Annex A rev.1
Spring Refit
2018

CCGS Pierre Radisson

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Contents

1 GENERAL REMARKS

1.1 Identification

These general remarks describe the requirements of the Canadian Coast Guard (CCG) applicable to all the attached technical specifications.

1.2 Reference documents

1.2.1 Applicable documents:

Fleet Safety and Security Manual (FSSM) procedures	Title
7.A.1	Assessing Risk
7. B.1	Diving operation
7. B.2.	Fall protection
7. B.3	Access to confined spaces
7. B.4	Hot work
7. B.5	Locking and labelling
7. B.6	Electrical work on energized circuits
10. A.7	Contractor safety and security

1.2.2 Publications :

TP3177E	Standard for the Control of Gas Hazards in Vessels to be Repaired or Altered
TP127E	Transport Canada's Marine Safety Electrical Standards
IEEE 45	Recommended Practice for Electrical Installations on Shipboard
CSA W47.1	Certification of companies for fusion welding of steel, section 2 (Certification)
CSA W47.2	Certification of companies for fusion welding of aluminum
CSA W59	Welded steel construction (metal arc welding)
CSA W59.2	Welded aluminum construction

c) Acts and regulations

CSA	Canada Shipping Act
CLC	Canada Labour Code
MOSH	Marine Occupational Safety and Health

1.2.3 **Occupational Health and Safety**

1.2.3.1 The contractor and all sub-contractors must comply with occupational health and safety (OHS) instructions in accordance with relevant federal and provincial OHS regulations and ensure that the contractor's activities are conducted safely and without compromising the safety of any personnel.

1.2.3.2 The contractor and its employees, including sub-contractors, must participate in an orientation session on safety on board the vessel prior to commencing work in order to fully understand the risks specific to a vessel and the work protocol permit systems, as well as the procedures for safety, risk prevention, intervention in case of danger and assessment of safety prior to working. The contractor will have access to an uncontrolled copy of the Fleet Safety and Security Manual.

1.2.3.3 The contractor must comply with the Fleet Safety and Security Manual (DFO/5737) and with the work instructions on board the vessel, in addition to the relevant Canada Labour Code regulations, while performing tasks that include the following aspects:

1.2.3.3.1 Hot work;

1.2.3.3.2 Work at height;

1.2.3.3.3 Confined spaces Entry;

1.2.3.3.4 Gas freeing for entry and hot work;

1.2.3.3.5 Lock out / Tag out;

1.2.3.3.6 Pre-Job Safety assessments.

1.2.3.4 For the purpose of Lock out / Tag out procedures, the contractor must provide locks and locking devices to its employees in addition to those supplied by the vessel's Chief Engineer.

1.2.3.5 The contractor must provide a copy of the gas free certificate from a certified marine chemist or other qualified person with technical authority when performing work in tanks and bilges, prior to beginning work. The certificates must specify "Safe for persons" or "Safe for hot work", as applicable. The certificates are to be displayed in full view close to the entrance to the compartment. All tanks and pipe tunnels open for inspections and tests must be cleaned and subject to a final inspection by the technical authority (TA) prior to closure.

1.2.3.6 The contractor and its employees will not have access to crew stations or to the

vessel's sanitary facilities. The contractor must provide the necessary amenities for its employees and sub-contractors.

1.3 Access to the workplace

1.3.1.1 The contractor must ensure that the technical authority and CCG staff has unrestricted access at all times to the workplace throughout the duration of the contract.

1.4 Workplace Hazard Material Information System (WHMIS).

1.4.1 The contractor must provide the TA with the Material Safety Data Sheets (MSDS) for all the products it supplies that are controlled under WHMIS.

1.4.2 The TA will allow the contractor access to the MSDS for all controlled products on board the vessel for all work items specified.

1.5 Tobacco in the workplace

1.5.1 The contractor must ensure compliance with the *Non-smokers' Health Act*. The contractor must ensure that each employer and any person acting on behalf of an employer ensure that they refrain from smoking in workplaces under the employer's control. The contractor must ensure that absolutely no person smokes on board the vessel.

1.6 Healthy and safe workplace

1.6.1 Before the contractor begins work on the vessel, the TA and the contractor's quality assurance representative must inspect the areas where the work will take place, including access ways. The contractor's quality assurance representative must take digital photographs of each area in order to demonstrate that it has complied with the requirements of this document. It must then upload such photographs in JPG format to a CD or a DVD. Each photograph must be dated and indicate where on the vessel it was taken. Copies of the CD or DVD must be provided to the TA for reference purposes within 48 hours of the start of the contract period.

1.6.2 During the period of the work, the contractor must ensure the upkeep of the areas of the vessel that its staff uses to access the work areas. The areas must be clean and free of debris and waste must be removed every day.

1.6.3 Areas that present a danger due to the work under this specification must be secured and clearly identified by the contractor. Posters must be installed to inform

and protect all members of staff in accordance with the applicable requirements of the Canada Labour Code.

1.6.4 At the end of this contract, the contractor must ensure that all waste produced by the work under this specification is disposed of and that the vessel is as clean as it was before beginning the contract period.

1.6.5 Once all the known work has been completed and the final cleaning has been performed, the contractor's quality assurance representative must inspect all areas of the vessel where work was performed by the contractor. Any deficiency or damage noted must be recorded and compared to the photographs taken in order to determine if the deficiency or damage stems from the work performed by the contractor. If this is the case, the damage must be repaired by the contractor, at no cost to the CCG.

1.7 Fire protection

1.7.1 The contractor must ensure that the isolation, removal and installation of fire detection and extinguishing systems and related components are performed by a qualified technician. When fire detection or extinguishing systems are deactivated or put out of service by the contractor throughout the duration of the contract, a qualified technician must certify that they are fully functional again.

1.7.2 DELIVERABLE: The original signed and dated certificate must be issued to the technical authority (TA) and to technical inspection before the end of the contract.

1.7.3 The contractor must inform the technical inspection and the TA and obtain written approval before disturbing, removing, isolating, deactivating, putting out of service or locking out any element of the fire detection and extinguishing systems, including heat and smoke detectors.

1.7.4 The contractor must provide protection against fires at all times and also while work is being performed on the vessel's fire detection and extinguishing systems. This may be performed in the manner proposed below, only after having obtained written approval from the TA:

1.7.5 put only one part of the system out of service at a a time;

1.7.6 keep the system functional by using spare parts while the work is underway;

1.7.7 employ other methods accepted and approved by the TA.

1.7.8 The contractor must know that if all the necessary precautions are not taken during work on the vessel's fire extinguishing systems, accidental discharge of extinguishing agent may occur. The contractor must fill and certify, at its expense, the containers or systems that are depleted due to such work.

1.8 Damaged paint and retouching

1.8.1 Unless otherwise indicated, the contractor must provide and apply two coats of marine primer paint compatible with the vessel's paint system on all new metal surfaces and surfaces requiring retouching.

1.8.2 Before applying the first coat, the contractor must prepare all new steel structures and those that require retouching in accordance with the paint manufacturer's directions.

1.9 CCG and other employees on board the vessel

1.9.1 Employees of the CCG and of DFO, as well as other employees such as manufacturer's representatives, TCMS or classification investigators, could result in further work on board the vessel, including work not mentioned in this specification, during the period of work. The TA will do its utmost so that other work, related inspections and investigations do not interfere with the contractor's work. The contractor should not coordinate the related inspections or pay the inspection costs for such work.

1.10 Regulatory inspections and/or classification examination

1.10.1 The contractor must schedule and coordinate all regulatory inspections and classification surveys in collaboration with the authority concerned, e.g., Transport Canada Marine Safety, Health Canada, Environment Canada and others, on the basis of this specification.

1.10.2 All documents produced in the context of the inspections and surveys referred to above and substantiating that they have taken place (e.g., original signed and dated certificates) must be submitted to the TA.

1.10.3 The contractor must not substitute the TA's inspection for regulatory inspections by the TCMS or classification surveys.

1.10.4 The contractor must give prior notice (of at least 24 hours) to the TA before the TCMS regulatory inspections or classification surveys planned so that the TA can be present for the inspection.

1.11 Results of tests and data collection

1.11.1 The contractor must develop a testing and trial plan including at least all of the tests and trials mentioned in the specification. This plan must be submitted to the TA for review purposes one week before the start of the work period originally planned.

1.11.2 Any data specific to the trials, measurements, calibration or readings must be recorded, dated, accompanied by the signature of the person who took the measurements, and forwarded to the technical authority and to Marine Safety as a report in hard copy and electronic format.

1.11.3 The data recorded must be accurate to three decimal places (unless otherwise specified) and comply with the measurement system in place on the vessel.

1.11.4 The contractor must provide the TA with valid calibration certificates for all instruments used for the testing and trial plan to prove that the instruments have been calibrated in accordance with the manufacturer's instructions.

1.11.5 Hard copies of reports must be placed in standard three-ring binders, typewritten on letter-size paper and classified by specification number. Electronic copies must be in unprotected Adobe PDF format on CD-ROM. The contractor must provide three paper copies and one electronic copy of all reports.

1.11.6 All documents produced during the contract must be placed in a data collection then submitted to the TA at the end of the contract.

1.11.7 All drawings requested must be produced on ANSI format B (11 in x 17 in) paper or smaller. Three copies must be provided. Drawings must also be forwarded in DWG format (AutoCAD 2000 or more recent version), on CD-ROM, and are not to be password protected. One (1) CD-ROM must be provided.

1.12 Material and tools provided by the contractor

1.12.1 The contractor must ensure that all material is new and has never been used.

1.12.2 The contractor must ensure that all replacement products such as sealing components, gaskets, insulation, small hardware items, oils, lubricants, degreasing solvents, preservation agents, paints, coatings, bolts and fastening materials, among others, comply with the drawings, manuals and instructions of the equipment's manufacturer.

1.12.3 When no particular item is specified or when a replacement must be made, the TA must approve the replacement item in writing. The contractor must give the TA details on the material used and the grade and quality certificate of the various materials before use.

1.12.4 The contractor must provide all equipment, devices, tools and machinery, such as welders, cranes, scaffolding and fixtures required to perform the work indicated in this specification.

1.12.5 The contractor must ensure services for removal of waste oil, hydrocarbons and any other hazardous waste or controlled products as part of the work planned under this

specification. The contractor must provide certificates of disposal for all waste listed above.

1.12.6 Such certificates of disposal must demonstrate that the disposal has been completed in accordance with federal, provincial and municipal regulations in force.

1.12.7 Material and tools provided by the government

1.12.8 All tools must be provided by the contractor unless otherwise specified in the technical specification.

1.12.9 If the TA provides tools, the contractor must return them in the condition in which they were borrowed. Borrowed tools must be inventoried. The contractor must affix its signature on the inventory statement upon receipt of the tools and when they are returned to the TA.

1.12.10 The contractor must keep all goods supplied by the government in a warehouse or secure storage in a controlled atmosphere, in accordance with the manufacturer's instructions.

1.13 Restricted access areas

1.13.1 The contractor must not enter the following areas (except to perform work in accordance with the specification): cabins, offices, workshops, engineer's office, wheelhouse, control room, toilets, kitchen, crew stations, recreation areas or other areas where restricted access is posted.

1.13.2 The contractor must give 24 hours prior notice to the TA when it needs to work in occupied spaces or offices. The CCG will then have sufficient time to move staff and secure the areas.

1.13.3 Contractor inspections and protection of equipment and the workplace

1.13.4 In collaboration with the TA, the contractor must coordinate an inspection of the condition and location of items to be removed before performing the work specified or accessing a location to work on it.

1.13.5 Any damage resulting from the contractor's work and attributable to its performance of the work must be repaired by the contractor at its own expense. Material used for replacements or repairs must comply with the criteria for the material supplied by the contractor, indicated in the section Material and tools provided by the contractor.

1.13.6 The contractor must protect adjacent equipment and areas from damage. Workplaces must be protected against water infiltration, sanding and welding particles, etc. Temporary covers must be installed on workplaces.

1.13.7 The contractor must protect the vessel from infestation by vermin (insects, mammals). If an infestation occurs during the contract period, the contractor must

ensure, at its expense, extermination of the vermin prior to the vessel's departure and the end of the contract.

