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Title - Sujet Radoub été 2018 - Des Groseilliers	
Solicitation No. - N° de l'invitation F3017-18N173/A	Date 2018-06-22
Client Reference No. - N° de référence du client F3017-18N173	GETS Ref. No. - N° de réf. de SEAG PW-\$QCL-041-17430
File No. - N° de dossier QCL-8-41017 (041)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-07-19	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Deblois, Vincent	Buyer Id - Id de l'acheteur qcl041
Telephone No. - N° de téléphone (418) 649-2712 ()	FAX No. - N° de FAX (418) 648-2209
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: MINISTERE DES PECHEES ET DES OCEANS NGCC DES GROSEILLIERS Garde côtière 101 boul Champlain QUEBEC Québec G1K7Y7 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

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Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
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Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
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Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM Destination	Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	Radoub été 2018 - Des Groseilliers	F3017	F3017	1	lot	\$		Voir doc	

NGCC *DES GROSEILLIERS*

F3017-18IN172

Various works

2018

2018-05-14

CCGS DES GROSEILLIERS

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CCGS DES GROSEILLIERS

Canadian Coast Guard (CCG) requirements

General Information

LIST OF ACRONYMS

Table 1 - List of Acronyms

CA Contract Authority (PWGSC)
CBW Canadian Bureau of Welding
CCG Canadian Coast Guard
CE Chief Engineer
CLC Canada Labour Code
CSM Contractor Supplied Material
CSA Canadian Standards Association
DFO Department of Fisheries and Oceans
FSM Fleet Safety Manual (CCG)
FSR Field Service Representative
GSM Government Supplied Materials
HC Health Canada
IA Inspection Authority – Technical Inspector CE Chief Engineer
IEEE Institute of Electrical and Electronic Engineers
MSDS Material Safety Data Sheet
PWGSC Public Works and Government Services Canada
SMS Safety Management System
TBS Treasury Board of Canada Secretariat
TCMS Transport Canada Marine Safety
TA Technical Authority (CCG) Ralph Wilhelm
WCB Work Safe BC
WHMIS Workplace Hazardous Material Information System

PART 1: SCOPE

1.1 General

- 1.1.1 This document describes Canadian Coast Guard (CCG) requirements applicable to all accompanying Technical Specifications.

PART 2: HEALTH AND SAFETY RELATED REQUIREMENTS

2.1 General

- 2.1.1 The Contractor must appoint a Health & Safety Manager or Supervisor responsible for ensuring compliance with the Health and Safety requirements listed herein. This includes monitoring of all work by Contractor employees and Sub-Contractor employees.
- 2.1.2 During the execution of Work, the Contractor must comply with:
- Applicable Provincial Health and Safety Regulations,
 - Canada Labour Code Part II,
 - Marine Occupational Health and Safety Regulations (MOSH),
 - The Gas Hazard Control Standard (TP3177),
 - Applicable CCG region specific Health and Safety requirements
 - DFO/5672 Welding Health and Safety Technical Program,
 - TBS “Smoking in the Workplace” Policy,
 - The following sections of DFO/5737- CCG Fleet Safety and Security Manual
 - o Fall Protection (section 7B2),
 - o Confined Space Entry (section 7B3),
 - o Hot Work (Section 7B4),
 - o Lock-Out - Tag-Out (Section 7B5).

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2.2 Hot Work

2.2.1 When executing Hot Work, the Contractor must:

- inform the TA & IA prior to commencing work and upon completion of work,
- supply sufficient and suitable fire extinguishers in support of the Hot Work,
- not use the Ship's fire extinguishers except in the case of emergency. Should the ship's extinguishers be used, the Contractor must ensure they are recharged and certified by a certified facility at no cost to Canada,
- maintain a competent and properly equipped Fire Watch while Hot Work is underway and for one hour following the completion of Hot Work. The Fire Watch must be situated such that all sides of the surfaces undergoing work are visible and accessible,
- ensure that all dust, debris, gas and smoke generated is evacuated from the vessel by the most direct method,
- provide suitable fire retardant coverings to protect wire ways, cables, equipment and structure from welding slag, splatter etc,
- comply with the specific Hot Work requirements listed in section 2.1 herein.

2.2.2 When executing Hot Work, the Contractor must define a surrounding zone that is to be kept sealed off from the rest of the vessel during the work period that involves the generation of welding gases, smoke, and grinding dust etc. All unscheduled work arising during the refit period involving Hot Work must have a similar zone isolated from the remainder of the vessel. The zone must be limited to the space(s) where the Hot Work is conducted, boundary areas where Fire Watches are required, and the access routes between the zone and the exterior of the vessel for workers, welding and cutting equipment and ventilation ductwork.

2.2.3 In areas where occupied accommodations and or workplaces cannot be completely isolated a double sealed door (air lock) arrangement must be erected to minimize ingress of contaminants into the occupied areas. A ventilation extraction point must be located as near as practical to the inside door on the worksite side to reduce the egress into the air lock and subsequently the accommodations and/or workspaces.

2.2.4 All doorways within the affected area that are not required for access to the work or for Fire Watch activities must be sealed off to prevent contaminants from entering. Passageway branches that connect to the zone are to be sealed off as well. The Contractor must clean all surfaces and fabrics within the zone and in surrounding areas, which have become contaminated, upon completion of work.

2.3 Confined Space Entry

2.3.1 In the execution of Confined Space Entry, the Contractor must comply with the requirements listed in section 2.1 herein. The following is a non-exhaustive list of Confined Spaces on CCG Vessels: Bilge Areas; Machinery Compartments; all storage compartments accessed by manhole covers including fuel tanks; water tanks; cofferdams; chain lockers; thruster compartments.

2.4 Monitoring Atmosphere for Confined Space Entry or Hot Work

2.4.1 Prior to Confined Space Entry and Hot Work within a Confined Space, including machinery compartments, the Contractor must:

- have the space gas freed and tested in accordance with TP3177,
- ensure the Permit states the type of work, the time period for which the Permit is valid and also indicates "Safe for Persons" or "Safe for Hot Work" as required,
- post the Permit in a conspicuous location and provide the TA and IA with the signed and dated Marine Chemist's or Contractor qualified persons Certificate,
- renew the Confined Space Entry or Hot Work Permit as required by Regulations.

2.5 Work At Heights and Fall Protection

2.5.1 In the execution of Work at Heights, the Contractor must:

- erect staging as required to safely carry-out work and remove it upon completion,
- ensure walkways, gangways, scaffolding, ladders, guard-rails and similar apparatus are maintained in proper and safe condition. Daily inspections are to be conducted and recorded by the Contractor,
- comply with requirements listed in 2.1 herein when conducting work aloft,
- must do so in accordance with the Contractor's standard operating procedures.

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2.6 Lock-Out / Tag-Out

2.6.1 The Contractor must comply with requirements listed in 2.1 herein for Lock-Out and Tagout.

2.7 Workplace Hazardous Materials Information System (W.H.M.I.S)

2.7.1 CCG shall provide the Contractor with access to M.S.D.S. for all controlled products located on the vessel. The Contractor must provide M.S.D.S for all Contractor supplied WHMIS controlled products.

2.8 Smoking

2.8.1 The Contractor must obtain written approval prior to smoking in designated areas.

2.9 Temporary Lighting and Ventillation

2.9.1 The Contractor must ensure temporary lighting and/or ventilation is supplied, installed and maintained in proper and safe condition and removed upon completion.

2.9.2 The Contractor must ensure temporary lighting incorporates shields/guards to protect against breakage.

2.10 Sign-in / Sign-out

2.10.1 When the vessel remains in Care and Custody of the Crown, the Contractor must ensure employees and Sub-Contractors sign-in and sign-out of the Vessel Register located at the Quartermasters Station, or in a convenient location to the gangway, whenever they enter or leave the vessel. Individuals violating this requirement may be denied access to the vessel for the duration of the work period upon advice from the TA to the CA.

2.11 Lead Based Paints and Paint Approvals

2.11.1 The Contractor must provide Health Canada product approval for underwater hull surface paints controlled by Health Canada and the Pest Management Regulatory Agency,

2.11.2 The Contractor must identify and take precautionary measures to ensure the application of paints complies with Federal, Provincial and Municipal regulations,

2.11.3 The Contractor must not use lead-based paints.

2.12 Clean and Hazard Free Site

2.12.1 The Contractor must maintain all spaces, compartments, work areas and areas used by Shipyard personnel as transit routes in a clean and sanitary condition and free from debris,

2.12.2 The Contractor must return the vessel to the CCG at least as clean as when work began. This includes both internal and external areas of work, as well as any affected adjacent spaces outside the principle areas of work,

2.12.3 The Contractor must supply own refuse containers to be emptied daily and removed upon completion of work. All rags, debris, and associated refuse are to be removed to refuse container(s) daily,

2.12.4 When working at CCG facilities, the Contractor must clean-up dock areas used by Contractor personnel and/or equipment. This includes but is not limited to the removal of all dirt, grit, debris, staging, containers and equipment as well as the immediate cleanup and proper disposal of leaked oil, solvent or any other hazardous materials,

2.12.5 If work will be conducted in the vicinity, the Contractor must supply and install for the duration of the work period a suitable material approved by the TA and IA at all main entries and over surfaces of the main, upper, flight and navigation officers decks to protect alleyways from dirt,

2.12.6 The Contractor must ensure safe access to the work area as required by applicable Health and Safety Regulations,

2.12.7 The Contractor must prevent rat and vermin harbourage onboard the vessel for the duration of the work period. The Contractor must remove any rats or vermin from the vessel if they do come onboard during the work period.

2.13 Fire Protection

2.13.1 The Contractor must ensure the isolation, removal and installation of fire detection and suppression systems or its components is performed by certified technicians familiar with the systems,

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- 2.13.2 The Contractor must notify the TA and IA and obtain written approval from the TA prior to disturbing, removing, isolating, deactivating/disabling or locking-out any part of the fire detection or suppression system including heat and smoke sensors. The Contractor must also notify the TA and the IA once the system has been reactivated,
- 2.13.3 The Contractor must ensure protection against fire at all times including when working on the ship's fire detection or suppression system. This may be accomplished as suggested below and requires the written approval from the TA:
- disabling only one portion of the system at a time,
 - by maintaining system function using spares while work is in progress,
 - other means acceptable to the TA.
- 2.13.4 The Contractor must note that failure to take necessary precautions while performing work on fire suppression systems may result in malfunction and discharge of CO₂, or other fire suppression agents. The Contractor must recharge and certify at their cost, containers that are discharged as a result of their work.
- 2.14 Hydrostatic / Pneumatic Tank Testing**
- 2.14.1 The Contractor must verify that all necessary openings are closed prior to hydrostatic or pneumatic testing of tanks. The Contractor must blank all suction and discharge lines, vents and sounding pipes. The Contractor is responsible for supplying, fitting and the subsequent removal of blanks.
- 2.14.2 The Contractor must drain the tanks upon completion of testing and wipe clean and dry the fuel tanks.
- 2.14.3 The Contractor must hydrostatically test tanks as specified with a 2.44m head of water. Where the Contractor wishes to perform a pneumatic test in lieu of the hydrostatic test, written approval must be obtained by the IA and TA.
- 2.14.4 The Contractor must provide the IA and TA with the Contractor's standard operating procedures for conducting pneumatic tank tests.
- 2.15 Contractor Supplied Potable Water**
- 2.15.1 The Contractor must provide water quality test results to the IA to demonstrate the potable water supplied meets the current Health Canada Guidelines for Canadian Drinking Water Quality (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/guidelines_sixth-rec-eng.php).
- 2.15.2 The Contractor must ensure lines are flushed prior to connecting the water supply to the vessel.

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PART 3: GENERAL REQUIREMENTS

3.1 Electrical Work / Electronics

- 3.1.1 The Contractor must carry-out all electrical and electronic installations, renewals and repairs in accordance with the latest editions of:
- TP127 - "Ship Safety Electrical Standards",
 - IEEE Standard 45 – 2002 "Recommended Practice for Electrical Installations on Shipboard 2002",
 - CGTS-3 - "General Specifications for the Installation of Shipboard Electronic Equipment".
- 3.1.2 The Contractor must replace, at no charge, the entire length of point to point cable if damaged as a result of installation.
- 3.1.3 The Contractor must not use plastic tie-wraps to secure wiring except in panels and junction boxes.

3.2 Paint Application

- 3.2.1 The Contractor must ensure new and/or disturbed steel work is painted in accordance with the specification.
- 3.2.2 The Contractor must power clean all new and disturbed steelwork prior to painting.
- 3.2.3 The Contractor must notify the IA to inspect after the surface preparation and the first coat of paint has cured and prior to application of the second coat.
- 3.2.4 N/A
- 3.2.5 The Contractor must ensure new and/or disturbed steelwork receives application of at least two (2) coats of marine primer immediately upon completion of work, unless specified otherwise.

3.3 Changes to Vessel Stability, Carrying Capacity or Structure

- 3.3.1 The Contractor must discuss with the TA any comments, concerns or observations they may have regarding the effect of work on the vessel's stability or carrying capacity. Additionally, any work item that, in the opinion of the Contractor may pose a vessel structural integrity problem is to be brought to the attention of the TA.
- 3.3.2 The Contractor must advise the IA and TA of the details of any major changes in the distribution of weights on the vessel while the vessel is in dry-dock.

3.4 CCG Employees and others on the Vessel

- 3.4.1 Canadian Coast Guard employees and other personnel such as Manufacturer's Representatives and TCMS Inspectors may carry-out other work, including work items not included in this Statement of Work, on board the vessel during this work period. Every effort will be made by Canada to ensure this work and the associated inspections do not interfere with the Contractor's work. The Contractor is not responsible for coordinating the related inspections or payment of inspection fees for this work.

3.5 Regulatory Inspections

- 3.5.1 The Contractor must ensure all work identified as requiring regulatory inspection is inspected by the applicable authority such as TCMS, Health Canada, Environment Canada etc., and that the required documentation is received to prove the inspections were conducted. The Contractor must not substitute inspection by the TA or IA for required regulatory inspections.
- 3.5.2 The Contractor must provide original Certificates issued by inspectors to the TA and a Copy to the IA.
- 3.5.3 The Contractor must coordinate all regulatory related inspections required for this Statement of Work.
- 3.5.4 The Contractor must provide timely advance notification of scheduled regulatory inspections to the TA and IA so they may attend the inspection.

