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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
TPSGC/PWGSC
601-1550, Avenue d'Estimauville
Québec
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Title - Sujet Recommissioning DP4 - Amundsen	
Solicitation No. - N° de l'invitation F3756-18N044/A	**Amendment No. - N° modif.** 003
Client Reference No. - N° de référence du client F3756-18N044	**Date** 2018-06-22
GETS Reference No. - N° de référence de SEAG PW-$QCL-036-17397	
File No. - N° de dossier QCL-8-41014 (036)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-07-24	**Time Zone** **Fuseau horaire** Heure Avancée de l'Est HAE
F.O.B. - F.A.B. Specified Herein - Précisé dans les présentes **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☑	
Address Enquiries to: - Adresser toutes questions à: Gagnon, Mathieu	**Buyer Id - Id de l'acheteur** qcl036
Telephone No. - N° de téléphone (418) 649-2883 ( )	**FAX No. - N° de FAX** (418) 648-2209
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
Vendor/Firm Name and Address **Raison sociale et adresse du fournisseur/de l'entrepreneur** **Telephone No. - N° de téléphone** **Facsimile No. - N° de télécopieur**	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature** **Date**	

Canada

Please amend the above mentioned bidding solicitation with the changes here below in relation to the Solicitation closing date and the Vessel viewing.

Item 1 – Section 2.7 Proposed Work Period of de Invitation to Tender

Eliminate Section 2.7 - Proposed Work Period, of the Invitation to Tender **and Replace it with the following Section 2.7:**

2.7 Proposed Work Period

Work is to commence and be completed as follows:

Start: September 11th, 2018 or as per ship's availability. (At the earlier date.)
End: November 30th, 2018 or 10 weeks after ship being made available by CCG

The Bidder agrees through submission of its response to the bid solicitation that the above time frame provides an adequate period to perform the subject work and absorb a reasonable amount of unscheduled work; and further, that they have sufficient material and human resources allocated or available to complete the subject work and a reasonable amount of unscheduled work within the Work period

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Item 2 – Section 4.2 Work Period of de Invitation to Tender, Part 7 – Resulting Contract Clauses

Eliminate Section 4.2 - Work Period, of the Invitation to Tender **and Replace it with the following Section 4.2:**

4.2 Work Period

Work is to commence and be completed as follows:

Start: September 11th, 2018 or as per ship's availability. (At the earlier date.)
End: November 30th, 2018 or 10 weeks after ship being made available by CCG

The Contractor agrees through submission of its response to the bid solicitation that the above time frame provides an adequate period to perform the subject work and absorb a reasonable amount of unscheduled work; and further, that they have sufficient material and human resources allocated or available to complete the subject work and a reasonable amount of unscheduled work within the Work period

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Item 3 – Additional reference documents

Bidders must consider the additional reference documents attached to this amendment, namely:

- The report of hazardous materials, particularly asbestos.
  Note that the report must be revised and that asbestos contained in the A-60 insulation of the main deck floor is not listed. We must warn the bidders that we have already tested this insulation and it has been confirmed that it contains asbestos. On the 221-H-80 plan, we see the areas where we find the Thermobestos insulation that has been analyzed and contains asbestos.

- The missing Ship plans

- Pictures of similar work

Item 4 – Subcontracts

Reminder of Article 2030 06 – Subcontract of General Conditions - Higher Complexity Goods, stating that:

"…the Contractor must, unless the Contracting Authority agrees in writing, ensure that the subcontractor is bound by conditions compatible with and, in the opinion of the Contracting Authority, not less favourable to Canada than the conditions of the Contract…"

Bidders are therefore responsible for informing their subcontractor and should provide all documentation related to the bid solicitation to them.

Item 5 – New version of the Technical Statement of Work

In order to respond to questions submitted during and after the Bidders' Conference, please:

Eliminate the Canadian Coast Guard Technical Statement of Work, entitled: '' REFIT FALL 2018 – CCGS AMUNDSEN – REMISE EN SERVICE DP4 V10 '' provide with the original Invitation to Tender,

And replace it with the Canadian Coast Guard Technical Statement of Work, entitled: '' REFIT FALL 2018 – CCGS AMUNDSEN – REMISE EN SERVICE DP4 V14 '' provide at the end of this amendment.

