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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

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Title - Sujet CCGS GRIFFON WHEELHOUSE HVAC COMPON	
Solicitation No. - N° de l'invitation F2599-120291/B	**Amendment No. - N° modif.** 001
Client Reference No. - N° de référence du client F2599-120291	**Date** 2012-12-07
GETS Reference No. - N° de référence de SEAG PW-$$ML-005-23393	
File No. - N° de dossier 005ml.F2599-120291	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2012-12-14**	**Time Zone** **Fuseau horaire** Eastern Standard Time EST
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Canada

This solicitation amendment is raised to include the Statement of Work.

After page 14 of the RFP, include the attched Statement of Work.

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Annex A

Statement of Work

CCGS Griffon Wheelhouse HVAC Component Replacement

Specification No: Spec # 743.12

Date: September 28, 2012

Prepared by Marine Engineering
Integrated Technical Services
Canadian Coast Guard
520 Exmouth Street
Sarnia, Ontario
N7T 8B1

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1.0 GENERAL NOTES

1.1 The CCGS Griffon will be in Self-refit from October 09 to October 26, 2012 and will be available for bid viewing during that time period as established by PWGSC.

2.0 VESSEL PARTICULARS

Name: CCGS Griffon

Type: Twin Screw, Medium Icebreaker/Navaids Tender

Class of Voyage: Inland Waters Class I Fire Extinguishing and Lifesaving Appliances for a vessel of Class X.

Year Built: 1970

Shipbuilder: Davie Shipbuilding Ltd., Lauzon, Quebec

Principal Dimensions:

Length O.A.	234’ – 0” (71.32m)
Length B.P.	214’ – 0” (65.23m)
Breadth Mld.	49’ – 0” (14.94m)
Depth Mld.	21’ – 6” (6.55m)
Draft (Mld Design)	15’ – 6 ¼” (4.73m)

Tonnages:

Gross	2211.87 L.T. (2252 Metric Tonnes)
Reg. Net	751.90 L.T. (765.56 Metric Tonnes)
Displacement 15’ – 6 ¼”	2944 L.T. (2991 Metric Tonnes)
Deadweight Max	744 L.T. (757.5 Metric Tonnes)

Propulsion:
Twin screw, fixed pitch, diesel electric, total power 2x2000 S.H.P. Main machinery: four (4) Fairbanks Morse 38D8-1/8” diesel engines driving four (4) Westinghouse DC two wire single armature, non-reversing variable voltage generators.

3.0 CCGS GRIFFON WHEELHOUSE HVAC COMPONENT REPLACEMENT

3.1 Identification

3.1.1 The Coast Guard has a requirement to replace the main components of the wheelhouse heating, ventilation, and air conditioning (HVAC) system on the CCGS Griffon.

3.1.2 The fitted components are not “marine” grade, are unreliable, and the fitted system does not provide sufficient heating or cooling capacity for the space.

3.1.3 The intent is to purchase new HVAC components to be delivered to the Coast Guard for installation at a later date.

3.2 References

3.2.1 Equipment Data

3.2.1.1 Air handling unit (Existing) :

Make	Carrier
Model	FA4CNF048000
Nominal Cooling Capacity (BTU)	48000
Electric Heat (KW)	0
Fan capacity (CFM)	1600
Motor HP	3/4

3.2.1.2 Condensing unit (Existing) :

Make	Heat wave
Model	WSC 30-1
Nominal cooling capacity (BTU)	30000 (2.5 Ton)

3.2.2 Drawings

Drawing Number	Description	Electronic Number
CMG05-111-GAHVAC	CCGS Griffon Part of General Arrangement Showing Wheelhouse HVAC	Griffon GA showing HVAC.pdf
G05WHHVAC-01	CCGS Griffon Wheelhouse Air Handler Layout	Griffon WH Air Handler.pdf
6902-501-2	HVAC ducting modifications (Concept)	HVAC ducting modifications.pdf

3.2.3 Regulations

3.2.3.1 Transport Canada TP127E – Ship's Electrical Standard;

3.2.3.2 Canada Shipping Act – Machinery Construction Regulations;

3.2.4 Standards

3.2.4.1 National Electrical Manufacturer's Association – Standard for NEMA Enclosures;

3.2.4.2 ISO 7547 – Air-conditioning and ventilation of accommodation spaces on board ships – design conditions and basis of calculations, Original 1985 Edition and Technical revision 2002.

