

Annex A

CCGS Pierre Radisson-Fan

F3065-210279

CCGS Pierre Radisson

DATES: Spring 2022

Original Version
November 4th, 2021

Prepared by:
Marine Engineering
101 boul. Champlain
Québec (Québec)
G1K 7Y7

F3065-210279

G	GENERAL NOTES	3
G 1	Vessel Particulars	3
G 2	References	4
G 3	Conditions and Definitions.....	8
G 4	Miscellaneous Provisions	10
G 5	Halocarbon containing Systems	20
G 6	Documentation	21
G 7	Drawings	23
G 8	Manuals	24
G 9	Identification[– Not Used]	25
S	SERVICES.....	26
S 1	General	26
S 2	Cranes.....	26
S 3	Mooring Lines[– Not Used]	26
S 4	Gangways[– Not Used]	26
S 5	Electrical Power	26
S 6	Protection of Decks and Lower Walls.....	26
S 7	Heating[– Not Used]	26
S 8	Worksite Inspections	27
S 9	Fire Protection	27
S 10	Project Facilities[– Not Used]	28
10.0	Safety and Security	28
11.0	Hull and Related Structures	28
12.0	Propulsion and Manuevering [- NOT USED]	28
13.0	Power Generation Systems[- NOT USED].....	28
14.0	Power Distribution Systems[- NOT USED]	28
15.0	Auxiliary Systems.....	28
16.0	Domestic System	29
16.1	Refurbishment of Engine Room Fans	29
17.0	Deck equipment	33
18.0	Communications and Navigation[- NOT USED]	33
19.0	Control Systems[- NOT USED]	33
20.0	Scientific, Oceanographic and Hydrographic Equipment	33

G GENERAL NOTES

G 1 VESSEL PARTICULARS

G 1.1 Details

Name:	CCGS Pierre Radisson
Type:	Medium Icebreaker / fluvial
Class:	Type 1200
Year Built:	1978
Yard	Burrard Dry dock, Vancouver, B-C
Principle Dimensions:	
Length:	98.2 m
Breadth, molded:	19.5 m
Loaded Draft:	7.2 m
Tonnage, displ:	1678.8 TM
Power	13 2000 KW
Propulsion	Diesel electrique

G 1.2 Equipment[– Not Used]

G 2 **REFERENCES**

G 2.1 **Acts, regulations, standards, publications and procedures**

G 2.1.1 The latest edition, at the time of contract signing, of all Acts, regulations, standards, publications, and procedures listed below are to be used as reference. The Contractor will ensure all work completed in the specification are done to all pertinent federal and territorial regulations and standards. CCG procedures are to be used as a guide if no other regulation takes precedence.

FSM Procedures	Title	Included Yes/No
DFO/5737	Fleet Safety Manual (Latest Edition)	Yes
7.A.1	Assessing Risk	Included CCG/5737
7.A.10	Handling and Containing Asbestos Materials	Included CCG/5737
7.A.12	Potable Water Quality	Included CCG/5737
7.B.1	Diving Operations	Included CCG/5737
7.B.2	Fall Protection	Included CCG/5737
7.B.3	Entry Into Confined Spaces	Included CCG/5737
7.B.4	Hotwork	Included CCG/5737
7.B.5	Lockout and Tagout	Included CCG/5737
7.B.6	Electrical Safety – Working on Energized Electrical Conductors or Circuit Parts	Included CCG/5737
7.E.5	Handling, Storage, and Disposal of Hazardous Materials	Included CCG/5737
7.E.8	Use of Halocarbons	Included CCG/5737
10.A.6	Paint and Other Coatings	Included CCG/5737
10.A.7	Contractor Safety and Security	Included CCG/5737
171-09529-52	Gestion des matières dangereuses	Yes
5323-2020-13	COVID-19 - Health Screening Questionnaire for Canadian Coast Guard Personnel and Visitors Accessing Canadian Coast Guard Facilities and Vessels	Yes
5404-2020-08	COVID-19 - Information Concerning the Use of Non-medical Masks at Work	Yes
6102-515	Issuance of Contractor Designation Letters during the COVID-19 pandemic	Yes
Publications		
TP 3177	Standard for the Control of Gas Hazards in Vessels to be repaired or altered	No
TP 127 E	Ships Electrical Standards (2018)	No

NFPA 306 2014	Standard for the Control of Gas Hazards on Vessels	No
TP 14231	Marine Occupational Health and Safety Program	No
TP 14612	Procedures for Approval of Life-saving Appliances and Fire Safety Systems, Equipment and Products	No
IEEE45	Institute of Electrical and Electronics Engineers, Recommended Practice for Electrical Installations on Shipboard	No
70-000-000-EU-JA-001	Specification for the Installation of Shipboard Electronic Equipment	Available at: CCG/ITS
Report EPS 1/RA/2	Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems	No
NFPA 10	Standard for Portable Fire Extinguishers	No
18-080-000-SG-003	Paints and Coatings Standard (formerly DFO/5884 – TP 12445F)	No
Circular 1206	Measures to Prevent Accidents with Lifeboats (IMO/MSC)	No
Standards		
CSA W47.1	Certification of Companies for Fusion Welding of Steel Structures Division 2 Certification	No
CSA W47.2	Certification of Companies for Fusion Welding of Aluminum	No
CSA W59	Welded Steel Construction – Metal Arc Welding	No
CSA W59.2	Welded Aluminum Construction	No
ISO 9712:2005	International Standards for NDT	No
CT-043-EQ-EG-001-E	Welding Specification http://intra.coast-guard.ca/folios/00922/docs/WeldingSpecification-eng.pdf	Available at: CCG/ITS
ISO 8501-1:2007	Preparation of steel substrates before application of paints and related products	No
IACS No. 47 – Part “B” –	Shipbuilding and Repair Quality Standard	
Acts (Laws)		
S.C. 2001, c. 26	Canada Shipping Act	No
R.S.C., 1985, c. L-2	Canada Labour Code	No
Regulations		

SOR/2010-120	Maritime Occupational Health and Safety Regulations	No
SOR/90-264	Marine Machinery Regulations	No
SOR/2017-14	Vessel Fire Safety Regulations	No
C.R.C., c. 1432	Hull Inspection Regulations	No
SOR/2003-289	Federal Halocarbon Regulations, 2003	No
SOR/87-183	Marine Occupational Safety and Health Regulations	No
IMO Circ. 1432	Revised guidelines for the maintenance and inspection of fire protection systems and appliances	No

G 2.1 Guidance Drawings

G 2.1.1 The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Numéro de dessin	TITRE DU DESSIN	Nombre de feuilles
------------------	-----------------	--------------------

G 2.2 Tanks

G 2.2.1 Listed are the tanks found on board, their Location by frame number and capacity (Where available). These are to be used as reference only and will not supersede any specification.

