

Annex A

NGCC Pierre Radisson- Spring Work 2022

F3065-210824

CCGS Pierre Radisson

DATES: 2022

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GENERAL REMARKS

G 1.0 **GENERAL REMARKS****G 1.1** **Introduction**

G 1.1.1 These project requirements are provided to the contractor to define the objectives, performance, standards and engineering requirements for the refit of the CCGS Pierre Radisson of the Canadian Coast Guard, Fisheries and Oceans Canada.

G 1.1.2 It is the responsibility of the contractor to ensure the following:

G 1.1.2.1 that the performance of the work specified herein meets the requirements specified and the regulatory agencies;

G 1.1.2.2 all items and equipment deemed necessary are provided to ensure the safe seaworthiness and operation of the vessel in accordance with the requirements for a vessel of this class;

G 1.1.3 The sections of this SOW define each element of the work for which the contractor is responsible on the CCGS Pierre Radisson Refit Project.

G 1.1.4 A full complement of crew will be present for the entire duration of the work. These crew members will be housed on board.

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G 1.2 **Vessel Information**G 1.2.1 **Main features**

Name:	CCGS Pierre Radisson
Type:	Medium / river icebreaker
Category:	Type 1200
Year of construction:	1978
Vessel builder	Burrard Dry dock, Vancouver, BC
Main dimensions:	
Length:	98.2 m
Width (excluding ribs) :	19.5 m
Loaded draft :	7.2 m
Loaded displacement :	1678.8 TM
Power	13 2000 KW
Propulsion	Electric Diesel

G 1.2.2 **Equipment[- not applicable]**

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G 1.3 References**G 1.3.1 Laws, regulations, standards, publications and procedures**

G 1.3.1.1 The latest version in effect at the time of contract signing of the laws, regulations, standards, publications and procedures listed below must be used for reference. The Contractor must ensure that all work performed in the specifications is performed in accordance with all federal and territorial standards and regulations. CCG procedures must be used as a guide if no other regulations take precedence.

GCC Procedures	Title	Included - Yes/No
GCC/5737	Fleet Safety Manual (latest edition)	Yes
7.A.1	Risk management	Includes GCC/5737
7.A.10	Handling and containment of asbestos containing materials	Includes GCC/5737
7.A.12	Drinking water quality	Includes GCC/5737
7.B.2	Protection against falls	Includes GCC/5737
7.B.3	Entry into confined spaces	Includes GCC/5737
7.B.4	Hot work	Includes GCC/5737
7.B.5	Locking and identification	Includes GCC/5737
7.B.6	Electrical Safety - Working on Conductors or Other Live Circuit Components	Includes GCC/5737
7.E.5	Handling, storage and disposal of hazardous materials	Includes GCC/5737
7.E.8	Use of halocarbons	Includes GCC/5737
10.A.6	Paint and other coatings	Includes GCC/5737
10.A.7	Safety and security of the contractor	Includes GCC/5737
	Hazardous Materials Management	yes
Circular 21-2021	COVID-19 - Health Screening Questionnaire and COVID-19 Testing Protocol for Canadian Coast Guard (CCG) Personnel and Persons Seeking Access to CCG Facilities, Vessels, Helicopters and Vehicles	Yes

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NSOP 515	COVID-19 Issuance of Contractor Designation Letters during the pandemic COVID-19	Yes
Publications		
TP 3177E	Standards for the protection against gas hazards on vessels to be repaired or modified	No
TP 127E	Electrical Standards for Vessels	No
NFPA 306 2014	Standards for protection against gas hazards on board ships	No
TP 14231	Occupational Safety and Health Program (ships)	No
TP 14612	Procedure for the approval of rescue appliances, systems, equipment and products for fire protection	No
IEEE45	Institute of Electrical and Electronics Engineers, Recommended Practice for Electrical Installations on Shipboard	No
70-000-000-EU-JA-001	General Guide to the Installation of Electronic Equipment on Board Vessels	Available at: GCC/ITS
Report EPS 1/RA/2	Environmental Code of Practice for the Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems (Environment Canada)	No
NFPA 10	Standard for portable fire extinguishers	No
18-080-000-SG-003	Paint and coating standards (formerly MPO/5884 - TP 12445E)	No
Circular 1206	Measures to Prevent Accidents with Lifeboats (IMO/MSC)	No
Standards		
CSA W47.1	Certification of Structural Steel Fusion Welding Companies, Part 2 (Certification)	No
CSA W47.2	Certification of aluminum fusion welding companies	No
CSA W59	Welded steel construction (arc welding)	No
CSA W59.2	Welded aluminum construction	No
ISO 9712:2005	International standards on non-destructive testing	No
CT-043-EQ-EG-001-E Welding specification	Welding specifications	yes
ISO 8501-1:2007	Preparation of steel substrates prior to application of paints and related products	No
Laws		
S.C. 2001, c. 26	Canada Shipping Act	No

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R.S.C. (1985, c. L-2)	Canada Labour Code (R.S.C. 1985, c. L-2)	No
Regulations		
SOR/2010-120	Marine Occupational Health and Safety Regulations	No
SOR/90-264	Ship Machinery Regulations	No
SOR/2017-14	Building Fire Safety Regulations	No
C.R.C., c. 1432	Hull Inspection Regulations	No
SOR/2003-289	Federal Halocarbon Regulations, 2003	No
SOR/87-183	Occupational Safety and Health (Ships) Regulations	No
IMO Circ. 1432	Revised guidelines for the maintenance and inspection of fire protection systems and appliances	No

10.1.A.1 Reference drawings - Not applicable -

G 1.3.1.2 The following drawings must be considered reference drawings as defined in the Drawings section of the General Notes.

Drawing number	TITLE OF THE DRAWING	Number of sheets
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GENERAL REMARKS

G 1.3.2 Tanks

G 1.3.2.1 The following is a list of tanks on board, with their location by frame number and capacity (if applicable). They are provided for information purposes only and do not take precedence over any specifications.

COM PARTMEN T/ compartments	FRAM ES/members	CAPACITY/capacité (m³)			
OIL FU EL			W ATER BALLAST (S.W .)		
NO. 1 D.B OIL FU EL P.	123 - 165	91.2	FORE PEAK W .B . TANK	83 - FWD	112.3
N O. 1 D.B OIL FU EL S.	123 - 165	95.3	AFT PEAK W .B . TANK	AFT	101.3
			FWD TRIM T ANK	176 - 183	181.8
NO. 2 D.B OIL FU EL P.	97 - 123	102.6	AFT TRIM T ANK	0 - 18	113.5
N O. 2 D.B OIL FU EL S.	97 - 123	113.0	HEELING TANK W ORKING LEVEL P.	138 - 165	101.5
			HEELING TANK W ORKING LEVEL S.	138 - 165	105.6
N O. 3 D.B OIL FU EL P.	61 - 23	141.2	HEELING TANK FU LL P.	138 - 165	200.5
NO. 3 D.B OIL FU EL S.	61 - 23	141.2	HEELING TANK FU LL S.	138 - 165	211.8
FW D. CENTER OIL FUEL DEEP TANK P.	146 - 165	139.8	FLUME TANKS (S.W .)		
FW D. CENTER OIL FUEL DEEP TANK S.	146 - 165	139.8	FLUM E T ANK U PPER FULL	127 - 138	268.0
OIL FU EL DAY TANK	123 - 127	42.7	FLUM E T ANK U PPER W ORKIN G LEVEL	127 - 138	188.3
OIL FU EL SETTling TANK P.	123 - 127	70.1	FLUM E T ANK LOW ER FU LL	127 - 138	275.8
OIL FU EL SETTling TANK S.	123 - 127	70.1	FLUM E T ANK LOW ER W ORKIN G LEVEL	127 - 138	131.8
FW D. LOWER OIL FUEL W ING TANK P.	138 - 158	55.0	FLUME T ANKS (O.F.)		
FW D. LOWER OIL FUEL W ING TANK S.	138 - 158	55.0	FLUME T ANK U PPER FULL	127 - 138	255.7
			FLUM E T ANK U PPER W ORKIN G LEVEL	127 - 138	189.0
AFT . OIL FUEL DEEP TANK P.	18 - 30	104.0	FLUM E T ANK LOW ER FU LL	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

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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 1.3.2.2

G 1.3.3 **Abbreviations**

ACM: Asbestos Containing Material	ACM: Asbestos-containing materials
CFM: Contractor Furnished Material and/or Equipment	MFE: Contractor Furnished Equipment
CLC: Canada Labour Code	CLC: <i>Canada Labour Code</i>
CSA - Canadian Standards Association	CSA: Canadian Standards Association (CSA)
CWB: Canadian Welding Bureau	BCS: Canadian Welding Bureau
DFO/CCG: Department of Fisheries and Oceans, Canadian Coast Guard	DFO/CCG: Fisheries and Oceans Canada, Canadian Coast Guard
FSR: Manufacturer's Field Service Representative	RSF: Manufacturer's Service Representative
FSM: Fleet Safety Manual	MSF: Fleet Safety Manual
GSM : Government Supplied Material and/or Equipment	MFG: Government Furnished Equipment
HC: Health Canada	HC: Health Canada
IEEE: The Institute of Electrical & Electronic Engineers Inc.	IEEE: Institute of Electrical and Electronics Engineers
MSDS: Material Safety Data Sheet	MSDS: Material Safety Data Sheet
NDT : Non Destructive Testing	NDT : Non Destructive Testing
OEM: Original Equipment Manufacturer	OEF : Original Equipment Manufacturer
OHS: Occupational Health and Safety	OHS: Occupational Health and Safety
PWGSC: Public Works and Government Services Canada	PWGSC: Public Works and Government Services Canada
RO: Recognized Organization as defined by Canada Shipping Act.	RO: Recognized Organization under the <i>Canada Shipping Act</i>
SSMS: Safety and Security Management System	SSMS: Safety and Security Management System
TBS: Treasury Board of Canada Secretariat	TBS: Treasury Board of Canada Secretariat
CA: Contract Authority - PSPC	CA: Contracting Authority - SPAC
TA: Technical Authority -CCG Superintendent, Marine Engineering Western Region, or her delegated Representative	TA: Technical Authority - CCG Superintendent, Naval Engineering, Western Region, or delegated representative
TCMS: Transport Canada Marine Safety	TCMS: Transport Canada Marine Safety
IA: Inspection Authority - CCG delegated	IA: Inspection Authority - CCG Delegate
VCS : Vessel Condition Survey	EEN: Examination of the condition of a vessel
VLE : Vessel Life Extension	PVN: Vessel Life Extension
WCB: Workers' Compensation Board	CNESST: Commission des normes, de l'équité, de la santé et de la sécurité du travail

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WHMIS: Workplace Hazardous Materials Information System	WHMIS: Workplace Hazardous Materials Information System
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G 1.4 **Conditions and definitions**G 1.4.1 **General**

G 1.4.1.1 The following conditions and definitions apply to all work in the specification and are intended to describe the quality of workmanship and practice that is the minimum acceptable level:

- a) The term "install" means that the contractor must mechanically connect, electrically connect, and provide the labor and materials necessary to complete the installation.
- b) The term "reinstall" means a piece of equipment that has been repaired by the Contractor and is to be returned or installed in its original location and mechanically and electrically connected. The Contractor must provide the labor and materials necessary to complete the reinstallation.
- c) The term "remove" means that the contractor must provide all labor and materials necessary to remove the unit, equipment, material, or the entire system. The removal process includes sealing openings and restoring the insulation and paint to its original condition.
- d) The term "relocate" means that the contractor must provide all labor and materials necessary to remove the unit, equipment, or system and install the same unit, equipment, or system in the new location;
- e) The term "or equivalent" means replacement equipment that has equal characteristics (e.g., size, type of material, service life, weight, input and output) to that which the Technical Authority has approved. A comparison of general specifications must be provided to the Technical Authority for the equipment specified in the specification and the "or equivalent" (i.e., old vs. new).
- f) The term "refurbishment" as applied to any mechanical equipment, structure or system includes disassembly, cleaning and inspection of components for defects, measurement of component wear, reporting of components worn beyond specification limits or defective components and assembly followed by adjustment in accordance with specification and testing, and functional testing.
- g) The term "disconnect" means that the contractor must mechanically separate and electrically disconnect the equipment from all pipes, cables, racks, and other components to allow for the removal of the entire unit.
- h) The term "disassemble" means that the Contractor must provide all labor to disassemble, piece by piece, the equipment, machinery or systems to be examined or repaired.
- i) The term "reassemble" means that the Contractor must provide all labor to assemble, piece by piece, the equipment, machinery, or systems upon completion of the examination or repair.

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- j) The term "addition to work procedures" refers to the procedures defined in the unanticipated work clause of the contract and includes any additional work required on a system, subsystem, or equipment that was not specified in the original specification.
- k) The term "calibrate" means to adjust readings and measurements to match a known standard.
- l) The term "check" means that the Contractor must provide labor to find defects by sight, touch or hearing. Verification of equipment does not involve the disturbance or removal of parts, components or subassemblies;
- m) The term "review" means that the Contractor must provide labor for the systematic examination, verification, and testing of equipment, documents, or its administrative procedures for actual or potential defects or errors.
- n) The term "test" means that the contractor must provide labor to verify the operation of a device against a stated standard or procedure.
- o) The term "commissioning" means the adjustment, alignment, and adjustment of equipment and systems required as a result of satisfactory installation, and inspection to prepare equipment and systems for engineering acceptance testing.
- p) The term "testing" is a quality assurance (QA) element that refers to a measure by which the contractor proves by visual or instrumental presentation that the equipment or system meets the specified test program requirements;
- q) The term "functional test" means the operation of a piece of equipment in all its normal modes of operation and throughout its operating range to establish that it will perform its intended function within the normal operating parameters specified in the manufacturer's literature.

- G 1.4.1.2 During the duration of the works the vessel will be docked at facilities provided by the contractor.
- G 1.4.1.3 The contractor must provide a list of employees and subcontractors to the Technical Authority prior to each work day to facilitate interactions at the bridge. The email addresses of the list recipients will be given to the contractor at the beginning of the work period.
- G 1.4.2 **Canadian Coast Guard employees and other contractors on board the vessel**
- G 1.4.2.1 Canadian Coast Guard and DFO personnel as well as other personnel, such as manufacturer's representatives, DBS inspectors, may conduct other work on the vessel, including work not mentioned in these specifications, during the period of the work. 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 related inspections or pay inspection fees for such work.
- G 1.4.2.2 During the course of the work, at least two other contracts will be executed in parallel to the one described herein. These other contracts include:

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- a) Maintenance of the generator engine
- b) Miscellaneous repairs by contractors

G 1.4.2.3 The contractor is not responsible for the supervision or performance of work associated with these other contracts, nor is the contractor responsible for the supervision of subcontractors associated with these other contracts. The TA may, however, require a daily or weekly meeting with all contractors, including the contractor on this contract, to ensure proper coordination between the various projects underway on the vessel.

G 1.5 **Miscellaneous provisions**

G 1.5.1 **COVID-19**

G 1.5.1.1 All contractors and their subcontractors must be double vaccinated as per the notice. [Notice to Federal Government Contractors - BuyingandSelling.gc.ca](https://buyingandselling.gc.ca)

G 1.5.1.2 Reference documents:

Circular 21-2021	COVID-19 - Health Screening Questionnaire and COVID-19 Testing Protocol for Canadian Coast Guard (CCG) Personnel and Persons Seeking Access to CCG Facilities, Vessels, Helicopters and Vehicles
NSOP-515 6102-515	Issuance of Contractor Designation Letters during the pandemic COVID-19

G 1.5.1.3 Due to the Covid-19 pandemic, the contractor must comply with Circular 21-2021 "COVID-19 Health Screening Questionnaire and Testing Protocol for Canadian Coast Guard (CCG) Personnel and Persons Seeking Access to CCG Facilities, Vessels, Helicopters and Vehicles" during an outbreak of an infectious disease such as COVID-19.

G 1.5.1.4 The contractor must ensure that all employees and subcontractors wear medical masks. The contractor must provide these masks to its employees and subcontractors. Medical masks must be worn at all times inside and outside the work area. The contractor must also provide hand sanitizer for use by its employees and subcontractors.

G 1.5.1.5 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 1.5.2 **Health and safety at work**

G 1.5.2.1 The contractor and all subcontractors must comply with occupational health and safety (OHS) measures in accordance with applicable federal and provincial OHS regulations to ensure that the contractor's activities are conducted safely and in a manner that does not compromise the safety of any personnel.