3.2.4.3 Air Conditioning and Refrigeration Institute Standard 410 (latest edition) – Forced-Circulation Air-Cooling and Air-Heating Coils.

3.2.4.4 ANSI/ASHRAE - American National Standards Institute Safety Standards for Refrigeration Systems.

3.3 Technical

3.3.1 Details of the Existing System

3.3.1.1 Air Handler (Existing)

3.3.1.1.1 The wheelhouse air handler is located on the wheelhouse top as shown in the reference drawing CMG05-111-GAHVAC.

3.3.1.1.2 The Griffon's fitted wheelhouse air handler is not original equipment - at some point in the past the original air handler was replaced by a custom unit. This air handler consists of a commercial evaporator/fan unit enclosed in an aluminum housing. This housing also contains a steam coil and filter bank. There is no air mixing with the fitted air handler - all air flow is re-circulated.

3.3.1.2 Condensing Unit (Existing)

3.3.1.2.1 The condensing unit is located in the Griffon's stack compartment above the main engine room fan plenum and is a household water cooled heat pump.

3.3.1.3 Control System and Power (Existing)

3.3.1.3.1 Power is supplied from the 460 VAC non-essential bus in the machinery control room.

3.3.1.3.2 A 460/240 VAC transformer has been installed in the stack to supply the air handler and condensing unit.

3.3.1.3.3 The control system is a simple household thermostat.

3.3.1.3.4 Steam supply is controlled by an electrically operated valve.

3.3.1.4 Sea Water Circulating Pump (Existing)

3.3.1.4.1 The sea water for the wheelhouse condensing unit is bled off the ship's main HVAC sea water circulating system which also supplies cooling water to the two main accommodation condensing units and the machinery control room AC unit.

Pump Details:

- Make - Eagle all stainless model A100 L3 1.5-3
- Capacity - 122 USGPM @ 104 feet TDH (45psi)
- 10 HP TEFC motor, 460 VAC, 3 phase, 1750 RPM

3.3.2 New Wheelhouse HVAC Unit - Scope of Supply

3.3.2.1 General

3.3.2.1.1 The Contractor shall supply the following:

- A new air handler as specified;
- A new condensing unit. This new unit will be located in the upper fan room;
- A new control system for the HVAC installation;
- A new cooling water pump with specified spares;
- Documentation such as installation, service and parts manuals.

3.3.2.2 Air Handler Unit (AHU) Requirements

3.3.2.2.1 The Contractor shall provide a factory assembled air handling unit as specified. The AHU shall have all components installed at the factory. Field fabrication of units and their components will not be accepted. The air handling unit shall be designed to operate in a marine environment and shall have a footprint and envelope that shall fit into the vessel CCGS Griffon without impacting the duties of the crew or on the operation of the vessel.

3.3.2.2.2 The AHU shall be suitable for installation on the exposed outside deck of the ship.

3.3.2.2.3 The AHU shall contain the following:

- A mixing plenum to blend re-circulated air and outside air;
- A filter section;
- A cooling coil to work with the condensing unit;
- A steam coil - steam is supplied from the ship's heating boilers at a pressure of 45 PSIG;
- A fan plenum;
- A silencer section (if required) to achieve the specified acoustical requirements.

3.3.2.2.4 The AHU shall be constructed of a complete frame with easily removable panels. The walls, roof, and frame are to be double-wall with marine approved insulation sealed between the walls.

3.3.2.2.5 The frame and all panels shall be of stainless steel or galvanized steel construction.

- If galvanized steel is used, casing panels (top, sides, and bottom) shall have the following exterior finish: Pre-painted with a baked enamel finish passing 500-hour salt spray test (ASTM B-117) for pre-painted steel and 125-hour marine level 1 prohesion test (ASTM G-85.A5) for pre-painted steel;
- All fasteners exposed to the elements (outside of the unit) shall be stainless steel.