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3.6 Welding

- 3.6.1 The Contractor must ensure welding is completed in accordance with DFO/5672 – “Welding Health and Safety Technical Program”.
- 3.6.2 The Contractor must obtain written permission of TA prior to commencing welding.
- 3.6.3 The Contractor must not locally ground welding equipment near bearings or electronic equipment.
- 3.6.4 The Contractor must ensure all steel welding is in accordance with 18-080-000-SG-001 Welding of Ferrous Materials and the Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151)
- 3.6.5 The Contractor must comply with CCG specification for ALUMINIUM WELDING (TP9415)
- 3.6.6 The Contractor must ensure that when welding of any item requires the application of fusion welding for stainless steel structures, the Contractor or his Sub-Contractors is certified in accordance with the Canadian Welding Bureau, CSA\ACNOR AWS; Division 1.6 certification – latest revision copies of which must be submitted to the IA/TA prior to the start of welding

3.7 Requirements imposed on Contractor when Equipment must be disturbed

- 3.7.1 The Contractor must coordinate an inspection of the condition of items (i.e.: piping, manholes, parts, equipment etc) to be removed, prior to carrying-out or to gain access to carry-out specified work. The inspection must be conducted jointly by the Contractor, the IA and the TA.
- 3.7.2 The Contractor must repair or replace any item that is damaged in this process. Any piping, manholes, parts, equipment etc. requiring installation after removal, must be refitted using new Contractor supplied materials such as jointing, packing, anti-seize compound, clamps, brackets, fasteners, oils, lubricants, cleaning solvents, preservatives and insulation. Materials must be in accordance with equipment manufacturers’ drawings, manuals or instructions. Where a substitution must be made, the IA and TA must approve in writing the materials used.
- 3.7.3 The Contractor must provide a test plan and test to prove operation of disturbed items after completion of work.

3.8 Test Results

- 3.8.1 The Contractor must ensure tests and trials are performed to the satisfaction of the IA, TA, and TCMS. All tests, measurements, calibrations and readings must be recorded and provided in a report to the IA, TA and TCMS. The reports must be bound and typewritten, double-spaced on 8 1/2" X 11" and indexed by specification number. The reports must also be provided in Adobe pdf format on 3 USB keys.
- 3.8.2 The Contractor must ensure all dimensions are measured and recorded. All measuring devices must be described in the report and the name of the person taking the readings must be recorded.
- 3.8.3 The Contractor must ensure all testing and measurement equipment (mechanical or electronic) are calibrated and that calibration certificates are provided to the IA prior to final inspection or witnessing of tests.

3.9 Contractor Supplied Materials and Tools

- 3.9.1 The Contractor must unless otherwise specified, supply all materials.
- 3.9.2 The Contractor must ensure materials are new.
- 3.9.3 The Contractor must ensure material such as jointing, packing, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints, coatings, etc., are in accordance with the equipment manufacturer’s drawings, manuals or instructions. Where no particular item is specified or where substitution must be made, the IA and TA must approve in writing the materials used. The Contractor must provide certificates of grade and quality for various materials, as requested to the TA and IA.
- 3.9.4 The Contractor must obtain CCG ship specific special tools from the TA and return them to the TA upon completion of work.

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3.10 Machinery and Overhaul Installation

- 3.10.1 The Contractor must overhaul and install machinery and equipment as per the manufacturer's instructions, drawings and specifications.

3.11 Restricted Areas

- 3.11.1 The Contractor must not enter the following areas except to perform work as required by the specifications: all cabins, offices, workshops, engineer's office, wheelhouse, control room, public washrooms, galley, mess rooms and lounge areas.

3.12 Protecting Equipment/Areas from Damage

- 3.12.1 The Contractor must protect equipment/areas (example: machinery, equipment, fittings stores or items of outfit) from damage by exposure, weather, movement of materials, sand, grit, or shot blasting, welding, grinding, burning, gouging, painting or airborne particles of paint etc.
- 3.12.2 The Contractor must provide the IA and TA the opportunity to inspect any protection installed prior to the work commencing.

3.13 Verification of Information Provided by CCG

- 3.13.1 The Contractor must verify, prior to bid submission, all drawings, pictures, dimensions, descriptions, locations, measurements, engineering values, materials, etc. listed or implied. Information such as engineering drawings, pictures, etc., may have been provided with the accompanying technical specifications.

3.14 Drawing Revisions

- 3.14.1 The Contractor must revise drawings as required to a quality at least equal to those being updated. For example, drawings that have been lettered and dimensioned in a professional manner are not to be updated by hand. Updated hard copy drawings must be provided to the IA and TA in an acceptable format and if electronic format drawings have been provided for updating, these must be returned using the same version of software as originally used.

3.15 Service Conditions

- 3.15.1 The Contractor must provide ice-clearing services if so required for ship movements.
- 3.15.2 The Contractor must provide all enclosures and heating required to carry out work, taking into account the nature of the work, time of year and weather conditions. Examples of work items where heating and enclosures may be required include but are not limited to painting, shaft withdrawal, and tank cleaning.
- 3.15.3 Unless otherwise specified, all components, materials and installations supplied by or carried-out by the Contractor must be adequate to meet the following service conditions:
- In areas that are exposed to the elements:
 - o outside air temperature of minus 40°C to plus +35°C;
 - o wind velocity up to 50 knots;
 - o water temperature of minus 2°C to plus +30°C;
 - shock loading of 2.5g horizontal, 1.5g vertical. All new components, materials and installations within the ship must be adequate to withstand the specified shock loading accelerations.

3.16 Recording of Work in Progress

- 3.16.1 The IA and TA may record work in progress using various means including but not limited to photography and video, digital or film

3.17 Washrooms and Working Hours

- 3.17.1 No washroom on board will be made available for the Contractor
- 3.17.2 Hours of work for CCG personnel working on board the vessel are from 0600 hours to 1930 hours, seven (7) days a week, excluding statutory holidays. Permission to work on the vessel outside these hours must be obtained from the TA.

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3.18.2 Normes and regulation applicable

3.18.1 The following work should be done in accordance with the following construction standards.

- Marine Machinery Regulations SOR/90-264
- Ships Electrical Standards (2008) - TP 127 E
- IAC No. 47 Shipbuilding and Repair Quality Standard;
- ASTM Standards, Section one Iron and Steel Products, volume 01.07 Ship and Marine Technology;
- Normes et procédures de mécano-soudage du BCS (ou équivalent);
- SSPCPA 2 (nov.1982), *Paint Application Specification No.2*;
- Norme ASTM F708-92, *Standard Practice for Design and Installation of Rigid Pipe Hangers*, 1992 (Reapproved 2008).

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Canadian Coast Guard (CCG) SPECIFICATION

SERVICES

1.1 Crane

- 1.1.1 The Contractor must provide the services of a 25-tonne crane for the ship's general needs, including an operator and all personnel needed to ensure that these operations are carried out safely. The Contractor must maintain a record of crane usage that must be signed weekly by the IA. The CCG will give the contractor a 24 hours notice before using the crane. See Appendix J for this purpose, unplanned or optional work.
- 1.1.2 The Contractor is responsible for verifying the applicable load restrictions of the wharf where the vessel will be docked. Slings and lifting gear must be provided by the Contractor.

1.2 Boom Lift

- 1.2.1 The Contractor must provide an articulated boom lift for a period of 10 consecutive weeks. The boom lift must be telescopic, capable to embark two persons, to have a horizontal reach of at least 70 ft. and a lifting height of at least 80 ft.
- 1.2.2 At the beginning of the work period, Canada will notify the Contractor of the date on which the 10 consecutive weeks will begin. See Appendix J for this purpose, unplanned or optional work.

1.3 Portable Toilets

- 1.3.1 The contractor must provide and install on the dock 6 portable toilets which must be cleaned and emptied on a regular basis. These toilets must be accessible to all workers on board the vessel, including those engaged by the CCG under other contracts.

1.4 TUG

- 1.4.1 The Contractor must supply all labor, materials, equipment and resources necessary for handling the ship's mooring lines and tug assistance as required to perform the 2 movements of 6 hours each as required throughout the duration of the contract period. The Contractor must be responsible for any associated fee.

1.5 FENCES

- 1.5.1 Erect a temporary fence around the site consisting of a 1.2 m high snow fence, attached with wire to T-shaped posts at a 2.4 m center-to-center distance. Provide one (1) lockable access barrier for trucks.

1.6 UNDERWATER INSPECTION OF THE HULL

- 1.6.1 Scope

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Canadian Coast Guard (CCG) SPECIFICATION

- 1.6.1.1 The Contractor shall provide a scuba diver and team to perform the underwater inspection of the ship's hull. Provide a valid copy of the divers' certification before the start of work.
- 1.6.2 References
 - 1.6.2.1 68-H-003
 - 1.6.2.2 68-H-101-T
 - 1.6.2.3 68-H-105
- 1.6.3 Technical description
 - 1.6.3.1 Provide a scuba diver to conduct an underwater inspection of the ship. The hull, sea connections, bow thruster, propellers, rope guards, rudder, rudder well and stock, shall be inspected to detect any anomalies.
 - 1.6.3.2 Provide the services of a video camera to film the entire inspection.
 - 1.6.3.3 The work shall be carried out to the satisfaction, and in presence of the MSO/TC maritime surveyor in order to delay a dry dock inspection by six months.
 - 1.6.3.4 The Contractor shall comply with Canadian Coast Guard Procedure 7.B.1 "Diving Operations".
 - 1.6.3.5 The contractor must comply with diving standards CSA Z275.23 and Z275.4, as obligated by the CSST
 - 1.6.3.6 The Contractor must ensure that the team presenting on the premises has a minimum of three (3) persons including:
 - 1.6.3.6.1 an active plunger to be connected to the surface;
 - 1.6.3.6.2 a standby divers (ready to intervene);
 - 1.6.3.6.3 a surface aid (tender).
- 1.6.4 Proof of performance
 - 1.6.4.1 Inspection
 - 1.6.4.2 All work must be approved by the Chief Engineer and the Transport Canada inspector.
 - 1.6.4.3 Report
 - 1.6.4.4 The Contractor shall provide a copy of the inspection video on a USB key and photos of all damage noted during the inspection. The copy shall be provided on the day of the inspection.
- 1.7 The Contractor will use a certified welder CSA W47.1 – Certification for Companies for Fusion Welding of Steel Structures (Minimum division level 2) for all work pertaining to this Statement of Requirement, including all unscheduled work or optionnal work; Refer to Annex J - unscheduled work or optionnal work.
- 1.8 The Contractor will use a certified pipe fitter for all work pertaining to this Statement of Requirement, including all unscheduled work or optionnal work; Refer to Annex J - unscheduled work or optionnal work.

Re : <http://www.ccq.org/~media/PDF/Communications/Metiers/Tuyauteur.pdf.pdf>.

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- 1.9 The Contractor will use a certified naval architect for all work pertaining to this Statement of Requirement, including all unscheduled work or optionnal work; Refer to Annex J - unscheduled work or optionnal work.
- 1.10 The Contractor will use a certified electricien for all work pertaining to this Statement of Requirement, including all unscheduled work or optionnal work; Refer to Annex J - unscheduled work or optionnal work.

Re: <http://www.ccq.org/~media/PDF/Communications/Metiers/Electricien.pdf.pdf>.

- 1.11 The Contractor will include 40 hours of a certified refrigeration technician for all work pertaining to this Statement of Requirement, including all unscheduled work or optionnal work; Refer to Annex J - unscheduled work or optionnal work.

Re: <http://www.ccq.org/~media/PDF/Communications/Metiers/Frigoriste.pdf.pdf>

1.12 Vessel Security

- 1.12.1 The Contractor shall be fully responsible for the security of the vessel. As a result, the Contractor shall be responsible for providing and maintaining security to the vessel during the course of this Contract. A continuous prescence will be maintained at the site entry, security patrols will be required to travel throughout the vessel's interior and exterior at a minimum of every hour, 24 hours a day, and 7 days a week.
- 1.12.2 In the event of any hot work occurring during the day, surveillance must be increased to once hourly for at least three (3) hours after the beginning of quiet hours. In the event that the Contractor utilizes a second or third shift during the period of the contract, the Contractor may commence security rounds at the end of the last shift.
- 1.12.3 Contractor must provide a logbook, which shall be initialed by the security person upon completion of each round.

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OXYGEN SENSORS

2.1 Scope

- 2.1.1 Provide materials, equipment and labor to carry out the verification and calibration of two (2) gas detectors brand "BW Technologies":

2.2 References

- 2.2.1 GasAlertMicroClip-manual, page 17.

2.3 Technical description

- 2.3.1 Provide materials, equipment and labor to carry out the verification and calibration of two (2) gas detectors brand "BW Technologies":

- 2.3.2 GasAlertMicroClip XT
Model: MC2-XWHM-Y-NA
Series: KA412-1010727

- 2.3.3 GasAlertMicroClip XL
Model: MCXL-XWHM-Y-NA
Series: KA415-1038360

- 2.3.4 The bid should include the basic pieces for certification. If additional parts are needed, they will be processed on 1379 PWGSC form.

2.4 Proof of performance

- 2.4.1 Provide calibration certificate for each device.
2.4.2 The work must be completed and detectors returned to the ship.

JORDAIR COMPRESSOR MAINTENANCE

3.1 Scope

- 3.1.1 Provide materials, equipment and labor for maintenance of breathing air compressor Jordair model 1K100II-3EH.

3.2 References

- 3.2.1 Everything must be done in compliance with CAN / CSA-Z180.1-00 standard.