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- G 1.5.2.2 Where reference is made in this document to a "safety management system", it refers to the contractor's safety management system that must be in effect when the contractor has equipment in its care and custody and that complies with applicable OHS regulations and procedures.
- a) The contractor must, for all work on the Coast Guard vessel, meet or exceed the safety management system defined in the MSF, unless the contractor has proposed a comprehensive safety management system that has been reviewed and accepted by the Technical Authority.
- G 1.5.2.3 The contractor working on the vessel, while in the care and custody of the Canadian Coast Guard, must comply with the CCG Safety Management System:
- a) The contractor and its representatives must participate in a vessel safety orientation prior to the commencement of any work to familiarize the contractor's employees with the hazards specific to the vessel and its work protocol permit systems. During this session, CCG will review procedures for safety, hazard prevention, hazard response and pre-work safety assessments. The contractor will have access to an uncontrolled copy of the Fleet Safety and Security Manual.
- b) The contractor will have access to an unchecked copy of the Fleet Safety Manual. The contractor must comply with the Fleet Safety Manual (DFO/5737), as well as the shipboard work instructions, in addition to the applicable Canada Labour Code requirements while performing the following types of work
- i) Work at height;
 - ii) Entry into enclosed spaces;
 - iii) Degassing before entering confined spaces and for hot work;
 - iv) Locking and labeling;
 - v) Pre-construction safety assessments.
- c) For the purpose of lockout/identification procedures, in addition to the devices provided to the ship's crew by the Chief Engineer, the Contractor must provide padlocks and locking devices to its employees.
- d) Contractor must comply with local facility ground safety procedures and instructions.
- G 1.5.2.4 The contractor must designate a specific individual who is responsible for managing the safety of the workplace. The safety manager must ensure that daily safety rounds are conducted, safety issues are identified, and safety precautions are maintained.
- G 1.5.2.5 Areas that are hazardous due to the work specified in the specifications must be secured by the contractor. The contractor must clearly identify these areas by posting signs to inform and protect all personnel in accordance with applicable regulations.
- G 1.5.2.6 The contractor and its employees will not have access to the vessel's washrooms or crew lounges. The contractor must provide the necessary facilities for its employees and subcontractors as required.

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- G 1.5.2.7 During the period of work, the contractor must maintain the areas of the vessel used by its personnel to access the work areas. The areas must be kept clean and free of debris, and trash must be removed daily.
- G 1.5.2.8 At the end of the work period, the contractor must ensure that all waste generated in the course of the work of these specifications is disposed of and that the vessel is as clean as it was prior to the start of the work period.
- G 1.5.2.9 Once all known work has been completed and final cleanup has been performed, the contractor's quality assurance representative must visit all areas of the vessel where work has been performed by the contractor. Any deficiencies or damage found must be documented, and compared to photos taken prior to the start of the work to determine if the deficiency or damage is a result of the work performed by the contractor. If so, the damage must be repaired by the contractor at no cost to CCG.
- G 1.5.3 **Lead paints and coatings**
- G 1.5.3.1 The contractor must not use lead paint.
- G 1.5.3.2 TB-BT-2020-03 Paint Containing Lead on CCG Vessels.
- G 1.5.3.3 In the past, lead-based paint has been used to paint CCG vessels. As a result, certain contractor processes such as grinding, soldering, and burning could release lead from the coatings. The Canadian Coast Guard will provide copies of all available lead analysis results.
- G 1.5.3.4 The contractor must ensure that coatings in affected work areas are examined for lead content and ensure that the work is performed in accordance with applicable federal and provincial regulations.
- G 1.5.3.5 The contractor must provide the Technical Authority with a hazard mitigation plan for each process requiring changes to the vessel's paint. The plan must be submitted in writing prior to the start of work
- G 1.5.3.6 The contractor must provide proof of product approval by Health Canada for hull paints controlled by Health Canada and the Pest Management Regulatory Agency.
- G 1.5.4 **Damaged paint and touch-ups**
- G 1.5.4.1 The contractor must, at a minimum, repair paint systems altered by the work indicated. Paint systems must match the vessel's paint system and be applied in accordance with the paint manufacturer's recommended procedures.
- G 1.5.4.2 Contractor must prepare any new or affected steel to the paint manufacturer's standards prior to painting.
- G 1.5.4.3 Unless otherwise specified, all new and/or affected steel must receive two coats of marine primer, compatible with the vessel's paint coating scheme.

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G 1.5.5 Asbestos containing materials (ACM)

- G 1.5.5.1 The contractor must not use any material containing asbestos.
- G 1.5.5.2 The contractor will be provided, upon request, with the most recent Asbestos Risk Assessment Report and the Canadian Coast Guard Hazardous Materials Management Plan.
- G 1.5.5.3 Handling of asbestos-containing materials should be done by trained personnel or a company certified in asbestos removal, in accordance with federal, provincial/territorial and municipal regulations.
- G 1.5.5.4 The contractor must provide the TA with disposal certificates for all asbestos-containing materials removed from the vessel to demonstrate that the disposal was performed in accordance with applicable federal, state, and local regulations.
- G 1.5.5.5 The contractor must provide an "Observation Report" addressing any concerns or intentions related to asbestos-containing materials that have not already been identified. Prior to performing the work, the contractor must identify all materials that may contain asbestos. Approved work resulting from the Observation Report must follow the Additional Work Procedures.

G 1.5.6 Enclosed spaces

- G 1.5.6.1 Access to confined spaces aboard the vessel during the contract period must be in accordance with the safety management system determined at the pre-work meeting. In addition to these requirements, the contractor must also perform the following tasks:
- a) Ensure that a qualified person issues a degassing certificate for the spaces to be visited, and then post the certificate near the entrance to those spaces. Certificates should state "safe for people" or "safe for hot work" as appropriate.
 - b) Provide TA with a copy of all certificates produced, as per the Documentation section of the General Notes.
- G 1.5.6.2 The contractor may request a list of the vessel's confined spaces at the meeting prior to the refit.

G 1.5.7 Hot work

- G 1.5.7.1 All hot work performed under the contract must comply with the safety management system. In addition to complying with the requirements of the safety management system, the contractor must also, at a minimum:
- a) Certify that the confined spaces involved are "safe for hot work" in accordance with the Confined Spaces section of the General Notes;
 - b) Keep all portable combustibles at least two metres away;
 - c) Provide and install protective materials to prevent the spread of sparks and to protect electrical wiring and other services;

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- d) Provide and post fire pickets in each space and in the adjacent space where welding, grinding, or burning is performed on partitions, ceilings, or decks;
- e) Provide appropriate fire extinguishers to the fire pickets and ensure that each member of the fire picket has been trained in the use of a fire extinguisher. The fire picket must maintain surveillance at its designated location for a minimum of thirty (30) minutes after completion of the hot work. The Contractor must record the time of fire picket supervision on all hot work permits, indicating the time of completion of the hot work and the time the picket left his post;
- f) Provide the TA with a copy of the hot work permits issued on site in accordance with the Documentation section of the General Notes and named according to the specification task generating the required work.

G 1.5.8 Working at height

- G 1.5.8.1 Any work performed at height during the maintenance or refit period must be in accordance with the safety management system. Notices must be posted to prevent radar operation while personnel are working at height on the mast or wheelhouse roof.

G 1.5.9 Electrical equipment

- G 1.5.9.1 When work is performed on electrical equipment, the contractor must lock out the equipment in accordance with the safety management system and, at a minimum, perform the following:
- a) Isolate the main power source and any other power sources to the equipment;
 - b) Install padlocks and warning labels on the main power source and on any other power source for switches/isolators connected to the equipment being serviced;
 - c) Check that there is no supply voltage at the terminals;
 - d) Ensure that padlocks and warning labels remain in place until all work is completed.
- G 1.5.9.2 TA must be notified of all work in progress.
- G 1.5.9.3 All electrical installations and repairs must be performed in accordance with the latest versions of Transport Canada Standard TP127E - Electrical Standards for Ships and IEEE Standard 45 - Recommended Practice for Electrical Installation on Ships. TP127 takes precedence over the IEEE standard.
- G 1.5.9.4 All installations and repairs of electronic equipment must be done in accordance with the Canadian Coast Guard publication on telecommunications and electronics entitled "General Guide to the Installation of Electronic Equipment on Ships".

G 1.5.10 Workplace Hazardous Materials Information System (WHMIS)

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- G 1.5.10.1 The contractor must provide the Technical Authority with Material Safety Data Sheets (MSDS) for all products supplied by the contractor and subcontractors that are controlled under WHMIS. SDSs must be submitted in the formats requested in the Documentation section of the General Notes.
- G 1.5.10.2 All SDSs must be maintained in accordance with OHS procedures.
- G 1.5.10.3 The TA must provide the contractor with access to the SDSs of all controlled products on board the vessel for all work items specified on the application.
- G 1.5.11 **Smoking in the workplace**
- G 1.5.11.1 The contractor must ensure compliance with the *Non-Smokers' Health Act*. The Contractor must ensure that no one smokes on the vessel, either its employees or subcontractors, including employees of any subcontractor.
- G 1.5.12 **Equipment (MFE) and tools provided by the contractor**
- G 1.5.12.1 The contractor must ensure that all equipment is new and unused.
- G 1.5.12.2 The Contractor must ensure that all replacement products, such as gaskets, seals, insulation, small hardware items, oils, lubricants, cleaning solvents, preservatives, paints, coatings, plasters, etc., are in accordance with the equipment manufacturer's drawings, manuals, and instructions.
- G 1.5.12.3 When no specific items are specified or when a replacement is to be made, the contractor must submit an observation report to the TA indicating the replacement or unspecified items. The Contractor must provide details to the TA on the materials used and the grade and quality certification of various materials prior to their use.
- G 1.5.12.4 The Contractor must furnish all equipment, apparatus, tools and machinery, such as cranes, scaffolding, palisades and hitches necessary to perform the work under these specifications.
- G 1.5.12.5 The Contractor must deliver to and store at its facility all new equipment to be provided by the Contractor. Contractor supplied equipment must be stored in a secure, environmentally controlled area in accordance with the Equipment Storage section of these specifications.
- G 1.5.12.6 All tools must be provided by the contractor unless otherwise specified in the technical specifications.
- G 1.5.13 **Equipment (MFG) and tools provided by the government**
- G 1.5.13.1 All tools must be supplied by the contractor unless otherwise specified in the technical specifications.

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- G 1.5.13.2 If the TA provides tools, the contractor must return them in the condition they were in prior to borrowing. Borrowed tools must be inventoried. The contractor must sign the inventory record upon receipt of the tools and when they are returned to the TA.
- G 1.5.13.3 The Contractor must maintain all Government furnished goods in a secure, climate controlled warehouse or store in accordance with the manufacturer's instructions.
- G 1.5.13.4 Government supplied equipment not specifically mentioned in the technical specifications must be sent to the contractor and stored in accordance with the equipment storage section of these specifications. These activities must be described in the Engineering Change or Extra Work Procedures (PWGSC Form 1379).
- G 1.5.14 **Storage**
- G 1.5.14.1 Equipment (i.e., covers, hoods, and other items that may need to be removed and stored) must be stored in accordance with the equipment manufacturer's or supplier's specific storage instructions. The contractor must make these instructions available to the Technical Authority.
- G 1.5.14.2 All equipment and items must be stored in such a manner as to be readily accessible for inspection. No items must be stored directly on the floor.
- G 1.5.15 **Regulatory inspections and classification surveys**
- G 1.5.15.1 The contractor must schedule and coordinate all regulatory inspections and classification surveys with the appropriate authority, e.g. Transport Canada Marine Safety, Classification Society, Health Canada, Environment Canada or others, in accordance with these specifications.
- G 1.5.15.2 Any documents produced as a result of the above inspections and investigations that demonstrate that they have taken place (e.g., original signed and dated certificates) must be submitted to the TA.
- G 1.5.15.3 The Contractor must not substitute TA inspection for TCMS regulatory inspections or classification surveys.
- G 1.5.15.4 The Contractor must provide advance notice (at least 48 hours) to the TA prior to scheduled TCMS regulatory inspections or classification surveys so that the TA can attend the inspection.
- G 1.5.16 **Contractor Inspections**
- G 1.5.16.1 The contractor must provide an opportunity for a joint inspection of the condition and location of items to be removed prior to performing the indicated work or accessing a location to work.

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- G 1.5.16.2 The contractor must take a witness photo of the condition of the item prior to removal. Each photo must be in accordance with the DocumentationG 1.5.23 section of the General Notes and named according to the section of the specification that resulted in the removal of those items.
- G 1.5.16.3 Any damage resulting from the Contractor's work and attributable to the Contractor's performance of the Work must be repaired by the Contractor at the Contractor's expense. Equipment used for replacement or repair must meet the criteria for contractor supplied equipment as outlined in the Contractor Supplied Equipment and Tools section.
- G 1.5.16.4 The contractor must protect the equipment and adjacent areas from damage. Work areas must be protected from water infiltration, blasting and welding particles, etc. Temporary covers must be installed at the work site.
- G 1.5.16.5 Prior to completion of any task under this specification, the contractor must allow the TA to verify that the work has been completed in accordance with the specification. The Contractor must then have all photos, documents, reports and test plans that pertain to the task that is deemed complete.
- G 1.5.17 **Recording of work in progress**
- G 1.5.17.1 The TA can record work in progress in a variety of ways, including photos, videos, digital media, or film.
- G 1.5.18 **Access for maintenance, installation and removal**
- G 1.5.18.1 The Contractor must ensure that the Technical Authority and CCG personnel have unrestricted access to the work site at all times during the term of the contract.
- G 1.5.18.2 All equipment removed as part of this specification remains the property of CCG unless otherwise specified in certain sections of the specification.
- G 1.5.19 **Restricted areas**
- G 1.5.19.1 The Contractor must not enter the following areas (except to perform work as specified): cabins, offices, workshops, engineer's office, wheelhouse, control room, restrooms, galley, crew stations, recreation areas and other areas where restricted access is posted.
- G 1.5.19.2 The contractor must give the TA 24 hours notice when work is to be performed in occupied premises or offices. This will allow CCG sufficient time to move personnel and secure areas.
- G 1.5.20 **Assembly of components**
- G 1.5.20.1 The Contractor must ensure that during installation of the specified equipment, the parts and assembled equipment are cleaned to remove stains, weld spatter or excess solder, filler metal, metal spalls, or any other foreign material that may

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interfere with the normal operation, function, or appearance of the equipment. This includes any particles that may become dislodged or displaced during the normal expected life of the equipment. All corrosive materials must be removed. This cleaning must take place prior to assembly of the equipment parts.

G 1.5.20.2 If the contractor damages the covers, hoods and elements, he must replace them with new ones.

G 1.5.20.3 If the manufacturer does not provide the necessary information, the bolt and nut tightening torques specified in SAE, ANSI or BS 1083 standards should be used.

G 1.5.21 Equipment protection

G 1.5.21.1 The contractor must take steps to ensure that surfaces and components of equipment installed on the vessel are free from damage, soiling and contaminants produced by the work.

G 1.5.21.2 Throughout the contracted work, all electrical and electronic equipment and components must be protected from physical and internal damage and from the effects of temperature or other adverse environmental conditions.

G 1.5.21.3 The Contractor must protect equipment that may be damaged due to the movement of materials and equipment in the vicinity. The Contractor must also protect equipment from nearby sources of contamination including, but not limited to, those from burning, welding, abrasive spraying (sandblasting), grinding, and painting operations.

G 1.5.21.4 All surfaces and equipment, furniture or decor damaged prior to acceptance must be restored to the condition they were in prior to the Contractor's work.

G 1.5.21.5 All openings in machines or systems must be provided at all times with solid, properly fitting and securely fastened covers or plugs, pending connections.

G 1.5.21.6 The Contractor must obtain and follow instructions from its subcontractors regarding special protective measures required for the equipment they provide during the course of the work. These instructions must be forwarded to the TA.

G 1.5.21.7 Protective devices including, but not limited to, plastic sheeting, fireproof covers, heavy material tarps, wood plugs, wood casings and heaters must be used as needed.

G 1.5.21.8 The contractor must protect the vessel from infestation by vermin (insects, mammals and birds). If an infestation occurs during the term of the contract, the contractor must ensure, at its own expense, that the vermin are exterminated prior to the departure of the vessel and the termination of the contract.

G 1.5.22 Systems containing halocarbons

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- G 1.5.22.1 All work performed on systems containing halocarbons must comply with the Federal Halocarbon Regulations, 2003 (SOR/2003-289). These regulations can be found at the following web address: <http://laws-lois.justice.gc.ca/fra/reglements/DORS-2003-289/page-1.html>
- G 1.5.22.2 All work on refrigeration and air conditioning systems must be performed in accordance with Sections 2.7 and 2.8 of the Environmental Code of Practice for the Elimination of Fluorocarbon Emissions from Refrigeration Systems.
- G 1.5.23 **Welding**
- G 1.5.23.1 In addition to Section 7.16 Welding Standards Certification - Contract, all welding and weld inspection work must be conducted in accordance with CCG Welding Specification CT-043-EQ-EG-001. This document is included in the technical package.
- G 1.5.23.2 The standards governing the welding of material less than 3 mm thick must be in accordance with the requirements of CCG Welding Specification CT-043-EQ-EG-001. For material thicker than 3 mm, the contractor must meet the following requirements:
- a) For structural steel over 3 mm thick, welding must meet the requirements of CSA W47.1-2019 - Appendix M, CSA W59-2018 and the requirements of CCG Specification CT-043-EQ-EG-001.
 - b) For structural aluminum over 3 mm thick, welding must meet the requirements of CSAW47.2-11 (R2015), CSA W59.2-2018, and the requirements of CCG specification CT-043-EQ-EG-001.
 - c) For structural stainless steel over 3 mm thick, welding must meet the requirements of W47.1-2019 - Appendix K, AWS D1.6, and the requirements of CCG Specification CT-043-EQ-EG-001.
- G 1.6 **Documentation**
- G 1.6.1 **Text documents**
- G 1.6.1.1 All text deliverables must be accompanied by a PDF file that contains the complete document. The contractor must perform quality control to verify that the content accurately reproduces the content and formatting of the master document file. If changes are made, a second PDF file must be provided containing only the changed pages.
- G 1.6.2 **Data collection**
- G 1.6.2.1 The contractor must provide all documentation resulting from specified deliverables in both electronic and hard copy versions. Per the Contractor Quality Assurance Program, two hard copies of each document in two separate binders are required. An electronic copy of all documentation must also be provided to the TA in accordance with the formats described in this section of the specification.