COM PARTM EN T	FRAMES	CAPACITY (m³)		
OIL FUEL			WATER BALLAST (S.W.)	
NO. 1 D.B OIL FUEL P.	123 - 165	91.2	FORE PEAK W.B. TANK	83 - FWD 112.3
NO. 1 D.B OIL FUEL S.	123 - 165	95.3	AFT PEAK W.B. TANK	AFT 101.3
			FWD TRIM TANK	176 - 183 181.8
NO. 2 D.B OIL FUEL P.	97 - 123	102.6	AFT TRIM TANK	0 - 18 113.5
NO. 2 D.B OIL FUEL S.	97 - 123	113.0	HEELING TANK WORKING LEVEL P.	138 - 165 101.5
			HEELING TANK WORKING LEVEL S.	138 - 165 105.6
NO. 3 D.B OIL FUEL P.	61 - 23	141.2	HEELING TANK FULL P.	138 - 165 200.5
NO. 3 D.B OIL FUEL S.	61 - 23	141.2	HEELING TANK FULL S.	138 - 165 211.8
FW D. CENTRE OIL FUEL DEEP TANK P.	146 - 165	139.8	FLUME TANKS (S.W.)	
FW D. CENTRE OIL FUEL DEEP TANK S.	146 - 165	139.8	FLUME TANK UPPER FULL	127 - 138 268.0
OIL FUEL DAY TANK	123 - 127	42.7	FLUME TANK UPPER WORKING LEVEL	127 - 138 188.3
OIL FUEL SETTLING TANK P.	123 - 127	70.1	FLUME TANK LOWER FULL	127 - 138 275.8
OIL FUEL SETTLING TANK S.	123 - 127	70.1	FLUME TANK LOWER WORKING LEVEL	127 - 138 131.8
			FLUME TANKS (O.F.)	
FW D. LOWER OIL FUEL WING TANK P.	138 - 158	55.0	FLUME TANK UPPER FULL	127 - 138 255.7
FW D. LOWER OIL FUEL WING TANK S.	138 - 158	55.0		
			FLUME TANK UPPER WORKING LEVEL	127 - 138 189.0
AFT. OIL FUEL DEEP TANK P.	18 - 30	104.0	FLUME TANK LOWER FULL	127 - 138 262.3

AFT . OIL FUEL DEEP TANK S.	18 - 30	104.0	FLUM E T ANK LOW ER W ORKIN G LEVEL	127 - 138	132.0
FW D. ENGINE R. OIL FUEL WING TANK P.	95 - 123	107.7			
FW D. ENGINE R. OIL FUEL WING TANK S.	95 - 123	107.7	BOILER FUEL OIL TANK	84 - 87	2.91
AFT. ENGINE R. OIL FUEL WING TANK P.	61 - 95	133.9	PURI FIER L.O. STORAGE	109 - 112	2.89
AFT . ENGINE R. OIL FUEL WING TANK S.	61 - 95	133.9	SLUDGE TANK	107 - 115	1.82
HELICOPTER FUEL TANK	4 - 11	28.3	BOILER FEED TANK	95 - 100	4.55
LUB OIL			HELICOPTER FUEL SUMP TANK	13 - 16	0.14
LUBE OIL STORA GE TANK INNER	114 - 123	9.8	LUB OIL TANK	103 - 104	0.23
LUBE OIL STORA GE TANK OUTER	114 - 123	9.8	LUB OIL TANK	104 - 105	0.23
LUBE OIL STORA GE	30 - 34	3.7	LUB OIL TANK	83 - 84	0.23
LUBE OIL STORA GE	34 - 38	3.7	LUB OIL TANK	84 - 85	0.23
FRESH WATER			LUB OIL TANK	85 - 87	0.23
FEED WATER TANK P.	27 - 30	16.4	EM ERGY. GENER ATOR F.O.TANK	72 - 76	3.86
FEED WATER TANKS.	27 - 30	16.4	GREY WATER RETENTION TANK	142 - 144	0.45
FRESH WATER TANK P.	13 - 27	68.8	PROP M OTOR L.O. CIRC. TANK	40 - 43	0.45
FRESH WATER TANK S.	13 - 27	68.8	PROP M OTOR L.O. CIRC. TANK	40 - 43	0.45
			HOT F.W . HEADER TANK	102 - 104	0.21
			DIRTY LUB OIL TANK	112 - 116	4.77
			BILGE RETENTION TANK	116 - 120	4.55
			D.B. #4 BILGE RETENTION P.	30 - 61	64.6
			D.B. #4 BILGE RETENTION S.	31 - 61	63.2

G 2.3 Abbreviations

ACM: Asbestos Containing Material	MCA: Matériaux contenant de l'amiante
CFM: Contractor Furnished Material and/or Equipment	MFE: Matériel fourni par l'entrepreneur
CLC: Canada Labour Code	CCT: Code canadien du travail
CSA: Canadian Standards Association	CSA: Association canadienne de normalisation - ACNOR
CWB: Canadian Welding Bureau	BCS: Bureau canadien du soudage
DFO/CCG: Department of Fisheries and Oceans, Canadian Coast Guard	MPO/ GCC: Ministère des Pêches et des Océans, Garde côtière canadienne
FSR: Manufacturer's Field Service Representative	RSF: Représentant de service du fabricant
FSM: Fleet Safety Manual	MSF: Manuel de sécurité de la Flotte
GSM: Government Supplied Material and/or Equipment	MFG: Matériel fourni par le Gouvernement
HC: Health Canada	SC: Santé Canada
IEEE: The Institute of Electrical & Electronic Engineers Inc.	IEEE: Institute of Electrical and Electronic Engineers
MSDS: Material Safety Data Sheet	FS: Fiche signalétique
NDT: Non Destructive Testing	END: Essais non destructifs
OEM: Original Equipment Manufacturer	FEO: Fabricant d'équipement d'origine
OHS: Occupational Health and Safety	SST: Santé et sécurité au travail
PWGSC: Public Works and Government Services Canada	TPSGC: Travaux publics et Services gouvernementaux Canada

RO: Recognized Organization as defined by Canada Shipping Act.	OR: organismes reconnus par la Loi sur la marine marchande du Canada
SSMS: Safety and Security Management System	SGSS: Système de gestion de la sécurité et de la sûreté
TBS: Treasury Board of Canada Secretariat	SCT: Secrétariat du Conseil du Trésor du Canada
CA : Contract Authority - PSPC	AC : Autorité contractuelle - SPAC
TA: Technical Authority -CCG Superintendent, Marine Engineering Western Region, or her delegated Representative.	AT: Autorité technique – Représentant du propriétaire (GCC)
TCMS: Transport Canada Marine Safety	SMTC: Sécurité Maritime de Transports Canada
TI: Technical Inspector – CCG delegated.	AI: Autorité de l'Inspection – Inspecteur technique (GCC)
VCS: Vessel Condition Survey	DCC: Demande de Changement de Configuration
VLE: Vessel Life Extension	PVN: Prolongement de vie d'un navire
WCB: Workers' Compensation Board	CNESST: Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)
WHMIS Workplace Hazardous Materials Information System	SIMDUT: Système d'information sur les matières dangereuses utilisées au travail