3.3.2.2.6 The internal liner of the AHU shall be stainless steel or galvanized steel.

- If a Stainless Steel internal liner is fitted the liner shall be suitable for washing with a pressure washer or steam cleaned without the risk of wetting the insulation. All liner seams shall be sealed;
- If galvanized steel is used, casing panels (top, sides, and bottom) shall have the following interior finish: pre-coated with a silver zeolite antimicrobial material registered by the US EPA for use in HVAC applications.

3.3.2.2.7 The roof of the AHU shall be sloped to shed water.

3.3.2.2.8 All panels shall be easily removable and hinged arrangements or dogs are acceptable. Rubber seals shall be fitted between the panels and the frame. All seals between the walls and panels shall form a watertight seal. All hinge and latch hardware shall be stainless steel.

3.3.2.2.9 The inside floor of the AHU shall be sealed watertight and be fitted with a minimum of four drains. For access, the drains are to be fed to the side of the AHU.

3.3.2.2.10 The AHU shall be mounted on a stainless or galvanized steel frame for support. This frame shall rigidly support the AHU and also act as a slinging skid. Lifting lugs are to be mounted on the base frame and shall be so positioned that the AHU can be lifted in a level condition. Details for lifting the unit shall be provided in the documentation for the unit.

3.3.2.2.11 Stiffeners shall be supplied as required to minimize the casing deflection. The limiting criteria shall be span/200 or length/200 whichever is applicable at 1.5 times the working pressure.

3.3.2.3 Finish

3.3.2.3.1 The unit shall be finished painted with two components, etch bond primer and finish painted with alkyd enamel, colour to be white.

3.3.2.3.2 All uncoated steel shall be painted with enamel, color to be white.

3.3.2.3.3 All metal surfaces shall be pre-painted with vinyl wash primer to ensure paint bonds to metal.

3.3.2.3.4 Outdoor unit shall be finish coated with polyurethane paint. Paint for outdoor units shall be tested to ATSM B117 for 5000hr salt spray endurance.

3.3.2.4 Acoustical Performance:

3.3.2.4.1 The housing shall have been tested for acoustical performance by an independent laboratory that is accredited.

3.3.2.4.2 Test methods and facilities used to establish sound transmission loss values shall conform explicitly to the ASTM designation E90-85 and E413-73.

Sound Transmission Loss DB ASTM E-90 & E413-73

	1	2	3	4	5	6	7	8	
2” Walls	18	19	27	33	43	52	52	52	STC=37

4” Walls	20	20	28	41	51	56	55	57	STC=40

3.3.2.4.3 Test methods and facilities used to establish sound absorption values shall conform explicitly to the requirements of the ASTM Standard Test Method for Sound Absorption Coefficients by the Reverberation Method: ASTM C423-84A and E795-83.

Sound Absorption ASTM C423-84A & E795-83

	1	2	3	4	5	6	7	8	
2” Walls	.10	.23	.75	1.08	1.05	.99	.97	.95	STC=37
4” Walls	.40	.65	1.38	1.28	1.09	1.05	1.02	1.02	STC=40

3.3.2.4.4 All lab reports shall be submitted to the Technical Authority for approval before delivery of the components.

3.3.2.4.5 The sound level of the unit at the supply and return air penetrations shall not exceed 55 dBA.

3.3.2.5 Radio Frequency (RF) Interference

3.3.2.5.1 Radio frequency interference is a consideration for the air handler location. The air handler shall not interfere with the ships navigation electronics.

3.3.2.6 Physical Limitations

3.3.2.6.1 Maximum overall dimensions of the AHU - 48” High x 144” long x 60” wide.

3.3.2.6.2 Maximum weight of the AHU - 3000 lbs.

3.3.2.7 Mixing Box Section Requirements

3.3.2.7.1 The mixing box shall be fitted with louvers on the outside air intake and return air openings.

3.3.2.7.2 These lovers are to be stainless steel or galvanized steel finished to match the unit.

3.3.2.7.3 A removable bug screen shall be fitted on the outside air inlet. Screen material to be aluminum.

3.3.2.7.4 The outside air inlet opening shall be fitted with a hood to prevent rain ingress. The hood material shall match the AHU construction material - stainless steel or galvanized finished steel. Minimum hood overhang to be 10 inches. Minimum hood metal thickness - 20 gauge.