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- G 1.6.2.2 All copies of documents resulting from specified deliverables will be referred to as the "Data Collection".
- G 1.6.2.3 The contractor must provide the TA with all files created as part of the Data Collection before the contract is considered executed. The files must be in physical format. Each specification task must have its own file named according to the specification task. For example, "G1.0 General Notes".
- G 1.6.2.4 All documents, information materials, and reports from additional work should also be included in the data collection.
- G 1.6.3 **File name**
- G 1.6.3.1 File names must include the section number of the specification to which it relates, the date, and a short description of the content. (example: "G_1.0_2019-03-25_Keyword Description.pdf")

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G 1.6.4 E-mails

- G 1.6.4.1 All attached files sent to the TA and IA by email must comply with the G 1.6.3 File name of this Statement of Work. The subject line of email attachments (deliverables) must contain the # contract - # specification item - date - keywords; short description of content.

G 1.6.5 Formatting the file

- G 1.6.5.1 All documents, reports, test results, certificates or information obtained by the Contractor in paper format must be scanned into unprotected, searchable Adobe PDF formatted files and named according to the File Naming section of this specification.
- G 1.6.5.2 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 copy and the converted copy must be included in the data package.

G 1.6.6 Photographs

- G 1.6.6.1 All photographs obtained by the Contractor as required by the specification must be provided in JPG format with a resolution of at least 640 x 480 and named according to the "File Naming" section of this specification.

G 1.6.7 Measurements, calibrations and readings

- G 1.6.7.1 All recorded measurements, calibrations and readings must be accompanied by the signature of the person who performed them. These precautions must be dated and scanned in electronic format for inclusion in the data collection.
- G 1.6.7.2 Unless otherwise specified, the Contractor must record dimensions in imperial units, retaining three significant digits and indicating the metric equivalent.
- G 1.6.7.3 The contractor must provide the TA with current and valid control values and calibration certificates for all instruments used in the test and trial plan to prove that the instruments have been calibrated in accordance with the manufacturer's instructions. These documents must be included in the data collection for all tasks requiring measurements.

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G 1.6.8 Inspection and test records and certificates

- G 1.6.8.1 Inspection or test records and certificates are designated as deliverables in the specification tasks that require them.
- G 1.6.8.2 Inspection or test records and certificates must be included in a separate section of the data collection and filed or organized by specification number.
- G 1.6.8.3 The contractor must maintain a complete and accurate record of all tests and trials performed on the vessel or each piece of equipment. Prior to commencing a test, all relevant documents and test sheets, including shop test data, must be completed and attached to the test program.
- G 1.6.8.4 All paper and electronic test and trial data must be legible. If necessary, handwritten documents may need to be reproduced in electronic format in order to be acceptable. The original copy must be signed by the regulator, TA, contractor, and, if applicable, subcontractors or FRLs who witnessed the testing. All data must be submitted to the TA in accordance with the Documentation section of the General Notes.
- G 1.6.8.5 Original records of tests, trials and inspections must be signed by ABS, the contractor and, if applicable, subcontractors or the field service representative who witnessed the tests.
- G 1.6.8.6 The contractor must provide 2 hard copies and one electronic copy of all copies of test, trial and inspection records.

G 1.7 Drawings**G 1.7.1 General**

- G 1.7.1.1 The "Drawings" section of the General Notes is intended to be used as a reference for minimum standards when specified deliverables are to be drawings.
- G 1.7.1.2 All requested drawings must be on ANSI - ANSI B size paper (11" x 17") minimum. Drawings will be submitted in DWG format (AutoCAD 2013 or later), on CD-ROM, and will not be password protected. The contractor must provide one (1) CD-ROM.
- G 1.7.1.3 Drawings must be created using AutoCAD and delivered in electronic DWG and PDF format. The contractor must use the CCG National Title Block Template as specified 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.

G 1.7.2 Reference drawings

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- G 1.7.2.1 All technical pilot drawings are provided to the contractor for reference purposes only. The contractor must produce as-built drawings and ensure that all such drawings receive appropriate regulatory approval. Not all technical pilot drawings provided are as-built drawings; therefore, the contractor must physically verify the affected items.
- G 1.7.2.2 The Contractor must indicate to the Technical Authority (TA) all deviations from the reference drawings and project specifications provided, and obtain written approval from the TA prior to making such changes or deviations.
- G 1.7.2.3 Deviations from the specification must be documented with an observation report.

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G 1.8 ManualsG 1.8.1 **General**

G 1.8.1.1 The "Manuals" section of the General Notes is intended to be used as a reference for minimum standards when specified deliverables are to be manuals.

G 1.8.1.2 Each instruction manual and logbook must be bound in a hard cover, 3-ring "D" binder with snap lock mechanisms that can accommodate 8 1/2" x 11" sheets. Larger drawings and documents must be accordion folded. The following information must be printed on the cover:

- a) CCGS Pierre Radisson
- b) Quote identification number
- c) Identification of the equipment or systems
- d) equipment manufacturer;
- e) revision number and date.

G 1.8.1.3 All sections of the manuals must have laminated tabs. Major equipment components must be subdivided into separate sections in the manuals.

G 1.8.1.4 A master index should be located at the beginning of each booklet, listing all items included in each section.

G 1.8.1.5 A list of contact names, addresses and telephone numbers associated with the equipment manufacturers must accompany the document for reference after completion of the project for maintenance and information management purposes.

G 1.8.1.6 A copy of the final, approved "as-built" drawings must be included in the maintenance manual.

G 1.8.1.7 The Contractor must provide the Technical Authority with two hard copies of all manuals and data sheets in English and French (one copy of each) of the items of equipment supplied by the Contractor prior to the expiration of the Contract.

G 1.8.1.8 The Contractor must provide four copies to the Technical Authority of all manuals and data sheets in PDF compatible format prior to the expiration of the contract.

G 1.8.2 **Operating manuals - as built [- not applicable]**

G 1.8.2.1 [- not applicable]

G 1.8.3 **Maintenance manuals - as built [- not applicable]**

G 1.8.3.1 [- not applicable]

G 1.9 **Identification [- not applicable]**

G 1.9.1 [- not applicable]

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G 1.10 Production diagram

- G 1.10.1 The purpose of this specification is to provide the Owner's representatives with an accurate schedule of the work and its completion for Coast Guard purposes.
- G 1.10.2 The contractor must provide a bar chart using a specialized workflow application (Ms Project 2010 format or equivalent) that illustrates the planned schedule for the vessel refit. This diagram must show each task in the specification with its start date, duration and expected completion date.
- G 1.10.3 Any critical work sequences should be identified, along with critical tasks that could delay the refit if it does not meet the planned work schedule. These may include manpower issues or tasks that cannot be performed in parallel with other tasks.
- G 1.10.4 In the event of any work affecting the critical progress of the work, the contractor must immediately notify the inspection authority. Every effort must be made to avoid delaying the vessel's refit. Regular quality assurance procedures must be followed.
- G 1.10.5 The bar graph will be updated weekly and in advance of each production meeting to show the actual progress of the refit and changes to the completion date of each item. The contractor must include in his updates to the bar graph any special work requested on PWGSC Form 1379 indicating the impact that the additional work will have on the work schedule.
- G 1.10.6 The contractor must provide a pdf copy and an .mpp copy (MS project 2010) or newer) of the bar graph to the TA and IA.

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S 1.0 SERVICES**S 1.1 General**

S 1.1.1 The Contractor is responsible for providing confined space rescue service and high angle rescue service to respond to these employees and its subcontractors.

S 1.2 Cranes

S 1.2.1 Crane on board the ship

S 1.2.2 The contractor must schedule requests for the ship's crane at least 24 hours in advance.

S 1.2.3 Contractor's crane

- a) It is the contractor's responsibility to verify the load restrictions applicable to the dock where the vessel is moored. Slings and lifting gear will be provided by the contractor.

S 1.3 Berthing

S 1.3.1 The Contractor must be responsible for the berthing and mooring of the vessel for the duration of the refit. Canada must have free access to the vessel at all times.

S 1.3.2 A mooring plan is available upon request to the Technical Authority. The contractor must make a copy and submit it to the Technical Authority.

S 1.3.3 The water must be deep enough to prevent the vessel from touching the bottom at low tide or low water conditions. The contractor must ensure that there is sufficient water under the keel to permit testing of the propulsion system during dockside trials.

S 1.4 Gateways [- not applicable]

S 1.4.1 [- not applicable]

S 1.5 (*)Power supply

S 1.5.1 The contractor must provide 2 service connections (600 VAC, 3-phase, 300 amps/connection) for the duration of the work (either dockside or dry dock).

S 1.5.2 The contractor must provide the material and labor to connect and disconnect, as required, the 2 electrical cables on the vessel, each 150 feet long with the male plug connected to the source. These two cables are connected in parallel on the vessel. The two power sources provided must have the same phase order at the source as well as

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on the vessel and the contractor must ensure this prior to powering the vessel. The vessel load rating is between 350 and 400 kilowatts. The vessel will provide 2 sockets with 2 meters of wire each for connection to the shipyard electrical system. These wires must not be shortened. Cables and connections must be megohmmeter tested prior to connection.

- S 1.5.3 The Contractor must provide a unit price per kilowatt hour. This unit price must be used by the contractor to include in its bid a firm price for a block of 500,000 kilowatt hours and to adjust the total consumption of the vessel up or down at the end of the work period using the PWGSC 1379 form.
- S 1.5.4 The contractor must provide and connect a kilowatt-hour meter to the vessel's power outlet to account for consumption and must provide a calibration certificate for each meter used. The contractor must read the kilowatt-hour meter in the presence of the Technical Authority prior to connection and upon disconnection of the power supply to verify power consumption. The meter must be read before and after any movement of the vessel in the presence of the Technical Authority. The reading of the electricity consumption must be reported to the technical authority on a weekly basis.
- S 1.5.5 The power supply quoted must be for the vessel's own use only.
- S 1.5.6 Once the refit is complete and shore power is removed, the plugs should be disconnected from the cables and handed over to the ship's electrical officer.
- S 1.5.7 NOTE: If the contractor is powering the vessel with a deck mounted diesel generator, the contractor is responsible for the watchstanders and the fuel for the generator.

S 1.6 Protection of the decks and the bottom of the walls

- S 1.6.1 In order to prevent the encrustation of dirt in the walkways and to protect the floor covering, the contractor must supply and install 1/8" thick Masonite on the interior deck surfaces in the access ways to the work from the exterior door to the work area.

S 1.7 Heating [- not applicable]

- S 1.7.1 [- not applicable]

S 1.8 Workplace Inspections

- S 1.8.1 Before the contractor begins any work on the vessel, the TA and the contractor's quality assurance representative must visit the areas where work will take place, including access roads. The contractor's QA representative must take digital photos of each area to demonstrate compliance with the requirements of this document. The Contractor's Quality Assurance Representative must then upload these photos in JPG

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format to a USB drive. Each photo must be dated and identified by the location of the vessel. Copies must be provided to the TA for reference within 48 hours of the start of the contract period.

- S 1.8.2 During the period of work, the contractor must maintain the areas of the vessel that its personnel use to access the work areas. Areas must be kept clean and free of debris and trash must be removed daily.
- S 1.8.3 Areas that present a hazard, as a result of the work under these specifications, must be secured and clearly identified by the contractor. Signs must be posted to inform and protect all personnel in accordance with applicable Canada Labour Code requirements.
- S 1.8.4 At the end of this contract, the Contractor must ensure that all waste generated in the course of the work of this specification is disposed of and that the vessel is as clean as it was prior to the start of the contract period.
- S 1.8.5 Once all known work has been completed and final cleanup has been performed, the contractor's quality assurance representative must visit all areas of the vessel where work has been performed by the contractor. Any deficiencies or damage found must be documented and compared to the photos taken to determine if the deficiency or damage is a result of the work performed by the contractor. If so, the damage must be repaired by the contractor at no cost to the CCG.

S 1.9 Protection against fire

- S 1.9.1 The contractor must ensure that the isolation, removal and installation of fire detection and suppression systems and related components are performed by a qualified technician. When fire detection or suppression systems are deactivated or taken out of service by the contractor during the life of the contract, a qualified technician must recertify that they are fully functional. The original signed and dated certificate must be submitted to the Technical Authority (TA) prior to the end of the contract.
- S 1.9.2 The Contractor must notify and obtain written approval from the Technical Authority prior to disturbing, removing, isolating, deactivating, disabling, or locking out any component of fire detection and suppression systems, including heat and smoke detectors.
- S 1.9.3 The contractor must provide fire protection at all times and therefore also while work is being performed on the vessel's fire detection and suppression systems. This can be done as proposed below, only after obtaining written approval from the TA:

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- a) Only shut down one part of the system at a time;
- b) Keep the system running with spare parts while work is in progress;
- c) Use other methods accepted and approved by the TA.

S 1.9.4 The contractor should be aware that if all necessary precautions are not taken when working on the vessel's fire suppression systems, an accidental release of extinguishing agents may result. The Contractor must then have any containers or systems emptied as a result of such work filled and certified at his expense.

S 1.10 Drinking water service

S 1.10.1 The Contractor must provide all materials and labor to connect the necessary fittings and provide the fresh water required to provide the services described below throughout the period of the work. The Contractor must disconnect the fittings at the completion of the work.

S 1.10.2 The following connections are required in order to perform the work:

S 1.10.3 The contractor must supply and install a 1½ inch hose, certified for potable water service. This connection must be from a source that is certified safe for human consumption by a local municipal or provincial health authority. The contractor must provide a valid drinking water certificate to the inspection authority prior to making the connection. The potable water must be piped through a pressure regulator which includes a pressure gauge and isolation valve. The potable water pressure must be maintained at fifty (50) psi gauge. Water consumption is approximately 10 tons/day. The capacity of the tank for filling the 2 drinking water tanks is 135m³.

S 1.11 Project installation

S 1.11.1 The following items must be provided at the contractor's site:

S 1.11.2 Six parking spaces must be provided for Canada's personnel. The spaces must be clearly marked with the name of the vessel. If required, passes must be provided to regular Canada personnel on the project,

S 1.11.3 Canada must have access to the facilities listed above 7 days a week, including evenings from 7 days after contract award until 7 days after acceptance of the Work.

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S 1.12 Meeting room and project meetings

- S 1.12.1 The contractor must invite and inform Canadian Coast Guard personnel of the daily production meetings. The Inspection Authority will participate in these daily meetings and will be responsible for discussing production and inspection activities.
- S 1.12.2 The contractor must provide a room for progress meetings. These meetings will be held every 4 weeks, but may be more frequent depending on the progress of the work and potential issues to be addressed

10.0 SECURITY**10.1 FIRE FIGHTING SYSTEMS**

- 10.1.A.1** The purpose of this section is to perform the annual inspection and maintenance of the various fire fighting systems and equipment on board the vessel.

10.1.B References

10.1.B.1 Equipment data - [not applicable].

10.1.B.2 Drawings and documents

Number of the document	Document title	
06418-20 sheet 1,2,3	Fire fighting plan	
F-3756-06M008.pdf DWG #3	Installation of CO ₂ extinguishing systems (2008)	
F-3756-06M008-001-QCC.pdf	CO extinguishing system ₂	
	08-Fixed extinguishing system	
	Extinguisher recharge details	
	11-extinguishers	

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10.1.B.3 Regulations and standards

10.1.B.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed meets the regulations and standards, as well as other applicable federal, provincial and territorial regulations and standards.

	Title	Included - Yes/No
MSF Procedures		
7.B.2	Protection against falls	Yes
7.B.3	Entry into closed spaces	Yes
Publications		
Standards		
IMO Circ. 1432	Revised guidelines for the maintenance and inspection of fire protection systems and appliances	No
IMO Circ 1318	Guidelines for maintenance and inspections of fixed Carbon Dioxide Fire-Extinguishing Systems	No
Regulations		
	Canada Shipping Act 2001 and Regulations	No

10.1.C Statement of Work**10.1.C.1 General**

10.1.C.1.1 The contractor must ensure that all inspections and maintenance are performed by a firm certified in the field. Prior to commencing any work, the contractor must provide the inspection authority with a valid copy of the relevant certificates.

10.1.C.1.2 After completion of the work, the contractor must restore all premises to their original functional and clean condition.

10.1.C.1.3 The Contractor must provide the equipment, parts, and labor required to recertify the vessel's fixed and portable firefighting systems. These systems, described in the appendix, include the ship's fixed CO2 systems the fixed galley

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system, the MINUTEMAN II and the flight deck Fire Combat, and the portable fire extinguishers.

10.1.C.1.4 The technician will be accompanied at all times by a ship's deck officer. This work must be coordinated with the Technical Authority to ensure that there is a deck officer on board. The contractor must provide a schedule to the technical authority as soon as possible.

10.1.C.1.5 The work must be completed to the satisfaction of an ABS inspector and the inspection authority.

10.1.C.1.6 Following the examination and testing of the systems listed below, the contractor must submit in triplicate to the inspection authority:

- a) A hydrostatic test certificate for all fixed cylinders and portable extinguishers tested;
- b) A certificate of inspection for fixed cylinders and portable extinguishers.
- c) A certificate of inspection for the MINUTEMAN II Model 150 system and the FireCombat system in the helicopter hangar.
- d) A certificate of analysis of the emulsifier for the MINUTEMAN II system, the FireCombat system and the spare containers stored in the compartment adjacent to the lifeboat (3 different lots).
- e) The inspection must be done by the manufacturer or by a qualified laboratory.