G 3 **CONDITIONS AND DEFINITIONS**

G 3.1 **General**

G 3.1.1 The following conditions and definitions are applicable to all work contained in the Specifications and are intended to outline the quality of workmanship and practice that is the minimum acceptable level:

- a) The word "install" means that the contractor must connect mechanically and electrically, and provide the labor and material to complete the installation;
- b) The word "reinstall" means a piece of equipment that the contractor has affected repairs on and is to be returned/installed in its original location and be mechanically and electrically connected. The contractor must provide the labor and material to complete the reinstallation;
- c) The word "remove" means that the contractor must provide all labor and material to remove the unit, equipment, material, or system in its entirety. Part of the removal process is to blank openings, restore insulation and paint;
- d) The word "relocate" means that the contractor must provide all labor and material to remove the unit, piece of equipment, or system and to install the same unit, piece of equipment, or system in the new location;
- e) The term "or equivalent" means a substitute which has equal characteristics (i.e. size, material type, life, weight, input, and output) as approved by the TA. A comparison of the general specifications must be provided to the TA for the equipment specified and the "or equivalent" (i.e. old compared to the new);

- f) The term "overhaul" as applied to any mechanical equipment, structure or system comprises: disassembly into component parts, cleaning examination of parts for defects, gauging of parts for wear, reporting of parts worn beyond specification limits or otherwise defective and reassembly followed by specification adjustments, tests, and functional trials;
- g) The word "disconnect" means the contractor must mechanically and electrically disconnect the piece of equipment of all piping, wiring, seatings and other attachments permitting the removal of the unit as a whole;
- h) The word "disassemble" means that the contractor must provide all labor to take apart, piece by piece, the equipment, machinery or system to be examined or repaired;
- i) The word "reassemble" means that the contractor must provide all labor and material to put together, piece by piece, the equipment, machinery or system on completion of examination or repair;
- j) The words "Additional Work Procedures" means the procedures as defined in solicitation and contract include any additional work required on a system, sub-system or equipment which the original specification did not specify;
- k) The word "calibrate" means the adjustment of readings and measurements to a known standard;
- l) The word "check" means that the contractor must provide labor to find faults by sighting, feeling or listening. The checking of any equipment does not involve the disturbance or removal of parts, components or sub-assemblies;
- m) The word "examine" means that the contractor must provide labor for the process of systematically examining, checking and testing equipment, records or administrative procedures to detect actual or potential defects or errors;
- n) The word "test" means that the contractor must provide labor to conduct the operation of a unit in relation to a stated standard or procedure;
- o) The words "set-to-work" means the tuning, alignment and adjustment of equipment/systems required subsequent to satisfactory installation. Inspection to make the equipment/systems ready for technical acceptance trials;
- p) The word "trials" is an element of QA that means an action(s) by which the contractor proves by a visual or instrumental presentation that the equipment or system satisfies the requirements of the specified trials agenda;
- q) The term "functional test" means operation of a piece of equipment in all its normal operating modes and throughout its operating range to establish that it will perform its designed function within normal operating parameters as indicated in the manufacturer's documentation.

G 3.1.2 For the duration of the work period, the vessel will be berthed at wharf 98 of the Canadian Coast Guard base located at 101Boul. Champlain, Quebec.

G 3.1.3 Space on the wharf is limited so the number of parking spaces for the contractor is limited and the contractor must provide shuttles and/or carpooling for their employees.

G 3.1.4 The Contractor must provide a list of employees and subcontractors to the Technical Authority prior to each working day to facilitate interactions at the security checkpoint. E-mail addresses of the list recipients will be given to the contractor at the beginning of the work period.

G 3.2 CCG Employees and Other Contractors on the Vessel

G 3.2.1 CCG and DFO employees and other employees, such as manufacturer's representatives, ABS investigators, may carry out other work on board the vessel, including work not mentioned in these specifications, during the work period. The TA will make every effort to ensure that other work, related inspections and investigations do not interfere with the Contractor's work. The Contractor must not coordinate or pay for any related inspections or inspection fees for this Work.

G 3.2.2 During the term of the Work, at least two other contracts will be performed concurrently with the Work described in this document. These two other contracts are :

- a) Generator Engine Maintenance En français, deux autres contrats supplémentaires.
- b) Steering Gear installation
- c) General repairs by contractors

G 3.2.3 The Contractor must not be responsible for the supervision or performance of the Work associated with these other contracts, nor for the supervision of subcontractors associated with these other contracts. The TA may, however, require a daily or weekly meeting in the presence of all contractors, including this Contract, to ensure proper coordination between the various projects underway on board the vessel.

G 4 MISCELLANEOUS PROVISIONS

G 4.1 COVID-19

G 4.1.1 All Contractor must be double vaccinated as per requirement:
<https://buyandsell.gc.ca/notice-to-federal-contractors>

G 4.1.2 Reference documents :

5323-2020-13	COVID-19 - Health Screening Questionnaire for Canadian Coast Guard Personnel and Visitors Accessing Canadian Coast Guard Facilities and Vessels
5404-2020-08	COVID-19 - Information Concerning the Use of Non-medical Masks at Work

6102-515	Issuance of Contractor Designation Letters during the COVID-19 pandemic
----------	---

G 4.1.3 Due to the Covid-19 pandemic, the Contractor must comply with CCC 12-2020 "COVID-19 - Health Screening Questionnaire for Canadian Coast Guard Personnel and Visitors Accessing Canadian Coast Guard Facilities and Vessels" during an outbreak of an infectious disease such as Covid-19.

G 4.1.4 The Contractor must ensure that all its employees and subcontractors wear non-medical masks while on board the vessel. The Contractor must provide these masks to its employees and subcontractors. The Contractor must also provide hand sanitizer for use by employees and subcontractors.

G 4.1.5 Contractor Essential Service Letters will be issued in accordance with Procedure 515 if required for the prime contractor and any named subcontractors to facilitate travel and work.

G 4.2 Occupational Health and Safety

G 4.2.1 The Contractor and all sub-contractors must follow Occupational Health and Safety (OHS) procedures in accordance with applicable federal and provincial OHS regulations ensuring that Contractor activities are carried out in a safe manner and do not endanger the safety of any personnel.

G 4.2.2 Where "Safety Management System" is referenced in this document, it is referring to the Contractor's Safety Management System, which must be in affect while in the Contractor's Care and Custody and must be in accordance with the applicable OHS regulations and procedures.

- a) The Contractor must, for all work on Canadian Coast Guard Vessel, meet or exceed the Safety Management System defiend in the FSM unless a Contractor propsed comprehensive Safety Management System is presented and accepted by the TA.

