

## **15.0**

### **15.6 ASBESTOS REMOVAL, INSPECTION AND INSTALLATION OF NEW ASBESTOS-FREE INSULATION**

#### **15.6.1 Identification**

- 15.6.1.1 The purpose of this work item is for the Contractor to:
- remove all the insulation material that may contain asbestos from the ship, and dispose them in accordance with all applicable regulations.
  - Replace (supply and install) new insulation in the area where insulation was removed.
- 15.6.1.2 The Contractor must provide the services of a firm specializing in asbestos removal to perform the work under this section of the SOW. The Contractor's bid must include an allowance of \$100,000 to cover the cost of the services to be provided by the specialized asbestos removal company. The \$100,000 allowance must form part of the overall bid and must be adjusted, up or down, using the PSPC 1379 process upon receipt of the final invoice from the service provider supported by copies of all related documents and invoices to verify the actual expenditures.
- 15.6.1.3 The Contractor must provide the services of IPI Isolation thermique to perform the re-insulation work under this section of the SOW. The Contractor must include an allowance of \$100,000 to cover the cost of the services to be provided. The \$100,000 allowance must be part of the overall offer and must be adjusted up or down using the PSPC 1379 process upon receipt of the final invoice from the FSR supported by copies of all related documents and invoices to verify actual expenditures.
- 15.6.1.4 Reasonable cost of travel and living expenses must be billed at cost without added overhead or profit. The associated cost will be addressed by way of PSPC 1379 Process upon receipt of the related invoice supported by copies of all associated bills and documentation to verify actual expenses.

#### **15.6.2 References**

- 15.6.2.1 Documents
- 15.6.2.1.1 The following drawings are to be considered orientation drawings as defined in the Drawings section of the General Notes.

<b>Drawing/Document No. Revision / Date</b>	<b>Title / Description</b>
002_201-10553-47_rev0_HazMat_NGCC_M-L-Black_	HazMat_NGCC_M-L-Black_20220727-Annual monitoring of hazardous materials management Martha L. Black 2021
001_201-10553-47_rev0_	Rapp_MCA_M-L-Black_ENG_220818
63-00-01-A Rev 4- March-1986	Engine exhaust system
63-10-01 Rev1-1986-03-06	Arrangement diesels and boilers exhaust piping piping
108-555-H-3800-2_Rev0_Fev-1985	Comp arrangement Upper deck R
108-555-H-3800-3_Rev0	composite arrangement boat deck
108-555-H-3810_Rev0_Jan-1985	_HVAC main deck
108-555-H-3820_Rev0_Jan-1985	HVAC Upper deck
108-555-H-3830_Rev0-Jan-1985	HVAC Boat deck
108-555-H-3840_Rev0_Jan-1985	HVAC officer deck and wheelhouse
108-555-H-3860_Rev12_Aout-1999	Natural ventilation
108-555-H-4050_Rev0_April-1985	Ceiling plan main deck
108-555-H-4060_Rev0_April-1985	Ceiling plan upper deck
108-555-H-4070_Rev0_April-1985	Ceiling plan boat deck
108-555-H-4080 Rev0_April-1985	Ceiling plan officers deck & wheelhouse
108-H-23_25_T- Rev9_ Sept_2011	General arrangement
108-H-4410_Rev-12_Nov-1985	Insulation plan

#### 15.6.2.2 Regulations and Standards

All materials and work must meet ABS and Transport Canada Marine Safety and Security (TCMSS) requirements for approval and use on the vessel. The contractor must identify and coordinate any specific requirements in accordance with applicable laws, regulations, standards, rules, codes and guidelines.

The standards and regulations listed below apply, at a minimum but not in any order of priority, to work performed in this section.