1.14 Records of work in progress

1.14.1 The TA may record work in progress by various methods, including photos, digital videos and film.

1.15 List of confined spaces

1.15.1.1 The contractor may request a list of confined spaces in the vessel at the meeting prior to the refit.

1.16 Hazardous material

1.16.1 CCG will provide a report of the hazardous material existing onboard the vessel. It is the contractor responsibility to plan the work according to the existing hazardous material.

1.17 The contractor must not use any material containing asbestos.

1.17.1 Handling of materials containing asbestos must be performed by personnel trained and certified in the removal of material containing asbestos in accordance with the federal, provincial and municipal regulations in force as well as the Fleet Safety and Security Manual. Such certificates of disposal must demonstrate that the disposal has been performed in accordance with federal, provincial and municipal regulations in force.

1.17.2 The contractor must not use paint containing lead.

1.17.3 In the past, paint containing lead was used to paint CCG vessels. Consequently, some of the contractor's processes, such as grinding, welding and burning, may release the lead content of the paint. The contractor must ensure that analyses are conducted in the work areas to test for the presence of lead in the paint and that the work is performed in accordance with applicable federal and provincial regulations.

1.17.4 The contractor must obtain approval from Health Canada for paint applied to the surface of hulls subject to regulations of Health Canada and the Pest Management Regulatory Agency.

1.18 Material and equipment removed

1.18.1 Tout l'équipement retiré dans le cadre du présent devis demeure la propriété de la GCC, à moins d'avis contraire dans certaines sections du devis.

1.19 Welding certification

1.19.1 For any work requiring fusion welding of steel, the contractor or its sub-contractors must hold certification from the Canadian Welding Bureau in accordance with subsection 2.1 of the most recent version of W47.1-03 standard of the Canadian Standards Association.

1.19.2 For any work requiring fusion welding of steel, the contractor or its sub-contractors must hold certification from the Canadian Welding Bureau in accordance with subsection 16 of the most recent version of CSA\ACNOR AWS standard of the Canadian Standards Association.

1.19.3 For any work requiring fusion welding of steel, the contractor or its sub-contractors must hold certification from the Canadian Welding Bureau in accordance with subsection 2.1 of the most recent version of W47.2 standard of the Canadian Standards Association.

1.19.4 The contractor must provide the technical authority with documents clearly indicating the welding certification for all the employees who will perform all the welding work planned in this specification.

1.20 Electrical installations

1.20.1 All electrical installations and repairs must be performed in accordance with the most recent version of Standard TP17E (Transport Canada's Marine Safety Electrical Standards) and Standard 45 of the Institute of Electrical and Electronic Engineers (Recommended Practice for Electrical Installations on Shipboard).

1.20.2 All electronic equipment installations and repairs must be performed in accordance with the Canadian Coast Guard publication on telecommunications and electronics entitled "General Specification for the Installation of Shipboard Electronic Equipment."

1.21 Refrigeration and Air Conditioning Systems

1.21.1 All engineering and installation on refrigeration and air conditioning systems shall be carried out in accordance with the federal Halocarbon regulations

1.21.2 Any work on refrigeration and air conditioning systems must be performed in accordance with Sections 2.7 and 2.8 of the Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

1.22 Tradesmen's competence

1.22.1 The contractor must use qualified tradesmen, certified (where applicable) and competent and supervise them in order to guarantee a high uniform level of performance quality.

1.22.2 The head of inspection may ask to consult and record details of the certification or competence of the contractor's tradesmen. This request must not be exercised unduly, but is only intended to ensure that qualified tradesmen are performing the necessary work.

1.23 Shipboard crane

1.23.1 The vessel's crane will be available to perform the necessary handling to load material on board the vessel, but the contractor must submit a request to the Chief Engineer at least 24 hours before the beginning of the handling.

1.24 Contractor's crane

1.24.1 It is the contractor's responsibility to verify applicable load restrictions at the dock at section 28 in the port of Montreal, where the vessel is moored. Slings and lifting gear are to be provided by the contractor.

1.25 Electric power and compressed air supply

1.25.1 120 VAC electricity and 120 psi compressed air will be provided by the vessel.

1.26 The Canada Shipping Act

1.26.1 All changes and work carried out must be made according to the regulations of the 2001 Act, the Canada Shipping, especially with the regulation on Marine Machinery.

2 SERVICES

2.1 Lift

2.1.1 The contractor must provide a monthly and weekly price for the optional provision of a telescopic lift for the crew's needs. The price provided shall include all costs, including mobilization, and other related costs. The lift must have a horizontal reach of at least 80 ft. and a lifting height of at least 130 ft.

2.2 Portable toilets

2.2.1 The contractor must provide a daily price for the optional provision of 6 portable toilets for a 10 days period. The price must include the transportation and the emptying of the toilets. These toilets will be necessary when the engine room staff will be maintaining the vessel's sanitary system.

2.2.2 The toilets are to be set forward of the vessel's gangway.

2.2.3 The toilet must be pumped and cleaned every 2 days.

3 LIST OF ACRONYMS

CA CONTRACTING AUTHORITY (PWGSC)
CCG CANADIAN COAST GUARD
CLC CANADA LABOUR CODE
CSM CONTRACTOR SUPPLIED MATERIAL
CSA CANADIAN STANDARDS ASSOCIATION
CWB CANADIAN WELDING BUREAU
DFO FISHERIES AND OCEANS CANADA
FSSM FLEET SAFETY AND SECURITY MANUAL (CCG)
FSR FIELD SERVICE REPRESENTATIVE
GSM GOVERNMENT SUPPLIED MATERIAL
GFE GOVERNMENT FURNISHED EQUIPMENT
HC HEALTH CANADA
IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
OL OVERALL LENGTH
MSDS MATERIAL SAFETY DATA SHEET
OHS OCCUPATIONAL HEALTH AND SAFETY
PWGSC PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
SSMS SAFETY AND SECURITY MANAGEMENT SYSTEM
TBS TREASURY BOARD SECRETARIAT OF CANADA
TCMS TRANSPORT CANADA MARINE SAFETY
TA TECHNICAL AUTHORITY – OWNER'S REPRESENTATIVE (CCG)
WHMIS WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM

4 GENERAL INFORMATION ABOUT THE VESSEL

Name: CCGS Pierre Radisson

Type: Medium Icebreaker / River

Year of construction: 1978

Shipbuilder: Burrard Dry Dock, Vancouver, BC

Length: 98.33 m

Width: 19.51 m

Draught loaded: 7.16 m

Displacement loaded: 8 090 mt

Power: 11 155 kW

Propulsion: Diesel electric

5 PRODUCTION DIAGRAM

5.1 Scope of work

5.1.1 La présente spécification vise à fournir aux représentants du propriétaire un calendrier précis des travaux et de leur achèvement pour les besoins de la Garde côtière.

5.2 Technical description

5.2.1 The Contractor must provide three bound copies of a detailed bar chart (Gantt chart type), illustrating the planned schedule of work to refit the vessel. The chart must show each task of the specification with its start date, duration, and planned and actual completion date. An electronic version must also be sent to the Vessel Maintenance Manager and to the contracting authority.

5.2.2 Any critical work path must be indicated, with the critical tasks that risk delaying the refit work if they do not comply with the planned work schedule. These may include problems with manpower or tasks that are unable to be carried out in parallel to other tasks.

5.2.3 In case of work affecting the critical workflow, the Chief Engineer, Vessel Maintenance Manager and PWGSC are to be notified immediately. Every effort must be made to avoid delaying the vessel's refit. Regular quality assurance procedures must be applied.

5.2.4 The bar chart will be updated each week and prior to each production meeting to illustrate actual progress of the refit and changes made to the completion date of each item. The Contractor must include in the updates to the chart any special work

requested on PWGSC Form 1379 by indicating the impact this additional work will have on the work schedule.

5.3 Proof of performance

5.3.1 Tout le travail doit être achevé à la satisfaction du chef-mécanicien et du responsable de l'entretien du navire

5.4 Deliverables

5.4.1 The Contractor must provide three hard copies of the bar chart to the vessel's Chief Engineer no later than 3 days after contract signature. An electronic copy must also be provided to the contracting authority and the Vessel Maintenance Manager.

6 SAFETY AND SECURITY EQUIPMENT

6.1 LIFEBOAT and RELEASE SYSTEM

6.1.1 Scope of work:

Effectuer l'entretien annuel et inspection de la chaloupe de sauvetage

6.1.2 Reference

Drawings and photographs

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6.1.3 Technical Description :

Lifeboat particulars :

Make : Watercraft International Ltd
Serial Number : 9213262
Dimensions : 8.5 x 2.75 x 2.35 m
Capacity : 60 persons
Net weight : 4275 kg

Contractor must provide parts and labor to perform the following tasks:

6.1.3.1 Check hull for water-tightness, cracks and defects, repair as required.

6.1.3.2 Verify the vessel identity markers CGSB and SOLAS reflective tape and replace as necessary

6.1.3.3 Hull must be cleaned, coated with UV filter, buffed and waxed.

6.1.3.4 Check weather-tightness of all doors, hatches penetrations and accessories. Repair as required.

6.1.3.5 Check and adjust Shaft seal packing, as required.

6.1.3.6 Check marine bearing.

6.1.3.7 Check entire system for oil, fuel, water, coolant and exhaust leaks.

6.1.3.8 Perform a comprehensive sea trial with members of the ship's crew, to demonstrate the lifeboat is in good working order.

6.1.3.9 Track humidity levels of the entire lifeboat.

6.1.3.10 Lifeboat must be delivered to the vessel and launched nearby, in the water and tied-up at a dock, near the ship. After work has been completed, the Lifeboat must be returned to the CCG at the same location. CCG will provide transport cradle.

6.1.3.11 Contractor must arrange for services of Transport Canada approved firm to inspect and certify Lifeboat and Davit. Supply labour and materials to inspect and certify Lifeboat launching systems. All parts used must be OEM.

6.1.3.11.1 Check protective devices.

6.1.3.11.2 Replace Diaphragm.

6.1.3.11.3 Visual inspection of hooks.

6.1.3.11.4 Functional test of hooks.

6.1.4 **Proof of performance**

6.1.4.1 Inspection

6.1.4.1.1 All work must be performed to the satisfaction of the Chief Officer.

6.1.4.2 Certificates

6.1.4.2.1 Contractor must submit original certificates to the Chief-Officer for lifting hooks. Electronic version of reports and certificates in PDF format must be given to the Chief-Officer and Vessel Maintenance Manager VMM. Certificates must be delivered before the end of the work period.

6.1.5 **Deliverables**

6.1.5.1 Rapport

6.1.5.1.1 Contractor must provide a detailed report of work performed, deficiencies noted, corrective actions taken and list of parts replaced. The report must be submitted before the end of the work period.

6.1.5.1.2 Contractor must provide a complete inspection report for lifeboat, davit and launching systems. The report must be submitted before the end of the work.

6.1.5.1.3 Contractor must provide original reports and electronic versions in PDF format to the Chief Engineer, and Vessel Maintenance Manager of these reports, submitted before the end of the work period.

6.2 FIRE FIGHTING SYSTEM

6.2.1 Scope of work

6.2.1.1 Inspect and perform annual maintenance of shipboard firefighting system in accordance with Transport Canada Regulations.

6.2.2 References

Drawings, service manuals or photographs

- Inspection list
- 06418-20 Fire-fighting plan
- F-3756-06M008.pdf DWG #3 CO2 Smothering systems (2008)
- F-3756-06M008-001-QCC.pdf CO2 Fire extinguishing systems

6.2.3 Technical Description

6.2.3.1 Fixed CO2 Smothering systems

6.2.3.1.1 Check system for proper operation of timers, visual indications, audible alarms and the ship's ventilation shut-downs. CO2 cylinders must be disconnected to avoid accidental discharge of CO2 gas. Piping must be blown-through and proven free, using compressed air, nitrogen or other inert gas.

6.2.3.1.1.1 While testing propulsion motors and propulsion alternators extinguishing systems, first remove the fusible nozzle cover before blowing through with inert gas. Reinstall the cover at the end of the testing.