G 4.2.3 When the Contractor works on the vessel while in the Care and Custody of the Canadian Coast Guard, the Safety Management System of CCG must be followed:

- a) Contractor and all its representatives must attend an orientation session on vessel safety before beginning any work to familiarize the Contractor's employees with the dangers specific to the vessel and with its permit systems for work protocols as well as with the procedures for safety, risk prevention, hazard response and pre-work safety assessments.
- a) The Contractor will have access to an uncontrolled copy of the Fleet Safety and Security Manual. The Contractor must comply with the Fleet Safety Manual (DFO/5737), as well as with the instructions for working on board

the vessel, in addition to the relevant requirements of the Canada Labour Code during performance of the following types of work:

- i) Work at heights;
 - ii) Entry into enclosed spaces;
 - iii) Degassing before entering into confined spaces and for hot work;
 - iv) Lockout and Tagout;
 - v) Pre-work safety assessments.
- b) For the purpose of the Lockout and identification procedure, the Contractor must provide the padlocks and locking devices for the Contractor's employees in addition to those provided by the Chief Engineer for the vessel's crew.
- c) The Contractor must adhere to local facilities shore based safety instructions and safety procedures.

- G 4.2.4 The Contractor must identify a specified person that is responsible for the safety management of the work site. The Safety Manager must insure that daily safety rounds are carried out and that safety issues are identified and safety precautions are maintained.
- G 4.2.5 Areas that pose a hazard as a result of the specification work are to be secured and clearly identified by the Contractor with signage to advise and protect all personnel from the hazard in accordance with applicable regulations.
- G 4.2.6 The Contractor and its employees will not have access to the ships washrooms or crew lounges. The Contractor must provide the necessary facilities for its employees and subcontractors as required.
- G 4.2.7 During the period of work, the contractor will be responsible for the maintenance of the areas of the ship that his personnel uses to access the work areas. Areas should be clean and free of debris, and garbage should be removed daily.
- G 4.2.8 At the end of this contract, the Contractor must ensure that all waste produced as a result of the work of this specification is disposed of and that the vessel is as clean as it was before the beginning of the period of the contract.
- G 4.2.9 Once all known work has been completed and final cleaning has been completed, the Contractor's Quality Assurance Representative will be required to visit all areas of the vessel where work has been completed by the Contractor. Any deficiencies or damage noted must be recorded and compared to the photographs taken to determine if the deficiency or damage arises from the work performed by the Contractor. If this is the case, the damage must be repaired by the contractor at no cost to the CCG.

G 4.3 Lead Paint and Paint Coatings

- G 4.3.1 The Contractor must not use lead based paints.
- G 4.3.2 TB-BT-2020-03 Paint Containing Lead on CCG Vessels
- G 4.3.3 CCG ships have been painted with lead based paints in the past and as a result some of the Contractor's processes such as grinding, welding and burning may release this lead from the coatings. Canadian Coast Guard will provide copies of all available lead testing results. Reference
- G 4.3.4 The Contractor must ensure that coatings in affected work areas are examined for lead content and that work is performed in accordance with applicable federal and provincial regulations.
- G 4.3.5 The Contractor must provide the Technical authority with a risk mitigation plan for each process requiring to alter the paint on the vessel. The plan must be given in a written form before the start of the work
- G 4.3.6 N/A The Contractor must demonstrate product approval by Health Canada for Health Canada controlled hull paints and the Pest Management Regulatory Agency.
- G 4.4 Touch-up / Disturbed Paint**
- G 4.4.1 The Contractor, at a minimum, must repair coating systems disturbed as a result of the specified work. Coating systems must be in accordance with the coating system of the vessel, and be applied in accordance with the paint manufacturer's recommended procedures.
- G 4.4.2 The Contractor must prepare any new steel or steel affected to the standards of the paint manufacturer prior to painting.
- G 4.4.3 Unless otherwise indicated, all new steel and / or steel affected must receive two coats of marine primer compatible with the ship's paint coating scheme.
- G 4.5 Asbestos Containing Materials (ACM)**
- G 4.5.1 The Contractor must NOT use any asbestos containing material.
- G 4.5.2 The Contractor will be supplied the most recent Asbestos Risk Assessment Report and Asbestos Management Plan by CCG.
- G 4.5.3 Handling of any asbestos containing materials must be performed by trained personnel and/or a company certified in the removal of asbestos in accordance with Federal, Provincial/Territorial and Municipal regulations.

G 4.5.4 The Contractor must provide the TA with disposal certificates for all asbestos containing material removed from the vessel indicating that the disposal was in accordance with Federal, Provincial and Municipal regulations in effect.

G 4.5.5 The Contractor must provide an “Observation Report (OR)” with reference to any concerns or intentions in regards to asbestos containing materials not already specified. The Contractor is to identify any materials that are suspected to contain asbestos prior to any work being completed. Any approved work resulting from the OR will follow the Additional Work Procedures.

G 4.6 Confined Spaces

G 4.6.1 Entry into any confined space onboard the vessel during the contract period must be conducted in accordance with the safety management system as determined in the Pre-Work Meeting. In addition to those requirements, the Contractor must also conduct the following:

- a) Have a qualified person issues a “Gas Free Certificate” for spaces that will be entered and post the certificate outside the entrance to the space. Certificates must specify, "Safe for persons" or "safe for hot work" as appropriate.
- b) Provide copies of all certificates generated to the TA in accordance with the Documentation section of the General Notes.

G 4.6.2 The Contractor may request a list of the enclosed spaces of the vessel at the meeting preceding the refit.

G 4.7 Hot Work

G 4.7.1 All hot work conducted during the contract must be in accordance with the Safety Management System. In addition to the requirements of the Safety Management System the Contractor must as a minimum also:

- a) Certify confined spaces affected by hot work as “safe for hot work” in accordance with the Confined Spaces section of the General Notes.
- b) Remove all portable combustible materials from the vicinity, to a safe distance not less than two meters away;
- c) Supply and install protective material to prevent the spread of sparks, protect electrical cables and other services;
- d) Supply and post fire sentries in each space and in the adjacent space where welding, grinding, or burning is being carried out on bulkheads, deckheads or decks;
- e) Supply and provide appropriate fire extinguisher(s) to the fire sentries and ensure each sentry is trained in the extinguisher’s use. The fire sentry must maintain a watch in his designated area for a minimum of thirty (30) minutes after any hot work has been completed. The Contractor must record the

sentry attendance time on all hot work permits indicating when hot work stopped, and time sentry left post;

- f) Provide a copy of the site generated hot work permits to the TA in accordance with the Documentation section of the General Notes; Named in accordance with the specification item generating the required work.

G 4.8 Work Aloft

- G 4.8.1 Any work aloft onboard the vessel during the maintenance/refit period must be conducted in accordance with the Safety Management System. Notices must be placed to prevent operation of Radars while personnel are working aloft on the mast or on the wheelhouse top.

G 4.9 Electrical Equipment

- G 4.9.1 When working on electrically operated equipment, the Contractor must lock-out equipment in accordance with the Safety Management System, and as a minimum conduct the following:

- a) Isolate the main power source and any alternative power source to the equipment;
- b) Install Electrical lock-outs and place electrical caution tags on the main power source and any alternate power sources for the switches/disconnects supplying the equipment under maintenance;
- c) Verify at the terminals to ensure power is not present.
- d) Ensure the lock-outs and electrical caution tags remain in place until completion of all work.