<b>Standards &amp; Regulations Revision / Date</b>	<b>Title / Description</b>
7.A.1	Hazard identification and risk assessment

<b>Standards &amp; Regulations Revision / Date</b>	<b>Title / Description</b>
7.A.1	Pre-work safety assessment
7.B.4	Hot work
ASME B16.5-2020	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24, Metric/Inch Standard
ASME B16.20-2017	Metallic Gaskets for Pipe Flanges
ASME B16.21-2016	Non Metallic Gaskets for Pipe Flanges
ASME B31.1-2016	Power Piping
ASTM A105-2018	Standard Specification for Carbon Steel Forgings for Piping Applications
ASTM A106-2019	Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A193-2020	Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
CAN/CGSB 48.9712	National Non-Destructive Testing Natural Resources Canada Certification Body
SSPC SP 15	Commercial Grade Power-Tool Cleaning
SOR/2010-120	Marine Occupational Health and Safety Regulations
SOR2017-14	Ship Fire Safety Regulations
FTP Code 2010 (IMO)	Fire Test Procedure Code
S-2.1	Government of Quebec - Occupational Health and Safety Act
	Government of Quebec - Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)

#### 15.6.2.3 Contractor Supplied Materiel

The Contractor must provide all materials and parts necessary for the performance of this specification work item, unless otherwise is clearly stated.

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### **15.6.3**      **Technical Description**

#### **General**

- 15.6.3.1      Immediately after contract award it is the Contractor's responsibility to take the required samples to determine the presence of asbestos in the areas affected by the work items.
- 15.6.3.2      The Contractor must supply all labor, personal protective equipment (PPE) for their employees, materials, tools and equipment required to perform the work described in this specification.
- 15.6.3.3      The Contractor must, prior to the commencement of work, take all precautionary measures in accordance with Federal, Provincial and Municipal regulations.
- 15.6.3.4      Prior to the commencement of work, the Contractor must ensure that all materials on the vessel, such as equipment, machinery, electrical cables, decks/floors, walls and all other equipment in the work area are adequately protected from damage during the work. All damages must be repaired at the Contractor's expense.
- 15.6.3.5      The Contractor must provide personnel to provide fire watch during hot work. All hot work must be performed in accordance with CCG Hot Work Procedure 7.B.4.
- 15.6.3.6      During the work, the Contractor must take measures to contain dust and paint chips, preventing these materials from entering the vessel or the vessel's ventilation system.
- 15.6.3.7      The Contractor must provide data sheets for the coatings, steel, piping, insulation materials and pipe joints provided by the Contractor to the CCG TA/IA for approval prior to use.

#### **Planning**

- 15.6.3.8      The Contractor must provide at least 5 days notice to the CCG TA and IA, and to the authorities responsible for asbestos waste disposal, prior to commencing the work described in these specifications.
- 15.6.3.9      The Contractor must submit a project-specific asbestos removal plan to the CCG TA and IA at least 10 calendar days before the work start. This plan must include a risk analysis by a qualified person that:

A) Is a Certified Industrial Hygienist (CIH), Registered Occupational Hygienist (ROH) or Registered Occupational Health Technologist (ROHT) with specific training and experience in asbestos management and work procedures.

OR

B) Is a Certified Safety Professional (CSP), Canadian Registered Safety Professional (CRSP) or Professional Engineer with specific training and experience in asbestos management and work procedures.

AND

C) Is qualified to prepare asbestos hazard identification and risk assessment, prepare asbestos safe work procedures, take samples of suspected asbestos containing materials, take air samples during asbestos abatement projects, conduct workplace inspections and prepare inspection reports.

15.6.3.10 The Contractor must include copies of the qualified person's credentials and details of their asbestos-related work experience.

15.6.3.11 The Contractor's plan must demonstrate compliance with the regulations of SOR/2010-120 and provincial regulations permitted under S-2.1 regarding hazard prevention, protective equipment, hazardous substances and management of asbestos exposure.

### **Health and safety**

15.6.3.12 The Contractor must perform asbestos removal in accordance with their project specific asbestos removal plan. A third party representative may be present during the work described in this specification to ensure that the plan is executed in accordance with federal, provincial and municipal regulations.

15.6.3.13 Prior to the start of work, the Contractor must seal the asbestos removal area to prevent asbestos dust or fibers from leaving the removal area.

15.6.3.14 Prior to the start of work, the Contractor must isolate the ventilation of the asbestos removal area.

15.6.3.15 Prior to the start of work, the Contractor must place warning signs at each access to an asbestos removal area and ensure that unauthorized visitors do not enter the area.

