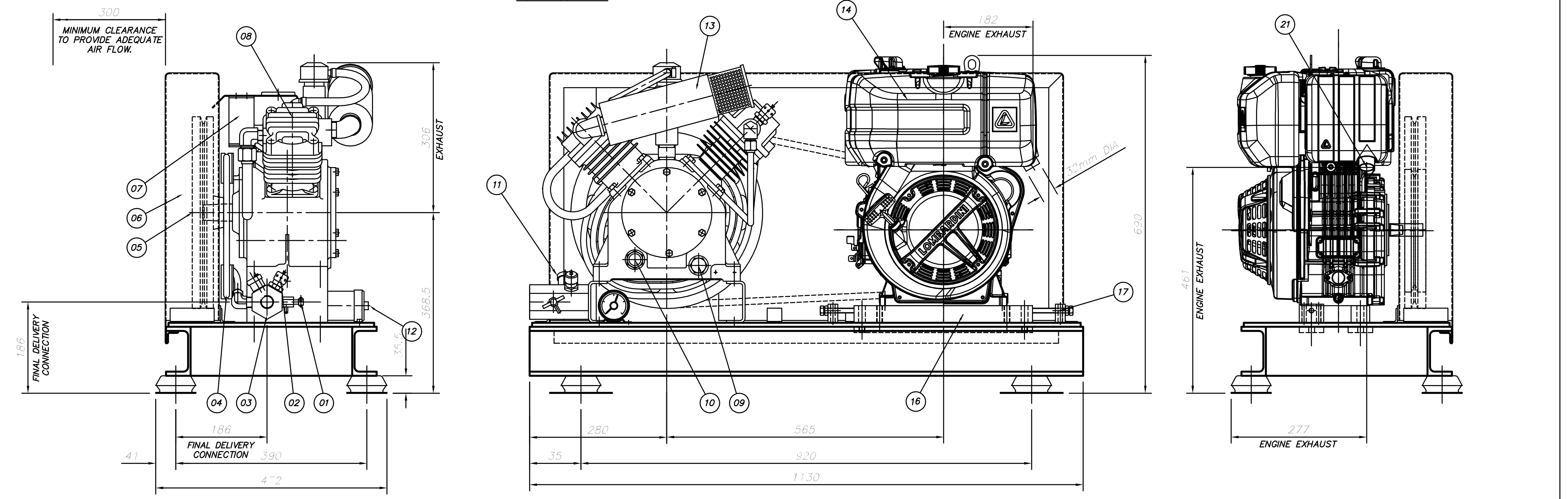
COMPUTER GENERATED DRAWING – DO NOT ALTER MANUALLY

PARTS LIST	
ITEM	DESCRIPTION
01	MANUAL UNLOADING VALVE
02	SAFETY VALVE – SECOND STAGE
03	BLOCK FITTING – E61010 FINAL DELIVERY WITH INTEGRAL NON–RETURN VALVE
04	AFTER COOLER
05	VEE BELT DRIVE
06	DRIVE GUARD
07	COOLER – FIRST STAGE
08	COMPRESSOR – C5207
09	PLUG – OIL DRAIN
10	SIGHT GLASS – OIL LEVEL
11	FUSIBLE PLUG ASSY. –78°C – C202557/3
12	TEMP. SWITCH/GAUGE – FINAL DELIVERY
13	SUCTION FILTER SILENCER
14	DIESEL ENGINE LV1 (LLOYDS APP'D)
15	FILLER CAP DIESEL
16	SLIDE BASE
17	ADJUSTING SCREW
18	OIL FILLER/BREATHER
19	PRESSURE GAUGE
20	SAFETY VALVE – FIRST STAGE
21	DIESEL EXHAUST





APPROXIMATE WEIGHT – 175 KG.



CompAir	DO NOT SCALE – IF IN DOUBT ASK	MATERIAL MATL. CODE / PATTERN No.	DRAWN MRP 15/09/2008 REVISED APPROVED	COMPAIR UK LIMITED, REAVELL HOUSE, 53–56 WHITE HOUSE RD., IPSWICH, SUFFOLK, IP1 5PB, UNITED KINGDOM. TEL. +44 (0) 1473 242000
	THIS DRAWING IS THE COPYRIGHT PROPERTY OF COMPAIR UK LIMITED AND MUST NOT BE COMMUNICATED OR COPIED WITHOUT THEIR WRITTEN PERMISSION. © AS ISSUE DATE	MANUFACTURING TOLERANCES TO BE AS FOLLOWS UNLESS OTHERWISE STATED MACHINED ±0.3 ANGULAR ±0.5° FABRICATED ±1.5 CAST BS6615 CT9 DIMENSIONS IN MILLIMETRES MACHINE WERE MARKED......... SURFACE TEXTURE VALUE IN MICROMETRES Ra REMOVE SHARP EDGES	SCALE (A0 PLOT) NONE PRODUCT 5207 JOB No. 385478	ISSUE DATE LAST MOD No.
	THIRD ANGLE PROJECTION STATUS Under Change SIZE A0L–A LOCATION A41444–A.dwg SOFTWARE AutoCAD Release 2008 AMMeridian 2007–1			

GENERAL ARRG'T 5207 D–V–A–A			
ERIKS INDUSTRIAL SERVICES			
SHT No.1 OF 1 SHTs	PHASE IP	DRAWING No. A41444	ISSUE A.1