- G 4.9.2 The TA must be notified of all such ongoing work.

- G 4.9.3 All electrical installations and repairs must be done in accordance with the latest revisions of TP127 - Electrical Standards of Transport Canada Marine Safety and of standard 45- Recommended Practice for electrical installation on ships – of the IEEE. Standard TP127 takes precedence over the IEEE standard.

- G 4.9.4 All electronic equipment installations and repairs must be performed in accordance with the Canadian Coast Guard's Telecommunications and Electronics publication " Specification for the Installation of Shipboard Electronic Equipment ".

G 4.10 Workplace Hazardous Materials Information System (WHIMS)

- G 4.10.1 The Contractor must provide the TA with Material Safety Data Sheets (MSDS) for all Contractor and sub-contractor supplied WHIMS controlled products. MSDS sheets are to be the formats requested in the Documentation section 0 of the General Notes.

- G 4.10.2 All MSDS sheets must be maintained in accordance with OHS procedures.
- G 4.10.3 The TA will provide the Contractor with access to MSDS sheets for all controlled products on the ship for all specified work items on request.

G 4.11 Smoking in the Work Space

- G 4.11.1 The Contractor must ensure compliance with the Non-Smokers' Health Act. The Contractor must ensure that there is absolutely no smoking onboard the vessel by their employees, sub-contractors, including the employees of any sub-contractor.

G 4.12 Contractor Furnished Materials (CFM) and Tools

- G 4.12.1 The contractor must ensure that all equipment is new and has never been used.
- G 4.12.2 The Contractor must ensure replacement material such as jointing, packing, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints, coatings etc. are in accordance with the equipment manufacturer's drawings, manuals and/or instructions.
- G 4.12.3 Where no particular item is specified or where substitution must be made, the Contractor must submit an Observation Report indicating the substitution or item not specified to the TA. The Contractor must provide information about materials used, certificate of grade and quality of various materials to the TA prior to use.
- G 4.12.4 The Contractor must provide all equipment, devices, tools and machinery such as crane, staging, scaffolding, hoarding, and rigging necessary for the completion of the work in this specification.
- G 4.12.5 The Contractor must deliver and store all new CFM equipment at their facility. The CFM must be stored in a secure, environmentally controlled space in accordance with the equipment storage section of this specification.
- G 4.12.6 All tools are Contractor supplied unless otherwise stated in the technical specifications.

G 4.13 Government Supplied Materials (GSM) & Tools

- G 4.13.1 All tools must be provided by the contractor unless otherwise stated in the technical specifications.
- G 4.13.2 Where tools are supplied by the TA they must be returned by the Contractor in the same condition as when they were borrowed. Borrowed tools must be inventoried and signed for by the Contractor on receipt and return to the TA.

G 4.13.3 The Contractor must retain all Government Furnished Goods in a secure atmosphere controlled warehouse or warehouse in accordance with the manufacturer's instructions.

G 4.13.4 Any GSM not specifically stated in the Technical Specification must be received by the Contractor and stored in accordance with the Equipment Storage section of this specification. These activities are to be covered by the Procedures for Design Change or Additional Work. (PWGSC 1379).

G 4.14 Storage

G 4.14.1 Equipment (i.e. covers, cowling and other items that may need to be removed and stored) must be stored in accordance with the equipment manufacturer's or equipment vendor's specific storage instructions. The Contractor must make these instructions available to the TA.

G 4.14.2 All equipment and items must be stored in such a manner so as to be easily accessible for inspection. No items are to be stored directly on floors.

G 4.14.3 Regulatory Inspections and/or Class Surveys

G 4.14.4 The Contractor must schedule and coordinate all regulatory inspections and classification investigations in collaboration with the appropriate authority, eg. eg, Transport Canada Marine Safety, Classification Society, Health Canada, Environment Canada or others, based on this specification.

G 4.14.5 Any documents produced as part of the inspections and investigations mentioned above and demonstrating that they have occurred (eg original signed and dated certificates) must be submitted to the TA.

G 4.14.6 The Contractor must not substitute inspection by the TA for TCMS regulatory inspections or classification surveys.

G 4.14.7 The Contractor must provide advance notice (not less than 24 hours) to the TA prior to TCMS regulatory inspections or scheduled classification surveys so that the TA can attend the inspection.

G 4.15 Contractor Inspections

G 4.15.1 The Contractor must afford the opportunity for the TA to conduct an inspection with the contractor on the condition and location of items to be removed prior to either carrying out the specified work or gaining access to a location to carry out the work.

- G 4.15.2 The Contractor must take a before picture of conditions prior to removing any items. These photographs are to be in accordance with the Documentation section of the General Notes, named according to the specification section that resulted in removing those items.
- G 4.15.3 Any damage resulting from the work of the contractor and attributable to the execution of these work by the latter must be repaired by him, at his expense. Equipment used for replacements or repairs must meet the criteria for Contractor supplied material as indicated in the Contractor Supplied Equipment and Tools section.
- G 4.15.4 Contractor must protect equipment and adjacent areas from damage. Workplaces should be protected against water ingress, sanding and welding particles, etc. Temporary covers will have to be installed in the workplace.
- G 4.15.5 Prior to the close out of any item under this specification, the Contractor must afford the TA the opportunity to verify the work has been completed in accordance with the specification. At that time the Contractor must have available all photographs, documents, reports, and trials in relation to the item being closed out as completed.

G 4.16 Recording of Work in Progress

- G 4.16.1 The TA may record any work in progress using various means including, but not limited to, photography and video, digital or film.
- G 4.16.2 Access for Maintenance, Installation, and Removal.
- G 4.16.3 The Contractor must ensure that the CCG Technical Authority and personnel have unrestricted access to the workplace at all times throughout the duration of the contract.
- G 4.16.4 All equipment removed as part of this specification remains the property of CCG, unless otherwise specified in certain sections of the specification.

G 4.17 Restricted areas

- G 4.17.1 The Contractor must not enter any of the following areas (except to perform work as per specifications): cabins, offices, workshops, engineering office, wheelhouse, control room, washrooms, galley, crew stations, locations recreational areas and other areas where restricted access is indicated by signs.
- G 4.17.2 The Contractor must give the TA 24 hours notice when working in occupied premises or offices. CCG will have sufficient time to move personnel and secure areas.

G 4.18 Assembly of Components

- G 4.18.1 The Contractor must ensure that during installation of specified equipment, that parts and assembled equipment are cleaned of smudges, spatter or excess solder, weld metal and metal chips or any other foreign material which might detract from the intended operation, function, or appearance of the equipment. (This would include any particles that could loosen or become dislodged during the normal expected life of the equipment). All corrosive material must be removed. This cleaning must take place before the parts are assembled into the equipment.
- G 4.18.2 Covers, cowlings and components damaged by the Contractor must be replaced with a new CFM cover, cowl, or component.
- G 4.18.3 Where torque specifications are not provided by the manufacturer, the applicable SAE, ANSI, or BS1083 nut and bolt standard torque must be used.