3.3.2.7.5 The louvers are to be fitted with electrical damper operators to vary the mix of air. These damper motors are to be fully compatible with the supplied control system. The damper motors are to be located inside the mixing box.

3.3.2.7.6 Note that the inside of the mixing box must be fully accessible for maintenance and cleaning.

3.3.2.7.7 Spares - the Contractor shall supply one spare damper actuator.

3.3.2.8 Filter Section Requirements

3.3.2.8.1 The filters shall be disposable pleated type listed by Underwriters Laboratory as Class 2.

3.3.2.8.2 The filters shall be accessible through a side access panel or door.

3.3.2.8.3 The filtration shall be a single row of filter elements fitted in a channel rack fabricated from stainless steel or coated galvanized steel.

3.3.2.8.4 A local differential pressure gauge shall be fitted to show the pressure drop across the filters. This Magnehelic Gage shall have the following characteristics: Housing shall be constructed of a die cast aluminum case and bezel with acrylic cover. Exterior finish shall be coated gray to withstand 168 hr salt spray corrosion test. Accuracy shall be ±2% of full scale throughout range at 70 F (21.1 C). Pressure limits shall be –20 in. Hg to 15 psig (0.677 bar to 1.034 bar).Overpressure relief plugs shall open at approximately 25 psig (1.72 kPa). Temperature limits shall be 20 to 140 F (–6.67 to 60 C). Diameter of dial face shall be 4 in. (101.6 mm). Process connections shall be 1/8-in. female NPT duplicate high and low pressure taps — one pair side and one pair back.

3.3.2.8.5 Spares - the Contractor shall supply two full spare set of filter elements.

3.3.2.9 Cooling and Heating Coil Sections

3.3.2.9.1 All coil performance shall be certified by the manufacturer in accordance with ARI Standard 410.

3.3.2.9.2 Coils shall be constructed of plate fin configuration and seamless tubes. Aluminum fins shall have collars drawn, belled and firmly bonded to tubes by means of mechanical expansion of tubes. Soldering or tinning shall not be used in the bonding process of the cooling fins to the coils.

3.3.2.9.3 Coils in cooling service shall have stainless steel casings.

3.3.2.9.4 Coils in heating-only service shall have galvanized steel casings.

3.3.2.9.5 Coils shall be mounted to allow coils to slide out individually.

3.3.2.9.6 Access to one side of each coil is to be provided for cleaning purposes.

3.3.2.10 Steam Heating Coil

3.3.2.10.1 Clearly label supply and return connections on outside of units.

3.3.2.10.2 Provide non-freeze steam distributing type coils.

3.3.2.10.3 Pitch steam coils in units for proper drainage of steam condensate from coils.

3.3.2.10.4 Proof test coils to 300 psig air under water and leak test coils to 200 psig air pressure under water.

3.3.2.10.5 Steam heating coil shall have a minimum capacity of 75,000 BtuH.

3.3.2.11 Refrigerant Cooling Coil

3.3.2.11.1 The refrigerant coil shall be designed for R407C refrigerant.

3.3.2.11.2 All refrigerant coils shall be designed to conform to ANSI/ASHRAE Standard 15 - Safety Standard for Refrigeration Systems. All DX coils shall contain a holding charge of dry nitrogen when shipped from the factory.

3.3.2.11.3 Coils shall be proof tested to 450 psig air under water and leak tested to 300 psig air pressure under water.

3.3.2.11.4 Suction headers shall be constructed with copper pipe.

3.3.2.11.5 Suction connections shall penetrate unit casings to allow for sweat connections to refrigerant lines.

3.3.2.11.6 The cooling coil shall have a stainless steel drip tray under it to collect condensation. This tray shall be a minimum 3”deep and have a drain leading outside the AHU on the side of the AHU.