All other terms and conditions of the invitation to tender remain the same.

Refit
Fall 2018

CCGS Amundsen

Prepared by Marine Engineering
101 Champlain Blvd.
Québec, Quebec
G2C 1W4

1 GENERAL

1.1 Localisation and date of work

The refit will take place at wharf 97 at CCG base in Québec. The work period is from September 11 to November 30.

1.2 List of acronyms

CA	Contracting Authority
TA	Technical Authority
IA	Inspection Authority
CCG	Canadian Coast Guard
CLC	Canada Labour Code
CSM	Contractor Supplied Material
CSA	Canadian Standards Association
CSA 2001	Canadian Shipping act
CWB	Canadian Welding Bureau
DFO-CCG	Fisheries and Oceans Canada and Canadian Coast guard
FSSM	Fleet Safety and Security Manual
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
WHMIS	Workplace Hazardous Materials Information System
LR	Lloyd's register
NDT	Non-destructive testing
UT	Ultrasonic
NRCan	Natural Ressources Canada
DSIP	Delegated statutory Inspection Program
ME#	Main Engine
OEM	Original Equipment Manufacturer

1.3 CCG requirements applicable to the entire specification

1.3.1 Occupational Health and Safety

1.3.1.1 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.

1.3.1.2 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.

1.3.1.3 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:

1.3.1.3.1 Diving operation

1.3.1.3.2 Hot work;

1.3.1.3.3 Work at height;

1.3.1.3.4 Confined spaces Entry;

1.3.1.3.5 Lock out / Tag out;

1.3.1.3.6 Electrical work on energized circuits

1.3.1.3.7 Safety assessments.

1.3.1.4 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.

1.3.1.5 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.

1.3.1.6 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.

1.3.2 Access to the workplace

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.

1.3.3 Workplace Hazard Material Information System (WHMIS).

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

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

1.3.4 Tobacco in the workplace

1.3.4.1 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.

1.3.5 Healthy and safe workplace

1.3.5.1 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.

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

1.3.5.3 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*.

1.3.5.4 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.

1.3.5.5 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.

1.3.6 Fire protection

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

1.3.6.2 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.

1.3.6.3 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:

1.3.6.3.1 Put only one part of the system out of service at a a time;

1.3.6.3.2 Keep the system functional by using spare parts while the work is underway;

1.3.6.3.3 Employ other methods accepted and approved by the TA.

1.3.6.4 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.

1.3.7 Damaged paint and retouching

1.3.7.1 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.

1.3.7.2 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.

1.3.8 CCG and other employees on board the vessel

1.3.8.1 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.

1.3.9 Regulatory inspections and/or classification examination

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

1.3.9.2 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.

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

1.3.9.4 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.

1.3.10 Results of tests and data collection

1.3.10.1 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.

1.3.10.2 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.

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

1.3.10.4 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.

1.3.10.5 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.

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

1.3.10.7 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.

1.3.11 Material and tools provided by the contractor

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

1.3.11.2 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.

1.3.11.3 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.

1.3.11.4 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.

1.3.11.5 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**.**

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

1.3.12 Material and tools provided by the government

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

1.3.12.2 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.

1.3.12.3 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.

1.3.13 Restricted access areas

1.3.13.1 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.

1.3.13.2 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.

1.3.14 Contractor inspections and protection of equipment and the workplace

1.3.14.1 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.

1.3.14.2 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.

1.3.14.3 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.

1.3.14.4 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.

1.3.15 Records of work in progress

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

1.3.16 List of confined spaces

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

1.3.17 Hazardous material

1.3.17.1 CCG will provide a report(141-19427-04) of the hazardous material existing onboard the vessel. It is the contractor responsibility to plan the work according to the existing hazardous material.

1.3.17.2 The contractor must not use any material containing asbestos.

1.3.17.3 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.

1.3.17.4 The contractor must not use paint containing lead.

1.3.17.5 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.

1.3.17.6 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.

1.3.18 Material and equipment removed

1.3.18.1 All equipment removed under this specification remains the property of the CCG unless otherwise noted in certain sections of the specification.

1.3.19 Welding certification

1.3.19.1 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.

1.3.19.2 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.

1.3.19.3 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.