6.2.3.1.2 At the start of each day, contractor must have sufficient reserves of compressed gas to perform all tests and inspections for that day, to avoid delays. Contractor must provide manpower to rearm system and perform trials at the same time. Contractor must coordinate trial and inspection period with Chief Officer.

6.2.3.1.3 Contractor must demonstrate that all nozzles and conduits are free from obstruction. This may require dismantling and blanking of certain sections of piping. Each system must be reassembled and restored to its original configuration at the end of each day.

6.2.3.1.4 Contractor must inspect all local and remote actuation devices, time delays and temperature rise actuators.

6.2.3.1.5 Contractor must ensure all hoses and flexible connections between bottles and distribution network are gas-tight.

6.2.3.1.6 All bottles must be checked for liquid level and marked accordingly.

6.2.3.1.7 It is understood that firefighting equipment must remain accessible and available in case of emergency. Adequate precautions must be taken when using hot work to perform inspection.

6.2.3.1.8 In every case, where a fixed firefighting cylinder is found defective, charged below its nominal capacity or requires hydrostatic testing, contractor is responsible for removal from vessel, perform necessary maintenance, return to its original position and re-connected. Parts to be replaced will be supplied by the contractor and dealt with using the PWGS 1379 form.

6.2.3.1.9 All systems must be identified with tags bearing the contractor's name, date and initials of person performing inspection.

6.2.3.1.10 One fixed CO2 cylinder must be tested hydrostatically (See list of fixed firefighting cylinders).

6.2.3.2 Galley, Fixed Fire Extinguishing Pero-chem PCL 300

6.2.3.2.1 Contractor must perform annual inspection of Galley Fixed Fire Extinguishing system. Work must be performed between 13h30 and 15h30.

6.2.3.2.2 Contractor must check ventilation shut-downs, visual alarms and fusible links for correct operation.

6.2.3.2.3 Contractor must check local, remote and automatic triggering devices.

6.2.3.2.4 Contractor must check cylinder for level of extinguishing agent and date of most recent hydrostatic test.

6.2.3.2.5 If system cylinder needs to be removed for inspection, testing of refilling, it must be replaced with a cylinder compatible with the system in place, until original cylinder can be re-installed. Parts to be replaced will be supplied by the contractor and dealt with using the PWGS 1379 form.

6.2.3.2.6 Upon completion, new tags bearing the contractor's name, date and initials of person performing inspection must be affixed to the system.

6.2.3.3 Flight Deck Fire Extinguishing System

6.2.3.3.1 Contractor must provide parts and labor to perform the following tasks:

6.2.3.3.2 Contractor must perform annual inspection of Flight Deck fire extinguishing system: FireCombat & Minuteman

6.2.3.3.3 Contractor must provide containers and draw a sample of AFFF Foam from the Minuteman system, the FireCombat System and one from each lot of spare foam, as identified by the Chief Officer. Results from the analysis of these samples must be given to the CCG.

6.2.3.3.4 Contractor must ensure, powder from the Minuteman system has not been compacted due to the ship's vibrations. If compaction is noticed, contractor must advise Chief Officer.

6.2.3.3.5 Technical Information :

6.2.3.3.5.1 Fixed System MinuteMan : Foame (container below nozzle)

6.2.3.3.5.2 Fixed System FireCombat : Powder (aft container) and foam (forward container)

6.2.3.3.6 Inventory of spare extinguishing agent :

6.2.3.3.6.1 2 containers Ansul-lite 3%, Helicopter Workshop.

6.2.3.3.6.2 2 containers Angus Tridol 3% (AFFF) Motor Propulsion Room.

6.2.3.3.6.3 12 containers Angus Tridol 3% (AFFF) Bosun's Store

6.2.3.3.6.4 3 container Ansul-lite 3% (AFFF) Bosun's Store

6.2.3.3.6.5 2 containers Angus Tridol 3% (AFFF), Fuel transfer compartiment.

6.2.3.4 Portable Fire Extinguishers

6.2.3.4.1 Contractor must perform annual inspection of all portable fire extinguishers aboard the vessel according to list provided. Inspection must be performed aboard the vessel. Date and time must be coordinated with Chief Officer. Chief Officer must be advised if any extinguishers must leave the vessel.

6.2.3.4.2 Each fire extinguisher must be removed from its wall support and inspected for anomalies. Pressure gauge and date of most recent hydrostatic test must be checked.

6.2.3.4.3 All cartridges on powder extinguisher must be verified and weighted.

6.2.3.4.4 All extinguishers must be identified with tags bearing the contractor's name, date and initials of person performing inspection.

6.2.3.4.5 Contractor must repair and recharge all extinguishers found defective, below nominal charge and perform hydrostatic testing if required. The contractor must remove the extinguishers from the vessel, transport to his facility and transport back to be ship and install in the original location. Parts to be replaced will be supplied by the contractor and dealt with using the PWGS 1379 form.

6.2.3.4.6 Contractor must provide replacement CO2 extinguishers during hydrostatic testing, in absence of the ship's extinguishers.

6.2.3.4.7 Firefighting equipment must remain available in case of emergency. Adequate precautionary measures must be taken during hot work to complete inspection.

6.2.3.4.8 The following extinguishers shall undergo testing:

6.2.3.4.8.1 One Foam extinguisher type AFF requires inspection and refilling.

6.2.3.4.8.2 Two (2) Foam extinguishers type AFF require hydrostatic testing and refilling

6.2.3.4.8.3 Five (5) powder extinguishers require maintenance and refilling

6.2.3.4.8.4 Three (3) CO2 extinguishers require hydrostatic testing and refilling.

6.2.3.4.9 Contractor must replace all extinguishers removed from the ship during all hydrostatic/maintenance/refilling by an extinguisher of the same type and capacity, so as to ensure the adequate compartment protection during the ships extinguishers absence.

6.2.3.4.10 When inspection is complete, (Date stamp), all extinguishers will have received necessary maintenance, and hydrostatic testing for them to be certified for 1 full year, until the next inspection, the following year.

6.2.4 **Proof of performance**

6.2.4.1 Inspection

6.2.4.1.1 All work carried out must be to the satisfaction of the Chief Officer. Chief officer, or delegated officer must be present during inspections.

6.2.4.2 Trials

6.2.4.2.1 Equipment must be proven operational to the Chief Officer.

6.2.4.3 Certification

6.2.4.3.1 Contractor must provide two paper copies along with the original certificate, to the Chief Officer. Electronic copies in PDF format must be sent to the Vessel Maintenance Manager. All deficiencies noted must be resolved before the end of the contract. Corrective actions and parts to be replaced will be supplied by the contractor and dealt with using the PWGS 1379 form.

6.2.5 **Deliverables**

6.2.5.1 Report

6.2.5.1.1 Contractor must provide a written report describing in detail all work performed the causes of noted deficiencies, corrective actions taken and parts replaced.

6.2.5.1.2 Contractor must provide the report in electronic format (.pdf), to the Chief Engineer and to the Vessel Maintenance Manager, before the end of the work period. L'entrepreneur devra remettre au chef-mécanicien et au responsable de l'entretien une copie électronique en format PDF du rapport.

7 HULL AND STRUCTURE

7.1 GALLEY RANGE HOOD CLEANING AND CERTIFICATION

7.1.1 Scope of work

7.1.1.1 Clean, repair and certify the galley range.

7.1.2 Reference

7.1.3 Technical Description

Contractor must provide parts and labor to perform the following tasks:

7.1.3.1 Clean and degrease the extractor duct from the kitchen hood to the suction grille located behind the emergency generator compartment. The duct of a rectangular section of 12 "X 32" has a horizontal segment of 36 feet, a bend of 90 degrees and a vertical segment of 27 feet. Two access hatches facilitate cleaning on the horizontal and vertical section.

7.1.3.2 Dispose of residues and leave the premises in the same state of cleanliness as it was found at the beginning of the work.

7.1.3.3 The work must be done outside the kitchen operating hours. The available hours are between 19:00 and 24:00.

7.1.3.4 Check the automatic cleaning system of the range hood.

7.1.3.5 Inspect and clean the scuppers of the hood by the four access hatches on the top

7.1.3.6 Check that all the cleaning nozzles are working condition (4 pipes of 10 nozzles).

7.1.3.7 Make sure main drain pipe adequately functions.

7.1.3.8 Check the emergency shut-off mechanism.

7.1.3.9 Provide a cleaning certificate upon completion of the work.

7.1.4 Proof of performance

7.1.4.1 Inspection

7.1.4.1.1 The work shall be inspected by the chief engineer of the vessel or his representative.

7.1.4.1.2 All work must be to the satisfaction of the Chief Engineer.

7.1.4.2 Certification

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

7.2 STOWAGE ATTACHEMENT POINTS ON THE BOAT DECK AND UPPER DECK.

7.2.1 Scope of work

The contractor shall carry out the analysis, manufacturing plan and installation to add points of attachment on the both the boat deck and upper deck.

7.2.2 Reference

7.2.2.1 Drawings and photos

- PierreRadissonPoint d'attachePA_25Dec
- 221-H-101 Plan general arrangement
- 221-H-79 Deck coverings
- 221-H-80 Insulation
- 221-H-81 Linings
- 221-H-82 Joiner and insulation details
- 221-H- 139 Profile and decks

7.2.2.2 Regulation

- Canada Shipping Act and Regulations

7.2.3 Technical Description

The contractor shall provide the material and the labor to perform the following tasks:

7.2.3.1 General description

7.2.3.1.1 Unless otherwise specified, the contractor shall supply all materials, all steel, all equipment, all machinery, all scaffolding, all lifting equipment, all insulation, and all parts necessary for the realization of Work shown.

7.2.3.1.2 To carry out the work, some ceilings, some wall coverings, as well as the equipment installed therein must be dismantled. The insulation covering the structure will also be dismantled to allow the cutting of the steel and the installation of the new inserted plates.

7.2.3.1.3 Reinforcements may also have to be installed on the existing structure.

7.2.3.1.4 Furnishings must be moved and protected for the duration of the work

7.2.3.1.5 All premises in which work will be carried out shall be emptied of the personal effects of the crew by the owner's crew.

7.2.3.1.6 The Contractor shall be responsible for the dismantling, re-assembling, displacement and protection of any equipment and furnishings required for the work.

7.2.3.1.7 All insulation that has been dismantled must be reinstalled according to the pre-dismantling condition. Suitable anchorages should be reinstalled to secure the insulation.

7.2.3.1.8 The dismantled ceilings and accessories must be reinstalled identically to the existing installation before the works.

7.2.3.1.9 Inspection of welds must comply with the standards mentioned in section 1.18 ' ' Weld certification ' ' in this document.

7.2.3.1.10 A specialized firm shall be hired to check the welds by magnetic particle. The firm will also provide the audit report.

7.2.3.2 Installation

7.2.3.2.1 The whole of the installation work must be carried out according to the instructions of herein specifications and plans.

7.2.3.2.2 The new steel parts must have been processed to obtain the required profile.

7.2.3.2.3 Paint (products will be confirmed by the owner)

7.2.3.2.3.1 Before applying paint, all surfaces must be prepared according to the paint manufacturer's recommendations.

7.2.3.2.3.2 All paints shall be of INTERNATIONAL mark and applied in accordance with the manufacturer's instructions and application criteria

7.2.3.2.3.3 Before application of paints, greases and other stubborn deposits will be removed by means of a degreaser approprié.la paint

7.2.3.2.3.4 Before application, the surfaces will be cleaned, the dust will be aspirated, a jet of compressed air will be applied and if necessary a washing and/or degreasing must be carried out on these surfaces.