3.3.2.11.7 Cooling coil shall have a minimum capacity of 75,000 BtuH.

3.3.2.12 Valves

3.3.2.12.1 The refrigerant coil shall be fitted with a Thermal expansion valve located inside the AHU at the coil.

3.3.2.12.2 A modulating steam control valve shall be provided loose for installation at a later date. This valve shall be sized to match the heating coil and be electrically compatible with the supplied control system.

3.3.2.13 Fan Section

3.3.2.13.1 Access doors on the fan section shall be large enough to access the fan for cleaning and maintenance. The fan motor must fit through the access door.

3.3.2.13.2 The fan shall be a direct drive airfoil.

3.3.2.13.3 The fan shall be coated for corrosion protection.

3.3.2.13.4 The fan shall be Variable Frequency Drive (VFD) controlled.

3.3.2.13.5 VFD shall be of a marine type and shall be compliant with Electromagnetic Compatibility - the EMC Directive 89/336/EEC, 1992.

3.3.2.13.6 Motor shall be IEEE 841 with IP 56 seals compatible with the VFD.

3.3.2.13.7 The fan shall have a capacity of 2000 CFM at 2” S.P.

3.3.2.13.8 The fan shall be mounted on vibration isolators.

3.3.2.13.9 Spares - the contractor shall supply a spare fan motor and a spare set of isolation mounts.

3.3.2.14 Electrical and Controls

3.3.2.14.1 A NEMA 4 rated stainless steel junction box shall be mounted on the AHU to house all electrical components and connections to and from the unit.

3.3.2.14.2 The fan VFD shall be 460 VAC, 3 phase.

3.3.2.14.3 Other controls shall have a primary supply 120VAC single phase.

3.3.2.14.4 The controls junction box shall be fitted with a 120VAC heater which is thermostatically controlled to maintain the control box at 15 degrees Celsius.

3.3.2.14.5 Units shall be CSA approved and shall meet TCMS requirements.

3.3.2.15 Condensing Unit Requirements

3.3.2.15.1 The condensing unit shall be designed for R407C.

3.3.2.15.2 The condensing unit shall be sized to supply 110% of the specified AHU cooling coil capacity.

3.3.2.15.3 The condensing unit sizing shall assume a sea water temperature of 30 degrees Celsius. (very common on the Great Lakes in the summer months).

3.3.2.15.4 The components of the condensing unit shall be mounted on a rigid steel frame. The condensing unit shall not be enclosed in a cabinet.

3.3.2.15.5 The condensing unit shall be coated for corrosion protection.

3.3.2.15.6 The condensing unit shall have a maximum footprint of 44” wide x 48” deep x 50” high.

3.3.2.16 Compressor

3.3.2.16.1 The compressor shall be semi-hermetic, 3 phase 460 VAC fitted with phase protection.

3.3.2.16.2 The compressor shall be fitted with a low lube oil pressure shut down device.

3.3.2.16.3 The compressor sump shall be fitted with an oil level sight glass.

3.3.2.16.4 The compressor shall be internally protected from over-heating.

3.3.2.16.5 The compressor shall be vibration isolated with external rubber mounting.

3.3.2.16.6 The compressor suction and discharge lines shall be connected to the system piping with flexible vibration absorbing pipe sections. All other compressor connections (gauge, water regulator, oil return, control devices, etc,) shall use flexible refrigeration hose.

3.3.2.16.7 The compressor shall be fitted with a crank case heater that shall switch on automatically when the compressor is not running.

3.3.2.17 Condenser

3.3.2.17.1 The sea water cooled condenser shall be of shell and tube design and Cupro-nickel (CuNi) construction.

3.3.2.17.2 The condenser shall be selected to maintain low refrigerant operating pressure.

3.3.2.17.3 Maximum working pressures shall not exceed 450 psig water side and 450 psig on the refrigerant side.

3.3.2.17.4 Steel piping shall be routed from the condenser and terminated at the back or side of the condensing unit.

3.3.2.18 Water Regulating Valve

3.3.2.18.1 A marine type Johnson Controls V46 water regulating valve shall be provided by the Contractor to maintain refrigerant pressures. This may be supplied loose if it is to be mounted on the condensing unit inlet piping.

