



RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Réception des soumissions - TPSGC / Bid

Receiving - PWGSC

1550, Avenue d'Estimauville

1550, D'Estimauville Avenue

Québec

Québec

G1J 0C7

INVITATION TO TENDER

APPEL D'OFFRES

**Tender To: Public Works and Government Services
Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Soumission aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici et sur toute feuille ci-annexée, au(x) prix indiqué(s).

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

Québec

G1J 0C7

Title - Sujet Pierre Radisson Dry Docking 2018	
Solicitation No. - N° de l'invitation F3019-18N228/A	Date 2018-09-19
Client Reference No. - N° de référence du client F3019-18N228	GETS Ref. No. - N° de réf. de SEAG PW-\$QCL-037-17487
File No. - N° de dossier QCL-8-41094 (037)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-10-05	
Time Zone Fuseau horaire Heure Avancée de l'Est HAE	
F.O.B. - F.A.B.	
Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Woods, Michael	Buyer Id - Id de l'acheteur qcl037
Telephone No. - N° de téléphone (418) 649-2715 ()	FAX No. - N° de FAX (418) 648-2209
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: Pêches et Océans Canada Att.Alexandre Gouin NGCC Pierre Radisson 101 Boul. Champlain QUEBEC Québec G1K7Y7 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée 2018-08-10	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

TABLE OF CONTENTS

PART 1 - GENERAL INFORMATION

- 1.1 Introduction
- 1.2 Summary

PART 2 - BIDDER INSTRUCTIONS

- 2.1 Standard Instructions, Clauses and Conditions
- 2.2 Submission of Bids
- 2.3 Enquiries - Bid Solicitation
- 2.4 Applicable Laws
- 2.5 Bidders' Conference
- 2.6 Viewing - Vessel
- 2.7 Work Period
- 2.8 Docking Facility
- 2.9 List of Proposed Subcontractors
- 2.10 Quality Control Plan
- 2.11 Inspection and Test Plan
- 2.12 Vessel Refit, Repair or Docking - Cost

PART 3 - BID PREPARATION INSTRUCTIONS

- 3.1 Bid Preparation Instructions

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

- 4.1 Evaluation Procedures
- 4.2 Basis of Selection
- 4.3 Public Bid Opening

PART 5 - CERTIFICATIONS

- 5.1 Certifications Precedent to Contract Award

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

- 6.1 Security Requirement (*not used*)
- 6.2 Financial Security Requirement
- 6.3 Accommodation
- 6.4 Parking
- 6.5 Material and Supply Support (*not used*)
- 6.6 Workers' Compensation - Letter of Good Standing
- 6.7 Welding Certification
- 6.8 Valid Labour Agreement
- 6.9 Work Schedule and Reports (*not used*)
- 6.10 Fueling and De-fueling Crown Vessels (*not used*)
- 6.11 ISO 9001:2008 - Quality Management Systems
- 6.12 Environmental Protection
- 6.13 Insurance Requirement

PART 7 - RESULTING CONTRACT CLAUSES

- 1. Requirement
- 2. Standard Clauses and Conditions

-
3. Security Requirement
 4. Term of Contract
 5. Authorities
 6. Payment
 7. Invoicing Instructions
 8. Certifications
 9. Applicable Laws
 10. Priority of Documents
 11. Insurance Requirements
 12. Financial Security
 13. Accommodation
 14. Parking
 15. Sub-contract and Sub-contractor List
 16. Work Schedule and Reports
 17. Insulation Materials - Asbestos Free
 18. Loan of Equipment – Marine
 19. Trade Qualifications
 20. Material and Supply Support (*not used*)
 21. ISO 9001:2008 - Quality Management Systems
 22. Quality Control Plan
 23. Welding Certification
 24. Environmental Protection
 25. Supervision of Fueling and Disembarking Fuel
 26. Procedure for Design Change or Additional Work
 27. Equipment/Systems: Inspection/Test
 28. Inspection and Test Plan
 29. Vessel Custody
 - 30 a. Vessel Unmanned Refits
 - 30 b. Vessel Manned Refits
 31. Pre-fit Meeting
 32. Meetings
 33. Outstanding Work and Acceptance
 34. Licensing
 35. Hazardous Waste
 36. Government Site Regulations
 37. Scrap and Waste Material
 38. Stability and Weight Management
 39. Vessel - Access by Canada
 40. Title to Property
 41. Defence Contract
 42. Limitation of Contractor's Liability for Damages to Canada

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
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Amd. No. - N° de la modif.
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CCC No./N° CCC - FMS No/ N° VME

List of Annexes:

Annex A	Technical Specification
Annex B	Basis of Payment
Annex C	Insurance Requirements
Annex D	Inspection/Quality Assurance/Quality Control
Annex E	Warranty
Annex F	Vessel Custody
Appendix 1 of Annex F	Acceptance Certificate (by shipyard)
Appendix 2 of Annex F	Acceptance Certificate (by CCG)
Annex G	Security Requirements Check List (<i>not used</i>)
Annex H	Project Management Services (<i>not used</i>)
Annex I	Financial Bid Presentation Sheet
Appendix 1 of Annex I	Price per Item Sheet
Annex J	Pricing Data Sheet
Annex K	OEM data sheet

PART 1 - GENERAL INFORMATION

1.1 Introduction

The bid solicitation and resulting contract document is divided into seven parts plus annexes as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation and states that the Bidder agrees to be bound by the clauses and conditions contained in all parts of the bid solicitation;
- Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, if applicable, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided;
- Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Requirement, the Basis of Payment and other annexes.

1.2 Summary

- (i) Requirement:
 - a) to carry out the docking and related work regarding the Canadian Coast Guard Ship (C.C.G.S.) Pierre Radisson in accordance with the associated Technical Statement of Requirement attached as Annex A and all related drawings.
 - b) to carry out any approved unscheduled work not covered in paragraph a) above.
- (ii) As per the Integrity Provisions under section 01 of *Standard Instructions 2003*, bidders must provide a list of all owners and/or Directors and other associated information as required. Refer to section [4.21](#) of the *Supply Manual* for additional information on the Integrity Provisions.
- (iii) The requirement is exempt from the provisions of the World Trade Organization Agreement on Government Procurement (WTO-AGP), Annex 4 and the North American Free Trade Agreement (NAFTA), Chapter Ten Annex 1001.2b Paragraph 1, however, it is subject to the Canadian Free Trade Agreement (CFTA) and will be limited to suppliers in Eastern Canada in accordance with Shipbuilding, Refit, Repair and Modernization Policy (1996-12-19).

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 (2018-05-22) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

2.2 Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than **seven (7) calendar days** before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a "proprietary" nature must be clearly marked "proprietary" at each relevant item. Items identified as proprietary will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the enquiry can be answered with copies to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in the Province of _____ .

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

2.5 Bidders' Conference – Vessel

A bidders' Conference chaired by the Contracting Authority will be convened at 101 Champlain Boulevard, Quebec, QC G1K 7Y7, room AD-1-1R-107, at 1:00 pm, October 2nd, 2018.

An attendance confirmation (by e-mail) is required before 11:00 am, September 28th, 2018, otherwise the bidders' conference will be cancelled.

It is recommended that the Bidder or a representative of the Bidder attend the Bidders' Conference in order to review the Scope of the Work required and to receive additional information and clarifications. Bidders are to communicate with the Contracting Authority prior to the conference to confirm attendance.

Bidders that do not attend are not precluded from submitting a bid. Bidders are to provide the Contracting Authority with the names of their representatives no later than two days prior to the conference. The Contracting Authority will have an attendance form which is to be signed by the Bidder's representative(s) in attendance. Bidders are advised that any clarifications or changes resulting from the Bidder's conference and/or the subsequent viewing of the vessel shall be included as an amendment to the bid solicitation document.

2.6 Viewing – Vessel

No visit of the vessel is scheduled.

2.7 Work Period – Marine - Bid

Work must commence and be completed as follows:

Start: October 24, 2018, or as per ship availability (at the earliest date)
End: November 26, 2018, or thirty-three (33) days after ship availability (at the earliest date)

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.

2.8 Docking Facility

Before award of Contract, the successful Bidder may be required to demonstrate to the satisfaction of Canada that the certified capacity of the dry docking facility to be used for the work is adequate for the anticipated loading as specified in the related dry docking plans and other documents. The successful Bidder will be notified in writing and be allowed a reasonable period of time to provide detailed keel block load distribution sketches and blocking stability considerations, along with the supporting calculations to clearly show the adequacy of the proposed docking arrangement.

Upon written request from the Contracting Authority, the Bidder must provide current (providing there is no end date on the certificate submitted, then it is to have been issued within the past two years) and valid certification of the capacity and condition of the docking facility to be used for the Work.

Although a dry docking facility may have a total capacity greater than the vessel to be docked, the weight distribution of the vessel may cause individual block loading to be exceeded. Also, while the physical dimensions of a *dry docking facility* may indicate acceptability for docking of a specific vessel, other limitations such as spacing of rails on a marine railway, concrete piers of abutments adjoining the dry dock may, in fact, preclude the facility from being considered as a possible dry docking site.

2.9 List of Proposed Sub-contractors

If the bid includes the use of subcontractors, the Bidder agrees, upon written request from the Contracting Authority, to provide a list of all subcontractors including a description of the things to be purchased, a description of the work to be performed by specification section and the location of the performance of that work. The list should not include the purchase of off-the-shelf items, software and such standard articles and materials as are ordinarily produced by manufacturers in the normal course of business, or the provision of such incidental services as might ordinarily be subcontracted in performing the Work, i.e. subcontract work valued at less than \$5000.00

2.10 Quality Plan - Solicitation

Upon written request from the Contracting Authority, the Bidder shall provide an example of its Quality Plans applied to similar former projects. The Plan must be in the same format that will be used after award of contract.