1.3.19.4 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.

1.3.20 Welding

1.3.20.1 All welding work shall be in compliance with the CCG welding specification (CT-043-EQ-EG-0001-E).

1.3.21 Electrical installations

1.3.21.1 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).

1.3.21.2 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."

1.3.22 Refrigeration and Air Conditioning Systems

a) 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.*

1.3.23 Tradesmen's competence

1.3.23.1 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.

1.3.23.2 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.

1.3.24 Shipboard crane

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

1.3.25 Contractor's crane

1.3.25.1 It is the contractor's responsibility to verify applicable load restrictions at the dock where the vessel is moored. Slings and lifting gear are to be provided by the contractor.

1.3.26 Electric power and compressed air supply

1.3.26.1 120 VAC electricity and 120 psi compressed air will be provided by the vessel.

1.3.27 Confine space rescue and rescue at height

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

1.3.28 Parking

1.3.28.1 Parking will be limited to 6 places for the contractor and these subcontractors. Parking will be based on CCG. The Contractor must schedule this work based on these parking limitations for these employees and subcontractors.

1.4 <u>Reglementation, standards and documents applicable to the entire specification</u>

1.4.1 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	Lockout and Tagout
7. B.6	Electrical work on energized circuits
10. A.7	Contractor safety and security

1.4.2 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

1.4.3 Acts and regulations:

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

1.5 <u>Informations about the vessel</u>

Name	CCGS *Amundsen*
Type	Medium/River Icebreaker
Year of construction	1979
Shipbuilder	Burrard Dry Dock, Vancouver, BC
Length	98.2 m
Width	19.5 m
Loaded draft	7.2 m
Loaded displacement	1678.8 t
Power	13,200 kw
Propulsion	Diesel electric

2 PRODUCTION DIAGRAM

2.1 Scope

2.1.1.1 This specification aims to provide the owner's representatives with an accurate schedule of the work and its completion for the needs of the Canadian Coast Guard (CCG).

2.2 Technical description

2.2.1.1 The Contractor must provide a detailed bar chart (Ms Project), 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.

2.2.1.2 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.

2.2.1.3 In case of work affecting the critical workflow, the CA, TA and IA are to be notified immediately. Every effort must be made to avoid delaying the vessel's refit. Regular quality assurance procedures must be applied.

2.2.1.4 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.

2.3 Proof of performance

2.3.1.1 The Contractor must provide pdf copy and .mpp copy (MS project 2010 or later) of the bar chart to the TA an IA no later than 3 days after contract signature.

3 RECOMMISSIONING OF DIESEL PROPULSION ENGINE #4

3.1 Scope

3.1.1.1 Diesel propulsion engine #4 of CCGS Amundsen suffered major damage in the winter of 2018. The engine block and crankshaft of the Alco 251F engine suffered irreversible damage requiring their replacement. The Canadian Coast Guard will supply a complete diesel propulsion engine for this work. The purpose of this document is to define the roles and responsibilities of the Contractor for the engine replacement work of diesel propulsion engine #4. The Contractor is responsible for handling and delivering the old engine block and crankshaft to the dock through a hole in the hull. The Contractor is responsible for handling and delivering the new engine block and crankshaft to the engine room through a hole in the hull. Work will be carried out afloat, at wharf 97 of the CCG base of Québec. The new engine must be partially assembled and the alignment shall be done under supervision of a Field Service Representative of the manufacturer (OEM). The Contractor must provide the necessary resources to check the alignment of the new engine.

3.2 Reference

3.2.1 Reference material

3.2.1.1 830F-33912_1

3.2.1.2 830F-33912_2

3.2.1.3 5222-008040

3.2.1.4 5227-008030

3.2.1.5 5623-008060 jacket water flow diagram

3.2.1.6 5823-008080 Lube oil flow diagram

3.2.1.7 6622-008030 Fuel oil flow diagram

3.2.1.8 9028-007000_1

3.2.1.9 9028-007000_2

3.2.1.10 9028-007020_1

3.2.1.11 9028-007020_2

3.2.1.12 9222-008050 Starting air diagram

3.2.1.13 Alco weights

3.2.1.14 CCGS Amundsen Final Manual_4-5-13

3.2.1.15 Amundsen_log_1977

3.2.1.16 Amundsen Engine #1 Test Logs

3.2.1.17 DP4 Pictures

3.3 Technical description

3.3.1 General information

3.3.1.1 The Contractor should note that similar work was performed in 2010 on DP #5 of CCGS Amundsen. The 2010 project's plans and specifications are given as a reference in the present statement of requirements. These plans and specifications are given as a reference only and the Contractor is responsible for the solution chosen to meet the requirement stated in the present statement of work.