3.3 Technical description

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- 3.3.1 Provide materials, equipment and labor for maintenance of breathing air compressor Jordair model 1K100II-3EH.
- 3.3.2 Perform the oil change (GR122, provided by the ship) and filter (BAU-N-25326, provided by the ship).
- 3.3.3 Change the air filter cartridges.
- 3.3.4 Check operation of purges.
- 3.3.5 Adjusting for an available pressure of 2900PSI
- 3.3.6 Replace the filter cartridge JOR-FC-1507-JB (BAU-80114 or equivalent provided by the ship) and the cartridge coalester JOR-FC-708-SE (supplied by ship). Provide additional coalester cartridge JOR-FC-708-SE to be submitted to chief officer.
- 3.3.7 If work or additional parts were required, their costs will be adjusted on TPSGC 1379.
- 3.3.8 Perform an air analysis to ensure compliance with CAN / CSA-Z180.1-00 standard.

3.4 Proof of performance

- 3.4.1 The Air analysis should be performed and the certificate sent to the ship.

FIREFIGHTING SYSTEMS AND EQUIPMENT

4.1 SCOPE

- 4.1.1 The purpose of this specification to carry out the annual inspection and maintenance of the various firefighting systems and equipment aboard the vessel.

4.2 REFERENCES

- 4.2.1 Reference Documents
 - 4.2.1.1 03 - Systèmes Fixes d'Extinction au CO2
 - 4.2.1.2 06- Extincteurs portatifs
 - 4.2.1.3 23B - Pont d'Envol - Extinction Fixe
- 4.2.2 Standards
 - 4.2.2.1 Fleet Safety and Security Manual (DFO 5737) – working in confined spaces, work at height.
 - 4.2.2.2 National Fire Protection Association (NFPA) standards
- 4.2.3 Regulations
 - 4.2.3.1 *Canada Shipping Act, 2001* and its regulations

4.3 TECHNICAL DESCRIPTION

- 4.3.1 General

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- 4.3.1.1 The Contractor must ensure that all inspections and maintenance are performed by a company certified to work on these types of systems/equipment. Before starting work, the Contractor must provide the IA with a valid copy of certificates.
- 4.3.1.2 After completion of the work, return all spaces to their original functional state and cleanliness.

4.3.2 FIREFIGHTING SYSTEM AND EQUIPEMENT

- 4.3.2.1 Provide the equipment, parts and labor required to re-certification fixed and portable firefighting systems of the ship and its boats. These fixed systems, described in the annex, include the ship and barge #3, the fixed system of the kitchen, the MINUTEMAN II, the Fire Combat of the flight deck, and portable fire extinguishers CO₂.
- 4.3.2.2 Technician will be accompanied at all times by a ship's deck officer.
- 4.3.2.3 All must be completed to the satisfaction of an Inspector of Transports Canada maritime safety.
- 4.3.2.4 Following the examination and testing of the systems referred to in the following pages, the contracting firm must submit three (3) copies to the Chief Engineer.
 - 4.3.2.4.1 A hydrostatic tests certificate of all fixed cylinders and fire extinguishers tested;
 - 4.3.2.4.2 A certificate of inspection of the fixed cylinders and portable fire extinguishers.
 - 4.3.2.4.3 A certificate of inspection of the MINUTEMAN II 150 model system and the helicopter hangar FireCombat system.
 - 4.3.2.4.4 A certificate of analysis from the foam of the MINUTEMAN II system, the FireCombat system and spare containers stored in the compartment adjacent to the lifeboat (3 different lots).
 - 4.3.2.4.5 Inspection must be made by the manufacturer or by a qualified laboratory.
- 4.3.2.5 See attached lists of equipment designed for hydrostatic testing or maintenance included in the known work.
 - 4.3.2.5.1 Extincteurs portatifs
 - 4.3.2.5.2 Pont d'Envol
 - 4.3.2.5.3 Systèmes Fixes d'Extinction au CO₂

4.3.3 Fixed CO₂ system:

- 4.3.3.1 Disassemble in turn all fixed cylinders, while ensuring the continuity of the systems for the protection of the ship;

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- 4.3.3.2 Check the amount of gas in each of the cylinders (see attached list; Systèmes Fixes d'Extinction au CO²); levels of liquid will be indicated on every cylinder.
- 4.3.3.3 Label each cylinder attesting to their verification and date verified;
- 4.3.3.4 Check the functioning of the system of trigger delay, Visual indicators, audible alarms and ventilation stops related to each sector. The audit will be made by dry air injection in the dispensing conduits to demonstrate their continuity and the proper functioning of the systems. Dry air can be replaced by an inert gas.
- 4.3.3.5 Check the safety line (header safety).
- 4.3.3.6 Check the functioning of local triggers, remotely, manual or automatic.
- 4.3.3.7 Check that the alarm in the wheelhouse Panel gives good indication.
- 4.3.3.8 Check the tightness of cylinders by a pressure test hose.
- 4.3.3.9 Each cylinder whose hydrostatic test is not at term (12 years) but whose last test is more than 5 years old shall undergo a new hydrostatic test as required in NFPA-12.
- 4.3.3.10 Each system is refitted to the satisfaction of the Chief Officer, Chief Engineer and Inspector of Transport Canada Marine Safety.
- 4.3.4 CO2 and dry chemical fire extinguishers
 - 4.3.4.1 Perform the annual audit, repairs, hydro testing and recharging necessary, portable fire extinguishers of the vessel (some with cartridge).
 - 4.3.4.2 Label each of the fire extinguishers in order to certify their verification and date.
 - 4.3.4.3 According to the attached list (Extincteurs portatifs): (4) fire extinguishers require a hydrostatic test.
- 4.3.5 Liquid chemical of the kitchen hood system
 - 4.3.5.1 Check the proper functioning of the system, the local trigger and away from the system.
 - 4.3.5.2 Check the amount of liquid in the cylinder.
 - 4.3.5.3 Provide an annual inspection certificate.
- 4.3.6 Fixed the BARGE starboard (#3) CO2 extinguishing system
 - 4.3.6.1 Perform annual verification. Repairs or charging of the (2) cylinders of the barge will be treated by 1379.
 - 4.3.6.2 Label each of the fire extinguishers in order to certify their verification and date.

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4.3.6.3 The system will be assembled to the satisfaction of the Chief Officer and the Chief Engineer.

4.3.7 MINUTEMAN II MODEL system 150 (helicopter HANGAR)

4.3.7.1 Check the correct functioning of the system;

4.3.7.2 Complete inspection of the tank and the quality of the emulsifier indoors.

4.3.7.3 Check the quality of the recharge AFFF 3% emulsifier stored in the compartment adjacent to the lifeboat (3 different lots).

4.3.8 FIRE fighting (helicopter HANGAR) system

4.3.8.1 Check the correct functioning of the system.

4.3.8.2 The emulsifier in the system will have to be analyzed to ensure its quality.

4.3.8.3 A hydrostatic test on the 3 Nitrogen cylinders.

4.3.8.4 See document attached for the list of all facilities as well as their location ; (23B - Pont d'Envol - Extinction Fixe)..

4.4 **PROOF OF PERFORMANCE**

4.4.1 Inspection

4.4.1.1 The Inspection Authority or delegate must be present during the inspections.

4.4.2 Testing

4.4.2.1 Proper equipment operation must be demonstrated to the Inspection Authority.

4.5 **DELIVERABLES**

4.5.1 Documentation

4.5.1.1 Before acceptance of the work described above, the Contractor must provide the Inspection Authority with a paper copy and an electronic version (PDF) of the inspection rapport detailing all changes and repairs made on any of the above systems.

4.5.1.2 The Contractor must provide the Inspection Authority with two paper copies of inspection certificates along with the original.

4.5.1.3 The Contractor must provide the Inspection and Technical Authorities with an electronic copy (PDF format). Any corrective measures noted in the reports must be addressed before the end of the work period. These corrections must be processed using the form PWGSC 1379.

4.5.1.4 The Contractor must provide the Inspection Authority with analysis results each sample taken of the foam (AFFF) solutions.

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ANNUAL INSPECTION - LIFEBOAT

5.1 SCOPE

- 5.1.1 Le but de cet item est d'effectuer l'entretien et l'inspection annuelle de la chaloupe de sauvetage.

5.2 REFERENCES

- 5.2.1 Standards
 - 5.2.1.1 Fleet Safety Manual (DFO 5737)
- 5.2.2 Regulations
 - 5.2.2.1 Loi sur la marchande marine du Canada 2001
- 5.2.3 Contractor Supplied Material
 - 5.2.3.1 The Contractor must provide all labor, materials and equipment, crane services, to complete the work described below.

5.3 TECHNICAL DESCRIPTION

- 5.3.1 The Contractor must supply the material and labor to complete the following work:
 - 5.3.1.1 Check the hull for water-tightness, cracks and defects. If required, the parts and additional work to repair the hull will be negotiated through a PWGSC 1379.
 - 5.3.1.2 The hull must be cleaned, coated with a UV protection, buffed and waxed.
 - 5.3.1.3 Check the weather tightness of all doors, hatches, penetrations and accessories. Repair as required.
 - 5.3.1.4 Check and adjust (if required) the propeller shaft packing gland.
 - 5.3.1.5 Check the shaft bearing (Cutlass bearing). Visual inspection, without removing the propeller shaft.
 - 5.3.1.6 Check for and correct any oil, cooling water, fuel and exhaust leaks.
 - 5.3.1.7 Verify the humidity throughout the whole lifeboat.
- 5.3.2 The Contractor must hire a TCMS accredited firm to inspect and certify the lifeboat's releasing mechanisms. Provide the material and labor to inspect and certify the releasing mechanisms. This work includes:
 - 5.3.2.1 Model of hooks; LHR6M2
 - 5.3.2.2 See technical document of hooks attached, section 7.4 ; (Installation opération entretien crochets LHR6 M2) .
 - 5.3.2.3 All worn or defective parts must be replaced with OEM parts in order to be certified. The parts and additional work will be negotiated through a PWGSC 1379.
 - 5.3.2.4 Prior the maintenance begin, the lifeboat will be placed on a cradle near the vessel, by the CCG. The cradle will be provided by the CCG as well.

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It is from this location that the contractor will take possession of the Lifeboat in order to carry out the work.

5.3.2.5 When required to perform the work, the Contractor must lift and handle the lifeboat by the two existing lifting points for the lifeboat's hooks. To avoid the stressing of the hull and structure of the lifeboat, the Contractor must use a lifting device with a lifting beam with lifting points positioned directly above the lifeboats lifting eyes. The Contractor must advise the Inspection Authority before lifting or moving the lifeboat.

5.3.2.6 The Contractor must take into consideration that the ship will be docked on its starboard side for the duration of the work period, thereby preventing the final testing of the lifeboat's launching system and hooks. During the work period, the CCG will determine a when the trials can be conducted. This date could be after the work period.

5.4 PROOF OF PERFORMANCE

5.4.1 Inspection

5.4.1.1 The Contractor must demonstrate to the Inspection Authority that all the work complies with this specification and applicable regulations.

5.4.2 Testing

5.4.2.1 The Contractor must perform a sea trial with members of the ship's crew, to demonstrate the lifeboat is in good working order.

5.5 DELIVERABLES

5.5.1 Documentation

5.5.1.1 The Contractor must provide the Inspection Authority with the original copy of the certificates for the hooks. The Contractor must also submit and an electronic copy in PDF format to the Inspection Authority and the Technical Authority.

5.5.1.2 Upon completion of the work, the Contractor must provide a complete report detailing the work performed, the cause of the failures (if applicable), the necessary modifications and the replaced parts on the lifeboat. The Contractor must also provide a report of the lifeboat drop system inspection report. The Contractor must provide 2 paper copies to the Inspection Authority and 1 electronic copy (PDF format) to the Inspection Authority and the Technical Authority.

SEATEL RELOCATION AND BASE REINFORCEMENT

6.1 Scope

6.1.1 This specification sets out the requirements for reinforcement of the forward mast foundation, and installation of a new SeaTel Antenna.

6.2 References

6.2.1 Drawings

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- 6.2.1.1 NT-2694-18-DE500A-(COMM)
- 6.2.1.2 SeaTel-6012
- 6.2.1.3 LM805-010-AL_01
- 6.2.1.4 6012-36 manual



- 6.2.1.5
- 6.2.2 Standards
 - 6.2.2.1 CSA W47.1 – Certification for Companies for Fusion Welding of Steel Structures (Minimum division level 2); and
 - 6.2.2.2 CSA W47.2 – M1987 (R2003), Certification for Companies for Fusion Welding of Aluminium (Minimum division level 2).

6.3 Technical

- 6.3.1 The Contractor shall include in its bid the costs of transport, scaffolding, rigging, slings, craning, removal and installation of parts and equipment necessary for the execution of the work of the estimate.
- 6.3.2 Two (2) new flatbards are to be installed for each of the existing identified 2 pipes. These 2 flatbars as seen in the attached plans (6.2.1.1 NT-2694-18-DE500A-(COMM)) are to be installed on their respective beams. The beams are to be cleaned of all loose scale, paint, dirt and rust, prior to welding the brackets in place.
- 6.3.3 All bare surfaces, shall be painted with one coat of INTERGARD 143 primer. Once primer has been applied to the bare areas, all surfaces are to receive an application of two (2) separate coats of INTERGARD 264 white epoxy paint. Each coat is to achieve a DFT of 0.005".
- 6.3.4 Suivre les instructions d'installations dans les plans ci-joint, NT-2694-18-DE500A.
- 6.3.5 The Contractor must obtain the services of a Naval architect who is also a member of the Order of Engineers for the inspection and production of a final drawings to be used for construction and "as fitted" drawings. This engineering firm will also provide engineering for the construction plans of the new SeaTel mounting base. The Contractor must consider a \$10,000.00 provision for the

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engineering services. The final cost of these services must be negotiated and raised or lowered using the PWSGC 1379 form.

- 6.3.6 The Contractor must consider a \$10,000.00 provision for the fabrication of the Antenna seat. The final cost of these services must be negotiated and raised or lowered using the PWSGC 1379 form.
- 6.3.7 The CCG will disconnect the existing Antenna.
- 6.3.8 The Contractor will proceed with the removal of the Existing Antenna.
- 6.3.9 Once removed the Antenna will be placed on a pallet and shipped to Depot 18 .
- 6.3.10 The Contractor will install the base needed fabricated in item 6.3.6.
- 6.3.11 The Contractor will install the new SeaTel Antenna (Coast guard supply).
- 6.3.12 The CCG will connect the new Antena.