2.11 Inspection and Test Plan

Upon written request from the Contracting Authority, the Bidder may be required to provide an example of its Inspection Plans for each item of the specifications.

2.12 Vessel Refit, Repair or Docking - Cost

All charges, fees expenses and disbursements incidental to the carrying out of the Work, including all items described in Supplemental General Conditions 1029 (2010-08-16) Ship Repair, section (07), are included in the Evaluation Price (and in the Contract Price under the Contract), including, without limitation:

1. **Services:** include all costs for ship services such as water, steam, electricity, etc., required for vessel maintenance for the duration of the Contract.
2. **Docking and Undocking includes:**
 - (a) all costs resulting from dry docking, wharfage, security, shoring, shifting and/or moving of the vessel within the successful Bidder's facility;
 - (b) the cost of services to tie up the vessel alongside and to cast off.

Unless specified otherwise, the vessel will be delivered by Canada to the successful Bidder's facility alongside a mutually agreed safe transfer point, afloat and upright, and the successful Bidder will do the same when the Work is completed. The cost of services to tie up the vessel alongside and to cast off is included in the Evaluation Price

3. **Field Service Representatives/Supervisory Services:** include all costs for field service representatives/supervisory services including manufacturers' representatives, engineers, etc.
4. **Removals:** include all costs for removals necessary to carry out the Work and will be the responsibility of the successful Bidder whether or not they are identified in the specifications, except those removals not apparent when viewing the vessel or examining the drawings. The successful Bidder will also be responsible for safe storage of removed items and reinstalling them on completion of the Work. The successful Bidder will be responsible for renewal of components damaged during removal.
5. **Sheltering, Staging, Cranage and Transportation:** include the cost of all sheltering, staging including handrails, cranage and transportation to carry out the Work as specified.

The successful Bidder will be responsible for the cost of any necessary modification of these facilities to meet applicable safety regulations.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

3.1.1 Canada requests that bidders provide their bid in separately bound sections as follows:

- Section I: Management Bid (1 hard copy)
- Section II: Financial Bid (1 hard copy)
- Section III: Certifications Requirements (1 hard copy)

Prices must appear in the financial bid only (Annex I) and Appendix 1 to Annex I. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process Policy on Green Procurement (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders are encouraged to :

- 1) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Management Bid

The Management Bid should be concise and should include all the certifications and other requirements as noted in Parts 4 and 6.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Financial Bid Presentation Sheet Annex I and the detailed Pricing Data Sheet, Appendix 1 to Annex I. The total amount of applicable taxes is to be shown separately, if applicable.

Section III: Certification Requirements

Bidders must submit the certifications required under Part 5.

3.1.2 Unscheduled Work and Evaluation Price

In any vessel refit, repair or docking contract, unscheduled work will arise after the vessel and its equipment is opened up and surveyed. The anticipated cost of the Work will be included in the evaluation of bids. The overall total cost will be calculated by including an estimated amount of additional personhours (and/or material) multiplied by a firm hourly charge-out labour rate and is added to the firm price for the Work.

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
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CCC No./N° CCC - FMS No/ N° VME

The overall total referred to as the "Evaluation Price" will be used for evaluating the bids. The estimated work will be based on historical experience and there is no minimum or maximum amount of unscheduled work nor is there a guarantee of such work.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical, management and financial evaluation criteria specified below.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Financial Bid

Bidders must submit their financial bid in accordance with the Financial Bid Presentation Sheet Annex "I" and the detailed Pricing Data Sheet, Appendix 1 to Annex "I". The total amount of Goods and Services Tax or Harmonized Sales Tax is to be shown separately, if applicable.

4.1.1.1 Unscheduled Work and Evaluation Price

In any vessel refit, repair or docking contract, unscheduled work will arise after the vessel and its equipment is opened up and surveyed. The anticipated cost of the Work will be included in the evaluation of bids. The overall total cost will be calculated by including an estimated amount of additional person-hours (and/or material) multiplied by a firm hourly charge-out labour rate and is added to the firm price for the Work.

The overall total referred to as the "Evaluation Price" will be used for evaluating the bids. The estimated work will be based on historical experience and there is no minimum or maximum amount of unscheduled work nor is there a guarantee of such work.

4.1.2 Mandatory Requirements

Bids will be assessed in accordance with the entire requirement of the bid solicitation including compliance with the mandatory certifications and table of deliverable requirements as detailed in Parts 2, 4, 5 and 6. Only those bids which are found to meet all the mandatory requirements within the specified time frames will be deemed responsive.