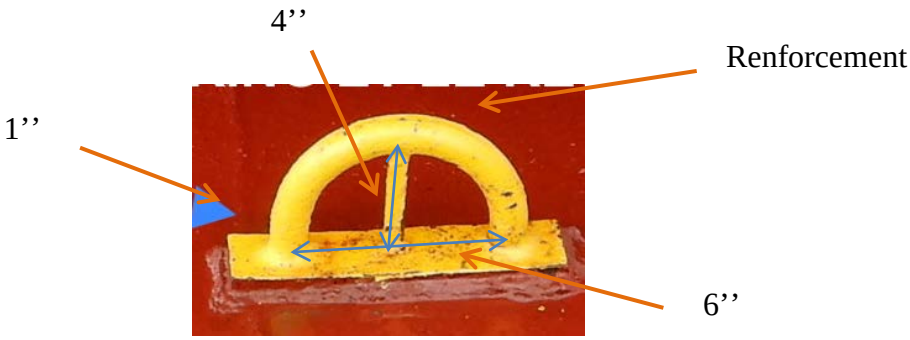
Attachement Points required for the 2018 Arctic

Summary of modification requirements							
	Installation				removal		
	D-Ring	Twists Lock[1]	Ratchets	Rail à ratchets	D-ring	Container attachement point	Doubler plate
Boat Deck, Starboard side	6	6	NA	NA	4	NA	NA
Boat Deck, Port side	5	7	NA	NA	2	1	3
Upper Deck, foreward section	16	7	6	2 (with 4 ratchets) 1(with 2 ratchets)	2	NA	NA
Strengthening **Existing D-Rings**	36						
Expansion of holes in bulwark brackets, support of davit and front of mooring winches	29						
Guard rail modifications	4						
Addition of a lifting pole assembly on the bridge behind the wheelhouse, port side	1						

883’ chain (including 15% error) and 161 grapple hooks grade 70 (including 15% error)

Note 1- Twist lock

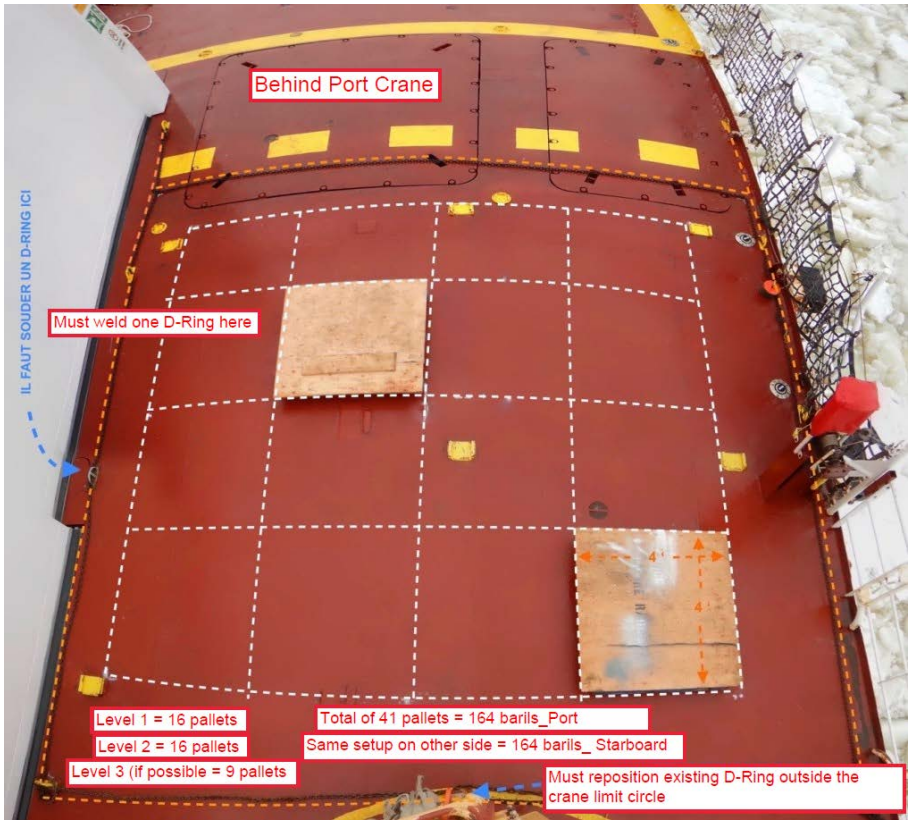
2- Strengthened D-Ring



7.2.3.3 Boat deck, port and starboard.

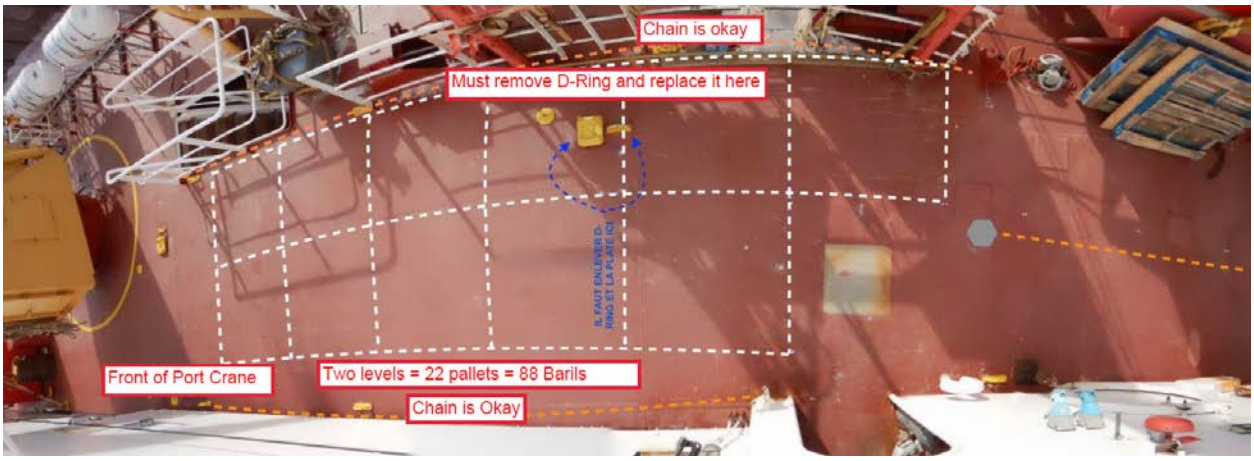
7.2.3.3.1 Reposition the d-ring located behind the cranes further from crane on indicated turning circle.

7.2.3.3.2 Add a D-ring along the hangar in line with the rings already in place.



7.2.3.4 Boat Deck, Port Side

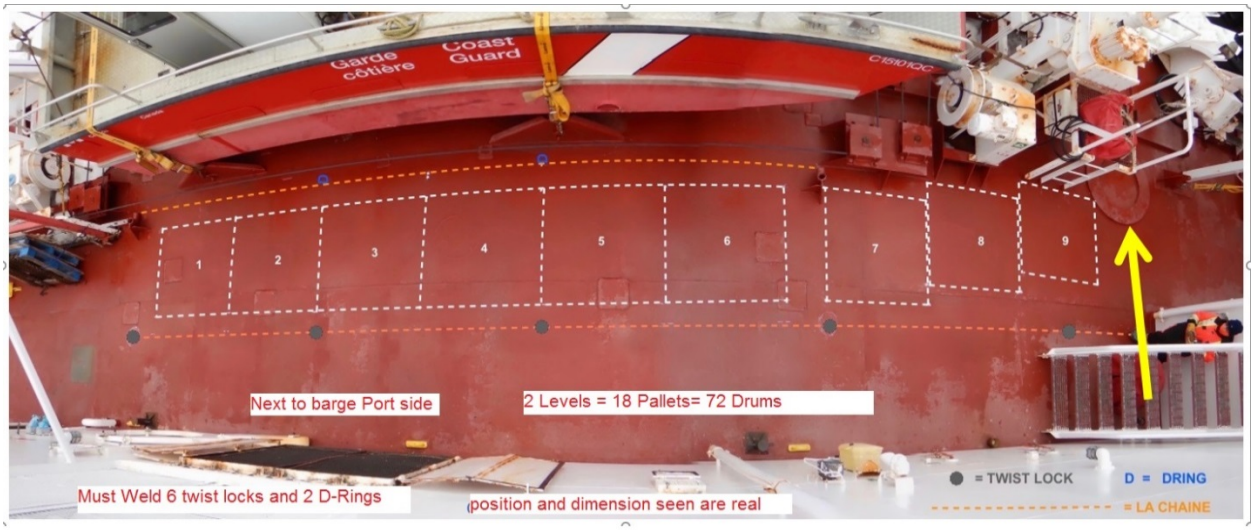
7.2.3.4.1 Remove the container attachment point (return it with removable system when returning from the Arctic voyage) and the reposition D-ring under the pallets

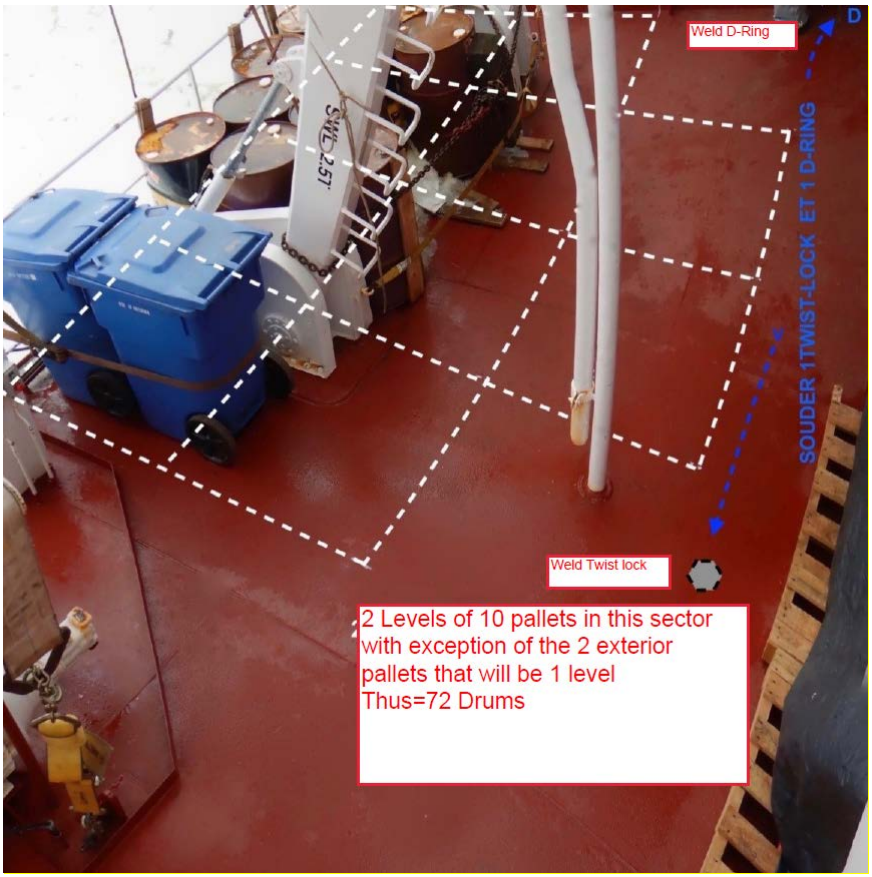


7.2.3.4.2 Add two D-rings aligned with the barge anchor points to the #2 and #3 pallet gasket and the one between #4 and #5.