6.4 Proof of performance

- 6.4.1 The contractor shall ensure that all welding is done by a welder certified by the Canadian Welding Bureau (CWB) in accordance with Canadian Standards Association (CSA) standards:
- 6.4.2 All material supplied and work performed by the contractor shall satisfy the following service conditions:
 - 6.4.2.1 Outdoor temperature of -40 to +35 degrees C;
 - 6.4.2.2 Wind speed of 50 knots;
 - 6.4.2.3 Water temperature of -2 to +30 degrees C;
 - 6.4.2.4 Shock load of 2.5g horizontal, 1.5g vertical.

DECK REINFORCEMENT

- 7.1 **Specification NT-2634-16-DT001B-A-(COMM) and drawing NT-2634-16-DE500A - (COMM) attached. In the event of a discrepancy between the multibeam sonar specification and the main specification, the main specification takes precedence over the latter.**

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MODIFICATION VESTIBULE / CABINE BOSUN

8.1 Scope

- 8.1.1 Provide equipment, tools, and labor to make modifications to the aft port vestibule and upper deck hallway to reduce noise in the bosun's cabin.

8.2 References

8.2.1 Drawings

- 8.2.1.1 68-H-114_1 Insulation plan
- 8.2.1.2 68-H-114_2 Insulation plan
- 8.2.1.3 68-H-115_2 Joiner system
- 8.2.1.4 68-H-101-T-Tabloid

8.2.2 Standards

- 8.2.2.1 FTP CODE (International Code for the Application of Fire Testing Procedures, 2010), Resolution MSC.307 (88).

8.3 Technical description

8.3.1 Dismantling Lobby:

- 8.3.1.1 Remove vinyl floor covering and Dex-O-Tex cement to bare metal, discard.
- 8.3.1.2 Take 10 ultrasonic thickness measurement of deck. Transmit the results to the Technical Authority.
- 8.3.1.3 Disassemble the suspended ceiling, its supports and suspension system taking care not to damage it in order to reinstall them at the end of the work. The Coast Guard will unplug the light fixture and reconnect it at the end of the work.
- 8.3.1.4 Disassemble the wall panels and supports, taking care not to damage them, they will be given to the representative of the Coast Guard.
- 8.3.1.5 Remove insulation on walls and discard.

8.3.2 Dismantling Corridor:

- 8.3.2.1 Remove the suspended ceiling in front of the vestibule door, plan to remove enough tile and support to go beyond the corner of the bosun's cabin wall, taking care not to damage the disassembled components.
- 8.3.2.2 Disassemble the extinguisher holder, reinstall at the end of the work.
- 8.3.2.3 Remove three (3) tile widths from the floor covering and vinyl surround and Dex-O-Tex cement floor covering to bare metal in front of the

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vestibule door and along the wall transversal from the cabin of the boatswain to the corner, discard.

8.3.2.4 Disassemble the longitudinal wall panel between the door frame and the bosun's cabin wall, hand over to the Coast Guard representative.

8.3.2.5 Remove the corner molding from the bosun's cabin, hand over to the Coast Guard.

8.3.3 Insulation Installation:

8.3.3.1 Provide and install on the walls of the vestibule, on the transverse bulkhead to the corner of the crewmember's cabin wall, and inside the longitudinal bulkhead of the interior door, rigid thermal insulation and approved by TC / BSM or a recognized marine classification society to achieve a minimum thickness of 4 ". The last coat shall be provided with a reinforced aluminum vapor barrier. Seal all joints of the vapor barrier, as well as existing insulation and bulkheads. Provide the necessary supports to properly support the insulation. Provide a copy of the certificate of approval for the insulation supplied.

8.3.4 Installation of Wall Panels:

8.3.4.1 Cut, adjust and install the new wall panels to cover all the vestibule walls, as well as the front transverse bulkhead to the corner of the bosun's cabin wall, as well as the longitudinal bulkhead between the interior door and the new wall panels. Adjust the positioning of the new panels with those of the corner of the wall of the cabin. Provide the installation of brackets to support the new sections of wall panels.

8.3.4.2 The new Joiner Wall Panels (PA30C25, 2300x600x25) will be provided by the Coast Guard.

8.3.5 Suspended Ceilings Installation:

8.3.5.1 Reinstall the suspended suspended ceilings in the vestibule and hallway, providing for the adjustment of these to the new configuration of the walls.

8.3.6 Floor Covering Installation:

8.3.6.1 Obtain the services of a specialized firm to repair the removed Dex-O-Tex cement in the vestibule and corridor. Reinstall a vinyl floor covering identical to the one removed in ALTRO's ALTRO WALKWAY 20 and blue tile for the corridor. All equipment will be provided by the contractor, the Coast Guard will provide only the blue tiles needed for the hallway.

8.4 Proof of performance

8.4.1 Certification

8.4.1.1 The Contractor must provide insulation certificates demonstrating that it meets Transport Canada requirements. The Contractor must provide the following materials certificates: wallpaper, subfloor, carpet and furniture veneer. Material certificates must be provided one week after contract award. These materials must be in compliance with the 2010

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FTP CODE (International Code for the Application of Fire Testing Procedures, 2010), Resolution MSC.307 (88).

8.4.2 Report

- 8.4.2.1 The Contractor must provide a drawing identifying the location of the ultrasonic thickness measurements and the thickness of the steel at this location. In addition, the contractor will be required to provide the percentage decrease in steel thickness from the original value. This report must be delivered to the IA no later than 2 weeks after the start of the work.

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ANNUAL INSPECTION – FUEL TRANSFER HOSES

9.1 SCOPE

- 9.1.1 The purpose of this specification is to carry out the annual inspection and certification of various fuel transfer hoses.

9.2 TECHNICAL DESCRIPTION

9.2.1 General

- 9.2.1.1 In order to respect the annual certification dates of the fuel transfer hoses, these hoses must be certified.
- 9.2.1.2 The Contractor must provide all materials and labor required to perform the inspection and hydrostatic testing of fuel transfer hoses (diesel and Jet A-1) in accordance with RMA IP-11-4, based on the operating pressure. The contractor is responsible for transporting the hoses to a workshop for testing, if necessary.
- 9.2.1.3 The Contractor must ensure that the hoses are capped. The Contractor must drain and dispose of any presence of fuel in the hoses according to all applicable regulations.

9.2.2 Details of the fuel transfer hoses to be inspected and certified:

- 9.2.2.1 Four (4) 4" hoses 50 feet long, numbers: A00266-012, A00267-012, A00268-012 and A00269-012,8.
- 9.2.2.2 One (1) 4" hose 85 feet long, number: 6A0279.
- 9.2.2.3 Two (2) 3/4" hoses 75 feet long, numbers: 7671-98 and 7671-99.
- 9.2.2.4 One (1) 1" hose 150 feet long, number: 7671-97.
- 9.2.2.5 One (1) 1-1/4" hose 100 feet long for supplying JP4, number: 636459.
- 9.2.2.6 Four (4) 4" aluminium collectors with glass windows, number: 7671-14, 7671-15, R34020-6257-1, R34020-6257-27671-16, 7671-17

9.3 PROOF OF PERFORMANCE

9.3.1 Certification

- 9.3.1.1 The Contractor must provide a certificate for each hose identifying the company that completed the inspection, the certificate number, the name and signature of the responsible technician.
- 9.3.1.2 The Contractor must ensure that a metal tag bearing the same information is attached to each hose with metal fasteners.

9.4 DELIVERABLES

9.4.1 Reports

- 9.4.1.1 The Contractor must provide a detailed report that explains the work carried out, the cause of any defects, corrective actions taken and any parts that were replaced.

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- 9.4.1.2 The Contractor must provide the original signed copies of the report and certificates to the Inspection Authority and an electronic copy in PDF format to both the Inspection Authority and Technical Authority.

BOILER SAFETY VALVES – BIENNIAL INSPECTION

10.1 SCOPE

- 10.1.1 The goal of this specification item is to conduct the biennial inspection of the ship's 4 boiler safety valves, as required by SMTCC. The work is necessary for the TCMS biennial inspection of the boilers. There are 2 Sunrod type boilers onboard the ship, each being fitted with 2 safety valves.

10.2 REFERENCES

10.2.1 Reference Documents

10.2.1.1 Amaturen safety valves.pdf

10.2.1.2 photos safety valves.pdf

10.2.2 Valve details

Kunkle

Kunkle

Model: 300 HG01-AS

Model: 300 HG01-AS

Capacité: 4829 LB/HR

Capacité: 5010 LB/HR

Set: 118 PSIG

Set: 123 PSIG

Size: 1 1/2"

Size: 1 1/2"

Kunkle

Kunkle

Model: 300 LHG01-AS

Model: 300 LHG01-AS

Capacité: 5087 LB/HR

Capacité: 5092 LB/HR

Set: 125 PSIG

Set: 125 PSIG

Size: 1 1/2"

Size: 1 1/2"

10.2.3 Standards

10.2.3.1 Marine Machinery Regulations SOR-90-264

10.3 TECHNICAL DESCRIPTION

10.3.1 General

10.3.1.1 The Contractor must provide all materials and labor to carry out the overhaul and inspection of the 4 boiler safety valves. This work must include the following items.

10.3.1.2 Disassembly, cleaning and visual inspection of all valve components.

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10.3.1.3 Grinding (lapping) and machining (as required).

10.3.1.4 Reassembly of the valves, pressure adjustment and pressure test (pop test).

10.3.1.5 Tagged and sealed

10.3.1.6 The overhaul and inspection of the valves must be completed by a company specialized in the field. Any replacement parts (if required) will be negotiated using a PWGSC 1379 form.

10.3.1.7 The valves must be removed and reinstalled alternately on the boilers by the ship's crew, in order to always keep at least one boiler in operation; the valves must be sent in two shipments. The Contractor must coordinate this work with the IA.

10.3.1.8 The Contractor is responsible for organising all TCMS inspections.

10.4 PROOF OF PERFORMANCE

10.4.1 Inspection

10.4.1.1 All valve parts must be inspected by a TCMS inspector.

10.4.2 Testing

10.4.2.1 Tests must be conducted in the presence of the TCMS inspector in order to obtain an inspection certificate for the 4 valves.

10.5 DELIVERABLES

10.5.1 Documentation

10.5.1.1 The Contractor must submit to the IA the original copy of the TCMS inspection certificate for the 4 safety valves, and a copy of the certificate to the TA.

10.5.1.2 The Contractor must submit to the IA and TA a complete report detailing the work carried out and any parts replaced, in PDF format.

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PUMPS to be replaced include: Submersible Fire pump

11.1 Scope

- 11.1.1 The intent of this item is to remove the existing pump modules in their entirety and install a new Contractor supplied, class approved, pump modules and obtain TCMS credit. The tender must include all fitting, parts, insulation, piping and other parts and equipment required to complete this item.
- 11.1.2 Option to purchase and install on the Pierre Radisson in Quebec. See Annexe J.
- 11.1.3 Option to purchase and install on the Amundsen in Quebec. See Annexe J.
- 11.1.4 The Contractor shall arrange scheduling of TCMS surveyor(s) as required.

11.2 References (Drawings / Standards / Regulations)

- 11.2.1 Drawings
 - 11.2.1.1 A-20170
 - 11.2.1.2 68-H-51_076
 - 11.2.1.3 68-E-156
- 11.2.2 Regulations
 - 11.2.2.1 MOSH, and FSSM (Fleet Safety Manual).
 - 11.2.2.2 TCMS Hull and Machinery Regs.
 - 11.2.2.3 The Contractor shall arrange for TCMS inspection, approvals and sign off for vessel's Division III report.
- 11.2.3 Standards
 - 11.2.3.1 Pump sets shall have class approval.
 - 11.2.3.2 Quality Assurance Standards
 - 11.2.3.3 As per Contractor's Program.

11.3 Technical

- 11.3.1 Lockout/tag out the electrical and fluid suction and discharges.
- 11.3.2 The Contractor will use their own locks and tags but complete the ship's lockout/tag out register.
- 11.3.3 Ensure PJSA (Pre Job Safety Assessment, FSM 10.A.7.4) is complete.
- 11.3.4 Prior to any hotwork ensure Hotwork Permit is in place (FSM 7.B.4).
- 11.3.5 Drain and remove ashore any sea water from piping. Fluids to be disposed of in accordance with provincial environmental regulations.
- 11.3.6 Disconnect the suction and discharges pipes as well as electrical connections.
- 11.3.7 Unship the pump modules and transport to Depot 18. The are to be protected from the elements, mounted to a pallet and handled so as to prevent damage.

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- 11.3.8 The existing seats are to be removed and the deck prepared to accept a new seat.
- 11.3.9 The Contractor is to supply a new seat to suit the new pumps modules.
- 11.3.10 Prior to mounting the seat the Contractor is to consult with the Chief Engineer or his delegate to decide upon location for seat to facilitate connection to existing piping as well as ergonomic considerations for maintenance.
- 11.3.11 Fit seat.
- 11.3.12 Apply one coat of contractor supplied primer to the new seat and any disturbed steel work.
- 11.3.13 Install the new pump modules to the new seats.
- 11.3.14 Connect the suction and discharge piping to the existing. Contractor shall make provisions for vibration by utilizing suitable flexible lines between new module and existing rigidly mounted services (contractor supply). Gaskets and bolts used on flanges are to be new and contractor supplied
- 11.3.15 Connect the electrical to the existing.
- 11.3.16 Open system valves and purge pumps.
- 11.3.17 Contractor in the presence of the Chief Engineer or his delegate is to commission the pumps as per the manufacturer's instructions.
- 11.3.18 Following successful start-up and trials operations the contractor shall arrange for TCMS attending surveyor inspection/testing as required.
- 11.3.19

General Information Pump Data		
Pump Media	Seawater	
Minimum Capacity	220	UK gpm
Minimum Pressure / Head	70	psi
Max. Working Pressure	15	Bar
Minimum Liquid Temperature	32.00 - 89.60	°F

Motor Data

Minimum Efficiency Class	IE1
Power Supply	3 x 440V, 60 Hz
Minimum Insulation Class	F
Motor Enclosure	IP58

Specification	Bronze (RG5) CC491K
Pump Casing	
Suction/Discharge Flanges	100/80 mm. EN1092-2 PN10
Impeller	NiAlBz (CC333)

Priming Unit	B114N/60HZ/2,6KW/TK10UM/MV220V
Manometer	None
Grain Size Minimum	7 mm

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Wear Ring	NiAlBz (CC333)	Color Specification	Yellow, Ral 1007
Shaft	Duplex Stainless Steel (AISI329)	Class Society Test	LRS - Lloyds Register of Shipping
Mechanical Shaft Seal	NITRIL Ø45	Test Grade	ISO 9906 Grade 2B
Bearing	Ball Bearings	Variable Speed Drive	None
Coupling	Rigid close Coupled		

11.3.20

11.4 Proof of Performance

11.4.1 Inspections

11.4.1.1 Coordinate with the IA for location of mounting bed.

11.4.1.2 Coordinate with the IA for witness of approved fluid filling.

11.4.2 Testing/Trials

11.4.2.1 Contractor in the presence of the Chief Engineer or his delegate shall commission the diesel/compressor module as per the manufacturer's instructions.