3.3.2.18.2 This valve is to be the same pipe size as the condenser inlet pipe.

3.3.2.18.3 The HP connection for the water regulating valve shall be fitted with an isolation valve.

3.3.2.18.4 The maximum operating water pressure for the 2-way “Sea Water Duty” regulating valve shall be 100 psi.

3.3.2.18.5 Spares - the Contractor shall supply a complete spare water regulating valve.

3.3.2.19 Electrical

3.3.2.19.1 The condensing unit shall be 460 VAC, 3 phase.

3.3.2.19.2 The unit shall have a single electrical control panel mounted on the condensing unit frame.

3.3.2.19.3 The compressor shall have its own definite purpose contactor.

3.3.2.19.4 The compressor shall be protected by high and low-pressure controls with auto reset.

3.3.2.19.5 A low voltage transformer with integral protection shall be provided to supply 24 VAC to the control circuit.

3.3.2.19.6 Clearly labeled low voltage terminal strips shall be provided for field wiring of the system controls such as thermostats.

3.3.2.19.7 Terminal blocks shall be provided in the electrical control box for power wiring.

3.3.2.19.8 Ground lugs shall be affixed in the condenser control panel.

3.3.2.19.9 Electrical control shall include phase-failure protection, on-off selector switch, power-available lights and an hour meter.

3.3.2.19.10 All control circuits and components shall be housed in a NEMA 4 enclosure or mounted on the enclosure as appropriate.

3.3.2.20 Refrigeration Circuit

3.3.2.20.1 The refrigeration circuit shall include:

- High and low side Schrader access valves;
- Sight glass with integral moisture indicator;
- Filter-drier fitted with isolation valves;
- High/low pressure switches;
- Suction and discharge gauges panel mounted and fitted with isolation valves. The gauges shall be stainless steel construction and glycerin filled;
- Liquid line solenoid valve;
- A relief valve to prevent overpressure of the system;
- An oil separator.

3.3.2.20.2 The Contractor shall supply the following spares: one suction gauge, one discharge gauge, and two filter-dryer elements.

3.3.2.21 Factory Testing and Breakdown

3.3.2.21.1 The unit shall be factory functionally run-tested. A dielectric insulation test shall also be done.

3.3.2.21.2 In order to avoid cutting bulkheads in the upper fan room, the condensing unit shall be delivered so that it can fit through the upper fan room door. The clearance for this door

is 27” wide by 62” high. The condensing unit shall be able to fit through this door - either as a complete unit or in separate components. The Contractor shall be responsible for the breakdown of the condensing unit (if required) as well as crating of individual components for shipping.

3.3.2.21.3 The unit shall be shipped from the factory with the components sealed and filled with nitrogen.

3.3.2.22 Control System Components

3.3.2.22.1 A dimmable control panel shall be provided for installation in the wheelhouse. Note that dimming is absolutely essential due to night vision requirements while navigating.

3.3.2.22.2 Available wall space for this control panel is 9” high x 14” wide x 3” deep.

3.3.2.22.3 The control panel shall include the following control functions:

- Temperature set point of the wheelhouse;
- Fan speed;
- Outside-air mix ratio.

3.3.2.22.4 The Control panel shall display:

- Wheelhouse temperature (sensor located mid wheelhouse at eye level);
- Return air temperature;
- Supply air temperature;
- Outside air temperature;
- Damper position - return and outside air (as a percentage open);
- Return air humidity.

3.3.2.22.5 All sensors shall be supplied by the Contractor as part of this supply contract.

3.3.2.22.6 All control components (sensors, controller, display, etc) shall be supplied loose and be compatible with the controller.

3.3.2.22.7 A Programmable Digital Controller shall be supplied to control the HVAC system.

3.3.2.23 New Sea Water Circulating Pump Requirements

3.3.2.23.1 The pump set shall have the following characteristics:

- Single stage centrifugal horizontal end suction - vertical discharge;
- Pump directly coupled to the motor and mounted on a steel channel;
- Pump to be flange connection - maximum 5” both suction and discharge;
- All wetted parts to be corrosion resistant to sea water - bronze or stainless steel;
- The pump casing shall be fitted with replaceable wear rings;
- The motor shall be TEFC, 460 VAC, 60 Hz, three phase, Insulation Class F;
- Pump shaft seals shall be mechanical;
- Pump capacity to be 200 GPM @ 116 feet.
- Priming not required - pump is flooded suction.