7.2.3.4.3 Add 6 twist lock anchor points aligned and opposite the attachment point on the other side of the pallets.

7.2.3.4.4 Remove the winch support ring (indicated by yellow arrow)





7.2.3.4.5 Add a D-ring along the wall near the fire hydrant.

7.2.3.4.6 Add a twist lock in line with the D-ring added and centered with the fourth pallet position.

7.2.3.4.7 Reinforce the railing.

7.2.3.4.8 Remove A-Frame reinforcements

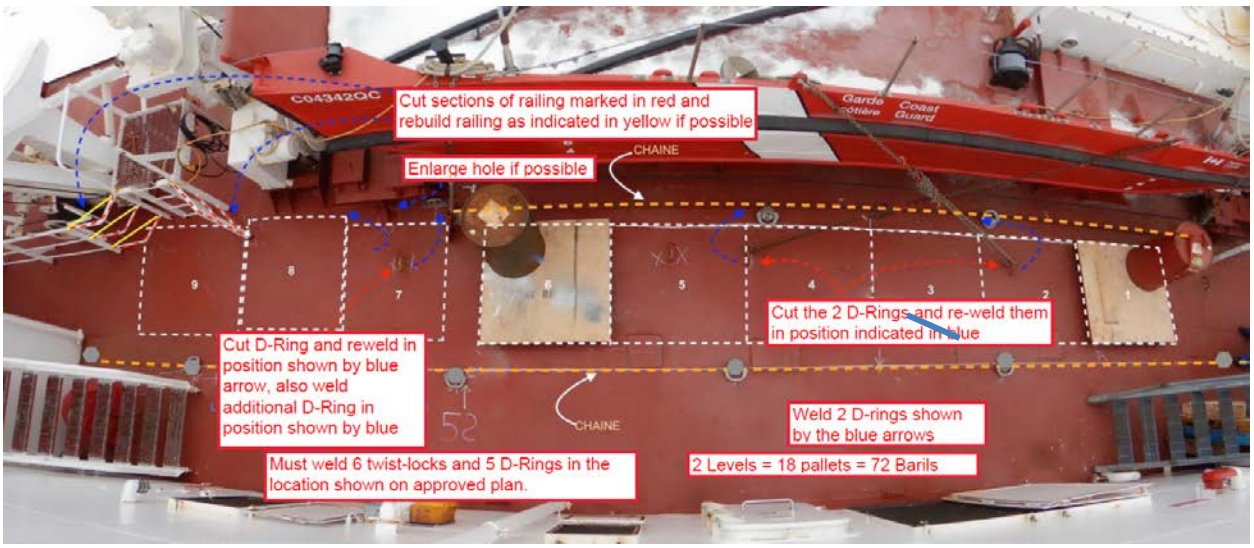
7.2.3.5 Boat Deck, Starboard Side

7.2.3.5.1 Add two D-rings aligned with the barge attachment points to the #5 and #4 and #3 and #2

7.2.3.5.2 Remove the two D-rings located under the pallets.

7.2.3.5.3 Add six aligned twist locks, four of which are opposite the attachment points on the other side of the pallets.

7.2.3.5.4 change the ' railing ' bars on the back of the life boat for to remove their curve, installating straight bars.

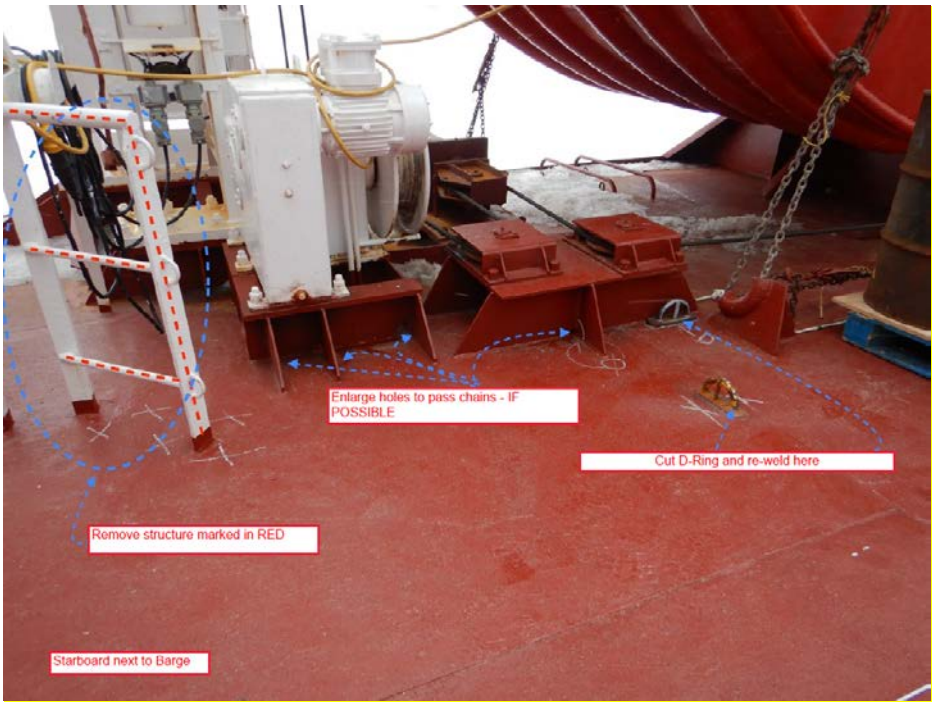


7.2.3.5.5 Remove the railing in found in front of the barge..

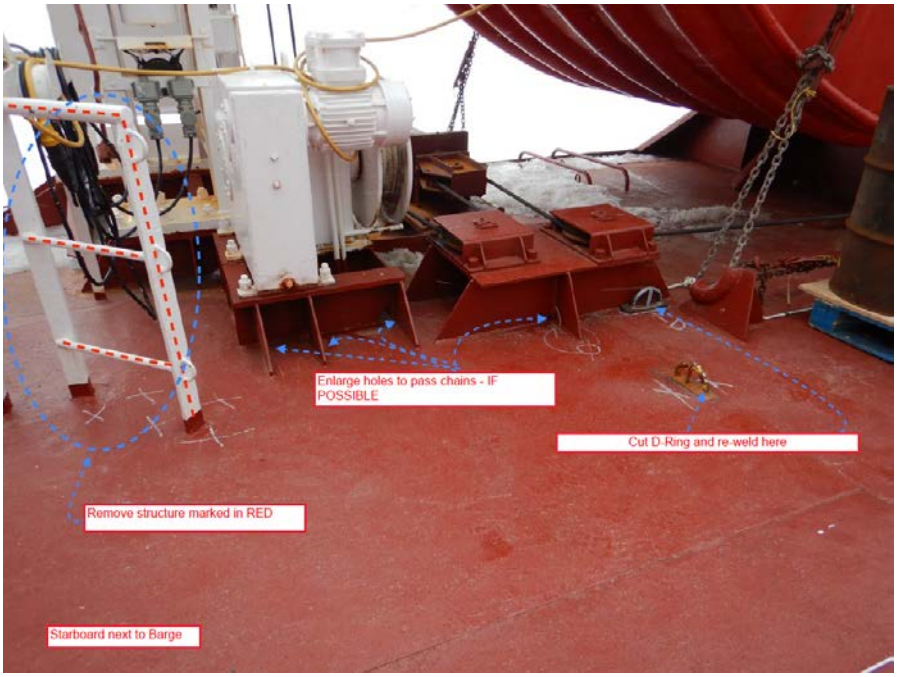
7.2.3.5.6 Remove the D-ring located under a pallet

7.2.3.5.7 Add a D-ring along the rear pulley bracket.

7.2.3.5.8 Enlarge the holes (four) already present in the brackets of the base of the davit of the barge, if structurally possible.



7.2.3.5.9 Add a D-ring in line with the holes in the ' brackets ' of the barge support and opposite the end of the pallet #9



7.2.3.6 Upper deck, fore section

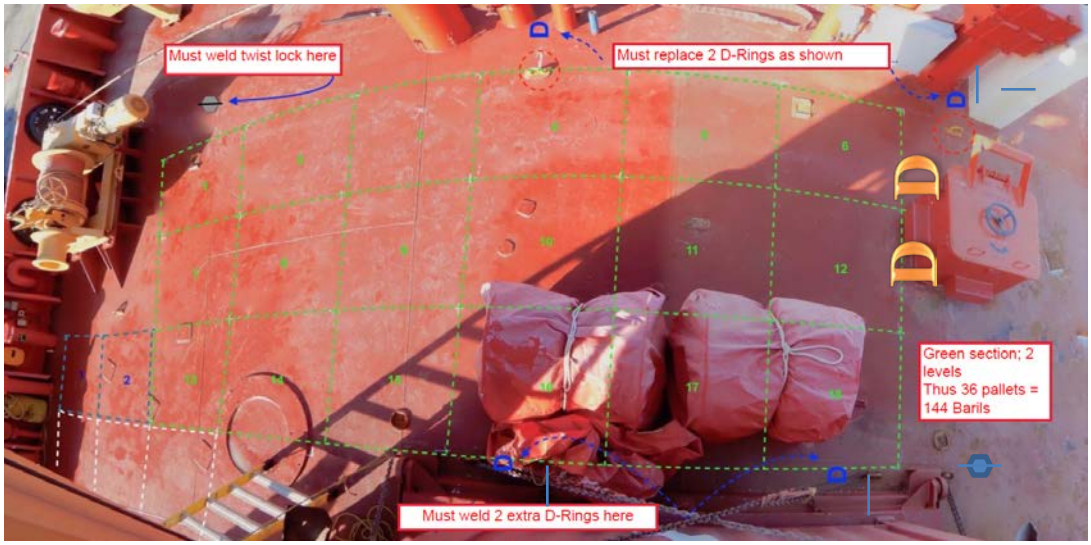
7.2.3.6.1 Add two D-rings next to the already existing rings in front of the hold.

7.2.3.6.2 Add two D-rings aligned to the front of the pallets

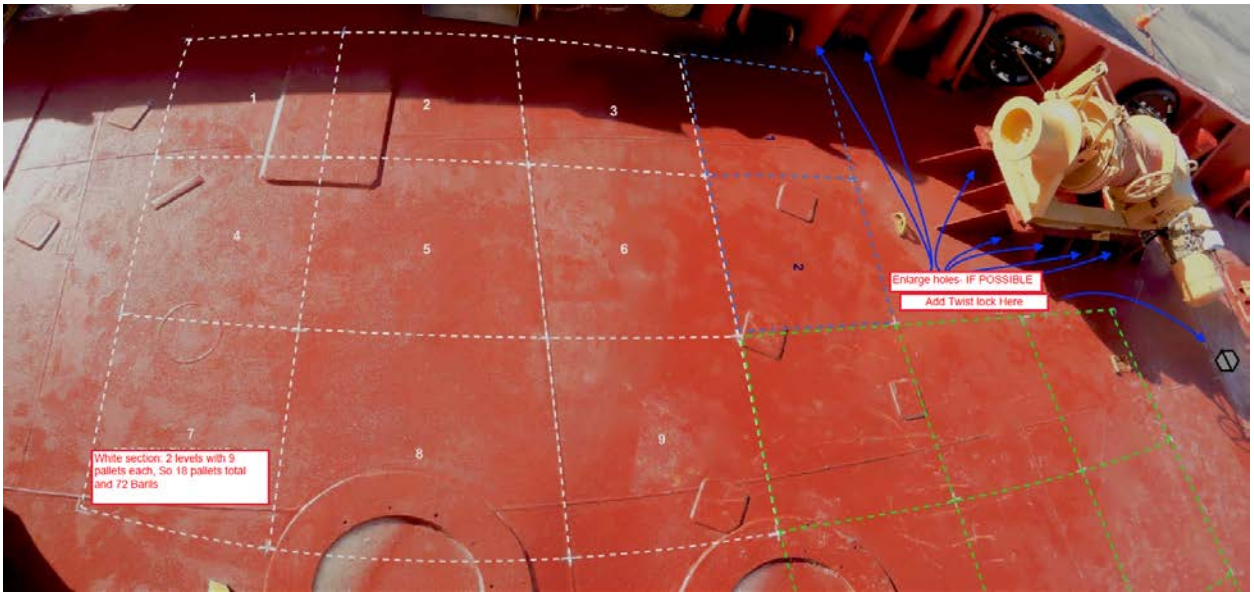
7.2.3.6.3 Add a Twist lock aligned with the two new rings to their left.

7.2.3.6.4 Remove the D-ring that is in front of the pallets and the one at the starboard bow.

7.2.3.6.5 Add two D-rings to the sides of the emergency exit of the and one aligned near the vent as well as a twist lock near the hold.



7.2.3.6.6 Enlarge the holes in the ' brackets ' of the winch support and the ' brackets ' of the bulwark to be able to pass a chain (port and starboard side), If structurally possible without compromising strength.