11.4.2.2 Upon completion of commissioning run, the Contractor shall verify again for leaks in the installation.

11.4.2.3 TCMS attending surveyor inspection/testing as required.

11.4.3 Certification

11.4.3.1 TCMS sign off.

11.5 Deliverables

11.5.1 Documentation (Reports/Drawings/Manuals)

11.5.1.1 The Contractor will provide Class Approval Documentation for modules.

11.5.1.2 The Contractor will provide written proof of TCMS survey credit for the installation.

11.5.1.3 The Contractor is to provide documentation denoting supplier contact information.

11.5.1.4 All manufacturers' special maintenance tools are to be included for the pumps modules. All manufacturers recommended spare parts for 1 year of maintenance and for one complete overhaul/survey are to be included.

11.5.1.5 Original Copies of the Operators manual, Maintenance or Shop manual (intended for technicians performing overhaul), and parts manual including original manufacturers part numbers, description, quantities and exploded parts views are to be included.

11.5.1.6 Two original copies of each manual in English. One pdf version.

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11.5.1.7 Two copies of each of the above noted manuals in French if available.
One pdf version.

11.5.2 Spares

11.5.2.1 All manufacturers recommended spare parts for 1 year of maintenance
and for one complete overhaul/survey are to be included.

11.5.3 Submersible Pump; DESMI vertical inline centrifugal pump NSL80-330/D02 or
equivalent. This pump will be supplied by the contractor and installed according to all
items from 11.

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FLOORING OF SHOWERS AND BATHROOMS

12.1 SCOPE

12.1.1 The following to detail work to refinish some bathroom floors, and redo others.

12.2 REFERENCE

12.2.1 Drawings

12.2.1.1 68-H-102_1

12.2.1.2 68-H-102_2

12.2.1.3 68-H-102_3

12.2.2 Equivalents

12.2.2.1 Terrazzo M – Products meeting the following standards

12.2.2.1.1 (MIL SPEC MIL-PRF-24613, Type 1, Class 3)

12.2.2.1.2 (MIL SPEC MIL-PRF-3134, Type 1, Class 2)

12.3 TECHNICAL DESCRIPTION

12.3.1 Provide the materials and labor to refurbish the floor of the following showers by retouching the damaged surfaces to restore a glossy, sealed finish of the Terrazzo M DEX O TEX floor or equivalent, in accordance with the manufacturer's maintenance recommendations.

12.3.2 Particular attention will be paid to the waterproofing of the coating near the shower drains and at some point a sleeve must be installed to ensure the seal between the drain and the Terrazzo M epoxy coating or equivalent. The edge of the showers will also be sealed with a product compatible with the shower acrylic coating to ensure watertightness.

LOCAL	PONT	ENDROIT	SURFACE	ESTIMÉ DE TRAVAIL
# 4 COMMANDANT	PONT DES OFFICIERS	DOUCHE	27" X 33"	REFINISH GROUT COAT + CLEAR FINISH + SLEEVE
# 10 CABINE OFFICIELLE	PONT DES EMBARCATIONS	DOUCHE	29" X 55"	REFINISH GROUT COAT + CLEAR FINISH

12.3.3 Remove the existing cover for the following showers, prepare the steel deck surface by removing all traces of corrosion using mechanical tools, cover with anti-corrosion paint compatible with the Dex-O-Tex system or equivalent.

12.3.4 Take 10 ultrasound thickness measurements of the deck in each bathroom and give the results to the technical authority.

12.3.5 Provide and apply the Dex-O-Tex or equivalent cement system to cover the bottom surface of the shower and the ledges, provide a slope for the flow of water to the drain. Forsee a trial of the slope with the IA at the end of work,

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- 12.3.6 Provide and install the Terrazzo Dex-O-Tex system in the same color as the current cover.
- 12.3.7 Ensure that the surface is adequate and in accordance with the manufacturer's recommendations for the installation of DEX O TEX Terrazzo M or equivalent jointless deck lining with a 4-inch edge. The rim will also be sealed with a product compatible with the shower acrylic coating to ensure perfect sealing.
- 12.3.8 Particular attention will be given to the waterproofing of the coating near the shower drains and a sleeve must be installed to ensure the seal between the drain and the Terrazzo M epoxy coating or equivalent. The drain grating must be at the same height as the floor of Terrazzo M or equivalent.

LOCAL	PONT	ENDROIT	SURFACE	ESTIMÉ DE TRAVAIL
SBD OFFICIERS	PONT DES EMBARCATIONS	DOUCHE	26" X 28 1/2"	REFAIRE LA DOUCHE AU COMPLET + SLEEVE
SDB FEMME	PONT PRINCIPAL	DOUCHE	28 1/2" X 27"	REFAIRE LA DOUCHE AU COMPLET + SLEEVE
SDB OFFICIER	PONT SUPÉRIEUR	DOUCHE	26" X 45"	REFAIRE LA DOUCHE AU COMPLET + SLEEVE

- 12.3.9 Dispose of all residues and discards as a result of the work.
- 12.3.10 It is the responsibility of the contractor to install the necessary protections so as not to damage the surrounding surfaces.
- 12.3.11 The Contractor shall leave the premises in the same state of cleanliness as before the start of the work. This must be inspected by the Canadian Coast Guard representative at the end of the work.
- 12.3.12 Obtain the services of a specialized firm for the entirety of this work.

12.4 PROOF OF PERFORMANCE

12.4.1 Certification

- 12.4.1.1 The Contractor must provide insulation certificates demonstrating that it meets Transport Canada requirements. The Contractor must provide the following materials certificates: wallpaper, subfloor, carpet and furniture veneer. Material certificates must be provided one week after contract award. These materials must be in compliance with the 2010 FTP CODE (International Code for the Application of Fire Testing Procedures, 2010), Resolution MSC.307 (88).

12.4.2 Report

- 12.4.2.1 The Contractor must provide a drawing identifying the location of the ultrasonic thickness measurements and the thickness of the steel at this location. In addition, the contractor will be required to provide the percentage decrease in steel thickness from the original value. This report must be delivered to the IA no later than 2 weeks after the start of the work.

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ANNUAL INSPECTION – REFRIGERATION SYSTEMS

13.1 SCOPE

- 13.1.1 The objective of this specification is to perform the annual maintenance and inspection of the ship's refrigeration systems (domestic and cargo)



13.1.2

13.2 REFERENCES

13.2.1 Plans

- 13.2.1.1 W02995BP1 (rev. 7): P & I Diagram Cargo System
13.2.1.2 W02995AP1 (rev. 8): P & I Diagram Domestic System

13.2.2 Standards

- 13.2.2.1 Fleet Safety Manual (DFO 5737)

13.2.3 Regulations

- 13.2.3.1 Federal Halocarbon Regulations (2003)

13.2.4 Material Provided by the Contractor

- 13.2.4.1 The Contractor must supply all materials, tools and labor to carry out the work described below, as well as the handling of refrigerant gas in accordance with the halocarbon regulations.

13.3 TECHNICAL DESCRIPTION

- 13.3.1 The make and mode of the compressors for the domestic and cargo refrigeration system are: Emerson Copeland scroll ZF41K5E-TFD-260 and ZF25K4E-TFD-261, respectively. Both systems operate using R-507 refrigerant gas.

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- 13.3.2 The Contractor must provide the services of a certified refrigeration technician to carry out the following work:
 - 13.3.2.1 Conduct a complete inspection of the systems.
 - 13.3.2.2 Replace the filter dryers.
 - 13.3.2.3 Clean the sea water side of the condensers and replace the zinc anodes supplied by the CCG.
 - 13.3.2.4 Conduct a refrigerant leak detection test. All system piping must be checked for the presence of leaks, including the piping in the ceiling of the passageway on the Main deck (port side). The Contractor must carefully remove the ceiling tiles, temporarily store them and reinstall them as it was originally. All tiles that are damaged during the work must be replaced by the contractor.
 - 13.3.2.5 Clean and inspect evaporator units and defrosting systems.
 - 13.3.2.6 Check evaporator drains and their heating cables. Ensure the drains are free and repair insulation upon completion.
 - 13.3.2.7 If the systems must be recharged with refrigerant gas, it must be provided by the contractor via Form 1379. The Contractor must provide a unit price for a 13.6 kg bottle of R-507 refrigerant.
 - 13.3.2.8 Check all operating parameters of each system and perform required adjustments by following manufacturer recommendations.
 - 13.3.2.9 Return the systems to service.
- 13.3.3 In order to respect the needs of the ship. The Contractor must co-ordinate the inspection and start-up of this air conditioning system with the Inspection Authority.
- 13.4 **PROOF OF PERFORMANCE**
 - 13.4.1 Testing
 - 13.4.1.1 The Inspection Authority or its delegate must be present during the tests.
- 13.5 **DELIVERABLES**
 - 13.5.1 Documentation
 - 13.5.1.1 The Contractor must the Inspection Authority with the original copy of certificates. The Contractor must also provide an electronic copy in PDF format to the Inspection Authority and to the Technical Authority.
 - 13.5.1.2 The Contractor must provide a complete report explaining in detail all the work carried out, the cause of any defects (if any), any corrective measures taken and any parts replaced. The Contractor must submit an electronic copy of the report in PDF format to PDF format to both the Inspection Authority and the Technical Authority.

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GALLEY EXHAUST SYSTEM

14.1 SCOPE

- 14.1.1 The purpose of this specification is to carry out the annual cleaning and maintenance of the galley exhaust system.

14.2 REFERENCES

14.2.1 Images

- 14.2.1.1 Hotte #1
- 14.2.1.2 Hotte #2
- 14.2.1.3 Hotte #3
- 14.2.1.4 Hotte #4
- 14.2.1.5 Hotte #5
- 14.2.1.6 Hotte #6
- 14.2.1.7 Hotte #7
- 14.2.1.8 Hotte #8
- 14.2.1.9 Hotte #9
- 14.2.1.10 68-H-126_01

14.3 TECHNICAL DESCRIPTION

14.3.1 General

- 14.3.1.1 The work must be completed outside of the galley operating hours. The galley will be available to the Contractor between 2000 and 2400.
- 14.3.1.2 The galley exhaust fan must be electrically isolated on the MCC located in the HVAC #2 and #3 compartment. The locking out of the breaker must be done with the ship's electrician.
- 14.3.1.3 The Contractor must provide all the material and labor to perform the following work:
 - a) Clean and degrease the galley exhaust hood conduit from the galley to the exhaust grill located behind the Emergency Generator compartment. The conduit is a 12" x 32" rectangular section comprising of a 36' horizontal segment, a 90 degree elbow and a 27' vertical segment.
 - b) Remove the access panel located in the cleaning products store giving additional access to the horizontal section of the conduit. To open the panel, carefully remove the insulation without damaging it. Once the work is completed, the panel must be closed and the insulation reinstalled.
 - c) Remove the access panel located in the galley, and protective clothing store. These panels must be reinstalled after the work is completed.
 - d) Verify that the automatic cleaning system is functioning properly.
 - e) Inspect and clean the hood scuppers through the four access doors located above the hood

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- f) Verify that all the cleaning nozzles clear and working properly (4 pipes of 10 nozzles).
- g) Verify that the main drainage pipe is clear and functioning properly.
- h) Verify the operation of the emergency damper closing mechanism.
- i) The hood must also be cleaned, as well as the underside of the cooking plates.

14.3.1.4 The Contractor must dispose of all residues and restore all areas to their original state of cleanliness once work is completed.

14.4 PROOF OF PERFORMANCE

14.4.1 Inspection

14.4.1.1 The Contractor must demonstrate to the Inspection Authority that the work completed meets the requirements of this specification.

14.5 DELIVERABLES

14.5.1 Documentation

14.5.1.1 The Contract must provide a certificate of cleaning and a report of all work carried out including any parts replaced (if required) to the Inspection Authority upon completion of the work.

14.5.2 Certification

14.5.2.1 Provide a certificate for the cleaning and inspection of the Galley Range hood and exhaust system.

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ANNUAL INSPECTION – ELEVATOR AND DUMBWAITER

15.1 SCOPE

- 15.1.1 The objective of this item is to carry out the annual inspection, maintenance and certification of the ship's elevator and dumbwaiter.

15.2 REFERENCES

15.2.1 Standards

- 15.2.1.1 CAN/CSA-B44-M90 Safety Code for Elevators, section 12

15.2.2 Regulations

- 15.2.2.1 Canada Shipping Act 2001 and its applicable regulations

15.2.3 Contractor Supplied Material

- 15.2.3.1 The Contractor must provide all the material and labor to carry out the inspection, maintenance and certification of the described equipment.