3.3.1.2 All work on the diesel engine must be performed in compliance with the latest maintenance instructions and bulletins of Fairbanks Morse.

3.3.1.3 The engine will be partially reassembled by the ship crew.

3.3.1.4 Important: the engine reassembly work done by the ship crew will begin on October 24th and continue until the end of the contract. The contractor shall complete the steel and insulation work on the main deck (engine room side) by October 24th. At the beginning of the work implementation period, the Contractor shall coordinate the following work with CCG to avoid causing a delay in CCG reassembly of the DP4:
• Complete reassembly of the ventilation ducts
• Complete reassembly of the exhaust ducts and their insulation.

• Complete reassembly of drinking water pipes
• Complete reassembly of the lifting beams
• Complete reassembly of storage cabinets

3.3.2 Engineering

3.3.2.1 The Contractor is responsible for performing all engineering for the replacement of diesel propulsion engine #4. The Contractor must provide all specifications and production drawings demonstrating the hole in the hull, the route taken for the transportation of parts, lifting and handling equipment.

3.3.2.2 Work must be planned to minimize the time in which there is an opening in the hull.

3.3.2.3 Production drawings and specifications must be approved by an engineer.

3.3.2.4 The production drawings and specifications must be submitted for approval to the IA, TA and TCMS inspector at least 10 days prior to the start of work.

3.3.2.5 The Contractor must provide the welding procedures for all components used to lift parts and for the welding of the hull plate at least 3 days prior to the start of work.

3.3.2.6 The Contractor must perform ultrasonic NDT on 100% of the hull welds. Quality control of the welding through ultrasonic NDT must be conducted by a Level 2 UT technician certified by NRCan.

3.3.3 Field Service Representative of the manufacturer, Fairbanks Morse

3.3.3.1 The Contractor must retain the services of an FSR of the Alco 251F engine manufacturer.

3.3.3.2 The engine manufacturer representative in Canada:

Fairbanks Morse
217 Bow Street – PO Box 247 | Cochrane, AB T4C 1A5
Brad Barros: 403-932-3230, 587-586-1438

3.3.3.3 The FSR's mandate will be to:

3.3.3.3.1 Inspect all components of the DP#4 engine and validate that they comply with the requirements and manufacturing drawings of the OEM;

3.3.3.3.2 Advise and supervise the contractor when handling the engine block and crankshaft to prevent damage to the engine parts.

3.3.3.3.3 With the general contractor, check that the engine base flatness and straightness to ensure exact alignment of the crankshaft.

3.3.3.3.4 The FSR shall demonstrate that the alignment of the motor-alternator complies with OEM requirements.

3.3.3.3.5 The FSR shall demonstrate that the alignment of the motor-alternator complies with OEM requirements.

3.3.4 Disassembly and reassembly of existing equipment

3.3.4.1 The DP#4 Alco 251F diesel engine will be fully disassembled and reassembled by the

ship's crew.

3.3.4.2 The following disassembly work will be undertaken by the Contractor under the supervision of the FSR from Fairbanks Morse:

3.3.4.2.1 Manufacture and install a support apparatus at the end of the generator engine;

3.3.4.2.2 Before disconnection, alignment measurements must be taken at the engine/alternator coupling;

3.3.4.2.3 Disconnect the engine from the generator;

3.3.4.2.4 Remove the flywheel

3.3.4.2.5 Unbolt the engine block from its base;

3.3.4.2.6 Raise the engine block and rotate 180° along its longitudinal axis. Lower the engine block onto wooden blocks, on the engine base. Special care must be taken to ensure that the studs of the cylinder head are removed before turning the engine block;

3.3.4.2.7 Unbolt the main bearings, lift the crankshaft and lower it onto the temporary supports as specified by the FSR;

3.3.4.2.8 Manufacture and supply the crankshaft supports;

3.3.4.2.9 Remove engine block #4 from the ship;

3.3.4.2.10 The engine base shall be entirely inspected by NDT dye penetrant to confirm that there is no crack.

3.3.4.2.11 Once the engine block leaves the ship, the Contractor must check the straightness and flatness of the engine base. This work must be performed by a company specializing in laser alignment measurement.