7.2.3.6.7 add two twists lock in front of cranes (port and starboard)

7.2.3.6.8 Add a D-ring next to the emergency exit of the bow thruster compartiment.

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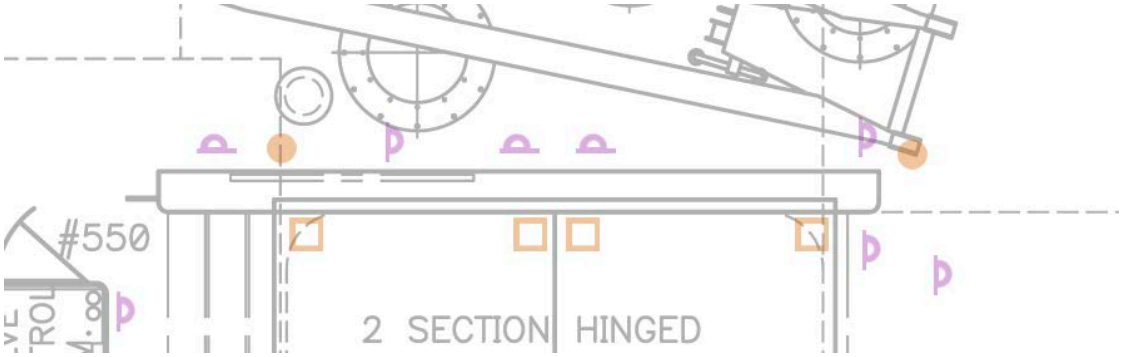
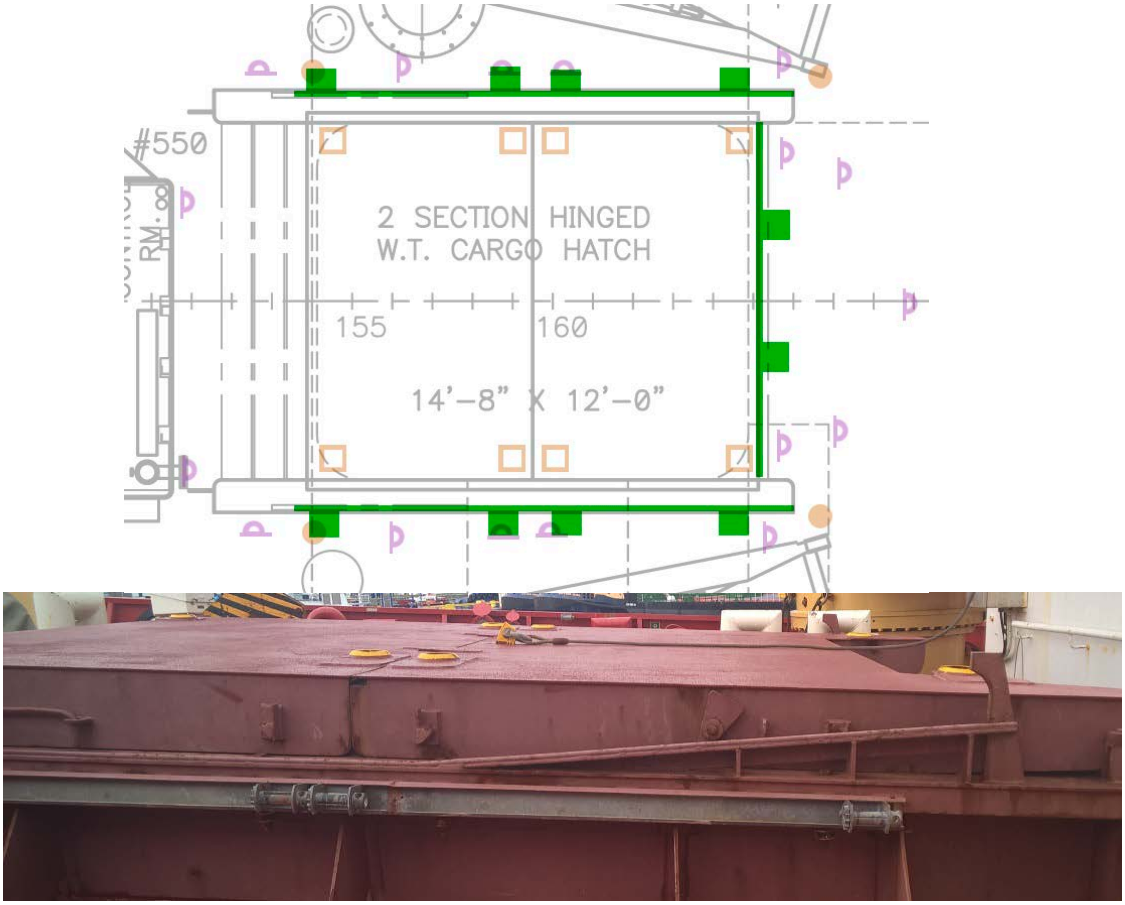
7.2.3.6.9 Add four D-rings along the cargo hold (port and Starboard)



7.2.3.6.10 Add a system of removable ratchet rails along the sides of the hold.

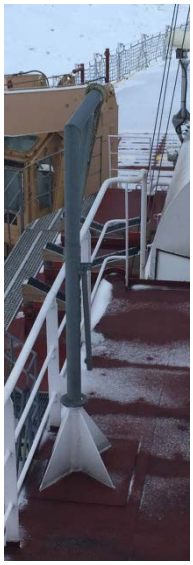
7.2.3.6.11 Two rails with four ratchets on the long side and a rail with two ratchets on the front.



7.2.3.6.12 Add three removable ratchets (green squares) to the Bulwark ledge (port and Starboard)

7.2.3.7 Deck behind wheelhouse (navigation bridge deck)

7.2.3.7.1 Add a lifting pole (as shown below) in the location shown here and modify the ' railing ' to make an access door.



7.2.4 **Proof of performance**

7.2.4.1 Inspection

7.2.4.1.1 All work must be inspected and completed to the satisfaction of the chief officer and chief engineer. The inspection and exact locations will be done before installation.

7.2.5 **Report**

7.2.5.1 Provide a certificate of inspection to the chief engineer before the completion of the work.

7.2.5.2 Provide the original copy of the inspection certificates by the specialised NDT firm, before the end of the work.

7.2.5.3 The contractor must also send an electronic copy of the certificates to the ship's maintenance officer before the completion of the work.

7.3 CHIEF ENGINEERS OFFICE RENOVATION

7.3.1 Scope of Work

7.3.1.1 The Contractor shall refurbish the Chief Engineer's Office. The work consists of replacing the compartment insulation, checking the steel structure at the floor (boat deck) and ceiling (officers' deck), replacing the floor covering, installing wallpaper on the wall panels, replace the cabinet and desk, make the necessary modifications to the electrical, telecommunication and HVAC systems

7.3.2 References

7.3.2.1 221-H-101 General Arrangement

7.3.2.2 221-H-79 Deck coverings

7.3.2.3 221-H-80 Insulation

7.3.2.4 221-H-81 Linings

7.3.2.5 221-H-82 Joiner and insulation details

7.3.2.6 221-H- 139 Profile and decks

7.3.2.7 06418S28 - Aménagement Cabine Chef Mecanicien

7.3.2.8 Surface calculations

7.3.2.9 Mobilier DWG 2

7.3.2.10 Photo CHEFMEC

7.3.3 Technical Description

7.3.3.1 Provide material and labor to complete the Chief Engineer's cabin renovations.

7.3.3.2 All existing compartment insulation must be completely removed and replaced with new insulation. Installation of new insulation must be in accordance with plans 221-H-80 and 221-H-82. Fiber glass insulation type PF 335 must be replaced by Roxul RHT 60 insulation or equivalent. The thermal resistance must equal or exceed 0.75 m^2K / W. The nominal density of the insulation must be at least 96 Kg / m^3. The approximate area to be covered with insulation is 50 m^2. The contractor will have to add 10% (5 m^2) to the total area to account for the insulation of the stiffeners (angle iron) structure.

7.3.3.3 The insulation must be covered with an aluminum vapor barrier. The joints between the insulation sheets must be sealed with 7.62cm (3 ") wide aluminum tape. The contractor shall install an insulation fastener system using nails welded to the steel sheet. The insulation must be fastened with new nails and washers. The amount of nails installed should be equivalent to what is currently in place.

7.3.3.4 Insulation shall be applied over a length of 450mm (18 ") to account for the thermal bridge between an insulated structure and a non-insulated structure.

This includes the stiffeners.

7.3.3.5 Reassembly of wall panels shall be done in accordance with plans 221-H-82

7.3.3.6 The Contractor shall install new wallpaper to cover the entire surface of the existing wall panels (including curtain moldings and hard cases). The approximate area to cover is 39 m². The wallpaper must be branded MDC, model: Vycon-Allure, pattern: Y47440al IMO certified Crown or equivalent.

7.3.3.7 The Contractor must replace the entire carpet and Linoleum at the Chief Engineer's office and at the entrance to the cabin (vestibule). The estimated area of carpet to be removed is 13.59 m2 (262.2 ft2). The new carpet must be Mohawk brand, model: Makers statement, Mushroom, 979 Braid: 44 (5275), C2: GB3 (5275). C3: 45 (5275) or equivalent. The office section, of the chief engineer's cabin will be renewed with Linoleum with an estimated area of 7.84m2. The entrance to the cabin (vestibule) will be renewed also with Linoleum with an estimated area of 2.92m2. Using Greflor creation 70-portobello prelab 0357 or equivalent. This product must be properly adhered to the subfloor.

7.3.3.8 The underlay of the floor, between steel and carpet / Linoleum must be completely redone for the total surface area of 24.35 m². The subfloor shall comply with the requirements of Part 2 of Annex 1 of the IMO FTP Code 2010.

7.3.3.9 Following the removal of the old floor, the Contractor shall take thickness measurements of the steel plating. Measurements will be taken by a calibrated ultra-sonic meter. The contractor must provide a minimum of 50 measurement points in total. The contractor must provide a unit price per point. There are to be 40 measuring points in a 50 cm band along the outer walls of the room. The Contractor must provide a price for the replacement of a sheet steel strip from the floor of the compartment. The steel strip has a width of 50 cm along the front wall (4.020m) and the starboard wall (4.693m). The thickness of the sheet is ¼ ". A section of steel sheet of area estimated at 24"x12 " is to be replaced under the sliding opening window in front of the chief engineer’s work desk.

7.3.3.10 Once all insulation has been removed, the contractor will mechanically sand surface rust on the exterior wall, ceiling and floor , up to the leveling cement of the floor. Special attention should be paid to the base of the exterior wall as water and moisture have been particularly aggressive.

7.3.3.11 The perimeter of the windows (frame) should be sanded (if necessary).

7.3.3.12 Rusted surfaces to be brushed and painted, 25% of the surface especially 2 feet above the deck, and around and under the windows, apply a coat of marine alkyd primer and two topcoats.

7.3.3.13 The Contractor must fabricate and install the furniture in accordance with the plan entitled; "Mobilier DWG 2"

7.3.3.14 The furniture shall be made of water repellent plywood and flame retardant on both sides. Marine plywood must be covered with Pionite - WW601-suede-

Cinnamon Noce laminate and Pionite-SG 228-Suede-Slate or equivalent. The Laminate design specifications give the distributions of the different shades of the Pionite veneer. Table edging must be black thermoplastic. Cabinet doors must be recessed in the furniture. All cabinet doors and drawers must be equipped with a lock. A unique key will have to be able to open all the locks of the furniture in this compartment. There must be a key per lock.

7.3.3.15 Requirements for the furniture accessories

7.3.3.15.1 Drawers shall be equipped with concealed slides

7.3.3.15.2 Drawer locks shall be push-button

7.3.3.15.3 A lock for two panels with an aluminum astragal

7.3.3.15.4 Cabinets shall be equipped with a locking mechanism preventing their opening in case of strong movement of the vessel.

7.3.3.15.5 All cabinet door hinges shall be of silent closure type.

7.3.3.15.6 All shelves shall be equipped with a removable retaining bar to hold books and accessories in the event of heavy movement of the ship.