10.1.C.1.7 See attached list of equipment intended for hydrostatic testing or maintenance included in the known work;

- a) 11- Fire Extinguishers
- b) 08- Fixed Extinguishing Systems
- c) 2 cylinders nitrogen 400 cubic feet firecombat system, hydrostatic (10 years) Serial number: 3733186Y and 3733219Y

10.1.C.2 Fixed CO2 system:

10.1.C.2.1 Check for proper operation of all timer systems, visual indications, audible alarms, and shutdowns of the vessel's ventilation systems. Cylinders must be uncoupled to prevent accidental discharge. Ducts must be blown out with dry air, nitrogen or other inert gas.

10.1.C.2.2 For propulsion engine and propulsion alternator suppression systems, remove fusible plugs before blowing with inert gas. Reinstall the plugs at the end of the tests.

10.1.C.2.3 The Contractor must have sufficient full cylinders at the beginning of each day to blow out the ducts for the duration of the inspection to avoid delays. The

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contractor must also have the manpower to reset the alarm system and test at the same time. The contractor must agree on the inspection period with the Inspection Authority.

- 10.1.C.2.4 Demonstrate that all nozzles and distribution lines are free of obstructions. These tests may require disassembly and sealing of portions of the ductwork. Each system must be returned to its original operating condition upon completion of testing at the end of each day.
- 10.1.C.2.5 Verify proper operation of all field and remote activation devices and time delays as well as temperature rise triggers.
- 10.1.C.2.6 Ensure that the hoses connecting the cylinders to the distribution lines are tight and in good condition.
- 10.1.C.2.7 The level of all cylinders in each system must be checked and marked.
- 10.1.C.2.8 It is agreed that fire equipment will be accessible and available in case of emergency and that adequate precautions will be taken when hot work is performed to complete the inspection.
- 10.1.C.2.9 In all cases where a fixed extinguishing agent cylinder is found to be defective, under its normal load, or where a hydrostatic test is required, the contractor will be responsible for removing the cylinder, refilling it, returning it to its original on-board location and connecting it. This work will be processed as an extra via the PWGSC 1379 form.
- 10.1.C.2.10 Labels bearing the contractor's name, date and initials of the person performing the inspection must accompany each system.
- 10.1.C.2.11 Hoses must be replaced according to the list 08-fixed extinguishing system.doc

10.1.C.3 Fixed extinguishing system Pero-chem PCL 300 in the kitchen

- 10.1.C.3.1 The contractor will perform a complete annual inspection of the kitchen's fixed system.
- 10.1.C.3.2 Contractor will verify proper operation of ventilation shutoffs, visual indications and fuses.
- 10.1.C.3.3 Local, remote and automatic operation devices must be verified.
- 10.1.C.3.4 The condition of the cylinder should be checked, its level and the date of the last hydrostatic test.

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10.1.C.3.5 The contractor will be required to install a system-compatible cylinder if the existing cylinder is to be removed to the contractor's facility. The cylinder will only be removed if it needs to be reloaded or hydrostatically tested. This work will be negotiated through the PWGSC 1379 form.

10.1.C.3.6 The contractor must re-label when the inspection is completed.

10.1.C.4 Flight deck fire extinguishing system

10.1.C.4.1 Perform annual inspection and maintenance of the flight deck fixed fire suppression systems: FireCombat and Minuteman

10.1.C.4.2 The contractor must provide sampling containers to collect one AFFF sample from each system: one from the Minuteman system, one from the FireCombat system, and one from each reserve lot specified by the Technical Authority. The results of the analysis of each sample must be provided to the Canadian Coast Guard.

10.1.C.4.3 The contractor must ensure that the powder in the Firecombat system is not compacted due to vibration of the vessel. If the powder is compacted, notify the technical authority.

10.1.C.4.4 Technical information:

- a) MinuteMan fixed system: Foam (container under the nozzle)
- b) Fixed firecombat system: Powder (rear container) and foam (front container)

10.1.C.4.5 Inventory of foam reserves:

- a) 2 Ansul-lite 3% containers in the helicopter workshop.
- b) 2 Ansul-lite 3% containers in the propulsion engine room.
- c) 12 Angus Tridol 3% (AFFF) containers in the boatswain's room.
 - i) 3 Ansul-lite 3% (AFFF) containers in the boatswain's room.
 - ii) 2 Angus Tridol 3% (AFFF) containers in fuel transfer compartment

10.1.C.5 Portable fire extinguishers

10.1.C.5.1 The contractor must perform the annual inspection of all portable fire extinguishers on board the vessel as per the list provided in reference. The inspection must be performed on board the vessel and the timing of the inspection

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must be coordinated with the inspection authority. If for any reason fire extinguishers must be taken ashore, the inspection authority must be notified.

- 10.1.C.5.2 Each extinguisher will be removed from its wall mount and inspected for any discrepancies. Pressure gauges and date of last hydrostatic test will be verified.
- 10.1.C.5.3 All powder extinguishers with cartridges must have the cartridges checked and weighed.
- 10.1.C.5.4 Labels bearing the name of the contractor, date and initials of the person performing the inspection must accompany each extinguisher.
- 10.1.C.5.5 The Contractor will repair, recharge any extinguishers found to be defective, below their normal load and hydrostatically test as required. The contractor will be responsible for removing the extinguishers, refilling them and replacing them in their respective locations. This work will be processed as an extra via the PWGSC 1379 form.
- 10.1.C.5.6 The Contractor must replace the CO₂ fire extinguishers during the time of hydrostatic testing so as to provide protection of the premises during the absence of the ship's fire extinguishers.
- 10.1.C.5.7 It is agreed that fire equipment will be accessible and available in case of emergency. Adequate protection will be taken when hot work is required to complete the inspection.
- 10.1.C.5.8 The list should be used as a reference to determine which extinguishers require special maintenance.
- 10.1.C.5.9 The Contractor must replace the fire extinguishers he lands from the vessel during the time of hydrostatic testing/maintenance/filling with fire extinguishers of the same type and capacity, so as to provide protection of the premises during the absence of the vessel's fire extinguishers.
- 10.1.C.5.10 At the end of the inspection (the date of the inspection), all fire extinguishers must have undergone maintenance and hydrostatic testing in order to be certified for a period of one full year, i.e., until the inspection date of the following year.

10.1.D Proof of performance

10.1.D.1 Inspection points

- 10.1.D.1.1 All work must be completed to the satisfaction of the Chief Officer. The Chief Officer or his representative must be present during inspections.

lifeboat and release system

10.1.D.2 Tests and trials

10.1.D.2.1 The proper functioning of the equipment must be demonstrated to the inspection authority.

10.1.D.3 Certification

10.1.D.3.1 The contractor must submit two hard copies of the inspection certificates to the Technical Authority along with the original copy. The contractor will also send an electronic copy of the certificates to the vessel maintenance manager. Corrective action will be negotiated by PWGSC 1379.

10.1.D.4 Documentation

10.1.D.4.1 The contractor must provide the technical authority with the documents relevant to the certification of the company that will do the work of inspection of the fire systems.

10.1.D.4.2 The contractor must provide the inspection authority with a complete report prior to the end of the work period detailing the work performed, the cause of the failures (if any), the modifications required and the parts replaced.

10.1.D.4.3 The contractor must submit an electronic copy of the report in PDF format to the inspection authority prior to the end of the work period.

10.1.D.5 Training [Not applicable]**10.2 LIFEBOAT AND RELEASE SYSTEM****10.2.A Identification**

10.2.A.1 The purpose of this item is to perform the annual inspection and maintenance of the lifeboat and the lifeboat davit.

10.2.A.2 The lifeboat will be on board the vessel upon arrival at the contractor's facility. The contractor must remove the boat from its davit prior to performing the work, and reinstall it upon completion of the work. The contractor must store the boat during the work period. The contractor must ensure that the boat is protected from damage, weather and dirt. The contractor must lift and handle the boat, this must be done only by the two existing hooks on the boat. In order to avoid stress on the hull and structure of the boat, the contractor must use a lifting device with a spreader bar having lifting points positioned directly above the lifting rings of the lifeboat. The contractor must notify the inspection authority prior to lifting or moving the boat.

lifeboat and release system

10.2.B References**10.2.B.1 Equipment data**

10.2.B.1.1 Boss : Schat-Davit Company Ltd, Type : SPG(L) 9500/4850

- a) The grease used is the white SKF LGWM2/04
- b) The gear oil is Mobil SHC 629

10.2.B.1.2 Characteristics of the lifeboat :

- a) Manufacturer: Watercraft International Ltd
- b) Serial number: 9213262
- c) Size : 8.5 x 2.75 x 2.35 m
- d) Capacity : 60 people
- e) Weight: 4275 kg

10.2.B.2 Drawings and documents -Not applicable -

Drawing number	Title of the drawing / document	Number of sheets

10.2.B.3 Regulations and standards

10.2.B.3.1 IMO, msc.1/circ. 1277

10.2.C Statement of Work**10.2.C.1 General**

10.2.C.1.1 The Contractor must provide material and labor to perform the annual inspection and maintenance of the lifeboat davit and the boat.

10.2.C.2 Chaloupe

10.2.C.3 The contractor must accommodate a visit from a service provider hired by the Coast Guard to perform work different from that described in this section.

10.2.C.3.1 Provide materials and labor to perform the following work on the lifeboat;

10.2.C.3.2 Lower the boat to a safe location on the dock where the work will take place.

10.2.C.3.3 Contractor must make two 3 inch long repairs to the exterior coating. The repairs must be done with gel coat. Defects must be 1/8 inch deep.

lifeboat and release system

- 10.2.C.3.4 floatation foam must be renewed in fender around the lifeboat.
 - 10.2.C.3.5 Check the hull for leaks and repair if necessary.
 - 10.2.C.3.6 Check the SOLAS retro-reflective tapes all over the hull and replace as necessary.
 - 10.2.C.3.7 Check the watertightness of the accessories on the boat's envelope, doors and hatches; seal as necessary.
 - 10.2.C.3.8 Check that the doors and hatches are working properly.
 - 10.2.C.3.9 Check and adjust the gland.
 - 10.2.C.3.10 Check the marine bearing.
 - 10.2.C.3.11 repair all oil, cooling water, fuel and exhaust leaks. Repairs will be negotiated by 1379.
 - 10.2.C.3.12 The contractor must provide services to remove the lifeboat and install it in a location that will be accessible to the company representative hired by the Coast Guard.
 - 10.2.C.3.13 The hull should be cleaned, coated with UV filter, polished and waxed.
-
- 10.2.C.4** The lifeboat will be delivered with the ship.
 - 10.2.C.5** Check the covers.
 - 10.2.C.6** Visual check of the hook release system. "Hanging Off Eye
 - 10.2.C.7** Check the lifting pin of the hook.
 - 10.2.C.8** Test and ensure that the hooks drop simultaneously.
 - 10.2.C.9** Check the hydrostatic function of the release unit with the vessel in the water.

10.2.D Proof of performance**10.2.D.1 Inspection points**

- 10.2.D.1.1 All work must be done according to the manufacturer's requirements and recommendations.
- 10.2.D.1.2 A representative of the Coast Guard must see the leak test

lifeboat and release system

10.2.D.1.3 The chief engineer must see the boat securely stored while the boat is on the dock. Covered if kept on the vessel.

10.2.D.2 Tests and trials

10.2.D.2.1 The contractor must demonstrate watertightness to the technical authority.

10.2.D.3 Certification

10.2.D.3.1 The contractor must submit a copy of the proof of ABS inspection to IA.

10.2.D.3.2 The qualifications of the technician performing the non-destructive testing must be demonstrated.

10.2.E Deliverables

10.2.E.1 Documentation

10.2.E.1.1 The contractor must submit to the inspection authority and the technical authority a complete report detailing the work undertaken, defects, repairs made, measurements and readings taken on all pins, pivots and sheaves.

10.2.E.2 Training - [not applicable]

Asbestos removal in chimneys

10.3 ASBESTOS REMOVAL IN CHIMNEYS**10.3.A Identification**

The objective of this item is to complete the following work on the exhaust pipes of the 6 main engines, 3 service generators and the emergency generator from the exit of their turbo to a height of 20 feet above the mufflers of the main engines Removal of asbestos by a qualified high risk removal company;

- a) Visual inspection;
- b) Ultrasonic thickness readings report submitted to CCG;
- c) Any other repairs required as a result of the inspection and thickness report. Repairs will be handled by 1379.

10.3.A.2 The objective of this item is also to remove all traces of asbestos from the exhaust pipes found in the chimney compartment for the emergency air compressor, boilers and incinerator for the designated sections.

10.3.B References**10.3.B.1 Equipment data**

10.3.B.1.1 The list of diesel engines for which the exhausts must be probed are the following: DP1, DP2, DP3, DP4, DP5, DP6, DA1, DA2, DA3 and Emergency Generator.

10.3.B.1.2 Technical information on silencers:

- DP Silencers : Manufacturer: Maxim
Model: MSA-2
Dimensions: 54 in. dia. × 161 in. length, 22 in. inlet/outlet.
Quantity: A total of 6 mufflers. The silencers are covered with a removable cover and are not covered with asbestos.

10.3.B.1.3 Exhaust line information:

- DP exhaust line from the turbo to the end excluding silencer (each):
Dimensions: 22 in. dia. × 95 ft. long
Quantity: A total of 6 exhaust lines. A distance of 20 feet is to be de-asphalted.
- DA exhaust line from the turbo to the end excluding silencer (each) :
Dimensions: 16 in. dia. × 95 ft. long

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Quantity: A total of 3 exhaust lines. A distance of 60 feet per exhaust line must be removed.

- Emergency generator of exhaust of the turbo at the end excluding silencer (each):
Dimensions: 12 in. dia. × 45 ft. Length
Quantity: A total of 1 exhaust lines
- Emergency compressor exhaust line (section in the chimney):
Dimensions: 3 in. dia. × 80 ft. Length
Quantity: A total of 1 exhaust lines A 60 foot length must have asbestos abatement.
- Incinerator exhaust line (section in the chimney) :
Dimensions: 10 in. dia. × 70 ft. long
Quantity: A total of 1 escape route. A 60 foot length must have asbestos abatement.
- Boiler exhaust line (each) (section in the chimney) :
Dimensions: 18 in. dia. × 76 ft. Length
Quantity: A total of 2 exhaust lines. A length of 40 feet each must have asbestos abatement.
- Ventilation duct :
Dimensions: 18" X 24" dia. × 76 ft. Length
Quantity: A total of 1 conduit over a length of 50 feet of conduit must have asbestos abatement.

10.3.B.2 Drawings and documents

10.3.B.2.1 The following drawings must be considered reference drawings as defined in the Drawings section of the General Notes:

Drawing number	Title of the drawing / document	Number of sheets
M-B0003	22" MSA-2 Spark Arresting Silencer	1
201-10553-06_GCC-MPO_Radisson_HazMat3_20210607	Annual monitoring of hazardous materials management	50
221-750-(1 to 6)	Arrangement of Diesel engine and Boiler exhausts	6

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222-H-101	General Arrangement	3
<i>Cheminée désamiantage 1</i>	Picture of the Stack	

10.3.B.3 Regulations and standards

10.3.B.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed in this section meets the regulations and standards as well as federal, provincial and territorial regulations and standards.

MSF Procedures	Title	Included - Yes/No
Publications		
Workplace Hazardous Materials Information System (WHMIS)/Health Canada	Material Safety Data Sheets (MSDS).	On request
Standards		
Regulations		
Department of Justice Canada	Environmental Protection Act, 1999 (CEPA)	
Department of Justice Canada	An Act respecting labour standards;	
Transport Canada (TC)	Transportation of Dangerous Goods Act, 1992 (TDGA)	
Government of Quebec	Safety code for construction work	
Government of Quebec	Occupational Health and Safety Regulation.	
	Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)	

10.3.B.3.2 DEFINITIONS

Asbestos removal in chimneys

Treated water :	water with a non-ionic surfactant wetting agent added to reduce its surface tension in order to favour a good impregnation of the asbestos fibres.
Contractor:	Contractor to perform the asbestos work as specified in this SOW.
Asbestos materials :	materials that contain 0.1 percent or more asbestos by weight of dry material and are defined in the Existing Conditions section, including loose material and settled dust.
Asbestos removal area:	Where work is being performed that involves or may involve the movement of asbestos materials.
Visitors allowed:	Canadian Coast Guard or its designated representative, and representatives of the appropriate regulatory agencies.
Skilled worker in asbestos removal:	In the case of a specific job, designates a worker: who, by reason of knowledge, training and experience, is qualified to perform the work; who is familiar with the provincial legislation and regulatory provisions that apply to the work; who has knowledge of all potential or actual occupational health and safety hazards associated with the job.
Friable materials :	materials which, when dry, can be crumbled, pulverized or reduced to dust with the bare hands, including materials so crumbled, pulverized or reduced to dust.
Glove bag:	prefabricated glove bag according to the following indications. Polyvinyl chloride (PVC) bag at least 0.25 mm (10 mils) thick. Polyvinyl chloride (PVC) gloves, 0.25 mm (10 mils) thick, with integrated elastic entry ports. Bag with reversible, double zipper pulls located at the top and approximately in the center of the bag. Straps to seal the bag in various places around the pipes.
HEPA vacuum cleaner:	vacuum cleaner equipped with a very high efficiency filtration system, designed to collect and retain 99.97% of fibers with any dimension larger than 0.3 micrometer.
Non-friable materials :	materials which, in their dry state, cannot be crushed, powdered or pulverized by hand pressure.
Area occupied:	any part of the building or site that is outside the asbestos removal area.
Polyethylene :	polyethylene sheeting or tear-resistant polyethylene sheeting with edges, penetrations, nicks, tears, and other interruptions in continuity sealed with tape to provide adequate protection and containment.