G 4.19 Protection of Equipment

- G 4.19.1 The Contractor must take measures to ensure that surfaces and components of equipment installed on the vessel are protected against damage, soiling, and contamination as a result of contracted work.
- G 4.19.2 All electrical and electronic equipment and components must be protected during the contract against physical damage, internal damage, and by the effects of adverse temperatures or other environmental conditions.
- G 4.19.3 The Contractor must protect equipment that could be damaged as a result of movement of materials and equipment nearby. The Contractor must also protect equipment from nearby sources of contamination including but not limited to burning, welding, media (sand) blasting, grinding and painting.
- G 4.19.4 Any damage to surfaces, equipment, furnishings or decor incurred prior to acceptance must be returned to As-Delivered condition by the Contractor.
- G 4.19.5 All openings in machinery and/or systems prior to connections being made must be kept covered by fitted secure solid inserts or covers at all times.
- G 4.19.6 The Contractor must obtain and follow instructions from its sub-Contractors for any special protection required for their equipment during the project work. Such instructions must be made available to the TA.
- G 4.19.7 Physical protection including but not limited to plastic sheets, fireproof covers, heavy weight material covers, wood plugs, wood encasements and heaters must be used as required.

- G 4.19.8 The Contractor must protect the vessel from the possibility of vermin infestation (insect/mammal/bird). If an infestation does occur during the contract period, the Contractor must bear all costs to ensure the vessel is made vermin free before the vessel's departure and contract completion.

G 5 **HALOCARBON CONTAINING SYSTEMS**

- G 5.1.1 All work conducted on Halocarbon containing systems, must be in accordance with the Federal Halocarbon Regulations, 2003 (SOR/2003-289). These regulations are available on the internet here: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2003-289/page-1.html>

- G 5.1.2 All work on refrigeration and air conditioning systems should be carried out in accordance with sections 2.7 and 2.8 of the Environmental Code of Practice for the Elimination of Releases to Air of Fluorocarbons from Refrigeration Systems.

G 5.2 Welding

- G 5.2.1 In addition to section 7.16 Welding Certification – Contract; All welding and weld inspection must be in accordance with the CCG Welding Specification CT-043-eq-eg-001. This document will be provided to the Contractor within 48 hours of written request to the TA.

- G 5.2.2 The governing standards for welding of materials less than 3 mm in thickness must be in accordance with the requirements of the CCG Welding Specification CT-043-EG-EQ-001. For materials greater than 3 mm in thickness, the Contractor must meet the following:

- a) For structural steels greater than 3 mm in thickness, welding must meet the requirements of CSA Standards W47.1 and W59, except as modified by the CCG Welding Specification CT-043-EG-EQ-001.
- b) For structural aluminum greater than 3 mm in thickness, welding must meet the requirements of CSA Standards W47.2 and W59.2, except as modified by the CCG Welding Specification CT-043-EG-EQ-001.
- c) For structural stainless steels greater than 3mm in thickness, welding must meet the requirements of CSA Standard W47.1 and AWS D1.6, and of the CCG Welding Specification CT-043-EG-EQ-001.

G 6 DOCUMENTATION

G 6.1 Text Documentenation

G 6.1.1 All text deliverables must be accompanied by a PDF file that must contain the complete document. The Contractor must check the quality to verify that the content reflects the same content/formatting as the Master Document file. In the case of changes, a second PDF file that contains only the changed sheets must be supplied.

G 6.2 Data Book

G 6.2.1 The Contractor must provide all documentation generated as a result of specified deliverables, in both electronic and paper formats. There must be 2 paper copies of each document, in two separate binders, as part of the contractors QA program. An electronic copy of all documentation must also be provided to the TA in accordance with the formats described in this specification section.

G 6.2.2 All copies of documents generated as a result of specified deliverables will be referred to as the “Data Book”.

G 6.2.3 The Contractor must provide to the TA all the files generated as part of the Data Book prior to the contract being considered complete. The files must be in hard format (CD-ROM, DVD-ROM, Flash Drive / Memory Stick). Each specification item is to have its own folder named according to the specification item. For example “G1.0 General Notes”.

G 6.2.4 Any documentation, media, and reports that are the result of Additional Work must be included as part of the Data Book.

G 6.3 File Naming

G 6.3.1 The name of the files must include the number of the section of the specification to which it relates, the date and a short description of the content. (example: "G_1.0_2019-03-25_Types Description.pdf")

G 6.4 E-mails

- G 6.4.1 All attached files sent to the TA and IA by email must comply with section G 6.3 File Naming of this Specification. The subject of emails containing attachments (deliverable) must contain the # contract - quote item # - date - keywords short description of the content.

G 6.5 File Formatting

- G 6.5.1 All documentation, reports, test results, certificates, or data obtained by the contractor in paper form must be scanned into unprotected, searchable, Adobe PDF formatted files and named according to the File Naming section of this specification.
- G 6.5.2 All reports, test results, certificates, or raw data obtained by the contractor in electronic format must be converted to unprotected Adobe PDF formatted files and named according to the “File Naming” section of this specification. Both the original and the converted copy must be provided as part of the Data Book.

G 6.6 Photographs

- G 6.6.1 All photographs obtained by the contractor as requested in the specification must be provided in .JPG formatted files at a resolution of at least 640 x 480 and named according to the “File Naming” section of this specification.

G 6.7 Measurements, Calibrations, and Readings.

- G 6.7.1 All measurements, calibrations and readings recorded, must be signed by the person taking the measurements, dated and scanned into electronic format as part of the Data Book.
- G 6.7.2 Unless other wise specified the Contractor must record dimensions to a precision of three significant digits in imperial along with the metric equivalent.
- G 6.7.3 The Contractor must provide to the TA current and valid calibration certificates, and control values for all instrumentation used in the Test and Trials Plan, showing that the instruments have been calibrated in accordance with the manufacturer’s instructions. These copies are to be provided as part of the Data Book, under any specification where measurements are required.

G 6.8 Test/Inspection Records and Certificates

- G 6.8.1 Test and/or Inspection Records and Certificates are identified as a deliverable in the individual specification item requesting them.
- G 6.8.2 Test and/or Inspection Records and Certificates, must be included as a separate section in the Databook and indexed/arranged in numeric order by specification number.
- G 6.8.3 The Contractor is responsible for maintaining a complete and accurate record of all tests and trials conducted on the vessel and on each piece of equipment. Prior to the commencement of a trial, all relevant documentation and associated test sheets, including shop test data, must be complete and attached to the trials agenda.
- G 6.8.4 All tests and trials data must be legible both in hard copy and electronic format. If necessary, handwritten records may require transcription into electronic format in order to be acceptable. The original must be signed by the regulatory body, the TA, the Contractor and where necessary, by the sub-Contractors and/or FSR's who witnessed the tests. All the data must be submitted to the TA in accordance with the Documentation section of these General Notes.
- G 6.8.5 The original records of tests, tests and inspections must be signed by TC, the contractor and, if applicable, the subcontractors or feild service representative who attended the tests.
- G 6.8.6 The Contractor must provide, in paper (2 copies) and electronic format, all copies of the tests, trials and inspection logs.