7.3.3.15.7 Plan 06418S29 - Cabin Installation Chief Engineer provides the following information:

7.3.3.15.7.1 The location of new furniture

7.3.3.15.7.2 Identify wall outlets, switches, heaters, fixtures, thermostat, wall anchors, intercom to add or relocate.

7.3.3.16 The following information will be provided by the Chief Engineer:

7.3.3.16.1 The furniture to be disassembled and removed

7.3.3.16.2 Identify wall outlets, lighting fixtures, intercom, heaters, thermostat to be removed or relocate.

7.3.3.17 The contractor will need to replace some ceiling tiles due to the recessing of the recessed luminaires. The new ceiling tiles must meet the following criteria: White 2 feet by 2 feet square tiles (2 'x 2') in white aluminum, pattern B197 (35%), model PANZ. Tiles must have a white "Acoustibond" membrane, glued to the aluminum panel and "Fibrex Marine Board and Flex 8" insulation (8 lb / ft3 or 128 kg / m3) one inch (1 ") thick, or equivalent, glued to the7.3.3.17

7.3.3.18 The 2 ventilation grilles must be replaced by grilles fitted with shutters to adjust the air flow. The shutters must allow the complete closure of the air vent causing the complete obstruct the air passage. The new grilles must be white

7.3.3.19 A section of the office desk panelling on the Starboard wall shall be removable to allow maintenance of the sliding window mechanism. Note that this requirement is represented in the document 06418S29 - Furnishing Cabin Chief Mechanic.

7.3.3.20 The contractor will have to renew the window dressings in the Chief engineers office as well as sleeping quarters.: 6 doubled windows and 6 lanes + 2 curtains

antechamber doubled 2 apparent sides. The work includes the making and installation of curtains, linings and laces. The work includes the supply of new rods. The fabric must be Darwin brand two colors (709 Flax and 739 Charcoal) or equivalent. The intervals will be equal and the side seams should not be rolled up. There shall be no apparent stitching.

7.3.3.21 All electrical and telecommunications wall outlets will be manufactured by the contractor. Holes resulting from the removal of accessories from the wall panels will need to be patched with recut Ayrlite panel. The recut panel will be provided by the CCG.

7.3.3.22 Installation of electrical circuits must conform to TP 127.

7.3.3.23 The following computer and electronic accessories will be dismantled and reassembled by CCG employees:

7.3.3.23.1 Television

7.3.3.23.2 Sound System and speakers

7.3.3.23.3 Phones

7.3.3.23.4 Printer

7.3.3.23.5 Computer

7.3.3.23.6 Telecommunication Circuit: Telephone, television, internal communication.

7.3.3.24 Plan 06418S29 - Cabin Installation Chief Engineer provides the following information:

7.3.3.24.1 The location of the new furniture

7.3.3.24.2 Identify wall outlets, switches, heaters, fixtures, thermostat, wall anchors, intercom to add or relocate.

7.3.3.25 All library shelves shall be equipped with a removable retaining bar to hold books and accessories in the event of heavy movement of the ship.

7.3.4 **Proof of Performance**

7.3.4.1 Certification

7.3.4.1.1 The Contractor shall provide the insulation certificates that demonstrate compliance with transport Canada's requirements. The Contractor shall provide certificates of the following materials: wallpaper, sub-floor, carpet and veneer of furniture. Materials certificates must be provided one week after the contract is awarded. These materials must be in accordance with the 2010 FTP Code (International code for application of Fire procedures, 2010), resolution MSC. 307 (88). Test Rapports

7.3.4.1.2 The Contractor shall provide a design identifying the location of measurements of ultrasonic thickness and the thickness of the steel at that location. In addition, the contractor will have to provide the percentage reduction in steel thickness relative to the original value. This report must

be delivered to the IA not more than 2 weeks after the start of the work.

7.4 INSOLATION REPLACEMENT CABINES 406 AND 408

7.4.1 Scope of work

7.4.1.1 The Contractor shall carry out the insulation replacement of cabins 406 and 408. The work consists of refurbishing the compartment insulation, checking the steel structure at the floor level (boat deck) and from the ceiling (officers' deck), install a wallpaper on the wall panels.

7.4.2 Reference

7.4.2.1 221-H-101 General arrangement plans

7.4.2.2 221-H-79 Deck coverings

7.4.2.3 221-H-80 Insulation

7.4.2.4 221-H-81 Linings

7.4.2.5 221-H-82 Joiner and insulation details

7.4.2.6 221-H- 139 Profile and decks

7.4.2.7 Photos

7.4.3 Technical description

7.4.3.1 All existing insulation of cabins 406 and 408 shall be completely removed and replaced with new insulation. Installation of new insulation must be in accordance with plans 221-H-80 and 221-H-82. Fiber glass insulation type PF 335 must be replaced by Roxul RHT 60 insulation or equivalent. The thermal resistance must equal or exceed 0.75 m^2K / W. The nominal density of the insulation must be at least 96 Kg / m^3. The approximate area to be covered with insulation is 80 m^2. The contractor will have to add 10% (8 m^2) to the total area to account for the insulation of the stiffeners (angle iron) structure

7.4.3.2 Once all insulation has been removed, the contractor will mechanically sand surface rust on the exterior wall, ceiling and floor , up to the leveling cement of the floor. Special attention should be paid to the base of the exterior wall as water and moisture have been particularly aggressive.

7.4.3.3 Rusted surfaces to be brushed and painted, 25% of the surface especially 2 feet above the deck, and around and under the windows, apply a coat of marine alkyd primer and two topcoats.

7.4.3.4 The perimeter of the windows (frame) should be sanded (if necessary).

7.4.3.5 the Contractor shall take thickness measurements of the steel plating. Measurements will be taken by a calibrated ultra-sonic meter. The contractor

must provide a minimum of 50 measurement points in total. The contractor must provide a unit price per point. The measuring points are to be taken in a 50 cm band along the outer walls of the room. The Contractor must provide a price for the replacement of a sheet steel strip from the floor of the compartment.

7.4.3.6 The insulation shall be covered with an aluminum vapor barrier. The joints between the insulation sheets must be sealed with 7.62cm (3 ") wide aluminum tape. The contractor shall install an insulation fastener system using nails welded to the steel sheet. The insulation must be fastened with new nails and washers. The amount of nails installed should be equivalent to what is currently in place.

7.4.3.7 The insulation shall be applied over a length of 450mm (18 ") to account for the thermal bridge between an insulated structure and a non-insulated structure. This includes the stiffeners.

7.4.3.8 Reassembly of wall panels shall be in accordance with plans 221-H-82.

7.4.3.9 The Contractor shall install new wallpaper to cover the entire surface of the old wall panels (including curtain moldings and hard cases). The approximate area to cover is 80m². The wallpaper must be branded MDC, model: Vycon-Allure, pattern: Y47440al IMO certified Crown or equivalent.

7.4.3.10 The installation of electrical circuits shall be in accordance with TP 127.

7.4.3.11 The following computer and electronic accessories will be dismantled and reassembled by CCG employees:

7.4.3.11.1 Television

7.4.3.11.2 Sound system and speakers

7.4.3.11.3 Telephones

7.4.3.11.4 Printer

7.4.3.11.5 Computer

7.4.3.11.6 Telecommunication circuit: telephone, television, internal communication, internal computer network.

7.4.4 **Proof of performance**

7.4.4.1 Certification

7.4.4.1.1 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).

7.4.4.2 Report

7.4.4.2.1 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.

8 AUXILIARY SYSTEMS

8.1 FUEL TRANSFER HOSES

8.1.1 Scope

8.1.1.1 Perform inspection and certification of fuel transfer hoses.

8.1.2 Technical description

Contractor must provide parts and labor to perform the following tasks:

8.1.2.1 Provide parts and labor to inspect and perform hydrostatic test on 9 fuel transfer hoses. (Diesel and Jet A-1)

8.1.2.2 Hoses must be capped. Presence of fuel must be disposed of and dealt with using PWGSC 1379 form.

8.1.2.3 Hoses for CCGS Pierre Radisson fuel transfers :

8.1.2.3.1 Diameter 1-½ inch.

8.1.2.3.1.1 G130601 100 feet, 150 lbs/in² R1505-A G130601(Kerosene Jet A-1)

8.1.2.3.2 Diameter 2 inch.

8.1.2.3.2.1 1699, 50 feet, 150 lbs/in² (black)

8.1.2.3.2.2 7810-7, 50 feet, 150 lbs/in² (black)

8.1.2.3.3 Diameter 4 inch.

8.1.2.3.3.1 S-143 SBQ-P331, 50 feet, 150 lbs/in²

8.1.2.3.3.2 7810-5, 50 feet, 150 lbs/in² (Peraflex rede + grounded)

8.1.2.3.3.3 Q2331, 50 feet, 150 lbs/in²

8.1.2.3.3.4 Q2316, 50 feet, 150 lbs/in²

8.1.2.3.4 Diameter 1 inch.

8.1.2.3.4.1 Q2270, 100 feet, 150 lbs/in²

8.1.2.3.4.2 Q2271, 100 feet, 150 lbs/in²

8.1.2.4 Refuelling equipment for Eureka borrowed from the CCGS Des Groseilliers :

8.1.2.4.1 Four (4) 4 "aluminum (" Pitcher and Catcher ") collectors with glass number:

8.1.2.4.1.1 7671-14 , tested at 225 lbs/in²

8.1.2.4.1.2 7671-15, tested at 225 lbs/in²

8.1.2.4.1.3 7671-16, tested at 160 lbs/in²

8.1.2.4.1.4 7671-17, tested at 225 lbs/in²

8.1.2.4.2 Collector named ‘’totem’’, tested at 225 lbs/in²

8.1.3 **Proof of performance**

8.1.3.1 Certification

8.1.3.1.1 Provide individual certificates for each hose, identifying the firm performing the inspection, certificate number, name and signature of technician.

8.1.4 **Deliverables**

8.1.4.1 Report

8.1.4.1.1 Contractor must provide a written report describing in detail all work performed the causes of noted deficiencies, corrective actions taken and parts replaced. The report must be submitted before the end of work period.

Contractor must provide the report in electronic format (.pdf), to the Chief Engineer and to the Vessel Maintenance, before the end of the work period.

9 DOMESTIC SYSTEMS

9.1 REFRIGERATION SYSTEMS AND AIR CONDITIONNING SYSTEMS

9.1.1 Scope of work

9.1.1.1 Perform annual inspection and maintenance of refrigeration and air conditioning systems.

9.1.2 Reference

9.1.2.1 Drawing, instruction manuals.

8.0 - Picture

9.1.2.2 Regulations

9.1.2.2.1 Canada Shipping act and regulations

9.1.2.2.2 Federal Halocarbon regulations, 2003

9.1.2.2.3 Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems, Environment Canada

9.1.3 Technical description

9.1.3.1 CARGO AND DOMESTIC REFRIGERATION (16-K-02)

Domestic refrigeration compressor model, Emerson Copeland scroll ZF41K5E-TFD-260, Cargo refrigeration model Emerson Copeland scroll ZF25K4E-TFD-261. These systems operate with R-507A.

Contractor must provide parts and labor to perform the following tasks:

9.1.3.1.1 Perform complete inspection of systems.

9.1.3.1.2 Perform refrigerant leak test. All piping must be checked for leaks, including piping in ceiling, on main deck. Check system for gas tightness. Contractor must preserve ceiling tiles from damage, during removal, storage and reinstallation. Systems presently have no known leaks.

9.1.3.1.3 Perform the complete recovery of refrigerant R-507A from the Cargo refrigeration system, to proceed with pressurizing the system with nitrogen. Drain nitrogen and repair any leaks, if any. Ensure that the system is emptied, dehydrated and leak free before charging refrigerant. Replace the dry filter Model immersion STAS-967T. Fill the system with the recovered refrigerant R-507A. Apply the standards of the Régie du bâtiment du Québec and the federal regulations on halocarbons.

9.1.3.1.4 Provide a refrigerated container for the refrigerated food located in the

domestic refrigeration compartments. The container will be stored on the flight deck. The transfer of food will be done by the ships crew members. The container must be installed on board a minimum of one week before the start of work on the domestic refrigeration system

9.1.3.1.5 Perform the complete recovery of refrigerant R-507A from the domestic refrigeration system, to proceed with pressurizing the system with nitrogen. Drain nitrogen and repair any leaks, if required. Ensure that the system is emptied, dehydrated and leak free before charging refrigerant. Replace the dry filter Model immersion STAS-967T. Fill the system with the recovered refrigerant R-507A. Apply the standards of the Régie du bâtiment du Québec and the federal regulations on halocarbons.