3.3.4.2.12 Optional work: This same company must also have the capacity to do the machining of the engine base to restore its flatness and machine the bore of the diesel engine's shaft. The contractor must provide a price for machining 0.025 " from the base surface to restore the flatness of the surface used to assemble the engine block at the base. The contractor must provide a price for the 0.025 " (line boring) machining of the main bearing bores of the engine.

3.3.4.3 The following components of the engine will be dismantled and reassembled by the crew:

3.3.4.3.1 Gears (fore end)

3.3.4.3.2 Cam shaft

3.3.4.3.3 Power units (rod, piston, heads and liners)

3.3.4.3.4 Raw water and fresh water pumps, lubricating oil pump and fuel oil pump

3.3.4.3.5 Turbo-compressor, aftercooler and exhaust manifold

3.3.4.3.6 Governor

3.3.4.3.7 Auxiliary equipment's: crankcase fan, overspeed trip, probe, gauge, filters, etc.

3.3.4.4 The following circuits of the diesel engine will be disassembled and reassembled by the crew. The crew will seal the conduits:

3.3.4.4.1 Diesel engine jacket water circuit

3.3.4.4.2 Diesel engine lube oil circuit

3.3.4.4.3 Diesel engine fuel oil circuit

3.3.4.4.4 Starting air circuit

3.3.4.4.5 Electrical circuit

3.3.4.4.6 Exhaust circuit before the turbocharger

3.3.4.5 The exhaust circuits after the turbocharger and all ventilation circuits making obstructions at the output of the diesel engine will be disassembled, stored and reassembled by the Contractor in their original state following the work. The exhaust pipe insulation may contain and may release refractory ceramic fibre particles that are harmful to health. The Contractor's employees must use, at a minimum, a half mask with a P100 filter when handling exhaust coverings. The sections of the exhaust and ventilation circuits will be reassembled with new seals.

3.3.4.6 All conduits, electrical wires or equipment not specified in these specifications that must be disassembled in order to remove the engine block will be the responsibility of the Contractor.

3.3.4.7 The two lift beams bolted above DP#4 must be disassembled by the Contractor to allow handling of the engine block. The beams will be reassembled after the work.

3.3.4.8 The 3 potable water pipes making obstructions at the output of the diesel engine must be disassembled and then reassembled following the work. During the duration of the work, the contractor will have to provide temporary pipelines to keep the water supply in service. Temporary water pipes must be made of new materials and comply with the NSF / ANSI 61 standard.

3.3.4.9 Storage cabinets and other interferences on the lower deck of the engine room must be carefully moved for the duration of the work and returned to their original state after the work.

3.3.4.10 The Contractor must install protection for the remaining wall panels, ceilings and floors in the work area.

3.3.4.11 The Contractor must install a temporary waterproof tarp to plug the hole in the hull between the operations for the removal of the old engine block and entry of the new block.

3.3.4.12 The Contractor must provide a temporary lighting system on the main deck and in the engine room.

3.3.4.13 Furniture, doors, wall panels, insulation and ceilings dismantled by the Contractor must be carefully moved to a dry place, protected from any damage. Furniture, wall panels, insulation and ceiling must be reassembled after the work.

3.3.4.14 The Contractor must provide a price for the replacement of a surface of 135 ft^2 and a thickness of 2 inches of thermal insulation on the main deck on the side of the engine

room. The Contractor must provide a price for the replacement of a surface of 72 ft² and a thickness of 4 inches of thermal insulation on the hull in the accommodations. The thermal insulation must be new and be Roxul brand RHT 60 insulation or equivalent. It must have a thermal performance equal to or greater than 0.75 m²K/W. Insulation must be non-combustible, water repellent and designed for high temperature applications. The total surface must take into account the presence of the 18-inch spaced stiffeners (angle irons) of the structure. The insulation must be covered by an aluminium vapour barrier. The joints between the sheets of insulation must be sealed with three-inch (76.2-mm) wide aluminium tape. The Contractor must install an insulation attachment system using nails welded to the steel sheet. Insulation must be attached using new nails and washers. The insulation must be covered by aluminium mesh in the engine room.