Asbestos removal in chimneys

Sprayer:	garden sprayer or airless spray equipment capable of producing a mist or fine droplets. The rate of flow of the sprayer used must be appropriate for the work to be done.
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10.3.C Statement of Work**10.3.C.1 General**

- 10.3.C.1.1 The contractor must hire a company specializing in asbestos in asbestos testing and removal including removal of removable covers on certain sections of the exhaust. This must be completed prior to inspections, surveys and repairs.
- 10.3.C.1.2 The contractor must dispose of asbestos and other hazardous materials in accordance with applicable safety and environmental measures and regulations. The same procedure must be followed for the removal and disposal of existing removable covers that have been identified as containing ceramic fibers.
- i) The contractor must provide a detailed schedule and safety plan for asbestos abatement divided into 4 areas for approval by the CCG. . The priority list of compartments is as follows:
 - b) Propulsion engine room
 - c) Rear engine room
 - d) Front engine room
 - e) The chimney compartment on all levels
- 10.3.C.1.3 The contractor must have all asbestos insulation removed from the remaining exhaust pipes (emergency compressor, boilers (2) and incinerator) in the stack compartment only.
- 10.3.C.1.4 Where permanent asbestos-containing insulation has already been removed, the contractor must install new permanent exhaust insulation material. The new material must have the ability to withstand a constant minimum of 1000 degrees F. The contractor must provide the proposed replacement material MSDS to the TA for approval prior to purchase and installation. The new insulation material must not contain ceramic fibers or other carcinogenic materials. Calcium silicate material such as thermo 12.
- 10.3.C.1.5 Once covered, the contractor must identify all exhausts at all levels in the chimney compartment with high temperature resistant identification plates.

Asbestos removal in chimneys

- 10.3.C.1.6 The contractor must reinstall all accessories as originally installed and to the satisfaction of IA.
- 10.3.C.1.7 The contractor must submit a thickness reading report to IA and TA.
- 10.3.C.1.8 The contractor must submit a complete report to IA and TA detailing all work completed.
- 10.3.C.1.9 The Contractor must provide all labor, materials, tools, lifting equipment, scaffolding, and cleaning supplies to do all work in this specification. The Contractor must perform all corrective work as deemed necessary by the IA and TA.
- 10.3.C.1.10 The Contractor must provide for the installation of work platforms of approximately 20' X 20' on each level of the chimney around the mufflers and surface frames. Upon completion of the work, the contractor must remove the scaffolding/platforms.
- 10.3.C.1.11 The chimney is approximately 80 feet high and 8 stories high.
- 10.3.C.1.12 The mufflers, which are 14 feet high, are mounted in the chimney at the boat deck level. The lower flange can be accessed from the previous level, identified as the Upper Deck. The upper flange can be accessed from the next level, identified as the Officers' Deck. The contractor must remove 10 sections of removable ramps to facilitate the work. The ramps will need to be reinstalled once the work is completed.
- 10.3.C.1.13 The contractor must put safety measures in place to completely confine the high-risk asbestos removal area and prevent parts, tools and debris from falling onto lower floors. Upon completion of the work, the Contractor must remove and dispose of the guards.
- 10.3.C.1.14 The Contractor must remove and dispose of waste materials from work areas at the end of each work day.
- 10.3.C.1.15 Upon completion of the work, the contractor must return the work surfaces to their original clean and serviceable condition.

Asbestos removal in chimneys

10.3.C.2 Asbestos removal

Figure1: Engine exhaust duct insulation

10.3.D Statement of Work**10.3.D.1 WASTE MANAGEMENT AND DISPOSAL**

- 10.3.D.1.1 Remove all packaging materials from the job site and dispose of them at appropriate recycling facilities.
- 10.3.D.1.2 Collect and sort cardboard, paper, plastic and polystyrene packaging and place in separate containers or bags for off-site recycling in accordance with the waste management plan.
- 10.3.D.1.3 Place substances that meet the definition of toxic or hazardous waste in designated containers.

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10.3.D.1.4 Handle and dispose of hazardous materials in accordance with the Canadian Environmental Protection Act, the Transportation of Dangerous Goods Act and applicable federal, state and municipal regulations.

10.3.D.1.5 Ensure that asbestos waste from asbestos removal work is disposed of in accordance with federal, provincial, territorial and municipal regulations. Dispose of asbestos waste in lined and sealed 0.15 mm (6 mils) bags or in leak-proof drums. Carefully mark waste bags or drums with appropriate warning labels.

10.3.D.1.6 Provide manifests listing and describing the waste generated during the course of the work and provide for the transportation of waste containers, by approved means, to accredited landfills for disposal.

10.3.D.2 EXISTING CONDITIONS

10.3.D.2.1 The reports and various information pertaining to the asbestos-containing materials to be removed and disposed of during the course of this work are attached to this Statement of Work.

10.3.D.2.2 Inform the Technical Authority of the presence of any friable material discovered during the course of the work but not indicated on the drawings, statement of work or reports for this work. Do not move such materials until instructed to do so by the Technical Authority. This work will be negotiated by the PWGSC 1379 form.

10.3.D.3 PLANNING

10.3.D.3.1 At least ten (10) days prior to the commencement of the work covered by this section, notify in writing the following persons and agencies:

- i) Canadian Coast Guard.
- ii) Authorities responsible for the disposal of asbestos waste.

10.3.D.3.2 Submit to the Canadian Coast Guard, or its designated representative, a copy of all notices given prior to the commencement of work.

10.3.D.3.3 The sampling report is attached. The project is to be considered a high risk asbestos removal.

10.3.D.3.4 The contractor must submit its project-specific asbestos removal plan. 5 calendar days of Contract Award, but prior to the commencement of asbestos removal work.

10.3.D.3.5 The Coast Guard will send an Industrial Hygiene Technician to verify that the contractor is adhering to the methods they have agreed to follow in their plan.

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10.3.D.3.6 The contractor must take an air sample outside his asbestos work area during demolition and after the work.

10.3.D.3.7 The contractor must take corrective action if asbestos is found outside the protected area.

10.3.D.3.8 The contractor must submit proof of training for employees and supervisors of asbestos removal tasks prior to the start of asbestos removal work.

10.3.D.4 Health and safety

10.3.D.4.1 Protective clothing and equipment to be used by workers and visitors when entering the asbestos removal area include the following:

- a) A half-facepiece air-purifying respirator with an N-100, R-100 or P-100 particulate filter, marked for effectiveness and use, providing adequate protection against asbestos and acceptable to the appropriate provincial and federal authorities. The respirator must provide a tight fit over the face of the person unless equipped with a hood or helmet. The respirator must be cleaned, disinfected and inspected after each work shift, or more frequently if necessary, when issued for use by a single worker, or after each use when used by more than one worker. Any part of the respirator that is damaged or deteriorated must be replaced before the respirator is used again. When not in use, the respirator must be stored in a clean and sanitary area. The employer must establish procedures for the selection, use and maintenance of respirators and a copy of these procedures must be given and explained to each worker required to wear a respirator. No worker must be assigned to a task requiring the use of a respirator unless the worker is physically capable of performing the task while wearing a respirator.
- b) Disposable protective clothing that does not retain or allow penetration of asbestos fibres. Protective clothing must be provided by the contractor and worn by each worker entering the work area. This clothing must include full body coveralls with hoods and bands that provide a tight fit at the wrists, ankles and neck to prevent asbestos fibers from reaching the clothing and skin under the protective clothing, and appropriate footwear. Torn protective clothing should be repaired or replaced.

10.3.D.4.2 Eating, drinking, gum chewing and smoking are prohibited in the asbestos removal area.

10.3.D.4.3 Before leaving the asbestos removal area, the worker may decontaminate protective clothing, without removing it, using a HEPA vacuum or damp cloth, or, if the clothing will not be reused, place it in containers for dust and waste. These

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containers must be: dust and asbestos tight; capable of handling this type of waste; marked as containing asbestos waste; and cleaned with a damp cloth or HEPA vacuum immediately before removal from the work area. In addition, these containers should be removed frequently, at regular intervals.

10.3.D.4.4 Ensure that workers wash their hands and face when leaving an asbestos removal area. Note that there is no ship's facility available for these purposes.

10.3.D.4.5 Ensure that the respirator mask of any worker entering the asbestos removal area is not compromised by facial hair or hair.

10.3.D.4.6 Visitor Protection:

- a) Provide protective clothing and approved respirators to authorized visitors who are required to enter the asbestos removal area.
- b) Instruct authorized visitors in the use of protective clothing and respirators and inform them of the procedures to follow.
- c) Instruct authorized visitors on how to enter and exit an asbestos removal area.

10.3.D.5 Product

10.3.D.5.1 MATERIALS/MATERIALS

- a) Cover and containment sheets
 - i) Polyethylene sheets: 0.15 mm thick.
 - ii) Reinforced polyethylene sheets: fibre reinforced woven, 0.15 mm thick, bonded on each side to a polyethylene sheet.
- b) Wetting agent: solution composed of 50% polyoxyethylene ester and 50% polyoxyethylene ether, mixed with water in sufficient concentration to ensure good impregnation of asbestos materials.

10.3.D.5.2 Containers of asbestos waste: deposit the waste in lined containers.

- a) The inner liner must be a prefabricated polyvinyl chloride (PVC) glove bag at least 0.25 mm (10 mils) thick.
- b) The outer casing, into which the inner casing will be inserted, must be a sealable container made of fiber or metal when the waste contains sharp-edged elements; otherwise, the outer casing may be a simple sealable bag made of fiber or metal, or a second sealable polyethylene bag 0.15 mm (6 mils) thick.

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- c) Labelling Requirements: Place a printed warning label, in both official languages, indicating the hazards associated with asbestos on all containers of asbestos waste so that it is clearly visible once the container is sealed and ready for disposal.

10.3.D.5.3 Glove bag

- a) Acceptable products: Safe-T-Strip brand products of the appropriate model for the work to be performed, or equivalent products approved by the technical authority.
- b) The glove bag must be equipped with the following:
 - i) sleeves and gloves permanently sealed to the body of the bag so that the worker can access and handle the insulation;
 - ii) Valves or openings that allow the introduction of a suction hose and the nozzle of a water sprayer while maintaining a seal with respect to the hose, duct or other similar element;
 - iii) tool holder with a drain;
 - iv) seamless bottom and means to seal the bottom of the bag;
 - v) removable straps if the bag is to be moved during operations.

10.3.D.5.4 Tape: of the type that can seal polyethylene sheets to different surfaces, both in dry and wet environments with treated water.

10.3.D.5.5 Encapsulant: Type 2, waterborne, Class A, approved by the Canadian Coast Guard or its designated representative.

10.3.D.6 Execution

10.3.D.6.1 SUPERVISION

- a) At least one supervisor must be designated for every ten workers.
- b) A licensed asbestos removal supervisor must remain in the asbestos removal area at all times during the movement, removal or other handling of asbestos materials.

10.3.D.7 STEPS TO FOLLOW

10.3.D.7.1 The Contractor must make the necessary health and safety arrangements.

10.3.D.7.2 Prior to the start of work, post warning signs at each access to an asbestos removal area that read: "CAUTION - ASBESTOS FIBRES - DANGER (25 mm)/ PERSONNEL ONLY (19 mm)/ Wearing of SIGNED PROTECTIVE EQUIPMENT IS MANDATORY (19 mm)/ INHALATION OF ASBESTOS

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DUST CAN CAUSE SERIOUS BODILY INJURY (7 mm)". The notice must be written in both official languages and in capital letters "Helvetica Medium". The numbers in parentheses indicate the type size to be used.

10.3.D.7.3 Removal of lagging from piping using glove bags:

- a) Glove bags must not be used to remove lagging from a pipe, duct, or similar item when:
 - i) It may not be possible to maintain a good seal for any reason, including:
 - ii) the condition of the insulation;
 - iii) the temperature of the pipe, duct or similar element.
- b) The glove bag could be damaged for any reason, including
 - i) the type of sheath;
 - ii) the temperature of the pipe, duct or similar element.
- c) Prior to any work being done, the steam supply or equipment connected to the exhaust pipes must be shut down by the Canadian Coast Guard at least 24 hours before any work is done on the pipes in a given sector.
- d) When installing the glove bag, check for damage or defects and repair or replace as necessary. The glove bag should be inspected at regular intervals and repaired or replaced as necessary. The asbestos-containing contents of a damaged or defective glove bag should be wetted. The bag, with its wet contents, must be removed and disposed of in a designated container. No damaged or defective glove bag must be reused.
- e) Place the tools needed to remove the lagging in the tool holder. Wrap the bag around the pipe and seal it.
- f) Slip your hands into your gloves and use the necessary tools to remove the lagging. Distribute the removed lagging in the lower part of the bag.
- g) Insert the nozzle of the garden sprayer into the bag and thoroughly wash the pipe section and the inside of the bag. Proceed in such a way as to wet the surface of the lagging in the lower part of the bag.
- h) Before removing the bag, once the pipe has been stripped, thoroughly wash the top of the bag and the tools. Evacuate air from the top of the bag through the flexible valve using a HEPA vacuum. Thread the polyethylene waste container over the glove bag before removing the bag. Release one of the straps and remove the freshly washed tools from the bag. Place the tools in a container filled with water. Fold the polyethylene bag into the waste container and seal it.

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- i) After removing the bag, check that no residue remains on the piping. Remove any residual particles with a HEPA vacuum or damp cloths. Ensure that no mud remains on the surfaces to prevent asbestos dust from being suspended from the dried mud. Seal exposed pipe surfaces and lagging ends with a slow drying sealant to encapsulate any residual fibres.
- j) At the end of each work period, cover the exposed ends of any section of undecontaminated pipe lagging with polyethylene sheeting taped in place.

10.3.D.7.4 All work must be visually inspected by the Technical Authority or its representative. If a visual inspection reveals that areas adjacent to the work have been contaminated, these areas must be fully contained and thoroughly cleaned.

10.3.D.8 Cleaning

10.3.D.8.1 Photos are provided showing the environment in which the exhausts are placed. Some removable covers are installed over the boiler exhausts, the insulation of some wall sections are made of perforated grid insulation and the underside of the work area is an open grating space that joins 2 engine rooms.

10.3.D.8.2 Remove asbestos-containing dust and debris with a HEPA vacuum or damp cloths at frequent intervals during the work and upon completion of the work.

10.3.D.8.3 Place asbestos-containing dust and waste in sealable waste bags. Treat polyethylene sheeting and disposable protective clothing as asbestos waste; wet and fold to contain dust, then place in waste bags.

10.3.D.8.4 Clean each bag containing waste with wet cloths or a HEPA vacuum immediately prior to removal from the asbestos removal area, then place in a second uncontaminated waste bag.

10.3.D.8.5 Seal waste bags and remove from site. Dispose of asbestos waste in accordance with federal and provincial requirements. The contractor must supervise the disposal of asbestos waste and ensure that the landfill operator is fully aware of the hazards associated with the material being brought to the landfill and that the guidelines and regulations for the disposal of asbestos materials are followed.

10.3.D.8.6 Complete a thorough HEPA vacuuming of the asbestos removal areas and adjacent areas affected by the work.

10.3.D.9 Re-insulation of pipes

10.3.D.9.1 The contractor must re-insulate the pipes upon completion of the inspection.

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10.3.D.9.2 The contractor must insulate the steam lines with 1.5" of insulation. Joints must be sealed. The material used must have a marine approval. Technical documentation on the material must be submitted to the technical authority.

10.3.D.10 Re-insulation of exhaust outlets

10.3.D.10.1 Contractor must re-insulate exhaust pipes with removable insulating blankets. With mesh inside and temperature resistant material for exhaust outlet.

10.3.D.10.2 Where permanent insulation containing asbestos has been previously removed, the contractor must install new permanent exhaust insulation material. The new material must have a resistance rating at a constant minimum of 1000 degrees F. The contractor must provide the proposed replacement material MSDS to the TA for approval prior to purchase and installation. The new insulation material must not contain ceramic fibers or other carcinogenic materials.

10.3.D.10.3 Proof of performance

10.3.D.11 Inspection points

10.3.D.11.1 The Coast Guard reserves the right to have an industrial hygiene technician inspect the asbestos removal work. This technician is at the expense of the Coast Guard. This technician will ask to see the preventive measures taken by the contractor to ensure compliance with the statement of work and the standards in force.

10.3.D.11.2 The contractor must take and have analyzed an air sample outside of his asbestos work area during demolition and after the work.

10.3.D.11.3 Regulatory Authority Requirements: Comply with local, provincial and federal government requirements for asbestos protection. In the event of a discrepancy between these requirements and those contained in these specifications, the more stringent requirements must prevail. Comply with regulations in effect at the time the work is performed.

10.3.D.11.4 A visual inspection by the technical authority prior to the start of the re-insulation of the pipes.