G 7 DRAWINGS

G 7.1 General

- G 7.1.1 The Drawings section of the General Notes is intended to be used as a reference for minimum standards where specified deliverables must be drawings.
- a) All drawings will be made on ANSI ANSI-size paper (11 "x 17") at least. The drawings will be sent in DWG format (AutoCAD 2013 or newer), on CD-ROM, and will not be protected by a password. One (1) CD-ROM must be provided.
 - b) Drawings shall be created using AutoCAD and delivered in electronic DWG and PDF format. The contractor shall use the CCG National Title Block Template as stipulated in CT-014-000-ES-TD-002 Computer Aided Design and Drafting (CADD) Using AutoCAD. The department will retain intellectual property of the plans. All documents must be prepared in both official languages of Canada and placed on a USB drive.
 - c) Guidance Drawings

- d) All technical guidance drawings are issued to the Contractor for guidance purposes only. It is the responsibility of the Contractor to develop working drawings and to ensure that all such drawings receive applicable regulatory approval. The Contractor is to note that not all technical guidance drawings supplied are As-Fitted drawings. It is the responsibility of the Contractor to physically verify all affected items.
- e) All departures from the provided guidance drawings and project specifications must be clearly indicated by the Contractor and written approval obtained from the TA before carrying out such alterations or departures.
- f) Specification deviations must be documented using an Observation Report.

G 8 MANUALS

G 8.1 General

- G 8.1.1 The "Manuals" section of the General Notes is intended for use as a reference for minimum standards where specified deliverables must be manuals.
- G 8.1.2 Each instruction manual and register must be bound in a "D" 3-ring hard cover book with interlocking latches that can accommodate 8-1 / 2 "by 11" sheets. Larger drawings and documents must be accordion folded. The following information must be printed on the cover:
 - a) CCGS Radisson
 - b) Specification identification number
 - c) Identification of equipment or systems
 - d) manufacturer of the equipment;
 - e) revision number and date.
- G 8.1.3 All sections of manuals must have laminated tabs. The main components of the equipment should be subdivided into separate sections in the manuals.
- G 8.1.4 A main index should be at the beginning of each notebook and indicate all the elements included in each section.
- G 8.1.5 A list of the names, addresses and telephone numbers of the equipment manufacturers' resource persons must accompany the document for reference after completion of the project for maintenance and information management purposes.
- G 8.1.6 A copy of the final approved version of the "as-built" drawings must be included in the service manual.
- G 8.1.7 The Contractor must provide the Technical Authority with two paper copies of all manuals and data sheets in English and French (one copy of each) of the equipment provided by the Contractor prior to the expiry of the Contract. .

G 8.1.8 The Contractor must provide 1 copie to the Technical Authority of all individual manuals and data sheets, in PDF-compatible format, before the expiry of the contract.

G 8.2 Operation Manuals – As-Fitted[– Not Used]

[– Not Used]

G 8.3 Maintenance Manuals – As-Fitted[– Not Used]

[– Not Used]

G 9 IDENTIFICATION[– NOT USED]

G 9.1 [– Not Used]

G 9.1 Production diagram

G 9.2 The purpose of this specification is to provide the owner's representatives with a clear schedule of work and completion for the needs of the Coast Guard.

G 9.3 The Contractor must provide a bar chart usig an application that shows the critical path (Ms Project 2010 format or equivalent) that illustrates the anticipated schedule of ship refit work. This chart should show each task in the specification with its start date, duration, and expected completion date.

G 9.4 Any critical work sequence must be indicated, with critical tasks likely to delay the refit if it does not meet the scheduled work schedule. These may be labor issues or tasks that can not be performed alongside other tasks.

G 9.5 In the event of work affecting the critical path of work, the TA, the IA and the CA are notified immediately. Every effort must be made not to delay the ship's refit. Regular quality assurance procedures must be applied.

G 9.6 The bar chart will be updated weekly and in advance of each production meeting to illustrate the actual progress of the refit work and the changes made to the completion date of each item. The Contractor must include in its chart updates any special work requested on PWGSC Form 1379 indicating the impact this additional work will have on the work schedule.

G 9.7 The Contractor must provide a pdf copy and a .mpp copy (MS Project 2010) or newer version of the Bar Chart to the TA and IA no later than three days after the date of contract award.

S **SERVICES**

S 1 **GENERAL**

S 1.1 The Contractor is responsible for providing the Confined Space Rescue Service and Rescue Service at a height to intervene with these employees and subcontractors.

S 2 **CRANES**

S 2.1 Crane on board the vessel

- a) The ship's crane will be available for the Contractor's purpose a minimum of 24 hours notice must be given.

S 2.2 Contractor's crane

- a) It is the responsibility of the contractor to verify the load restrictions applicable to the dock where the ship is moored. Lifting slings and equipment will be provided by the contractor.

S 3 **MOORING LINES[– NOT USED]**

S 3.1 [– Not Used]

S 4 **GANGWAYS[– NOT USED]**

S 4.1 [– Not Used]

S 5 **ELECTRICAL POWER**

S 5.1 120 VAC electricity and 120 psi compressed air will be provided by the vessel.

S 6 **PROTECTION OF DECKS AND LOWER WALLS**

S 6.1 In order to prevent encrustation of dirt in corridors and protect the floor covering, supply and install Masonite 1/8 "thick on the surfaces of internal bridges in the paths access to work from the outside door to the workplace.

S 7 **HEATING[– NOT USED]**

S 7.1 [– Not Used]

S 8 WORKSITE INSPECTIONS

- S 8.1 Before the Contractor begins work on the vessel, the TA and the Contractor's Quality Assurance Representative must visit areas where work will be carried out, including access roads. The Contractor's Quality Assurance Representative must take digital photographs of each area to demonstrate compliance with the requirements of this document. He must then download these photos in JPG. Each photo must be dated and indicate which location on the ship it is. Copies of the must be provided to the TA for reference within 48 hours of the start of the contract period.
- S 8.2 During the construction period, the contractor will be responsible for the maintenance of the areas of the ship that his personnel uses to access the work areas. Areas should be clean and free of debris, and garbage should be removed daily.
- S 8.3 Hazardous areas, due to the work provided for in this specification, must be secure and clearly identified by the contractor. Posters must be posted to inform and protect all staff in accordance with the applicable requirements of the Canada Labor Code.
- S 8.4 At the end of this contract, the Contractor must ensure that all waste produced as a result of the work of this specification is disposed of and that the vessel is as clean as it was before the beginning of the period. of the contract.
- S 8.5 Once all known work has been completed and final cleaning has been completed, the Contractor's Quality Assurance Representative will be required to visit all areas of the vessel where work has been completed by the Contractor. Any deficiencies or damage noted must be recorded and compared to the photographs taken to determine if the deficiency or damage arises from the work performed by the Contractor. If this is the case, the damage must be repaired by the contractor at no cost to the CCG.