9.1.3.1.6 Clean and inspect evaporator units and defrosting systems.

9.1.3.1.7 Check evaporator drains, heating cables and drains. Ensure drains are free. Repair insulation upon completion.

9.1.3.1.8 Refrigerant, if required will be supplied by the contractor and dealt with using PWGS 1379 form. Provide a price for 13,6 kg bottle.

9.1.3.1.9 Check all operating parameters.

9.1.3.2 AIR CONDITIONNING SYSTEMS 2, 3, 4and 5 (16-F-04-A)

Model Compressors Units # 4 Emerson Copeland Scroll ZR125KCE-TFD, Units # 2 # 3, #5 Emerson Copeland Scroll Model Cargo Compressors Emerson Copeland Scroll ZR144KCE-TFD. These systems operate on the R-407C

The Contract or must provide materials and labor to perform the following work:

9.1.3.2.1 Perform a complete inspection of the systems.

9.1.3.2.2 Replace the model SPORLAN C-967-g drying filter on units 2, 3, 5 and model SPORLAN C-485-G on Unit 4.

9.1.3.2.3 Conduct a refrigerant leak detection test. Currently, there is no known leak.

9.1.3.2.4 Refrigerant gas if necessary must be provided by the contractor via form 1379. Provide a price for a 13.6 kg bottle.

9.1.3.2.5 Check all operating parameters.

9.1.3.2.6 Perform system startup.

9.1.3.2.7 Make necessary adjustments.

9.1.4 **Proof of performance**

9.1.4.1 Inspection

9.1.4.1.1 All work must be to the satisfaction of the Chief Engineer.

9.1.4.2 Trials

9.1.4.2.1 The Chief Engineer or his delegate must be present to witness trials.

9.1.4.3 Certification

9.1.4.3.1 Provide original, individual certificates for each system, identifying the firm performing the inspection, certificate number, name and signature of technician.

9.1.4.3.2 Contractor must provide the originals certificate to the Chief Engineer and also electronic format (.pdf), to the Chief Engineer and to the Vessel Maintenance Manager.

9.1.5 **Deliverables**

9.1.5.1 Report

9.1.5.1.1 Contractor must provide a written report describing in detail all work performed the causes of noted deficiencies, corrective actions taken and parts replaced. The report must be submitted before the end of work period.

9.1.5.1.2 Contractor must provide the report in electronic format (.pdf), to the Chief Engineer and to the Vessel Maintenance, before the end of work period.

10 SHIP SUPPORT SYSTEMS

10.1 ELEVATOR AND DUMB-WAITER

10.1.1 **Scope**

10.1.1.1 Annual inspection and maintenance for recertification and effective life extension of this equipment.

10.1.2 **Reference**

10.1.2.1 Instruction manuals or photo

10.1.2.1.1 7.0 - Picture

10.1.2.2 Regulations

10.1.2.2.1 Canada Shipping Act and regulations

10.1.2.2.2 Standards

10.1.2.2.3 CAN/CSA-B44-M90, section 12

10.1.3 **Technical description**

10.1.3.1 Equipment particulars :

Elevator

Make : Montgomery Elevator Co. Ltd.

Capacity 600 lbs

Speed, 100 ft/min

Dumb-waiter (17-C-04-C):

Make : Montgomery Elevator Co. Ltd.

Capacity 250 lbs

Speed 50 ft/min

Contractor must provide parts and labor to perform the following tasks :

10.1.3.2 Provide parts and labor to perform inspection and annual maintenance of the ship's elevator and dumb-waiter in accordance with section 12 of CAN/CSA-B44-M90 norms.

10.1.3.3 Carry out the 5 years inspection of the elevator and the dumbwaiter. (last five years on June 15, 2013). Note: major work completed in the spring of 2016.

10.1.3.4 Upon completion of tasks, update maintenance register for each equipment.

10.1.3.5 Contractor must, within a 3 day period following the inspection, provide an inspection certificate for each unit proving compliance with the norm and include all tasks and inspections listed above.

10.1.4 **Proof of performance**

10.1.4.1 Inspection

10.1.4.1.1 All work must be to the satisfaction of the Chief Engineer.

10.1.4.2 Trials

10.1.4.2.1 Chief Engineer must witness all inspections and trials.

10.1.4.3 Certificates

10.1.4.3.1 Provide original, individual certificates for each system, identifying the firm performing the inspection, certificate number, name and signature of technician. Contractor must provide the certificate originals to the Chief Engineer and also electronic format (.pdf), to the Chief Engineer and to the Vessel Maintenance Manager.

10.1.5 **Deliverables**

10.1.5.1 Report

10.1.5.1.1 Upon completion, contractor must provide a written report describing in detail all work performed the causes of noted deficiencies, corrective actions taken and parts replaced. Contractor must provide the report in electronic format (.pdf), to the Chief Engineer and to the Vessel.

11 DECK EQUIPEMENT

11.1 A-FRAME HYDRAULIQUE

11.1.1 Scope of work

11.1.1.1 Maintenance and five-year inspection of the A-frame for the re-certification of this equipment, to obtain Transport Canada T-2 certification.

11.1.2 Reference

11.1.2.1 98004_01.TIF “A-Frame lifting appliance arrangement”

11.1.2.2 98004_2.TIF “A-Frame lifting appliance sub-assembly and details”

11.1.2.3 98004_03.TIF “A-Frame lifting appliance sub-assembly and details”

11.1.2.4 Photos

11.1.3 Particularities and Remarks

11.1.3.1 The coordination of the work will be under the supervision of the Chief Engineer assisted by the Chief Officer with the collaboration of the Maritime Safety Office. The Contractor will be responsible for coordinating inspections with the Transport Canada Inspector. The costs incurred by these inspections will be at the contractor's expense

11.1.3.2 There will be no crane service available on board the vessel, the Contractor shall provide its own crane service as required. The contractor will provide scaffolding and crane services.

11.1.4 Description Technique

Provide material and labor for the following work:

11.1.4.1 Complete the 5 year inspection and maintenance and certification of the A-Frame.

11.1.4.2 Disassemble and measure the axes on the cylinders and on the A-Frame. The dismantling of all axes of rotation will be done taking care to take the necessary measures to go up to the same places at the end of the work.

11.1.4.3 After the cylinders have been disassembled, cleaned and inspected, the Contractor shall contact Coast Guard representatives at the required time for a component inspection.

11.1.4.4 Provide a unit price to renew the chrome of a cylinder rod in the event that one or more rods are to be redone.

11.1.4.5 Inspect all bearing axises and measure play.

11.1.4.6 Perform full inspection of all axes and pulleys

11.1.4.7 Grease paths will all be cleaned and inspected.

11.1.4.8 Lubrication will be done taking care to move the components during lubrication. In the présence of a représentative from the CCG.

11.1.4.9 If components require additional work or need to be replaced, costs will be negotiated on PWGSC 1379 form.

11.1.4.10 After the tests have been completed, provide Petro Tape and cover all hydraulic adapters that have been dismantled.

11.1.4.11 The Contractor shall use a product compatible with the existing product that is International 264 Painted Primer when paint is damaged or heated.

11.1.5 **Proof of Performance**

11.1.5.1 Inspection

11.1.5.1.1 All work, must be inspected and completed to the satisfaction of the Chief Officer and Chief Engineer and the Transport Canada Inspector.

11.1.5.2 Trials

11.1.5.2.1 At the end of the work, static and dynamic tests shall be conducted in the presence of the Coast Guard Representative and the Transport Canada Inspector. Weights will be provided by the CCG.

11.1.6 **Livrables**

11.1.6.1 Rapport

11.1.6.1.1 The Contractor must provide a complete report detailing the work performed, the cause of any failures, necessary modifications and replaced parts. The report must be submitted before the end of the work period.

11.1.6.1.2 The Contractor shall provide the Chief Engineer and the Maintenance Authority with an electronic PDF copy of the report. Before the end of the work.

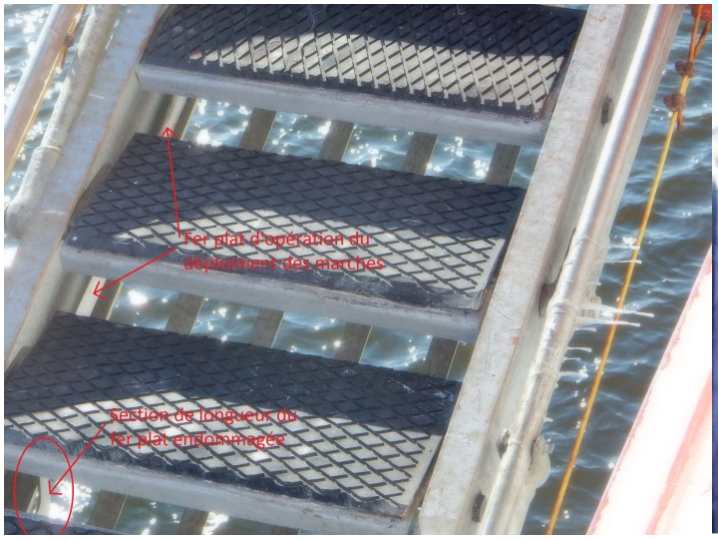
11.1.6.1.3 The Contractor must provide a T-2 Certificate for Lifting Equipment and a measurement book in pdf format before the completion of the work.

11.2 Accommodations ladder _ Maintenance & Repair

11.2.1 Scope of Work

The contractor must carry out the inspection, maintenance and repair of the two ships retractable gangways

11.2.2 Reference :



Port Accomodations gangway

Starboard accomodations gangway

11.2.2.1 Instruction manuals and plans

11.2.2.1.1 Instruction manual _ Marine Aluminium

11.2.2.1.2 P-3384 Standard platform 1; P-3384 Standard platform 2

11.2.2.1.3 F3-3169 Accommodation ladder

11.2.2.1.4 DA-10R-3469

11.2.2.1.5 DA-10R-3468

11.2.3 Description technique

The contractor shall provide the material and labor to carry out the following work:

11.2.3.1 Annual and in-depth Inspection of the two accommodation ladders. Inspect and repair the steps and rotation of the platform as necessary. The fixing axes of the steps must be free to pivot. When reassembling, apply an aluminum-

compatible anti-seize paste to the pivot points. The edges at the ends of the steps must not touch the longitudinal joists.

11.2.3.2 On the Port side accommodation ladder, the two (2) flat operating bars for the inclination of the steps are to be replaced. The flat operating bars are bent between the 5th and the 6th steps.

11.2.3.3 On the starboard side accommodation ladder, reposition the lower flat bar above its anchor point

11.2.4 **Particularities and Remarks**

11.2.4.1 Once the contract has been granted, the contractor will have to inspect and repair the accommodation ladders at their facilities, before the beginning of the ships repair period. The contractor must contact the ship to plan the accommodation ladders removal from the ship. The time and place will be determined according to the ship's availability. The contractor will have to provide transportation and crane for the removal of ladders. The Travel of employees and equipment will be negotiated through a request for additional work 1379.

11.2.4.2 The contractor will have to ensure that the ladders are operational and installed on board the ship before 25th of May.

11.2.4.3 The contractor must have employees who have undergone training for ‘’working at heights training’’ and provide their certified safety equipment.

11.2.5 **Proof of performance**

11.2.5.1 Inspection

11.2.5.1.1 All work must be inspected and completed to the satisfaction of the chief officer and chief engineer. The inspection will be done prior installation.

11.2.5.2 Trials

11.2.5.2.1 The proper functioning of the accommodation ladders must be demonstrated to the chief officer and the chief engineer or their representatives.

11.2.5.3 Rapport

11.2.5.3.1 The contractor must provide a complete report that explains in detail the work done, the cause of the failures (if any), the necessary modifications and the replaced parts. The report must be submitted before the end of work period.

11.2.5.3.2 The contractor shall provide the chief mechanic and the maintenance manager with an electronic copy of the report in PDF format, before the end of work period.