10.3.D.11.5 The contractor must coordinate with IA to perform a final cleanup inspection prior to the removal of the asbestos removal insulation parrots.

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10.3.D.12 Tests and trials

10.3.D.12.1 A dust test must be done by a firm hired by the contractor.

10.3.D.12.2 In reference to 10.3.D.3.6, the contractor must provide test results.

10.3.D.12.3 De facto air tests before dismantling

10.3.D.13 Certification

10.3.D.13.1 The contractor must provide the TA with a certificate of disposal of hazardous materials.

10.3.D.14 Documentation

10.3.D.14.1 Prior to the commencement of work, the contractor must provide documentation to the Canadian Coast Guard demonstrating that all workers have received: adequate training regarding the risks of asbestos exposure; personal hygiene measures; proper work procedures; use of glove bags and rules for their use; cleaning and disposal of respirators; and protective clothing.

- a) The contractor must provide documentation that supervisory personnel have completed an asbestos removal course of at least 2 days duration. At least one supervisor must be designated for each group of ten workers.

10.3.D.14.2 The Contractor must submit to the Technical Authority prior to the end of the work period:

- a) documentation that satisfactorily demonstrates that appropriate arrangements have been made for the receipt and proper disposal of asbestos waste. Ensure that the landfill operator is well informed of the hazards associated with the materials brought to the landfill and is aware of the appropriate methods for disposal.
- b) documentation demonstrating that the contractor has liability insurance covering the asbestos removal work.
- c) all tracking slips confirming that the asbestos waste was received and disposed of properly.
- d) documentation that all workers have received adequate training and education regarding the risks associated with: exposure to asbestos; personal hygiene; use of respirators; required protective clothing; entry/exit procedures for asbestos removal areas; techniques and safeguards to be followed while working in an

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asbestos removal area; use, cleaning and disposal of respirators; and protective clothing

- e) Material Safety Data Sheets (MSDS) for materials and chemicals used.
- f) documentation showing that the operation and fit of the respirators issued to each worker has been verified and tested.

10.3.D.15 Training (N/A)

Steel replacement for rear structure

11.0 HULL AND STRUCTURE**11.1 STEEL REPLACEMENT FOR REAR STRUCTURE****11.1.A Identification**

11.1.A.1 The purpose of this item is to perform a repair to the rear structure of the vessel.

11.1.B References**11.1.C Equipment data**

11.1.C.1.1 Steering gear compartment. Aft structure.

11.1.C.2 Drawings

11.1.C.2.1 All drawings are listed in the General Notes. The following drawings are to be considered as reference drawings as defined in the Drawings section of the General Notes.

Drawing number	TITLE OF THE DRAWING	Number of sheets
221-H-16	Web FRS & FRS - FRS A-Aft (MN- Upper DK)	1
221-H-11	Floors FRS A-AFT inc rudder trunk	1
221-H-1	Shell expansion	1
221-H-33	Bridgefront & Topsides	1
221-H-30	Upper Deck	1
NT-2369-11-DE001A-EX01	Mooring Equipment	1
221-h-139 221-H-13902	Profile and decks	1
221-730-1_04	Arrgt of Sprinkler & deck scuppers (flight & Boat deck)	1
221-H-34	Flight and boat deck	1
F3065-210824 photos	Photos and details	1
Flight deck	Photo flight deck	1

11.1.C.3 Regulations and standards

11.1.C.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed in this section meets the regulations and standards as well as federal and territorial regulations and standards.

Steel replacement for rear structure

Fleet Safety and Security Manual (FSM) Procedures	Title	Included - Yes/No
	Coast Guard Lockout	
Publications		
Standards		
	IACS 47 Shipbuilding and repair Quality standard	
CT-014-000-ES-TD-002	Computer Aided Design and Drafting (CADD) using AutoCad	yes
Welding specification-fra	Welding specification	yes
Regulations	Canada Shipping Act and Regulations	

11.1.D Statement of Work**11.1.D.1 Dismantling and removal of equipment**

11.1.D.1.1 It should be noted that all painted surfaces must be reported as lead contaminated.

11.1.D.1.2 Flight deck

- a) The net and attachment posts must be removed during the work. The contractor must reuse them later on new anchor points manufactured by the contractor.
- b) The contractor must remove the damaged steel from the stern of the vessel to the 2nd and 3rd deck beam

11.1.D.1.3 Steering apparatus

- a) To gain access, the contractor must remove the storage cabinets aft of the steering gear room. New storage will need to be reinstalled after the work. A metal cage must be removed to gain access to the work area.
- b) A steam unit heater and its piping must be temporarily removed to allow access to the work.
- c) The Contractor must cover all equipment in the room to protect it.

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11.1.D.1.4 Tween Deck

- a) The contractor must temporarily remove 2 rectangular ventilation ducts that pass through the ceiling of the tween deck for a length of 12 feet each. One is on the port side and one on the starboard side.
- b) The tween deck has electrical components that must be removed during the steel work period. Anything removed will need to be reinstalled once the steel repairs are completed.
- c) A pedestal roller must be removed for steel replacement.

11.1.D.2 Steel work

11.1.D.2.1 The contractor must arrange for welding inspections by a representative of an outside inspection company. One before the start of the work and one during the work.

11.1.D.2.2 Flight deck

- a) Cut and remove collision deformed steel and replace with new steel. Grade A certified.
- i) Transverse diaphragm ("I" beam) is made of 1/2" steel and measures 18" X 8" and measures 18 feet. Secondary longitudinal, 3/8" thick "L" section 4" X 7".
- ii) Contractor must make transits for ventilation ducts through the I-beam cross member and transits for electrical cables.
- iii) Replace anchors for retractable flight deck net posts. Manufacture as existing.

11.1.D.2.3 Two flight deck drains need to be rebuilt and reattached to the inter-deck drain that exits through the bulwark. The tween deck section is not damaged. Each of the two pipes can be estimated to be 6 inches in diameter and 10 feet long schedule 80 with 2 bends to bring the pipe closer to the bulwark. Supports to reattach the pipes must be reinstalled.

11.1.D.2.4 Fabricate and install a stern light bracket that complies with the Collision Regulations, Schedule I Location and Specifications of Lights and Markings. Part "A" rule 21.

11.1.D.2.5 The flight deck contour plate must be replaced aft of the vessel.

11.1.D.2.6 Bulwark:

- a) The contractor must remove the bulwark aft.

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- b) Deck equipment. One of the pedestal rollers must be removed to allow for deck replacement.
- c) The contractor must build a box to support the 3 rollers.
- d) The contractor must replace the steel between the bulwark and the flight deck on the port side only.

11.1.D.2.7 Steering gear room :

- a) Contractor must fabricate and replace center beam ½" with 5" reinforcement. From the upper deck to a distance of 3" above the Stringer H.
- b) Contractor must fabricate and replace Cant FR #8 ½" web with 5" reinforcement. From the top deck to a distance of 3" above the Stringer H.
- c) Contractor must replace 5 top deck chords up to 3 inches above the H stringer.
- d) Contractor to do J stringer replacement.
- e) The back sheets must be renewed. A Lloyd's D ½" plate. Boundaries are to be considered as between chord 1 and 2 starboard up to 7

11.1.D.2.8 Deck equipment

- a) The contractor must replace the following: the Tow Roller at the rear of the vessel. The triple rollers and their base.
- b) The contractor must consider deck equipment that is an encumbrance to the steel work.
- c) Considerations for aft ballast tank vent, port mooring bits and roller on pedestal.

11.1.D.3 Electrical work

11.1.D.3.1 The contractor is responsible for taking all necessary measures for lockout according to the Canadian Coast Guard standards.

11.1.D.3.2 All electrical components that are temporarily removed must be reinstalled. With wire supports and guides where wires must pass through steel beams to protect the wires.

11.1.D.3.3 The contractor must remove two projector style lights attached to the rear of the flight deck during the work. The lights and their wires and junction boxes must be removed during the steel work and replaced afterwards.

Steel replacement for rear structure

- 11.1.D.3.4 Contractor must remove the lights screwed into the flight deck. Remove the 2 wires and the junction boxes during the work period. The contractor must reinstall these lights after the steel work. These lights are screwed in.
- 11.1.D.3.5 A talkback communication unit is installed on the steerage ceiling structures and must be removed during construction and reinstalled.
- 11.1.D.3.6 A phone in a waterproof box is located at the back of the transom and must be removed for reinstallation.
- 11.1.D.3.7 A surveillance camera, with junction boxes and such, is located at the rear of the inter-deck and must be removed for reinstallation.
- 11.1.D.3.8 The navigation lights have electrical outlets that are attached to a structure below the flight deck. A new support must be built and new electrical outlets installed.

11.1.D.4 Painting and cleaning

- a) The contractor must repaint the interior and exterior of all steel that has been replaced. The contractor must provide a paint application report.
- b) The interior spaces must be painted with a new steel primer. Special preparation must be done on the welds to create a bonding profile as required by the paint manufacturer.
- c) A stripe coat must be applied.
- d) Hull steel above the waterline. The paint system currently in place is: Intergard 264 Light grey 125 microns; Intergard 264 red 125 microns; Interthane 990 50 microns; Interthane 990 50 microns. The color is RAL 3000 and white for the letters RAL 9003
- e) White ceiling: Primer - Interprime CPA 235 (white)
- f) Topcoat - Interlac 665 Signal white
- g) Interior of the bulwarks Primer - Interprime CPA 234 (red)
- h) Topcoat - Interlac 665 Hull Red Ral 3000
- i) Interdeck Primer - Interbond 201 Red Deck (Silica used as an anti-skid in the primer)
- j) Topcoat - Interthane 990 Red

Steel replacement for rear structure

- k) Black Docking Accessories: Primer - Interprime CPA 234 (red)
- l) Topcoat - Interlac 665 Black
- m) Flight Deck: Primer - Interbond 201 Red Deck (Silica used as an anti-skid in the primer)
- n) Topcoat - Interthane 990 Red
- o) Yellow lines - Interlac 665 Ral 1021
- p) Black helicopter landing zone : Wälh Bed Liner, Series WBL
- q) White lines (H heli) - Interlac 665 Signal white

11.1.D.4.2 Symbolization

- a) The contractor must provide cut letters to weld the letters identifying the vessel. The letters to be replaced are **P I E R R E R A D** and **O T T A W A** of Ottawa. The size of the letters should be verified with the letters present. For evaluation consider 18 inches high.

11.1.D.5 Insulation and perforated aluminum

- 11.1.D.5.1 The contractor must re-insulate with a 4 inch rock wool material with marine approval. With a 100% permeable membrane installed over over 3M Venture Clad style with marine approval . The ceiling of the steering gear from
- 11.1.D.5.2 The contractor must install according to the insulation manufacturer's methods for nail spacing and member placement.
- 11.1.D.5.3 The contractor must install a mechanical protection on the perforated aluminum insulation. The shape of the rear hull from starboard frame 6 to port frame 12. Ceiling to deck. And the ceiling of the steering gear consider

11.1.D.6 Storage units

- 11.1.D.6.1 The contractor must supply and install two navy blue storage units with doors and locks (7 shelves W-42" D-24" H75") and two navy blue storage units with doors and locks (7 shelves W-42" D-24" H87"). The contractor must fix these 4 storage units on the deck.

Steel replacement for rear structure

11.1.E Proof of performance

11.1.E.1 Inspection points

- 11.1.E.1.1 The chief engineer must see the paint paint before the insulation is installed.
- 11.1.E.1.2 The chief mechanic and ABS inspector must see all welds before the paint is applied

11.1.E.2 Tests and trials

- 11.1.E.2.1 Each weld must be checked by the contractor before being verified by an external certified technician.
- 11.1.E.2.2 All welds must be inspected by a Level 2 technician for visual and magnetic particle testing and non-destructive testing fees must be included.

11.1.E.3 Certification

- 11.1.E.3.1 The steel used must be certified by a recognized classification society. The vessel was built with Lloyd's certified steel.
- 11.1.E.3.2 The non-destructive testing technician must be certified. Natural Resources Canada.
- 11.1.E.3.3 Welders must be CWB Schedule M certified.

11.1.E.4 Documentation

- 11.1.E.4.1 A steel replacement drawing of the completed work must be provided upon completion of the work. The format of the drawings must be in accordance with the
- 11.1.E.4.2 The numbers of the steel plates with their traceability must be documented. The final location of each steel plate must be documented.
- 11.1.E.4.3 All steel certifications must be provided by the end of the work period.
- 11.1.E.4.4 Non-destructive test reports must be provided before paint is applied.
- 11.1.E.4.5 Contractor must provide TA with electronic copies of the reports in PDF format.

11.1.E.5 Training[- not applicable]

Window work in the wheelhouse

11.2 WINDOW WORK IN THE WHEELHOUSE**11.2.A Identification**

11.2.A.1 The contractor must replace a 3/4 inch thick window of 71 " X 47thick window provided by the Coast Guard and install a port side cover.

11.2.B References**11.2.C Equipment data**

11.2.C.1.1 Rear window of the wheelhouse.

11.2.C.2 Drawings

11.2.C.2.1 All drawings are listed in the General Notes. The following drawings are to be considered as reference drawings as defined in the Drawings section of the General Notes.

Drawing number	TITLE OF THE DRAWING	Number of sheets
Photo wheelhouse	Photo of the window	

11.2.C.3 Regulations and standards

11.2.C.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed in this section meets the regulations and standards as well as federal and territorial regulations and standards.

Fleet Safety and Security Manual (FSM) Procedures	Title	Included - Yes/No
	Coast Guard Lockout	
Publications		
Standards		
	IACS 47 Shipbuilding and repair Quality standard	
Regulations	Canada Shipping Act and Regulations	

11.2.D Statement of Work**11.2.D.1 Dismantling and removal of equipment**

Window work in the wheelhouse

11.2.D.1.1 Contractor to remove and dispose of window. Port side. For installation of a new window provided by the Coast Guard.

11.2.D.1.2 Contractor must remove and dispose of the starboard side window. Contractor must supply and install a sheet of lexan. For the starboard window.

11.2.D.2 Electrical work

11.2.D.2.1 The contractor is responsible for taking all necessary measures for lockout according to the Canadian Coast Guard standards.

11.2.D.2.2 The contractor must remove the heating elements for reinstallation.

11.2.D.3 Installation

11.2.D.3.1 The contractor must provide a gasket and sealant for the installation of a temporary replacement window and panel.

11.2.D.4 Painting and cleaning

11.2.D.4.1 The window frame should be cleaned inside and out. The cleaning should include a cleanup to remove all

11.2.D.5 Interior finish

11.2.D.5.1 Inside the wheelhouse, wall panels and moldings must be removed to access the work area.

11.2.E Proof of performance

11.2.E.1 Inspection points

11.2.E.1.1 The chief mechanic must see the preparation of the window frame.

11.2.E.2 Tests and trials

11.2.E.2.1 The contractor must demonstrate to the chief engineer the tightness of the window by performing a fire hose test.

11.2.E.3 Certification[- not applicable]

11.2.E.4 Documentation

11.2.E.4.1 A report of the work must be submitted to the Technical Authority.

11.2.E.5 Training[- not applicable]

OPTIONAL Rearrangement Battery Compartment

11.3 OPTIONAL REARRANGEMENT BATTERY COMPARTMENT**11.3.A Identification**

- 11.3.A.1** A new survival suit storage area is to be created in the existing battery room: Space #317 on the aft officer's deck, main deck, starboard side.
- 11.3.A.2** The battery room must be moved forward and to the port side UPS room #318. The existing port aft stowage space No. 320 must be converted to a passageway to allow cross flow from the open port outer deck to the new starboard survival suit stowage space.
- 11.3.A.3** The spaces described above are contained longitudinally from the engine room envelope division aft of frame 102, to the forward division, including the accommodation spaces forward of frame 106. Transversely, the work area is bounded by port and starboard longitudinal exterior bulkheads. The space is bounded as follows: Vertically, by the officer's deck; below, by the mechanical and HVAC spaces; above, by the navigation bridge deck and the open deck. The ceiling height inside the space is 2585 mm.
- 11.3.A.4** To create the passageway described above, the existing longitudinal bulkhead located 1219 mm to port of the centerline of the vessel must be pierced with an opening. This opening must be a simple opening to access the survival suit storage area from the port side exterior passageway. The passageway must have a steel spray door on the port side. The new survival suit storage area will provide access to the lifeboat areas through a similar existing spray tight door on the starboard side.
- 11.3.A.5** The passageway has a steel splashproof door on the port side. The new survival suit storage area will allow access to the lifeboat areas through a similar spray-proof door on the starboard side.
- 11.3.A.6** The existing equipment in the three existing spaces (317, 318, and 320) should be removed and the majority of this equipment should be relocated to the adjacent spaces. It should be noted that several existing items are to remain in their current locations, such as the existing CO2 suppression system and cylinder, ductwork, and lighting in the walk-through area. There are two 2 existing steam heating units that must remain in their current location.
- 11.3.A.7** All 3 spaces will be fully cleaned and prepared for their intended new use.
- 11.3.A.8** Install three (3) different sized storage units to allow for the storage of a minimum of 92 different sized survival suits Reference: Component Location and Positioning

OPTIONAL Rearrangement Battery Compartment

Diagram for Rooms 317-318-320. Shelving units must be provided by the Coast Guard. Contractor must provide attachment to deck.

- 11.3.A.9** Survival suits will also be provided by CCG. To secure these three (3) storage units, three (3) welded steel foundations will need to be constructed and welded to the deck.