- Spare parts to be supplied - mechanical seal (2 of), pump bearing set (1 of), set of wear rings (1 of), set of gaskets (2 of).

3.4 Proof of Performance

3.4.1 Inspections

3.4.1.1 The Contractor shall supply a complete quality audit report for the supplied components from their Quality Assurance department indicating that all components meet and/or exceed the manufacturer's quality assurance standards. Inspection documents shall be provided as part of the overall documentation as per Section 3.5.1.

3.4.2 Testing/Trials

3.4.2.1 The Contractor shall provide proof of all tests and trials performed on the various HVAC components as required in this specification. Test and trials data shall be provided as part of the overall documentation as per Section 3.5.1

3.4.3 Certification

3.4.3.1 The Contactor shall provide proof of certification of the various components in the structure as required by the specification. Specific attention shall be given to the requirements for plan approval drawings as required under the various Schedules of the Machinery Construction and Inspection Regulations of the Canada Shipping Act.

3.5 Deliverables

3.5.1 Documentation (Reports/Drawings/Manuals)

3.5.1.1 Documentation shall be supplied in the following formats: 3 paper copies of all manuals and drawings. These shall be supplied on standard 8.5 by 11 inch letter format paper. Drawings shall be on standard ANSI sized paper and shall be concertina folded and attached to the manuals. The Contractor shall also supply this documentation in electronic format on CD-ROM media that is not password protected. All manuals shall be in Adobe PDF format and all drawings shall be in AutoCAD 2010 or later format. The drawings shall not be password protected.

3.5.1.2 The Contractor shall provide:

- Product data including dimensions, weights, centers of gravity, capacities, certifications, component performance, electrical characteristics, casing construction details, wiring interconnections, gauges and finishes of materials.
- All technical information relevant to the product being provided, including but not limited to all the information shown in the schedules of this specification. It is the responsibility of the Contractor to highlight any variances that the equipment has with the requirements of this specification whether or not pre-approval has been obtained. Provide the information in the same measurement units as indicated elsewhere in this specification.
- Fan curves (not fan tables), with specified operating points clearly plotted.

- Coil selection worksheets, clearly showing proper consideration for altitude, air density, and glycol corrections. Indicate coil tube fin and casing construction.
- Filter information, including initial Air Pressure Drop (APD), final APD, dust spot efficiency, final dust holding capacity, filter media description, filter frame details, and filter removal details.
- Submit sound power levels for both air handling unit inlet, outlet and radiated at rated capacity. If unit exceeds sound power levels at scheduled conditions, manufacturer must provide sound attenuators and meet specified BHP.
- Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory-installed and field-installed wiring.
- Submit manufacturer's recommended installation instructions.
- Submit operation and maintenance data. Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists, and wiring diagram

3.5.1.3 All documentation resulting from Section 3.4 of this specification.

3.5.2 Spares

3.5.2.1 The Contractor shall supply a complete parts list for all items being supplied. From this list the Contractor shall identify consumable parts and those that perform a critical function and which should be carried as critical spares. Items that are readily available and off the shelf should be identified as such on the list.

3.5.2.2 Pricing for parts shall be included as part of the deliverables for the spares parts list.

3.5.3 Training

3.5.3.1 The Contractor shall identify any familiarization and maintenance training available for the specific equipment being delivered. The Contractor shall provide three hard copies of the and one soft copy of the detailed course syllabus. The Contractor shall provide an-site training session for 5 persons on two separate occasions by a licensed OEM representative at the delivery address listed in Section 3.5.4

3.5.4 Delivery

3.5.4.1 Location

3.5.4.1.1 The Contractor shall provide delivery of the components and spares to:

CCGS Griffon
Canadian Coast Guard Base Prescott
401 King Street West
Prescott, Ontario
K0E 1T0
Phone 613-925-2865

3.5.4.2 Delivery Date

3.5.4.2.1 The components shall be delivered to Prescott, Ontario no later than March 29, 2013.