15.3 TECHNICAL DESCRIPTION

15.3.1 Equipment Characteristic :

15.3.1.1 Elevator

Manufacturer: Montgomery Elevator Co. Ltd

Capacity: 1200 lbs

15.3.1.2 Dumbwaiter

Manufacturer: Montgomery Elevator Co. Ltd

Capacity: 300 lbs

- 15.3.2 The Contractor must hire a certified firm to carry out the maintenance, inspection and certification of the elevator and dumbwaiter in accordance with CAN / CSA-B44-M90, section 12.

- 15.3.3 The Contractor must update the maintenance register for each piece of equipment once the work is completed.

- 15.3.4 The Contractor must clean and adjust the brake for the dumbwaiter. The Contractor must clean the floor and compartment containing the electric motor.

- 15.3.5 This inspection includes a test of the Montgomery elevator's speed limiter.

- 15.3.6 Upon completion of the work, the Contractor must return all spaces to their original functional state and cleanliness.

15.4 PROOF OF PERFORMANCE

15.4.1 Testing

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15.4.1.1 The Contractor must perform operation tests, in the presence of the Inspection Authority, demonstrating the proper operation of each piece of equipment prior to being put back in service.

15.5 DELIVERABLES

15.5.1 Documentation

15.5.1.1 The Contractor must provide the original copy of the inspection certificates to the Inspection Authority before the end of the work period (one certificate per piece of equipment). The Contractor must also provide an electronic copy in PDF format to the Technical Authority.

15.5.1.2 Upon completion of the work, the Contractor must provide a detailed report explaining the work carried out, the cause of any defects (if any), any corrective measures taken and any parts replaced. The Contractor must also submit an electronic copy of the report in PDF format to the Technical Authority.

QUINQUENNIAL INSPECTION - FORWARD DECK CRANES (HAGGLUNDS SSV 10 X 10)

16.1 SCOPE

16.1.1 The purpose of this specification item is to complete the five-year inspection and certification of two port deck cranes in order to obtain a certificate from TCMS valid for 5 years.

16.2 REFERENCES

16.2.1 Reference Documents

16.2.1.1 68-H-137 Arrangement

16.2.1.2 68-H-137 Stowage

16.2.1.3 Cylindre grue Hagglund

16.2.1.4 Fiche technique Hagglund

16.2.1.5 Fonctionnement Hagglund

16.2.2 Standards

16.2.2.1 Fleet Safety and Security Manual (DFO5737)

16.2.2.2 TP 127, Ships Electrical Standards

16.2.2.3 IEEE 45, Recommended Practice for Electrical Installations Shipboard

16.2.3 Regulations

16.2.3.1 Canada Shipping Act, 2001 – Cargo, Fumigation and Tackle Regulations

16.2.4 Contractor Supplied Material

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16.2.4.1 The Contractor must provide all materials, equipment, tools and labour to perform the work required for the inspection and five-year certification of two HAGGLUNDS SSV 10 X 10 forward cranes.

16.2.5 CCG Supplied Material

16.2.5.1 The required amount of new hydraulic oil to fill the hydraulic system of each crane.

16.3 TECHNICAL DESCRIPTION

16.3.1 General

16.3.1.1 The Contractor is responsible for coordinating inspections with the Inspection Authority (IA) and TCMS. The Contractor must coordinate the preparation of the cranes by giving advanced notice to the IA in order to coordinate the installation of the steel cables and the delivery of the weights required for certification (The weights and steel cables will be provided by the CCG).

16.3.1.2 The Contractor must comply with on-board regulations: lockout, working aloft and hot work.

16.3.1.3 All parts found to be defective or excessively worn must be replaced with equivalent parts supplied by the Contractor. Replacement costs must be negotiated using a 1379 form.

16.3.1.4 If hot work is required, the Contractor must obtain each day a hot work permit, signed by the IA.

16.3.1.5 There is no crane service available on board the vessel. The Contractor must provide any crane services it will require. The Contractor must supply staging/scaffolding and crane services, taking into consideration any restriction of the wharf where the ship is docked.

16.3.1.6 There will be no rooms available for the Contractor's personnel. After each day's work the Contractor must leave the area around the cranes clean and safe.

16.3.1.7 All electrical work must be performed by certified electricians.

16.3.1.8 All hydraulic work must be performed by experienced technicians.

16.3.1.9 Upon completion of work, the Contractor must leave the ship in the same state of cleanliness as before the work started.

16.3.2 The following work must be carried out on the two port cranes:

16.3.2.1 Perform a rocking test to assess the state of the slewing bearing of each crane as per the **Rocking Test** Method document. During the test, the Contractor must record the temperature, the speed and direction of the wind, the trim and the heel of the ship.

16.3.2.2 Prepare and carry out a **magnetic** particle inspection of the crane bases. The Contractor must apply two coats of Interprime 234 marine primer, red, (2.0 mils per dry coat) or equivalent, followed by one coat of Interprime 234 primer, white, (2.0 mils per dry coat) or equivalent, on the exposed metal. Paint must be applied according to the manufacturer's standards.

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- 16.3.2.3 The Contractor must remove the steel cable, and dismantle the three cylinders, six pins and six bearings on each crane. The Contractor must clean and measure them. The seals of the cylinder heads and cylinder seals (seal kit) must be replaced. The Contractor must supply these parts.
- 16.3.2.4 Check all the lubrication points. Replace all grease nipples with 316 stainless steel ones if not already installed. All components must be lubricated with grease (Petro-Canada PXL2C30, Precision XL EP2, or equivalent) supplied by the Contractor.
- 16.3.2.5 Disassemble the cylinder axes, clean and inspect by means of penetrant for cracks, provide a report for each test. Clean sleeves, measure pins and bushings, verify the clearances. Supply and replace all grease nipples and reassemble, making sure to lubricate all components.
- 16.3.2.6 Disassemble the upper boom, including the bearing covers, pulley axes, bearings of the boom and the pulleys. Clean components, replace grease lubricators and clean all connected grease lines, check axes by means of penetrant for cracks and provide a report for each test. Measure axes and bearings, verify clearances. Reassemble, making sure to lubricate the all components.
- 16.3.2.7 Dismantle the bearings of the lower boom, clean and inspect the axes by means of penetrant for cracks, provide a report for each test, measure components, check clearances. Clean grease lines and replace all grease nipples. Reassemble, making sure to lubricate all components.
- 16.3.2.8 Disassemble the block pulley hook, clean and measure the components, check the clearances, check the axes with penetrant for cracks, provide a report for each test. Supply and replace all grease nipples and reassemble making sure to lubricate all components. Blocks pulleys must be certified by a recognized firm and certificates must be provided.
- 16.3.2.9 Bolts removed all components should be inspected for signs of corrosion or cracks. If bolts need to be replaced, they must be replaced by an equivalent grade bolts.
- 16.3.2.10 After disassembled and cleaned, inspect and measure all components. The Transport Canada Maritime Safety inspector and representative of the Coast Guard must be contacted to inspect before reassembly.
- 16.3.2.11 Drain and replace the oil in the gearboxes of gyration, the oil will be provided by the Coast Guard.
- 16.3.2.12 Provide the services of a firm specializing in hydrauliques to make the following work on hydraulic cranes:
- 16.3.2.13 Aft port Crane:

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- 16.3.2.14 Remove completely the three (3) hydraulic cylinders. Proceed with an acid bath to remove the chromium layer, and then a sandblast to achieve a surface finish of SA2.
- 16.3.2.15 Perform cleaning and inspection of components
- 16.3.2.16 Recoat the stems of the (3) cylinders with tungsten carbide based coating for marine application in a saline medium
- 16.3.2.17 Reassemble with new gaskets supplied by the contractor
- 16.3.2.18 Perform a leak tests and cylinder operation at workshop
- 16.3.2.19 Aft starboard Crane:
- 16.3.2.20 Remove completely the three (3) hydraulic cylinders. Proceed with an acid bath to remove the chromium layer, and then a sandblast to achieve a surface finish of SA2.
- 16.3.2.21 Perform cleaning and inspection of components
- 16.3.2.22 Re-chromate the stems of the (3) cylinders with a tungsten carbide based coating for marine application in a saline medium
- 16.3.2.23 Reassemble with new gaskets supplied by the contractor
- 16.3.2.24 Perform a leak test and operating of cylinders in workshop
- 16.3.2.25 Provide material and replace adapters and (2) rigid hydraulic winch lines by stainless steel adapters and hydraulic lines
- 16.3.2.26 After the cylinders have been disassembled, cleaned and inspected, the Contractor shall contact representatives of the Coast Guard at the time required to carry out an inspection of the components.
- 16.3.2.27 Provide price addendum to redo the coat of a chrome rod cylinder in the event that one or more rods to be redone.
- 16.3.2.28 Transport to and from of the cylinders to contractors' workshop will be included in the submission.
- 16.3.2.29 After the tests have been completed, provide Petro Tape and cover all hydraulic adapters that were removed.
- 16.3.2.30 Conduct a **dye penetrant** inspection of all pins to detect any fissures, remove and measure.
- 16.3.2.31 Test on the **lock valves** and counter-balance of the cylinders.
- 16.3.2.32 Show the parts removed and measurements taken to the TCMS inspector.
- 16.3.2.33 **Reassemble all parts** as described in the manufacturer's user guide.
- 16.3.2.34 The Contractor must supply and replace the filter elements in the hydraulic system and clean the tank. A 10-micron filter pump must be used to fill the tank with the new oil supplied by the CCG. The Contractor must dispose of the old oil in accordance with environmental standards in force. The Contractor must plan to empty 350 litres of oil from the hydraulic system of each crane.

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- 16.3.2.35 The Contractor must check the condition of the hydraulic hoses and replace them if needed. Replacement costs must be negotiated using form 1379.
- 16.3.2.36 Hoist hooks must be disassembled and sent for certification. Upon return, the certificate must be submitted to the Inspection Authority. Hooks must undergo a liquid penetrant test on the pins. Before reassembling the hook, the Contractor must coordinate the work to allow the crew to paint the components. The Contractor must then reassemble the hooks of each crane.
- 16.3.2.37 Check that the horn is working properly. If it is defective, the contractor must repair it. The cost of the repair will be negotiated through a 1379 form.
- 16.3.2.38 Check the windshield wipers of each crane. Check the heating elements of the windshield wipers and submit to the IA the ground insulation resistance, the resistance of each element and the amperage of the current in each element. If required, the Contractor must replace all defective heaters and windshield wipers. The costs of this replacement will be negotiated using form 1379.
- 16.3.2.39 Check the heating elements for the hydraulic oil and submit the ground insulation resistance, the resistance of each element and the amperage of the current in each element for each crane to the Inspection Authority. Check that the thermostats are functioning properly and replace them as necessary. Adjust them to the manufacturer's specifications.
- 16.3.2.40 On the heating systems for each crane check the heating elements and submit the ground insulation resistance, the resistance of each element and the amperage of the current in each element to the Inspection Authority. Replacement costs for the heating elements must be negotiated using form 1379.
- 16.3.2.41 Check anti-condensation heaters of the motors and control panels, and provide the IA with the ground insulation resistance, the resistance of each element and the amperage of the current in each element.
- 16.3.2.42 Check that the control pedals inside the cabin are functioning properly.
- 16.3.2.43 Check the operation of the thermostat that prevents the pump from starting up if oil temperature is below 10°C.
- 16.3.2.44 **Brakes** must be properly serviced. Use a lathe cutter to rectify braking surface of the drum. To do so, the drum must be turned with the cable removed and the encoder's signal bypassed. The brake bands may need to be replaced.
- 16.3.2.45 All components must be lubricated comprehensively with grease (Petro-Canada PXL2C30, Precision XL EP2, or equivalent) supplied by the Contractor.

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- 16.3.2.46 Supply and apply **Petro-Tape** to all cylinder end covers and hose connectors for each crane. The repair of any oil leaks observed during the work will be treated by means of a 1379.
- 16.3.2.47 Check that the limit switches are functioning properly and make any necessary replacements. There are two on the slewing and one for the slack line.
- 16.3.2.48 Places where the painting has been damaged by work (such as hot work), must be repainted. The Contractor must apply two coats of Interprime 234 marine primer, red or equivalent, (2.0 mils per dry coat) followed by one coat of Interprime 234 primer, white or equivalent, (2.0 mils per dry coat) on the exposed metal. Paint must be applied in accordance with the manufacturer's standards. The Contractor must coordinate the work with the Inspection Authority to allow the crew to paint the structure of both cranes once the removed parts have been reinstalled and the welding points removed.
- 16.3.2.49 The inside of the hydraulic compartments and the bases of the cranes must be cleaned of all greasy and oily residues.
- 16.3.2.50 Conduct a leak test on the windows and the various panels on the crane.

16.4 PROOF OF PERFORMANCE

16.4.1 Inspection

- 16.4.1.1 The Contractor must demonstrate to the Inspection Authority that the work is in compliance with these specifications and the requirements of the TCMS.

16.4.2 Testing

- 16.4.2.1 The Contractor must demonstrate the proper operation of the cranes and their components to the IA.
- 16.4.2.2 Lift tests must be conducted in the presence of the TCMS inspector at 125 percent of maximum crane load. CCG will supply the weights.

16.5 DELIVERABLES

16.5.1 Documentation

- 16.5.1.1 The Contractor must take and submit a report of the following measurements:
 - a) Mast, aft of cabin: pin, mast fastener and fasteners to cabin, right side and left side
 - b) Mast cylinder fasteners, mast cylinder pin: right side and left side
 - c) Cylinder fasteners to cabin and cylinder pins to cabin: right side and left side

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- d) Front cylinder fasteners, front cylinder pin
- e) Mast fasteners to boom and mast pin to boom: right side and left side
- f) Cylinder fasteners to boom, cylinder pin to boom
- g) Front boom pulley fasteners and pin of the front boom pulley

16.5.1.2 The Contractor must submit two copies (paper) of the inspection certificates to the IA, with the original copy for the Tackle Register. The Contractor must also provide an electronic copy (PDF format) of the certificates to the TA.

16.5.1.3 The Contractor must submit a complete report explaining in detail the work done, cause of failures (if any), corrective measures taken, all parts replaced, the exact measurements of all components, the required electrical component measurements, the results of the magnetic particle inspection and the condition of the pivot pins for each crane. This report must also include all certificates. The Contractor must provide the IA and the TA with an electronic copy (PDF format) of the report.