S 9 FIRE PROTECTION

- S 9.1 The Contractor must ensure that insulation, removal and installation of fire detection and suppression systems and related components are performed by a qualified technician. When fire detection or extinguishing systems are deactivated or decommissioned by the contractor during the term of the contract, a qualified technician must re-certify that they are fully functional. The original signed and dated certificate must be delivered to the Technical Authority (TA) and Technical Inspection before the end of the contract.
- S 9.2 The Contractor must notify and obtain written approval from the Technical Inspection and the TA prior to disturbing, removing, isolating, deactivating, decommissioning or

locking any part of the detection and control systems. extinguishing fires, including heat and smoke detectors.

S 9.3 The Contractor must provide fire protection at all times and therefore also while work is being performed on the vessel's fire detection and extinguishing systems. This can be done as suggested below, only after obtaining the written approval of the TA:

- a) Only disable one part of the system at a time;
- b) Maintain the system operational using spare parts while the work is in progress;
- c) Use other methods accepted and approved by the TA.

S 9.4 The Contractor must be aware that, if all necessary precautions are not taken when working on the ship's fire suppression systems, this could result in an accidental release of extinguishing agents. The contractor will then have to fill and certify, at his expense, containers or systems that have emptied due to such work.

S 10 **PROJECT FACILITIES[– NOT USED]**

S 10.1 [– Not Used]

10.0 Safety and Security

11.0 Hull and Related Structures

12.0 Propulsion and Manuevering [- NOT USED]

13.0 Power Generation Systems[- NOT USED]

14.0 Power Distribution Systems[- NOT USED]

15.0 Auxiliary Systems

16.0 Domestic System

16.1 REFURBISHMENT OF ENGINE ROOM FANS

16.1.A Identification

16.1.A.1.1 The objective of this item is to inspect and refurbish 5 fans for the ventilation of the forward engine room, the aft engine room and the propulsion engine room.

16.1.B Références

16.1.C Données sur l'équipement

16.1.C.1.1 The motors are 460vac 3 phases, with 2 windings for slow speed and fast speed (all tests must be carried out for the 2 speeds);

16.1.C.2 Table 1: Fans to be refurbished

item	Fan reference	HP ou KW	Notes de dessin
1	Exhaust Aft engine room stbd		Scaffolding in the funnel
2	Exhaust Forward engine room stbd		Scaffolding in the funnel
3	Intake Aft Engine Room Stbd		Scaffolding in the funnel
4	Intake Control Room		Scaffolding in the funnel
5	Intake Propulsion motor Room		8 feet from the ground on top of the metal lathe

16.1.C.3 Drawings

16.1.C.3.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Numéro de dessin	TITRE DU DESSIN	Nombre de feuilles
Fans Data Sheets	Fans Data Sheets	18
Fans Service Manual	Fans Service Manual	20
221-625-2_01	Ventilation Arrangement in machinery space (forward engine room)	1
221-625-2_02	Ventilation Arrangement in machinery space (Aft engine room)	1
221-625-2_03	Ventilation Arrangement in machinery space (Propulsion Motor room)	

16.1.C.1 Regulations and Standards

16.1.C.4.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
	Lockout procedure	
Publications		
Standards		
Regulations	Canada Shipping Act and Regulations	

16.1.D Statement of Work**16.1.D.1 manutention**

- 16.1.D.1.1 The contractor must include all handling and transportation costs.
- 16.1.D.1.2 The contractor must provide all labor, materials, tools, lifting equipment and scaffolding to remove and install the 5 fans for the forward engine room, the aft engine room and the propulsion engine room.
- 16.1.D.1.3 Before removing the fans, the contractor must correctly identify them, their location, their position.
- 16.1.D.1.4 An access from the chimney to the outside of the ship is possible from an access in the chimney in room 420. This access goes out to the boat port. The contractor must unbolt the removable panel.

16.1.D.2 Electrical Work

- 16.1.D.2.1 The contractor is responsible for taking all necessary measures for lockout according to Canadian Coast Guard standards.
- 16.1.D.2.2 The contractor must send the 5 fans to a specialized company for them to be dismantled, cleaned and inspected. An inspection report should be sent to the IA and TA for review.
- 16.1.D.2.3 The contractor must install new bearings that are sealed and high performance.
- 16.1.D.2.4 If there are lubrication points, they must be replaced by plugs.
- 16.1.D.2.5 Inspect the general condition of the winding. Take the winding / earth measurements and the winding / phase resistances for the windings of the two motor speeds.

16.1.D.2.6 Cleaning and re-insulation of the winding with a new coat of varnish must be applied for the 5 motors.

16.1.D.2.7 All required repairs will have their costs negotiated and covered in a PWGSC 1379 form. All replacement components for the refurbishment of fans must be carried out with top quality components.

16.1.D.3 Paint and Cleaning

16.1.D.3.1 The fan flanges should be brushed to remove rust and 2 coats of a marine coating should be applied. Sections of ventilation duct that remain on the vessel should be cleaned and painted inside and out to a distance of 2 feet. The air duct seals must be renewed.

16.1.D.3.2 The electric motor must be repainted.

16.1.D.3.3 The motor-fan duct which is removed in the workshop must be cleaned and repainted.

16.1.E Proof of Performance

16.1.E.1 Inspection Points

16.1.E.1.1 The contractor shall do a no load test on the motor and the performance shall be noted.

16.1.E.1.2 The electric balance must be checked between the phases. The data must be noted.

16.1.E.1.3 The Contractor must coordinate the inspections with the IA.

16.1.E.1.4 The Contractor must provide the first inspection report and the second detailed report of completed work on time to the IA and TA.

16.1.E.1.5 All work must be completed, submitted and accepted by the IA.

16.1.E.1.6 The contractor must demonstrate the correct operation of the motors in place on the vessel, this includes starting from the control room and starting locally near the fan.

16.1.E.2 Tests and Trials

16.1.E.2.1 A Megger test must be performed on each of the engines.

16.1.E.2.2 Resistance and impedance between the phases and this for the windings of the two speeds. The data must be entered in the service report.

16.1.E.2.3 A vibration test that meets industry standards.

16.1.E.2.4 A balancing of the motor with its fan must be done on the 5 motors.

16.1.E.2.5 The tests must be completed in the presence of the IA. The Contractor must demonstrate the correct operation of the fans from all control stations.

16.1.E.3 Certification[– NA]

16.1.E.4 Documentation

16.1.E.4.1 The contractor must provide a complete first inspection report detailing the work performed, the cause of the failures (if any), the modifications required and the parts to be replaced.

16.1.E.4.2 The contractor must provide a second complete inspection report detailing the work carried out, the modifications made, the parts used, the vibration test and the electrical insulation test (Megger).

16.1.E.4.3 The Contractor must provide the TA with electronic copies of the reports in PDF format.

16.1.E.5 Training[– NA]

17.0 Deck equipment

18.0 Communications and Navigation[- NOT USED]

19.0 Control Systems[- NOT USED]

**20.0 Scientific, Oceanographic and Hydrographic
Equipment**