- 15.6.3.16 During the work, the Contractor must ensure that the air pressure in the asbestos removal area is lower than the air pressure in the area immediately outside the asbestos removal area.
- 15.6.3.17 Prior to leaving the asbestos abatement area, Contractor employees must decontaminate protective clothing, without removing it, using a HEPA vacuum or damp cloth, or, if the clothing will not be reused, place it in dust and waste containers. These containers must be dust and asbestos tight, capable of handling this type of waste, marked as containing asbestos waste, and cleaned with a damp cloth or HEPA vacuum immediately before removal from the work area. In addition, these containers should be removed frequently, at regular intervals, every day.

**Removal of insulation on walls in the funnel, helicopter hangar (work shop) and in the propulsion generator room**

- 15.6.3.18 The work areas are from the funnel to the propulsion generator room.
- 15.6.3.19 The Contractor must remove insulation on certain interior walls in the funnel and in the propulsion generator room.
- 15.6.3.20 The Contractor must remove the wire mesh covering the insulation.
- 15.6.3.21 The Contractor must remove all trace of insulation on the interior walls.
- 15.6.3.22 The surface to be removed is estimated at 150m<sup>2</sup> of insulation and 100m<sup>2</sup> of mesh. The insulation area is larger because it takes into account the structural elements.

**Removal of insulation, inspection and repair of steam and condensate piping**

- 15.6.3.23 The work areas are: the funnel to the propulsion generator room, the helicopter garage including the workshop, cycloconverter room and purifier room.
- 15.6.3.24 The Contractor must remove all insulation on all of the following steam and condensate piping, identified in Table 15.6-1, below:

**Table 15.6-1:** Steam and Condensate Piping

Identification	Piping Length	Steel pipe diameter	No. of Union, valve, flange or steam trap	No. of Elbow	Location
Safety valve – Boiler Port	17 m	2-½’’			Funnel

Identification	Piping Length	Steel pipe diameter	No. of Union, valve, flange or steam trap	No. of Elbow	Location
Safety valve – Boiler STBD	17 m	2-½’’			Funnel
Steam and condensate lines	26 m	2-½’’			Funnel
Steam and condensate lines	20 m	2-½’’			Funnel
Steam and condensate lines	6 m	3’’	12	10	Generator room
Steam and condensate lines	33.5 m	2-½’’	14	25	Generator room
Steam and condensate lines	76.5 m	2’’	63	70	Generator room
Steam and condensate lines	52.5 m	1-¼’’	22	54	Generator room
Steam and condensate lines	44 m	1’’	31	51	Generator room
Steam and condensate lines	5 m	¾’’	1	7	Generator room
Steam and condensate lines	60 m	½’’	9	18	Generator room
Steam and condensate lines	13 m	1’’	4	8	Purifier room
Steam and condensate lines	8 m	1’’	4	10	Cyclo converter room
Steam and condensate lines	24 m	½’’	3	9	Helicopter hangar workshop
Steam and condensate lines	11 m	¾’’	3	10	Helicopter hangar
Steam and condensate lines	15.5 m	½’’	13	9	Helicopter hangar

### **Cleaning, management and disposal of waste**

15.6.3.25 The Contractor must remove asbestos-containing dust and debris on a daily basis, at the minimum, and according to the best industry practices in compliance with all applicable regulations.

- 15.6.3.26 The Contractor must seal the waste bags and remove them from the site daily. The Contractor must dispose of asbestos waste in accordance with federal and provincial requirements. The Contractor must submit, to CCG, all certificates of disposals in accordance to all applicable regulations. .
- 15.6.3.27 The Contractor must remove and dispose of all other waste from work areas at the end of each work day.
- 15.6.3.28 Upon completion of the work, the Contractor must restore all areas and surfaces to their original, clean and usable condition.

#### **Re-insulation of Interior funnel walls, helicopter hangar and engine Room**

- 15.6.3.29 The Contractor must supply and install new insulation on the interior walls of the funnel and on the interior walls of the engine room where insulation has been removed.
- 15.6.3.30 The Contractor must supply and install Roxul searox sl620 insulation with integral vapour barrier or equivalent on the affected walls. Installation must be in accordance with the manufacturer's recommendations. The Contractor must include in his price the fastening nails.
- 15.6.3.31 Upon completion of the insulation installation, the Contractor must install the protective mesh covering the insulation. The Contractor must refer to the drawing '108-H-4410\_Rev-12\_Nov-1985 Insulation plan' for more details on the insulation and the mesh.