SEA WATER REPLACEMENT PIPING

17.1 Scope

17.1.1 Provide equipment, tools and labor to manufacture and replace ship's seawater piping as per the list in (5) and the reference drawings in Annex A.

17.2 References

17.2.1 19.2.1 Drawings

17.2.1.1 Dessins tuyauterie rev1

17.2.2 19.2.2 Standards

17.2.2.1 ASTM F708-92, Standard Practice for Design and Installation of Rigid Pipe Hangers, 1992 (Reapproved 2008).

17.2.2.2 PART 3: GENERAL REQUIREMENTS, item 3.6

17.3 Technical Description

17.3.1 Dismantling the pipes

17.3.1.1 In conjunction with the Coast Guard representative, ensure that the valves are properly closed before beginning the dismantling of the hoses.

17.3.1.2 Remove all pipes according to the attached drawings; Dessins tuyauterie rev1.

17.3.1.3 If floors and their supports are to be dismantled, the Contractor shall include them in their bid.

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- 17.3.1.4 If pipes are to be cut into several sections in order to be removed from their location, the Contractor shall include them in their bid.
- 17.3.1.5 After dismantling, all flanges left open will be closed with a blanking flange and the necessary bolting provided by the contractor.
- 17.3.2 **Manufacture of new pipes**
 - 17.3.2.1 Provide the required hardware, pipe 80, flanges 150, elbows and adapters and fabricate the new pipes identical to those removed.
 - 17.3.2.2 Provide all hardware certificates.
 - 17.3.2.3 Due to tight locations, some pipes will have to be manufactured in 2 or 3 sections with flanges to facilitate reinstallation. The contractor must notify the Coast Guard representative.
 - 17.3.2.4 If some hoses are to be initially assembled in place prior to final manufacturing, the Contractor shall include them in their bid.
 - 17.3.2.5 After fabrication, verify that the dimensions of each new pipe corresponds to the designated location.
 - 17.3.2.6 After fabrication has been completed, test the new hoses at 100 PSI for integrity and leak tightness in the presence of a Coast Guard representative. Provide a pressure test certificate.
 - 17.3.2.7 Hot dip galvanized (hot dip galvanized) new pipes manufactured.
- 17.3.3 **Installation of new pipes**
 - 17.3.3.1 19.3.3.1 Remove the blanks, clean the flanges for assembly, provide new seals and all new bolts, install the new pipes in place.
 - 17.3.3.2 19.3.3.2 In conjunction with the Coast Guard representative, open the valves that were closed and check for leaks. Seal any leak.
 - 17.3.3.3 19.3.3.3 Reinstall floor sections and supports that have been removed for access to the pipes.
- 17.3.4 **General notes**
 - 17.3.4.1 The Contractor shall dispose of all garbage at the end of each shift.
 - 17.3.4.2 The Contractor shall leave the premises in the same state of cleanliness as before the start of the work. The workspace, including the chines, should be picked up at the end of each working day to allow for the movement of the ship's personnel.
 - 17.3.4.3 If hot work is required, the contractor will be required to obtain a hot work permit from the vessel authorities prior to commencing work.
 - 17.3.4.4 All work shall be to the satisfaction of the Coast Guard Representative.
 - 17.3.4.5 If additional work or components are required, they will be negotiated on PWGSC Form 1379.

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17.3.5 List of hoses

17.3.5.1	Number	Size	Location
17.3.5.2	111-SC-13	2-1 / 2 "	Machine Room Front
17.3.5.3	120-SC-6	4 "	Propulsion Motor Room
17.3.5.4	136-SC-1	1-1 / 2 "	Propulsion Motor Room
17.3.5.5	134-SC-3	3 "	Propulsion Motor Room
17.3.5.6	5-SC-5	6 "(sch 80)	Rear engine room
17.3.5.7	3-SC-6	6 "	Rear engine room
17.3.5.8	4-SC-2	6 "	Rear engine room
17.3.5.9	104-SC-3	6 "	Forward engine room

17.4 **Proof of performance**

17.4.1 Test

17.4.1.1 Test new hoses at 100 PSI for integrity and leak tightness in the presence of a Coast Guard representative. Provide a pressure test certificate.

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REPLACEMENT OF HELICOPTER LANDING LIGHTS

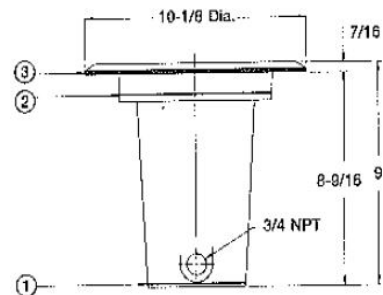
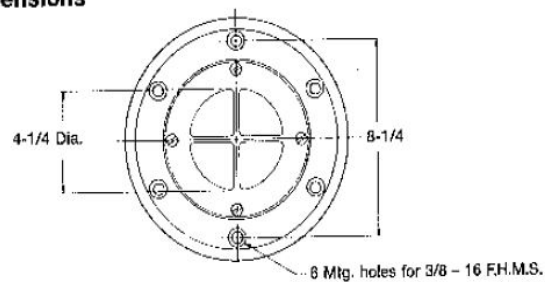
18.1 SCOPE

The Contractor must replace the 16 helicopter deck landing lights with a new LED model (Glamox AquaSignal #NS0270, or equivalent). The work also includes replacement of all electrical cables located under the helicopter deck and of all junction boxes.

18.2 REFERENCES

18.2.1 **Original lights:** Appleton/Kondu # KM-9 (Quantity: 16)

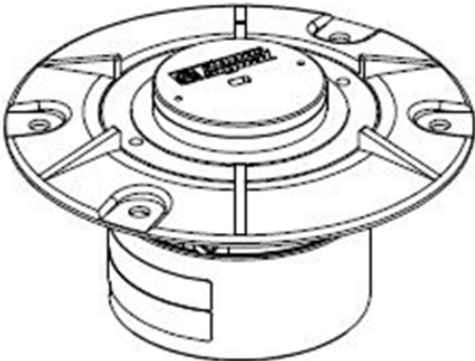
Dimensions



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18.2.2 Replacement lights provided by the Contractor:

Quantity: 18 (including 2 spares)

<p>Glamox # NS0270</p> <p><i>Aqua Signal HX55P-R, Recessed Green LED Helideck perimeter Light, Explosion proof light fixture Zone 1 and Zone 2, 115-230VAC 50/60Hz, 7W Max, Ex II 2G Ex IIC T5 Gb, IP 66/67, ambient temperatures from -40C up to +55C, PMMA lens w/ special Stainless Steel trim flange with guarding for lens, dimming function 10%, 30% or 100%, 100,000 hours life at +45C, 5 Year warranty, Helicopter landing areas according to ICAO Annex 14 and CAP437.</i></p>	
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18.2.3 Material supplied by the Entrepreneur

Part #	Manufacturer	Description	Quantity
LFBC150C	Ipex	Round outlet box, 4 outlets, ¾ NPT, PVC	16
TSRC15	Ipex	Waterproof connectors, ¾ NPT, PVC	48
WIE2131012530	Ideal	Terminal junction Block	16
AWG14/3c	Shawflex	Marine electrical cable, AWG #14/3c	300m

Note: Any other materials that may be required for performing the work must be supplied by the Contractor.

18.2.4 Reference diagrams

# Diagram	Description	# File
68-E-40	Flight Deck Overview	68-E-40....pdf
10184_1	V-3800 Light Overview	10184_1....pdf
10184_2	V-3800 Light Dimensions	10184_2....pdf
7336104700	NS0270 Glamox - Dimensions	7336104700....pdf
NS0270	NS0270 Glamox – Overview	NS0270....pdf

18.2.5 Power circuits

Breaker #	Description	Location
NA-16	8 Landing Lights – Flight deck	Bridge
NA-17	8 Landing Lights – Flight deck	Bridge

18.2.6 Applicable regulations and standards

- a) Transport Canada TP 127 (Ships Electrical Standards)
- b) IEEE 45 (Recommended Practice for Electrical Installations on Shipboard)

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c) CAP 437, ICAO Annex 14 Volume II

18.3 TECHNICAL DESCRIPTION

- 18.2.7 Before starting the work, the Contractor must ensure that the lighting equipment is electrically locked, directly on the distribution panel on the bridge (Panel "NA", circuits 16 and 17).
- 18.2.8 All steel surfaces affected by the work must receive two coats of marine quality primer (Interprime 234, 2 mils dry thickness / coat) and two additional coats of paint that meet the following specifications:
- a) On the deck: INTERBOND 201 KDL274 or equivalent, red, 6 mils dry with anti-slip particles.
 - b) Below the deck: INTERLAC 665 or equivalent, signal white RAL 9003, 2 mils dry.
- 18.2.9 The Contractor is responsible for purchasing and supplying new Glamox #NS0270 lighting fixtures. Quantity: 18 (including 2 spares). The Contractor must also make 16 seals for attaching the new lights on the deck.
- 18.2.10 The 16 old lighting fixtures (Appleton/Kondu #V-3800) on the helicopter pad must be disconnected, removed and given back to the CCG. These fixtures are attached with six screws directly in the helicopter pad.
- 18.2.11 The dimensions of and the mounting holes for the new fixtures are not compatible with the old models. All holes left by the removal of the old fixtures must be adapted to receive the new model, which requires adding an insert plate to each of the lights, and new holes. The TA or IA's approval is required before proceeding with this work. The surface must be painted before the new fixtures are put in.
- 18.2.12 New lighting equipment must be recessed in the deck with a new seal and be attached with four grade 316 stainless steel UNC 3/8" bolts. A Marine RTV sealant must be added between the seal, the lighting fixture and the deck.
- 18.2.13 With the exception of the two main power cables from panel "NA", all cables and junction boxes located under the helicopter deck must be removed and disposed of. All support rods of the old junction boxes must be removed and ground. Mechanical cleaning of old paint at the rear of old boxes should be performed following their withdrawals. Primer and paint must be added on all metallic surfaces exposed following the withdrawal of junction boxes.
- 18.2.14 16 new watertight and corrosion resistant junction boxes (Nema 4X) must be installed less than two feet from each of the new lights. Each junction box must be attached and secured by two threaded anchoring rods welded under the helicopter deck. ¼ UNC stainless steel 316 bolts should be used to secure the junction boxes in place.
- 18.2.15 The Contractor must install and connect all new cables in order to supply the 16 lighting fixtures. When required, anchoring rods must be welded and stainless steel fasteners added under the deck in order to keep the electrical cables firmly in place.
- 18.2.16 The electrical connections inside each junction box must be made using a terminal block. The use of marrettes is not accepted. The Contractor must

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ensure that the ground wire in each of the new lights is connected correctly to the vessel's grounding through power cables.

18.3 PROOF OF PERFORMANCE

18.3.1 Inspections

18.3.1.1 The facilities must meet the requirements of the Technical Authority (TA) mandated by the Coast Guard and the Chief Engineer aboard the vessel.

18.3.2 Test and trial

18.3.2.1 All lighting fixtures must undergo a power-on test to ensure that they work properly.

18.3.2.2 All lighting fixtures must be tested with a fire hose at a minimum pressure of 40 PSI to ensure watertightness.

18.3.2.3 All electrical circuits must be Megger-tested in order to measure the grounded insulation level before and after hydrostatic testing.

18.4 DELIVERABLES

18.4.1 Documents (reports, drawings and manuals)

18.4.1.1 Upon completion of the work, the Contractor must provide two paper copies and one electronic copy of all testing reports, drawings, and manuals.

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19.0 OVERHAUL OF HELICOPTER HANGAR

19.1 SCOPE

- 19.1.1 The purpose of these specifications is to describe how to carry out a major overhaul of the helicopter hangar and its mechanical and electrical components. The work includes completely replacing the rails and several other hangar components. It is an aluminium telescopic hangar made by DAF Indal Ltd. with two moving sections and one fixed section.

19.2 REFERENCES

- 19.2.1 DAF indal dwgsrev1
19.2.2 Daf Indal Manual FRrev1

19.3 TECHNICAL DESCRIPTION

19.3.1 GENERAL

- 19.3.1.1 The IA of the work will be the Chief Engineer assisted by the Chief Officer.
- 19.3.1.2 The Contractor shall provide scaffolding and crane services.
- 19.3.1.3 The Contractor shall install and commence work in a safe manner in accordance with applicable regulations on board. In the event of hot work, a hot work permit must be obtained from the Chief Engineer or his representative by the Contractor prior to commencing work.
- 19.3.1.4 In the garage, protect all installed electrical equipment and fixings. Toolboxes, fire protection systems all moving parts of the garage (closing system of the door and garage), protect the exposed gears and heating systems, the drains in the trenches of the rails will be blocked for the duration of the works.
- 19.3.1.5 Check with a water jet the areas where there is infiltration to better understand the anomalies before the work begins. To be done with a Coast Guard representative.
- 19.3.1.6 A preliminary check of the straightness and the alignment of the rails will have to be made before the beginning of the works, and be included in the firm price. Alignment should be by laser or theodolite. The data must be entered in a register.
- 19.3.1.7 It will be necessary to disconnect and identify the electrical wiring in order to separate the sections of the garage. Reconnect and attach the wiring at the end of the work.
- 19.3.1.8 The sections of the garage will be separated from each other. The middle section will be moved completely backwards to give maximum access for the front part of the rails. To avoid stress on sections when moving, install cross braces. Disassemble the brakes to avoid damaging them when moving the sections.
- 19.3.2 The free sections of the garage must be secured in place at all times to prevent the wind from lifting them. RAILS

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19.3.2.1

- 19.3.2.2 The entire rail system will be dismantled. Aluminum shims, phenolic wafers, fasteners, electric heating wires will be replaced and supplied by the Contractor. Identify the positioning of each of the components in order to reinstall them in the same locations.
- 19.3.2.3 Sandblast all surfaces of the two (2) trenches, the bottom (including the support blocks) and the two (2) sides, to obtain a surface conforming to the SA2 trade standard. Protections and shelters will have to be made to prevent sand blast sand from being found outside the perimeter and to protect the equipment surrounding the trenches.
- 19.3.2.4 Clean the surfaces by blowing them with compressed air and dispose of the waste in compliance with environmental standards.
- 19.3.2.5 Using ultrasound, evaluate the thickness of the metal in the trenches, specifically at deep cavity locations, provide 200 readings, to be adjusted up or down on Form 1379. Provide a complete report. The necessary replacement of steel will be processed on Form 1379.
- 19.3.2.6 Inspect the steel support blocks that are welded at the bottom of the trenches used as wedges and attachment points.
- 19.3.2.7 Coat all surfaces with Interzinc 52 or equivalent, coats of .005 "wet and .003" dry and two (2) coats of Intergard 377 or equivalent, deck red. Obtain the application conditions recommended by the manufacturer before starting work. The paintings will be provided by the contractor.
- 19.3.2.8 Remove the racks on the top of the rails. Clean the racks
- 19.3.2.9 Apply an aluminum "Zinchromate" primer or equivalent to the aluminum surfaces, which, once the rails are installed, will no longer be visible

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(under and on the sides). Prepare the surfaces before applying the product. Obtain the conditions of preparation and application recommended by the manufacturer before application. The Zinchromate product will be provided by the contractor.