11.3.B References

11.3.B.1 Equipment data (N/A)

11.3.B.2 Drawings

- 11.3.B.2.1 All drawings are listed in the General Notes. The following drawings are to be considered as reference drawings as defined in the Drawings section of the General Notes .

Drawing number	TITLE OF THE DRAWING	Number of sheets
19077-503-A-045	Battery & Survival Suit Room Arrangement	
19077-503-S-055	Passageway Bulkhead Modification	
19077-503-A-056	Fire Zone Arrangement	
19077-503-A-057	Relocation & Foundations	
PRD- DCC 317-318-320 proposal 2020-02-14.pdf	Positioning and location diagram of the components of rooms 317-318-320	

11.3.B.3 Regulations and standards

- 11.3.B.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed in this section meets the regulations and standards as well as federal and territorial regulations and standards.

MSF Procedures	Title	Included - Yes/No
Publications		
Standards		
ASHRAE 62.1-2016	Ventilation for Acceptable Indoor Air Quality	

OPTIONAL Rearrangement Battery Compartment

ASME B16.11- 2016	Forged Fittings, Socket-Welding and Threaded	
ASME B16.34- 2017	Flanged, Threaded, and Welding End Valves	
ASME B31.3-2016	Process Piping	
ASTM A29-16	Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought	
ASTM A53-12	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc- Coated, Welded and Seamless	
ASTM A108-13	Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished ASTM A123-17 Standard Specification of Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	
ASTM A653-17	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process	
ASTM A924-17a	Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process	
ASTM C585-10	Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing	
Pipe and Tubing		
ASTM D1418-17	Standard Practice for Rubber and Rubber Lattices - Nomenclature	
CAN/ULC S102, Ed. 7	Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies	
Building Materials		

OPTIONAL Rearrangement Battery Compartment

and Assemblies		
CSA C22.2 No. 100-14	Motors and Generators	
IEC 60034-1:2017	Rotating Electrical Machines - Part 1: Ratings and Performance	
IEC 60034-11:2017	Rotating Electrical Machines - Part 11: Thermal Protection	
MIL-PRF-22344E	Performance Specification - Insulation, Pipe, Thermal	
NEMA 250-2014	Enclosures for Electrical Equipment (1000 Volts Maximum)	
NEMA MG-1-2016	Motors and Generators	
SMACNA 006-2006	HVAC Duct Construction Standards - Metal and Flexible	
TP 11469 E (1993)	Guide to Structural Fire Protection	
UL 1004-1, Ed. 2	Rotating Electrical Machines - General Requirements	
IACS No. 47 - Part "B" -	Shipbuilding and Repair Quality Standard	

11.3.C Statement of Work**11.3.C.1 Preliminary inspection**

11.3.C.1.1 The Contractor must perform a detailed survey of the existing #317, #318 and #320 spaces. If unsafe conditions, unusual shape, deterioration, undocumented holes in remaining bulkhead divisions, or significant damage to pipes, conduits, electrical equipment, alarms, or safety equipment are discovered, the discrepancies must be documented and reported to the Ship's Representative. The three (3) existing splash-proof doors must be inspected for damage. The adjacent vent inlet and outlet covers must also be inspected for damage. If damage is detected, the contractor must notify the TA.

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- 11.3.C.1.2 In adjacent passageways, all fire detection devices, alarms, loudspeakers, electrical switches and safety equipment on the vessel must be either removed or protected from physical damage and/or environmental contamination. When electrical equipment and devices are to be moved or removed, lockout and tagout of circuits supplying these devices must be completed prior to moving or removing the devices.
- 11.3.C.1.3 Note that no work will be done on existing wall or partition insulation, ceiling insulation, or interior finishes. See drawing 19077-503-A-045 for the final layout of the three (3) spaces that will be worked on.
- 11.3.C.1.4 The contractor must inspect adjacent spaces with the ship's representative and note existing conditions. The contractor must note where hot work is to be performed on the deck and bulkheads. Existing conditions must be noted and adjacent spaces must be secured and sealed to prevent dust and contaminants from entering the spaces. Any ventilation inlet and outlet areas that may allow dust and fumes to spread to other areas of the vessel must be properly sealed.
- 11.3.C.1.5 The contractor is responsible for the removal of millwork panels and ceiling tiles. The contractor is also responsible for removing insulation in adjacent spaces where there is a risk of heat exposure. The contractor must also determine if there is any piping or electrical items in areas where there is a risk of hot work damage with the vessel representative. All potentially affected items must be removed or temporarily protected with heat blankets.
- 11.3.C.1.6 Upon completion of the hot work, the removed or protected items must be re-inspected with the ship's representative. If damage is found, the contractor must repair the damage under the direction of the ship's representative. Once all items are determined to be in good condition, the contractor must reinstall insulation, carpenter wall panels and systems, and suspended ceiling.
- 11.3.C.1.7 It should be noted that the existing steam heaters and piping in the port passageway and starboard survival suit space will not be displaced or disturbed. However, the piping may be insulated with materials that may possibly contain asbestos fibers. The steam supply to the two (2) heating units must be shut off according to accepted lockout/tagout procedures. The heating units themselves must be protected from mechanical damage and potential dust accumulation.
- 11.3.C.1.8 The contractor must perform appropriate material testing and air testing to determine if asbestos fibers are present. If asbestos fibers are found, removal will be processed by Form 1379.

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11.3.C.1.9 The contractor must conduct additional air testing to determine if it is safe to work in the spaces before personnel are allowed to begin work in the adjacent work spaces and corridors.

11.3.C.1.10 The contractor is responsible for the temporary supply of fresh air and temporary removal of stale air in the work area. This supply and disposal arrangement must comply with all safety and environmental regulations for the tasks to be performed. The Contractor must be responsible for providing the temporary lighting necessary to perform the work in the spaces, as the ship's lighting in the area will be disabled to allow for the modification of the electrical wiring.

11.3.C.1.11 The contractor must coordinate with the Chief Engineer to isolate, drain, and de-energize any existing vessel systems in the specified work area. All tasks must follow Fleet Safety Manual guidelines for lockout/tagout procedures.

11.3.C.2 Dismantling

11.3.C.2.1 The contractor must be responsible for all removals within the three (3) work spaces and adjacent walkways. The scope of removals must include storage on the vessel and disposal of the removed material. The work must be coordinated with the vessel crew to remove any specialized or specific equipment (as determined by the vessel owner) that requires special attention during removal and storage, which must be reinstalled prior to the vessel's return to service. The contractor must ensure that all removals do not cause damage to adjacent areas. The contractor must coordinate with the vessel TA to determine storage locations for removed and relocated equipment.

11.3.C.2.2 The contractor must remove the following items from the existing Battery Room No. 317 space: Reference Drawing 19077-503-A-057 Relocation & Foundations

- a) Main battery bank, four (4) vertical angles L75x75x8 in the corners, to be removed in order to move them to the new battery room. Contractor must fabricate a new rack for these same batteries.
- b) GMDSS Battery backup for navigation, four (4) angles L65x65x6 to remove. New frames will be fabricated for use in a new location. See diagram PRD-DCC 317-318-320 Proposal 2020-02-14.pdf
- c) The Killark explosion rated light switch on the rear bulkhead at the entrance to the space must be disconnected and removed to be moved to the new battery space.

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- d) The Crouse-Hinds explosion proof motor control switch and Crouse-Hinds explosion proof motor control push button starter on the rear bulkhead at the entrance to the space must be disconnected and removed to be moved to the new battery space.
- e) Two (2) ceiling mounted explosion proof fixtures in the battery storage area must be removed for relocation to the new battery area.
- f) The Appleton ECK2023 explosion-proof receptacle on the interior bulkhead must be removed to be moved to the new battery space.
- g) The Crouse-Hinds explosion-proof switch mounted on the front bulkhead and used as a battery switch for GMDSS batteries must be removed to be moved to the new battery space.
- h) The junction box mounted on the front bulkhead and used for GMDSS battery temperature monitoring should be removed to the same ceiling space above the new storage shelves.
- i) The L01-M018 smoke detector must be removed to be moved to the new battery compartment.
- j) Two (2) 457x910x1820 mm racks must be removed and one (1) 535x540x1820 mm rack must be removed. The crew must provide instructions for storage or disposal.
- k) The storage unit for spare batteries must be removed. The crew must provide instructions for storage or disposal.
- l) Spare batteries should be removed and stored for movement to the new battery room.
- m) The 715x1904x950 mm work bench must be removed. Crew must provide instructions on storage or disposal.

11.3.C.2.3 The contractor must remove the following items from UPS Space No. 318:
Drawing Reference 19077-503-A-057 Relocation & Foundations

- a) A steel insert must be made at the end where 2 water outlets were originally used for air conditioning units to have a continuous deck.
- b) The existing general alarm panel is to be removed and relocated to the rear side of the partition, former storage space #320.

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- c) Five (5) propellers and mounting hardware must be removed from the bulkhead and relocated.
- d) The contractor should note that the UPS identified on the drawings is already removed.
- e) The UPS transformer must be removed and moved.
- f) The UPS switch panel must be removed and relocated.
- g) The Zodiac battery charger disconnect panel must be removed and relocated.
- h) The UPS 30 kVA battery bank disconnect panel must be removed and relocated.
- i) The light switch near the door needs to be removed for reinstallation in the new survival storage area.
- j) The ceiling fixture must be removed.
- k) The plug must be removed for reinstallation in the new survival suit storage area.
- l) The L01-D028 smoke detector must be removed to be moved to the new survival suit storage area.

11.3.C.2.4 The contractor must remove the following items from storage space #320:
Allswater drawing reference 19077-503-A-057.

- a) The separate shelf must be removed. Ship's crew to provide instructions or storage or disposal.
- b) The separate unit, as well as the shelf and cabinet, must be removed. The ship's crew must provide instructions or storage or disposal.

11.3.C.3 Surface preparation

11.3.C.3.1 The contractor must seal the three (3) vacated spaces to prevent dust from escaping from the work area. The spaces must be cleaned of most debris and dust, during and after completion of the work.

11.3.C.3.2 After the space has been cleaned, the contractor must blast the floor surfaces with a low-dust blasting agent. Blasting must be performed in an environmentally friendly manner by capturing the blasting media and the dust generated, while preventing the dust from spreading to other areas of the vessel.

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11.3.C.4 Steel partition work

11.3.C.4.1 The contractor must prepare the internal longitudinal bulkhead that separates the existing starboard battery room from the aft port storage room to cut an opening on 3 sides. The opening must start from the deck surface and continue upward. For cutting details, see drawing 19077-503-S-055 - Passageway Bulkhead Modification. Once the cut is made and all edges and deck surface are ground smooth, a reinforcing pipe should be installed on the 2 vertical edges and on the top horizontal edge.

11.3.C.4.2 The paint on this wall contains lead. Grinding activities must therefore be contained in order to collect the dust and dispose of it according to federal and provincial standards.

11.3.C.4.3 The local work area must be shot blasted as required in Section 11.3.C.3 Surface Preparation. After blasting, the local area must be prepared and painted in accordance with the vessel owner's specifications and Section 11.3.C.7 Floor Painting.

11.3.C.5 New foundation

11.3.C.5.1 The local work area must be shot blasted as required in the Surface Preparation 11.2.C.7 Floor paint Painting.

11.3.C.5.2 Three (3) new corner frames to support the survival suit storage cabinets must be installed. Frames must be made on mitered and welded corners, having 4 sides, made from L150x75x8 corners, with the long leg positioned vertically to the deck. Frames must be welded with a continuous double-sided fillet weld.

11.3.C.5.3 New replacement battery shelves 337 x 1405 mm. Contractor must check with ship's crew to adjust frame size to work with required battery dimensions. The frame must be made with a L65x65x8 perimeter corner frame with four (4) mitered and welded corners. The frame must be installed on the deck with four (4) L65x65x8 vertical corners welded to the deck.

11.3.C.5.4 New double stacked shelf frame for GMDSS and emergency shipping batteries, 480mm x 560mm. Contractor to check with ship's crew to adjust frame size to work with required battery dimensions. The frame must be made with a perimeter corner frame L65x65x8 with 4 mitered and welded corners. The frame must be installed on deck with four (4) L65x65x8 vertical corners welded to the deck.

11.3.C.5.5 The PRD reference drawing - DCC 317-318-320 proposal 2020-02-14

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11.3.C.6 Relocation of equipment and foundations

11.3.C.6.1 The contractor must relocate and install several existing items that were removed at Section. The items must be relocated to new locations in Battery Room #318, Corridor Space #320, and Life Suit Storage Room/UPS Space #317. For location information, see drawing 19077-503-A-057. Relocations must match existing racks.

- a) The Zodiac battery charger disconnect switch moved to the port side interior corridor (space #320).
- b) General alarm panel moved to the front bulkhead inside passageway space #320
- c) Storage of propellers on the bulkhead for five (5) propellers on the rear division inside the passageway space No. 320.
- d) Main battery bank with four (4) L75x75x6 vertical corners, welded to the deck inside the new drum room space #318.
- e) Disconnect panel for the 30 kVA UPS battery bank to a starboard aft location near the door inside the 317 survival suit room area
- f) Transformer for the UPS on the inner longitudinal division move just to the port of the ship axis in the UPS space.
- g) The Killark explosion-proof light switch must be relocated to the entrance of the new battery space #318, replacing the non-explosion-proof light switch previously at that location.
- h) Crouse-Hinds explosion-proof motor control switch and Crouse-Hinds explosion-proof motor control push-button starter relocated near the entrance to the new #318 battery space.
- i) The Appleton ECSK2023 explosion-proof receptacle must be relocated to the entrance in the new #318 battery space, replacing the non-explosion-proof receptacle previously in that location.
- j) Two (2) explosion proof fixtures, relocated to the new battery space #318 replacing the non-explosion proof fixture previously in that location.
- k) Crouse-Hinds explosion-proof switch mounted on the front bulkhead and used as a GMDSS battery disconnect switch must be moved to the new battery space #318 near the new GMDSS battery location

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- l) The L01-M018 smoke detector must be moved to the new battery space #318 by replacing the non-explosion proof smoke detector previously located there.
- m) Non-explosion proof light switch to be relocated to the new survival suit storage area near the door to space #317, replacing the explosion proof light switch previously in that location.
- n) The non-explosive receptacle must be moved to the new survival suit storage area #317 at the interior bulkhead location by replacing the explosion-proof receptacle previously at that location.
- o) Smoke detector L01-D028 must be moved to the new survival suit storage area #317, replacing the explosion proof smoke detector previously in that location.
- p) Two (2) 457x910x1820 mm lockers must be removed and one (1) 535x540x1820 mm locker must be removed. The crew will provide the final location of the lockers.

11.3.C.6.2 The Contractor must ensure that all new and relocated equipment is protected from mechanical damage, dust and moisture for the remaining duration of the work.

11.3.C.7 Floor paint

- 11.3.C.7.1 The contractor must furnish, prepare and apply a painted finish to the exposed areas of the deck within the three (3) spaces. Painting of the deck must be performed after all new and relocated foundations are welded to the deck. The exposed deck area is approximately 24.0 square meters.
- 11.3.C.7.2 The surfacing system must provide adequate slip resistance suitable for an interior space where water and moisture will be present and must be a minimum three (3) layer system. The surfacing system must also be rated for heavy exterior foot traffic.
- 11.3.C.7.3 The complete system must be applied after all hot work, with all welds inspected and repairs made. The complete paint system must be approved by the Chief Engineer prior to ordering.
- 11.3.C.7.4 The primer and first coat must be applied to the interior of the survival suit cabinet foundations. Any additional coats and the top coat must be applied to visible and exposed floor surfaces.

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11.3.C.8 Paint touch-ups

11.3.C.8.1 The contractor must perform all required touch-up painting on partitions and supports where the relocated equipment was installed. Touch-up must be performed after all hot work has been completed for the space in question. Touch-up painting must be performed in accordance with requirements similar to those identified in Section 11.3.C.7 Floor Painting. The finish color must match the current finish color for the surface in question.

11.3.C.8.2 The contractor must apply the final coat to all surfaces of the partitions.

11.3.C.9 Common systems

11.3.C.9.1 Moving the CO2 nozzle and piping

- a) The contractor must remove the existing CO2 application nozzle that is located in space #318 above the UPS unit in its current location. The contractor must inspect the supply piping and controls to ensure that the system is not active and that the CO2 supply is isolated. In addition, the contractor must ensure proper lockout and tagout at the source.
- b) The contractor must inspect the existing piping and plan an extension of the piping routing to the adjacent interior space. The existing CO2 nozzle must be relocated above the top of the UPS to its new planned location. The contractor must provide and install piping to relocate the nozzle as shown on reference drawings 19077-503-A-045 Battery & Survival Suit Room Arrangement and 19077-503-A-057 Relocation & Foundations.
- c) The contractor must also install a penetration (with location to be determined on site) in the longitudinal division between the new battery room and the UPS area. The penetration must meet flag and class requirements and must be considered fireproof and gas tight in design. The contractor must provide the vessel owner with the details of the penetration for approval prior to commencing any work.
- d) The contractor must perform a complete visual inspection and full non-destructive examination of all piping welds associated with the CO2 pipe reroute and perform all required pressure tests. All inspections must be performed in accordance with CAN/CSA and CWB rules and requirements as well as the vessel owner, class and flag requirements. The inspected hose system must be cleaned of debris with a compressed air charge.