#### **Re-insulation of the steam and condensate pipes**

- 15.6.3.32 The work areas for this part of the specification are:
- Funnel.
  - Propulsion generator room.
  - Helicopter hangar and hangar workshop.
  - Cycloconverter room and purifier room.
- 15.6.3.33 The Contractor must supply and install new insulation on all steam and condensate lines and removable thermal blankets on all valves, steam traps, flanges and other fittings in accordance with the manufacturer's specifications.
- 15.6.3.34 Pipe insulation must be mineral fiber and 63.5 mm (2.5 in) thick. All joints and seams must be sealed to prevent water infiltration.
- 15.6.3.35 All flanges and valves must be covered with removable insulating blankets suitable for damp or wet locations.



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- 15.6.3.36 New insulation on all pipes, elbows and tees must be covered with a covering tape.
- 15.6.3.37 The Contractor must supply and install the insulation materials for all steam and condensate piping identified in Table 15.6-1.
- 15.6.3.38 All materials supplied by the Contractor and used to perform the work described in this specification must be suitable for the operating temperature of the steam system, be free of ceramic fibers, and be asbestos free, and non-combustible. All materials must be Type-Approved for marine use. Tapes, vapor barriers, adhesives, and sealants must meet the flame spread and toxicity requirements of Annex 1 of the IMO 2010 FTP Code; in accordance with paragraph 7 of the 2010 FTP Code, materials tested by methods described in recognized standards equivalent to those listed in the Code are acceptable.
- 15.6.3.39 The Contractor must submit to the CCG TA the technical documentation for insulation materials, including Safety Data Sheets.

#### **15.6.4 Proof of performance**

- 15.6.4.1 Inspection
- 15.6.4.1.1 Identification of operational hazards and on-site risk assessment by the Contractor.
- 15.6.4.1.2 CCG reserves the right to have an industrial hygiene technician inspect the asbestos removal work. This technician will be at CCG's expense. The technician will request to see the preventive measures taken by the Contractor to ensure compliance with this specification and applicable regulations.
- 15.6.4.1.3 The Contractor supplied materials, to be used in performing the work described in these specification, must be reviewed and accepted by the CCG TA and IA before their use.
- 15.6.4.1.4 The CCG TA must perform a visual inspection of the piping after cleaning and before coating.
- 15.6.4.1.5 The CCG IA and TA must visually inspect the installation to ensure that the requirements of this specification are met.
- 15.6.4.1.6 The CCG IA must perform a final cleanup inspection of the asbestos removal areas. All waste materials must have be removed and all surfaces must be cleaned and functional.

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#### 15.6.4.2 Tests

- 15.6.4.2.1 The Contractor must collect and analyze air samples in accordance with the requirements of this specification.
- 15.6.4.2.2 The Contractor and the CCG TA must visually inspect all steam and condensate lines and welded joints in accordance with the requirements of this specification.

#### **15.6.5 Deliverables**

##### 15.6.5.1.1 Documents

- 15.6.5.1.2 The Contractor must submit the Contractor's own asbestos abatement plan to the CCG. This plan must be submitted to the CCG TA five (5) calendar days prior to the start of work under these specifications. The Contractor's plan must include documentation demonstrating that all personnel have received adequate training regarding asbestos exposure hazards, personal hygiene measures, work procedures, provision and maintenance of respirators and protective clothing.
- 15.6.5.1.3 The Contractor must submit documentation to the GCC TA demonstrating that proper arrangements have been made for the receipt and proper disposal of asbestos waste. This documentation must be submitted prior to completion of the work.
- 15.6.5.1.4 The Contractor must submit to the CCG TA all tracking slips confirming that the asbestos waste was received and disposed of in accordance with applicable federal and state regulations.
- 15.6.5.1.5 The Contractor must submit to the GCC TA SDS for all new insulation materials, sealants, tapes, etc. to be used in performance of this Work Item. This documentation must be submitted at least 5 calendar days prior to the start of work.

##### 15.6.5.2 Certification

- 15.6.5.2.1 The Contractor must provide the CCG TA with a hazardous materials disposal certificates when disposing of asbestos-containing waste.
- 15.6.5.2.2 The Contractor must submit the Type-Approval of all the supplied material, where applicable – before their installation to be reviewed and accepted by CCG.