3.3.4.15 The A-60 insulation of the main deck contains asbestos. This insulation must be removed without risk to the health of workers and ship personnel. Handling of materials containing asbestos must be done in compliance with the standards and regulations in force. The Contractor must provide a price for the replacement of 315 ft² of A-60 insulation with a thickness of 3 inches. The new A-60 insulation product must be approved by a classification society recognized by the DSIP and compatible with the existing cement.

3.3.4.16 The Contractor must provide a price for the supply and installation of 12 new Ayrlite 2054 wall panels or equivalent. The colours of the panels will be determined once the contract is awarded. The wall panels must be approved by a classification society recognized by the DSIP.

3.3.4.17 The Contractor must provide a price for replacement of 32 ft² of passageway floor tiles. The underlay, cement and glue must be approved by a classification society recognized by the DSIP. The new tiles must be Armstrong Excelon, or equivalent. The colours of the tiles will be determined once the contract is awarded.

3.3.4.18 The Contractor must provide a price for replacement of 270 ft² of cabin flooring. The underlay, cement and glue must be approved by a classification society recognized by the DSIP. The new floor covering will be Armstrong PREMIUM G 6210 linoleum or equivalent. The colours of the linoleum will be determined upon contract award.

3.3.4.19 The following work for the reassembly and recommissioning of the diesel engine will be undertaken by the Contractor under the supervision of the FSR from Fairbanks Morse:

3.3.4.19.1 The new engine block will be delivered to a place on the dock near the ship. The Contractor will not have to do work on the block prior to it being placed in the aft engine room, with the exception of the installation of supports used for ship handling.

3.3.4.19.2 Using hoisting equipment, perform the necessary manoeuvres to bring the new engine block to its base in the aft engine room of the ship. Place the engine block on the wooden blocks in a position that allows installation of the crankshaft. It is important that these rigging and hoisting operations be performed by qualified personnel to prevent damaging the engine block on its way into the ship.

3.3.4.19.3 Install the caps of the main bearings without the crankshaft. The engine block will then be bolted directly onto its base without its crankshaft in order to check the alignment of the main bearings. Alignment of the crankshaft line will be laser checked by the company indicated in 1.3.4.3.9.

3.3.4.19.4 Remove the caps from the main bearings. Unbolt the engine block and place the block in a safe position in order to install the crankshaft. Install the crankshaft and the vibration damper. The FSR shall measure the dimensions of the main bearings shells to confirm that they comply with the OEM requirements.

3.3.4.19.5 Turn the cylinder block, once deep cleaned (engine base to be cleaned also), apply sealant to the contact surfaces and attach the engine block to its base.

3.3.4.19.6 Install the flywheel and measure the alignment in accordance with the Generator Mountings Instructions 5222-008040 and the generator connection 5227-008080. The timing pointer position, the deflexion, the run-out and the backlash readings shall be logged in the report. Connect the engine to its generator and remove the generator support apparatus.

3.3.4.19.7 Measure the deflection of the crankshaft and note the readings in the work report. The measurements must comply with the tolerances established by the manufacturer. Carry out a bump test on every main bearing.

3.4 <u>Proof of performance</u>

3.4.1 Inspection

3.4.1.1 All work governed by the Canada Shipping Act and its regulations must be approved by TCMS or, if applicable, the classification society.

3.4.2 Dockside testing

3.4.2.1 All equipment reinstalled in the ship, such as engine #4, the exhaust line, lighting, ventilation conduits, doors and heating equipment will undergo dockside testing. The Contractor must provide a list of the equipment that will be dismantled and reinstalled for testing and approval by the Technical Authority.

3.4.3 Deliverable documents

3.4.3.1 The Contractor must provide a complete report of the work. The report must include the quality control plan duly completed by the Contractor and signed by the CCG.

3.4.3.2 The manufacturer’s representative from Fairbanks Morse must provide a complete report of the work. The report must contain all readings (dimensionals, clearance, calibration) required by the manufacturer during the works.