- 19.3.2.10 Install rails (Part # 1208-153) using new shims and phenolic insulation plates. Use new stainless steel fasteners. The assembly should be done using a laser or theodolite to obtain the same data obtained before disassembly. Do not overtighten the rails to allow them to expand freely. Take care to respect the distances between the rails as shown on plan # 1228-7. Alignment measures should be taken throughout the work using laser or a theodolite. A final reading must be taken in the presence of the CCG representatives at the end of the installation of the rails, before continuing the work. A report of the readings obtained must be submitted to the Chief Engineer. Thickness shims, phenolic insulation boards and new stainless steel fasteners will be provided by CCG.
- 19.3.2.11 Install racks on rails using new fasteners (part # 1208-153-3 or equivalent).
- 19.3.2.12 Install the new heating wiring (parts # 1209-14-10 & 1209-14-11 or equivalent) on the rails, provided by the Coast Guard.
- 19.3.2.13 All sections will be reinstalled at the end of the work.

19.3.3 TELESCOPIC SECTIONS



- 19.3.3.1 Send the two (2) electric motors and magnetic brakes to a specialized company for cleaning and refurbishing. The bearings will be replaced by sealed types. The selected contractor will be required to provide a report of the replaced parts and work performed. Spare parts, other than bearings, will be provided by the contractor and processed via a 1379 form.
- 19.3.3.2 The four (4) gearboxes shall be sent to the workshop for complete disassembly: drain oil, complete cleaning of internal components, check gears, renew bearings and gaskets, check shafts and their straightness, up and fill with new oil provided by the vessel (SPARTAN EP ALL

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SEASON). Spare parts will be provided by the contractor and processed via a 1379 form.

- 19.3.3.3 Drive shaft bearings and universal joints shall be inspected and replaced as necessary. Parts deemed necessary to be replaced will be provided by the contractor and their prices negotiated via a 1379 form. When reassembling provide and replace the shear pins.
- 19.3.3.4 Remove the curtain to inspect the reel and its bearings. Clean the sliding parts of the curtain with a degreaser and allow to dry before applying a low temperature graphite grease supplied by the contractor.
- 19.3.3.5 Replace the Belleville spring washers on the stops (see part #: 1202-16-7 or equivalent). Belleville washers (96) will be provided by the contractor. Description and quantity are listed under "pick-up pad ass'y" of the instruction book.
- 19.3.3.6 Replace Side Wheels (Part #: 1200 -220-1 or equivalent) and Section Wheels (Part #: 1200 -253 or equivalent). Disassemble, inspect and measure all wheels, sleeves, shafts and their supports (ref drawing: 1200 -514). Check grease paths, supply and replace all grease nozzles. Reassemble by applying grease to necessary areas. If parts need to be replaced, the cost will be processed on forms 1379. The wheels will be provided by the contractor.
- 19.3.3.7 Replace the guides (part #: 1200 -307-1 or equivalent) of the sliding driving section in the rails. Guides will be provided by Contractor.
- 19.3.3.8 Adjust all gates as specified by the manufacturer.
- 19.3.3.9 Check lighting lights and replace bulbs as needed.
- 19.3.3.10 (Reference drawings: 1200 -186 and 1200 -187) Remove the existing seals and replace the seals between the sliding sections (part no.: 1200 -186-15 and 1200 -187-15 or equivalent), the joints will be provided by the Contractor. Rivets for installation will be provided by the contractor. The mounting plates will be retrieved for the installation of the new seals.

19.3.4 CLEANING AND FINAL TESTING

- 19.3.4.1 Rail drains will be opened, cleaned and a demonstration of their operation will be made in the presence of the CCG representative.
- 19.3.4.2 All installed protections will be removed.
- 19.3.4.3 Final cleaning and washing will be done throughout the garage.
- 19.3.4.4 Using a water jet, make a tightness test on the joints at the sliding sections when the shed is in full extension.
- 19.3.4.5 Accurate alignment measures should be taken and noted in a final report describing all work done. It will be delivered in (1) hard copy to the Chief Engineer at the end of the work, along with an electronic copy in PDF format. Provide a list of all parts that have been replaced.
- 19.3.4.6 Alignment should be by laser or theodolite. A final reading will have to be taken in the presence of the CCG people at the end of the work.

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- 19.3.4.7 A second lubrication will be done taking care to move the components during lubrication.
- 19.3.4.8 EP Grease will be supplied by the vessel.
- 19.3.4.9 All the bolts, nuts and washers of the seats of the different equipment must be replaced by the new parts. Use stainless steel fasteners when assembling aluminum parts. All bolts, nuts and washers will be provided by the contractor.
- 19.3.4.10 At the end of the work, tests shall be done in the presence of the Contractor and CCG representatives.

19.4 Proof of performance

- 19.4.1.1 The Contractor must submit a complete report explaining in detail the work done, cause of failures (if any), corrective measures taken, all parts replaced, the exact measurements of all components, the required electrical component measurements, the results of the magnetic particle inspection and the alignment. This report must also include all certificates. The Contractor must provide the IA and the TA with an electronic copy (PDF format) of the report.

REPLACEMENT OF CONTROL PANEL FOR WATERTIGHT DOORS

20.1 PORTÉE

- 20.1.1 The purpose of this section is to establish the technical requirements for replacement of the main control panel for the watertight doors supplied by the CCG. This panel is located in the crawl space below the wheelhouse and consists of a series of relays that enable fourteen watertight doors to be opened and closed automatically from the wheelhouse.
- 20.1.2 The Contractor must install a replacement pannel supplied by the CCG that allows the features of the current system to be maintained and the addition of some supplementary features, which will be described in more detail in the sections below. Plans and drawings of the new panel "as fitted" must be approved by the TA and Transport Canada (TCMS).
- 20.1.3 The Contractor must also adapt the circuits outside the main panel so that the entire control system is fully functional.

20.2 REFERENCES

20.2.1 Drawings / Documents

File / Plan #	Description
68-4140-2	Hydraulic system diagram for watertight doors
STD-4320- 3	Detail of type 'a' hinge for watertight cover
CD27864_1	Watertight doors series ii unit system controls
CD27864_2	Watertight doors series ii unit system controls
CD27865	15-watertight doors. series ii unit syst. controls
68-4120-1	Hydraulic piping watertight doors

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68-E-11_1	Watertight door system block and connection diagram
68-E-11_2	Watertight door system block diagram
68-E-11_3	Watertight door system block and connection diagram
68PROP-01-RE.dwg	Réseau ETHERNET pour système de surveillance
185B8739C_A3F.DWG	115 VAC & 24 VDC PLC & genius I/O power distribution
P17-1005- WD_DWG_R02_APP	Système de contrôle des portes étanches (Ébauch Techsol)
20171106_130952	Photo Radisson
20171024_125400	Photo Radisson

20.2.2 Applicable regulations / standards

20.2.2.1 TP127E – Ship Electrical Standards

20.2.2.2 IEEE-45(2002) – “Recommended Practice for Electrical Installations on Shipboard”

20.2.2.3 IACS UR E – “Unified Requirements Concerning Electrical Installations (2010)”

20.2.3 Material supplied by the Canadian Coast Guard (CCG)

20.2.3.1 Control panel supplied by Techsol

20.2.4 Material provided by the contractor

20.2.4.1 All materials required for replacement of the internal components of the main control panel, as per the technical requirements stipulated in this section.

20.2.4.2 Any other materials or components that may be required outside the control panel to ensure that the system is fully functional.

20.3 TECHNICAL DESCRIPTION

20.3.1 General

20.3.1.1 The purpose of this section is not to provide all of the design and installation details of the new panel but to make note of certain requirements specific to this project. The Contractor must carry out its own assessment in order to install the control panel that is supplied, compliant with the regulations for this type of equipment and that allows the system for the watertight doors to function effectively.

20.3.2 Installation of new control panel

20.3.2.1 CCG technicians have the training and all of the software needed to use GE AUTOMATION programmable logic controllers (PLC) (www.geautomation.com). The Contractor can use another make of PLC, but if so, it must meet the following conditions:

- a) Provide all software required for the use and programming of the new PLC model (at the Contractor's expense).

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- b) Offer 3 days of practical and theoretical training on the use, programming and troubleshooting of the new model of the PLC used in the manufacturing of the panel. This training is at the Contractor's expense. A maximum of eight CCG technicians may participate in this training session.
- 20.3.2.2 If required, the Contractor must adapt the circuits outside the main panel so that the entire control system is fully functional.
- 20.3.2.3 The control panel to be replaced is currently connected to another PLC located inside the information console (wheelhouse) by cables WD-33 and WD-37. The function of this other PLC is, among others, to display the status of each of the watertight doors on the wheelhouse and engine room monitors (Monitoring and Alarm System). The new panel is designed so as to maintain this functional display feature.
- 20.3.2.4 The new control panel must be powered by two 120VAC sources already available for this system, which are circuits TEL1-7 & EL1-10. To power the central processing unit (CPU) of the new PLC, the Contractor must supply two 120VAC/24VDC supply converters. The configuration of the circuit must be designed so that the loss of one of the two 120VAC sources does not cause the loss of 24VDC power supply, which requires an automatic DC power selector
- 20.3.2.5 The PLC must be programmed so as to reproduce the function of the current control system (relay logic). One additional feature must be added to the programming to allow a delay during the opening and closing of each of the watertight doors. The purpose of this modification is to prevent the simultaneous start-up of the 14 hydraulic pumps controlling each of the doors, which could cause the power circuit to overload. The start-up sequence of the pumps will be determined by the TA during programming of the PLC by the Contractor.
- 20.3.2.6 The Ethernet IP address assigned to the new PLC must respect the standard used on board the ship. The TA must provide the Contractor with the addressing code during programming of the device.
- 20.3.2.7 The Contractor must connect the new PLC to the existing Ethernet network. To do so, an industrial-quality network cable must be passed through to the information console in the wheelhouse, a distance of approximately 20 feet.
- 20.3.2.8 All wires and cables added or modified in the manufacturing and installation of the panel must be marked with a label referencing them to the drawings.

20.4 PROOF OF PERFORMANCE

- 20.4.1 All work performed must be completed to the satisfaction of the Inspection Authority (IA). Electrical connections must be inspected by the ship's electrical officer.
- 20.4.2 Prior to proceeding with tests, each door must be checked to make sure that there is no equipment blocking passage and that human safety is not

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compromised. A public announcement must be made by the Chief Engineer so that all workers on board the ship are aware of the upcoming tests.

20.4.3 The Contractor must develop a verification chart listing all of the tests to be performed on the system. The new panel must be tested in the presence of the IA and TCMS in all operating modes, including but not limited to the following points:

- a) Closing and opening of each of the doors following a joint request from the wheelhouse;
- b) Local closing and opening of each door;
- c) Functioning of bells and strobe lights announcing the closing and opening of doors;
- d) Check of new closing and opening delays;
- e) Functioning of local switches preventing the closing and opening of a specific door (isolating switch);
- f) Momentary opening of two circuits, TEL1-7 & EL1-10, to check PLC function following a complete power cut;
- g) Functioning of the ship's alarm system (Cimplicity): display of the status of each of the watertight doors on the wheelhouse and engine room monitors.

20.4.4 The Contractor must submit information on the tests performed to the IA.

20.5 DELIVERABLES

20.5.1 Final as-built or as-fitted drawings. These diagrams must include a detailed list of parts used and their locations.

20.5.2 Test report.

THERMAL INSULATION, EXHAUST SYSTEM, 6 D / P

21.0 Scope

21.0.1 Supply material and labor for the manufacture of 6 thermal insulation covers to cover the exhaust systems of the 6 ALCO 251F diesel engines.

21.1 References

21.1.1 Drawings

21.1.1.1 830F-33912_2

21.1.1.2 9028-007000_1

21.1.1.3 9028-007000_2

21.1.1.4 9028-007020_1

21.1.1.5 9028-007020_2

21.2 Technical description

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- 21.2.1 Supply material and labor for the manufacture of 6 thermal insulation blankets to cover the exhaust systems of the 6 ALCO 251F diesel engines.
- 21.2.2 The covers shall not contain ceramic fibers in the materials of manufacture.
- 21.2.3 The covers will be made in 5 parts on the sides, and 3 parts for the top. The covers will be manufactured according to the following measurements (75" circumference x 166 " in length)
- 21.2.4 Description of the product:
 - 21.2.4.1 Interior and exterior fabric: 18 oz silica fabrics (service temperature: 1800 ° F minimum continuous).
 - 21.2.4.2 Insulation: 1.5 " of high performance fiberglass (service temperature 2372 ° F minimum continuous)
 - 21.2.4.3 Second fabric: Stainless mesh to cover the inside and outside of the blankets
 - 21.2.4.4 Accessories: hooks and stainless steel wire
- 21.3 **Proof of performance**
 - 21.3.1 Provide a certificate of materials for the covers.
 - 21.3.2 All work performed must be completed to the satisfaction of the IA.