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11.3.C.10 Reactivation of steam radiators

- a) The contractor must perform a detailed inspection of both (2) steam radiators as well as a thorough cleaning to ensure that there is no small debris or dust present in the heating units. The steam radiator system must be reactivated and tested in accordance with the performance requirements provided by the vessel

11.3.C.11 Exhaust ventilation battery storage space

- a) The new battery storage area must be equipped with a new exhaust system. The system must include a new explosion proof exhaust fan and required ductwork. The contractor must install an inlet duct leading from a point just above the main battery bank at its new location to the fan in a location to be determined on site and approved by the Chief Engineer. The outlet duct must lead from the exhaust fan to the existing ventilation opening near the door.

11.3.C.12 Modification of the power supply and lighting

- a) Prior to the commencement of removal of any electrical equipment, all circuits must be properly de-energized and isolated as outlined in Section 201. Cables that have been disconnected from removed equipment must be tagged when disconnected

11.3.C.13 Zodiac battery switch

- a) The incoming power cable to the Zodiac battery switch that has been moved to space #320 must be rerouted through space #318 and must pass through a new sealed penetration in the bulkhead separating space #318 from space #320. It must not be necessary to splice the cable in order to reach the new location of the Zodiac charger on the front bulkhead of space #320.

11.3.C.14 General alarm panel

- 11.3.C.14.1 The general alarm panel must be moved from space #318 to space #320 on the opposite side of the same partition where it is currently installed. All cables must be disconnected and labeled with the terminals to which they belong. A new fire rated penetration must be installed in the partition near the bottom edge of the location where the general alarm panel was installed.

11.3.C.15 Main battery bank and disconnect panel

- 11.3.C.15.1 The main 30 kVA disconnect panel previously installed on the front bulkhead of room #318, identified EB-415-C cables as entries. These cables are routed from a penetration in the floor near the door to space #317, along the ceiling through space

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#317, through a penetration in the interior bulkhead and continue through space #318 to the disconnect switch on the front bulkhead of that space. These cables will be reused for both the disconnect switch and the main batteries. The cables should be cut approximately halfway up the bulkhead in space #317. The ends of the incoming cables, coming from below, should be terminated as the entrance to the disconnect switch in its new location near the door to space #317. The remaining length of the EB-415- C cables that run through the space to the old disconnect switch location in space #318 must remain in place and must be used as the disconnect switch feed in its new location to the main batteries. The cut end of the cables extending to space No. 318 must be connected as the disconnect switch outlet. The other end of the EB-415-C cables previously connected to the disconnect switch in space No. 318 must be rerouted locally in that space to connect as an input to the main batteries

11.3.C.16 UPS system and transformer and UPS switch

11.3.C.16.1 The incoming EB 415 power cable to the UPS system originates in space #317 and runs through a penetration in the interior bulkhead to space #318 where it connects to the transformer. The transformer should be moved to the opposite side of the bulkhead and the EB 415 cable feeding it should be removed through the penetration and reconnected to the transformer at its new location in space #317. The cable exiting the UPS switch (UPS cable number 3-1) is routed through the bulkhead to space #317. This cable must also be removed through its penetration of the bulkhead and terminated at the UPS switch in its new location in room #317. Cable EP 415-2 and EP 415-3 between the UPS and the UPS switch must be reinstalled between the UPS switch and the UPS in their new locations in room #317. Cable EP 415-1 between the transformer and the UPS switch must be terminated back into the transformer and UPS switch in their new locations in room #317. All cables must be reused and no cables must be extended. Penetrations through the interior wall that are no longer in use must be sealed.

11.3.C.17 Lighting and outlets

11.3.C.17.1 For the 2 light fixtures and outlet, explosion proof, removed from the old battery space #317 and moved to the new battery space #318, these fixtures must be electrically connected to the existing circuits in place of the non-explosion proof fixtures removed from the new battery space #318. Similarly, the non-explosion proof outlet in the old UPS room #318 must be electrically connected to the existing circuitry in the new survival suit space #317 in place of the removed explosion proof device. The non-explosion proof light fixture removed from the old UPS Space #318 is not suitable for use in the new Survival Suit Space #317 because it is only a single bulb. Instead, a new marine grade fluorescent fixture with 3 T8 bulbs, such as a

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Glamox GKI U or similar, must be purchased and installed in the existing circuit where the explosion proof fixture was removed. The 3 light fixtures in the new #317 survival suit storage area must be field adjusted as needed to provide sufficient lighting for the area after the survival suit cabinets are installed.

11.3.C.18 Smoke detector

- 11.3.C.18.1 For the explosion proof smoke detector removed from the old battery space #317 and moved to the new battery space #318, it must be electrically connected to the existing circuit in place of the removed non-explosion proof devices in the new battery space #318. Similarly, the non-explosion proof smoke detector in the old UPS room #318 must be electrically connected to the existing circuit in the new #317 survival suit space in place of the removed explosion proof device.

11.3.C.19 Exhaust fan

- 11.3.C.19.1 A new explosion proof fan for the new battery space #318 must be installed. The existing Crouse-Hinds explosion proof motor control switch and Crouse-Hinds explosion proof motor control push button starter must be relocated to a location near the entrance to the new #318 battery space to control this fan. The power source is to be determined. The Contractor must consult with the Chief Engineer regarding the preferred source for this power supply. The Contractor must install and terminate the cables from the power source to the motor control switch and from the switch to the fan. The cable must be supported using existing cable trays where possible. A new non-explosion proof motor control switch must be purchased and installed in Space No. 317 to be installed where the explosion proof switch was removed. The switch must be electrically connected using the existing wiring to the fan in that space

11.3.D Proof of performance

11.3.D.1 Inspection points

- 11.3.D.1.1 All work must be inspected by the IA or his/her designee.
- 11.3.D.1.2 A visual inspection of the welds must be performed on the welds of the door opening reinforcements. An inspection of the magnetic particle for the insert that blocks the old AC pipes.
- 11.3.D.1.3 The contractor must perform a function test of the equipment in the presence of the chief engineer.

OPTIONAL Rearrangement Battery Compartment**11.3.D.2 Tests and trials[- not applicable]****11.3.D.3 Certification[- not applicable]****11.3.D.4 Documentation**

11.3.D.4.1 The contractor must provide a complete documentation of findings, reports and results. Documentation must be provided to the Technical Authority prior to the end of the work period.

11.3.D.5 Training[- not applicable]

Cabin Insulation main deck

11.4 CABIN INSULATION MAIN DECK**11.4.A Identification**

11.4.A.1 The objective of this item is to renew the insulation in 7 cabins on the main deck.

11.4.B References**11.4.C Equipment data**

11.4.C.1.1 Cabins: 122,123,124,145,146,147,148. As shown on the insulation plan.

11.4.C.2 Drawings

11.4.C.2.1 All drawings are listed in the General Notes. The following drawings are to be considered as reference drawings as defined in the Drawings section of the General Notes.

Drawing number	TITLE OF THE DRAWING	Number of sheets
221-H-80 sheet 1	Insulation Plan at superstructure decks	1
221-H-80 sheet 2	Insulation Plan at upper & main dks, & 17'-0" Flat	1

11.4.C.3 Regulations and standards

11.4.C.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed in this section meets the regulations and standards as well as federal and territorial regulations and standards.

Fleet Safety and Security Manual (FSM) Procedures	Title	Included - Yes/No
Publications		
Standards	Coast Guard Lockout	
Regulations	Canada Shipping Act and Regulations	

Cabin Insulation main deck

11.4.D Statement of Work**11.4.D.1 Dismantling and reassembly**

- 11.4.D.1.1 Contractor must remove in each of the 7 cabins 1 tall cabinet and a sofa.
- 11.4.D.1.2 The Contractor must remove the wall panels on the hull side.
- 11.4.D.1.3 The contractor must remove the ceiling tiles and rails to gain access to the ceiling insulation work. The diagram shows that most of the ceiling in the room must be removed. Care must be taken when removing the tiles for reinstallation. Each tile is held in place by four screws.

11.4.D.2 Withdrawal

- 11.4.D.2.1 The Contractor must remove all removed insulation.

11.4.D.3 Cleaning and painting

- 11.4.D.3.1 The contractor must prepare the steel surface for coating, remove loose rust and clean. The area to be coated is 10 square meters of touch up.
- 11.4.D.3.2 The paint currently in place contains lead.

11.4.D.4 Insulation materials

- 11.4.D.4.1 Materials used for this project must meet Transport Canada requirements for use on vessels. Materials must be batting, not insulation rolls.
- 11.4.D.4.2 The material is intended for thermal insulation.
- 11.4.D.4.3 A membrane must be used over the insulation material to create a 100% airtight membrane as a vapour barrier. An IMO approved liner system membrane. Embossed aluminum finish. Venture Clad style.

11.4.D.5 Installation

- 11.4.D.5.1 Installation must be in accordance with the manufacturer's installation for a marine installation: the distance between the insulation nails must be respected and the nails must pass over the frames as specified in the installation guide.
- 11.4.D.5.2 A safety cap must be installed on each nail.
- 11.4.D.5.3 The coating membrane must completely seal the insulated area.

Port Cranes - Five Year Inspection

11.4.E Proof of performance

11.4.E.1 Inspection points

- 11.4.E.1.1 The chief engineer should see the steel surface after the old insulation is removed.
- 11.4.E.1.2 The chief engineer must see the painted surface before reinstalling the insulation.
- 11.4.E.1.3 The chief engineer must see the installation of the vapor barrier prior to the reinstallation of the wall panels and ceiling tiles.

11.4.E.2 Tests and trials – Not applicable -

11.4.E.3 Certification

- 11.4.F** Each material must be supplied with a data sheet and a Canadian marine certificate. Vapor barrier membrane and insulation material.

11.4.F.1 Documentation

- 11.4.F.1.1 Technical sheets of the products used

11.4.F.2 Training[- not applicable]

12.0 PROPULSION AND HANDLING [- NOT APPLICABLE]

13.0 ENERGY PRODUCTION SYSTEMS[- NOT APPLICABLE]

14.0 POWER DISTRIBUTION SYSTEMS [- NOT APPLICABLE]

15.0 AUXILIARY SYSTEMS[- NOT APPLICABLE]

16.0 Domestic Systems [- NOT APPLICABLE]

17.0 DECK EQUIPMENT

17.1 PORT CRANES - FIVE YEAR INSPECTION

17.1.A Identification

- 17.1.A.1 The purpose of this item is to perform maintenance, inspection, and five-year certification of the two aft deck cranes.

Port Cranes - Five Year Inspection

17.1.B References**17.1.B.1 Equipment data**

- **Port cranes**

17.1.B.2 Drawings and documents

17.1.B.2.1 The following drawings must be considered as reference drawings as defined in the Drawings section of the General Notes.

Number of the document	Document title	No. of sheets
	Manuel d'instruction Hepburn	

17.1.B.3 Regulations and standards

17.1.B.3.1 The following regulations and standards apply to the work performed in this section and the Contractor must ensure that all work performed meets the regulations and standards, as well as other applicable federal, provincial and territorial regulations and standards.

	Title	Included Yes/No
FSM Procedures		
7.B.2	Protection against falls	Yes
7.B.4	Hot work	Yes
7.B.5	Locking and labeling	Yes
Publications		
Standards		
Regulations		
SOR 2007-128	Cargo, Fumigation and Fishing Tackle Regulations	No

17.1.C Statement of Work**17.1.C.1.1 General**

17.1.C.1.2 The contractor must provide all materials, equipment, tools and labor necessary to perform the work described below. The Contractor must provide sufficient scaffolding to allow the ABS inspector to visually inspect all crane components (pins, bearings, sheaves, etc.) that will not be dismantled.

17.1.C.1.3 Prior to undertaking any work on the cranes, the contractor must ensure that both cranes have been properly locked out. This must be done in coordination with the IA.

Port Cranes - Five Year Inspection

- 17.1.C.1.4 All work on the hydraulic system should be performed by a specialized hydraulic company with experience in marine applications.
- 17.1.C.1.5 The contractor is responsible for coordinating all inspections with the ABS inspector.
- 17.1.C.1.6 Any paint damaged by the work must be repaired. The contractor must apply two coats of primer followed by a top coat, compatible with the existing paint system (primer: Interprime 234, top coat: Interlac 665, buff color).
- 17.1.C.1.7 At the end of the work day, the contractor must ensure that the work area around the cranes is clean and safe. At the end of the work, the contractor must restore the work area to its original clean and functional condition.
- 17.1.C.1.8 Upon completion of the work, the Contractor must perform load tests in accordance with Section 17.1.D.2 below.
- 17.1.C.2 **Work to be done on the two cranes**
 - 17.1.C.2.1 The contractor must conduct a rock test to evaluate the condition of each crane's slewing bearing in accordance with the Rocking Test Method. During the test, the Contractor must record the temperature, wind speed and direction, trim and heel of the vessel.
 - 17.1.C.2.2 The contractor must remove the cable for inspection and then reinstall it. If the cable needs to be replaced, it will be provided by the CCG.
 - 17.1.C.2.3 The contractor must remove the hook from the crane. The Contractor must disassemble the hook sheave, clean the components, measure clearances, and perform a dye penetrant test of the pins and hook, and provide a report for each test. The contractor must reassemble the sheave and hook, ensuring that all components are greased.
 - 17.1.C.2.4 Contractor must remove two pulleys at the end of the boom and their respective pins. Contractor must disassemble, clean, inspect and measure all components. All grease passages must be cleaned and checked. The contractor must perform a dye penetrant inspection on the pins. Contractor must reinstall all components using new grease.
 - 17.1.C.2.5 The contractor must coordinate an inspection with the ABS inspector as early as possible in the work period to visually inspect all crane components (cylinders, bearings, pins, pulleys, hoist assembly, etc.) to determine if additional disassembly is required.

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- 17.1.C.2.6 Once all components have been disassembled, cleaned, inspected, and measured, the contractor must coordinate the inspection with the RN inspector and the ABS inspector prior to reassembly.
- 17.1.C.2.7 The Contractor must inspect the hydraulic system for leaks in the worn hoses. Any defects must be noted on the initial inspection report and brought to the attention of the RN as soon as possible.
- 17.1.C.2.8 The contractor must drain the hydraulic system oil (approximately 430 L) from each crane and replace it with new oil (MV 22), supplied by CCG. The contractor must also replace the oil filters, provided by CCG. Contractor must use a 10 micron filter pump to fill the oil tank. The contractor must dispose of the old oil in accordance with federal and provincial regulations.
- 17.1.C.2.9 The contractor must drain and replace the oil (approximately 70 L) and filter in the steering system. CCG will provide the new oil (Mobil SHC 150) and filters. The contractor must dispose of the used oil in accordance with federal and provincial regulations.
- 17.1.C.2.10 The Contractor must verify the proper operation of all interlocking and counterbalancing valves.
- 17.1.C.2.11 The contractor must check all grease points and perform a final greasing of all crane components before testing the crane. The contractor must use a grease compatible with the existing grease type (SKF LGWM-2/0.4).
- 17.1.C.2.12 The contractor must inspect the bolts of all dismantled components for corrosion or cracks. If bolts are to be replaced, they must be replaced with bolts of equivalent quality and size.
- 17.1.C.2.13 The contractor must provide the IA and TA with an initial inspection report indicating all parts that need to be replaced and the recommended repairs. Any parts found to be defective or excessively worn must be replaced with equivalent parts provided by the contractor. This will be negotiated through Form 1379.
- 17.1.C.2.14 Upon completion of all testing, the contractor must supply and reinstall Denso Tape and LT-tape on all hydraulic fittings.
- 17.1.C.2.15 The inside of the hydraulic compartments and the bases of the cranes must be cleaned of all greasy and oily residues.

17.1.D Proof of performance

17.1.D.1 Inspection points

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- 17.1.D.1.1 All work must be completed to the satisfaction of the RN and ABS Inspector.
- 17.1.D.1.2 The contractor must perform an inspection of all parts with the RN and ABS inspector during disassembly and prior to reassembly.

17.1.D.2 Tests and trials

- 17.1.D.2.1 The contractor must demonstrate the proper operation of the cranes (including limit switch protections) and their components to the RN and the ABS inspector. Any leaks detected must be corrected by the contractor.
- 17.1.D.2.2 The contractor must perform a 125% load test of each crane in the presence of the IA and the ABS inspector. After acceptance of the load tests, the contractor must adjust the crane capacity to 100% of the load capacity using weights. Weights will be provided by CCG. The contractor must provide at least 48 hours notice to the IA prior to the load test to ensure the weights are on site.

17.1.D.3 Certification

- 17.1.D.3.1 The contractor must provide a T2 certificate for each crane, certifying them for 5 years.

17.1.E deliverables

17.1.E.1 Documentation

- 17.1.E.1.1 Upon completion of the work, the contractor must provide a complete report detailing the work performed, including subcontractor inspection/work reports, actions taken, cause of failures, modifications required, parts replaced, and testing. The contractor must provide an electronic version in PDF format to the IA and TA.
- 17.1.E.1.2 The contractor must provide original signed copies of the T2 certificates to the IA. The contractor must also provide an electronic version to IA and TA.

17.1.E.2 Training - N/A

18.0 COMMUNICATIONS AND NAVIGATION[- NOT APPLICABLE]

19.0 CONTROL SYSTEMS [- NOT APPLICABLE]

20.0 SCIENTIFIC, OCEANOGRAPHIC AND HYDROGRAPHIC MATERIALS[- NOT APPLICABLE]