4.1.3 Table of Mandatory Requirements to be met by bid closing

Notwithstanding deliverable requirements specified anywhere else within this solicitation and its associated Technical Specification, the following are the only mandatory deliverables that must be submitted with the Bid at the time of bid closing. The following are mandatory and the Bidder must be compliant on each item to be considered responsive.

Item	Description	Completed and attached
1	Completed Annex "I" Financial Bid presentation Sheet;	
2	Completed Appendix 1 to Annex "I" Price per item sheet;	
3	Information regarding Financial Security as per Part 6 Article 6.2.2	
4	Letter or proof of Insurance as per article 6.13 of Part 6;	
5	Annex "K" – OEM data sheet	

4.1.4 Other information upon request only

The following information, which supports the bid, may be requested by the Contracting Authority from the bidder and it must be provided within **two (2)** working days of the written request:

Item	Description	Completed and attached	To be forwarded if requested by the CA
1	Current and valid certification of the capacity and condition of the docking facility, as per clause 2.8 of Part 2;		Prior to contract award
2	Examples of quality and inspections plans, as per articles 2.10 and 2.11		Prior to contract award
3	Financial Capability and information, as per article 6.2.1		Prior to contract award
4	Proof of good standing with Worker's Compensation Board as per clause 6.6 of Part 6;		Prior to contract award
5	Proof of welding certification, as per clause 6.7 of Part 6;		Prior to contract award
6	Proof of valid Labor Agreement or similar instrument covering the work period as per clause 6.8 of Part 6;		Prior to contract award
7	ISO Registration Certificate or Quality Assurance Documentation, as per article 11 of Part 6		Prior to contract award
8	Environment Protection as per article 6.12 Part 6		Prior to contract award
9	List of Proposed Sub-contractors		Prior to contract award
10	Annex "J" – Pricing Data Sheets		Prior to contract award
11	Supply a plan of the dry dock		Prior to contract award

4.1.5 Deliverables after Contract award

Item	Description	Must be supplied after contract award, within
1	Insurance Requirements as per article 7.11, Part 7;	5 calendar days
2	Work Schedule and reports as per item 7.16, Part 7.	5 calendar days

4.2 Basis of Selection

A bid must comply with the requirements of the bid solicitation and meet all mandatory evaluation criteria to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

4.2.1 Equivalent Products

SACC Manual Clause B3000T (2006-06-16) Equivalent Products

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

4.3 Public Bid Opening

A public bid opening will be held in Public Works and Government Services Canada, 601-1550, D'Estimauville Ave., Québec, Qc at 02:00 PM (EDT) on the date show at the first page.

Following solicitation closing, bid results may be obtained by calling at No. (418) 649-2888.

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide with its bid the required documentation, as applicable, to be given further consideration in the procurement process.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

5.2.1 Integrity Provisions – Required Documentation

In accordance with the Ineligibility and Suspension Policy (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

6.1 Security Requirement *(Not used)*

6.2 Financial Requirements

6.2.1 Financial Capability

1. Financial Capability Requirement: The Bidder must have the financial capability to undertake this requirement. To determine the Bidder's financial capability, the Contracting Authority may, by written notice to the Bidder, require the submission of some or all of the financial information detailed below during the evaluation of bids. The Bidder must provide the following information to the Contracting Authority within two (2) working days of the request or as specified by the Contracting Authority in the notice:
 - (a) Audited financial statements, if available, or the unaudited financial statements (prepared by the Bidder's outside accounting firm, if available, or prepared in-house if no external statements have been prepared) for the Bidder's last three fiscal years, or for the years that the Bidder has been in business if this is less than three years (including, as a minimum, the Balance Sheet, the Statement of Retained Earnings, the Income Statement and any notes to the statements).
 - (b) If the date of the financial statements is more than five months before the date of the request for information by the Contracting Authority in (a) above, the Bidder must also provide the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement) as of two months before the date on which the Contracting Authority requests the information.
 - (c) If the Bidder has not been in business for at least one full fiscal year, the following must be provided:
 - (i) the opening Balance Sheet on commencement of business (in the case of a corporation, the date of incorporation); and
 - (ii) the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement) as of two months before the date on which the Contracting Authority requests the information.
 - (d) A certification from the Chief Financial Officer or an authorized signing officer of the Bidder that the financial information provided is complete and accurate.
 - (e) A confirmation letter from all of the financial institution(s) that have provided short-term financing to the Bidder outlining the total of lines of credit granted to the Bidder and the amount of credit that remains available and not drawn upon as of one month prior to the date on which the Contracting Authority requests this information.

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- (f) A detailed monthly Cash Flow Statement, covering all the Bidder's activities (including the requirement) for the first two years of the requirement that is the subject of the bid solicitation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures on a monthly basis, for all the Bidder's activities. All assumptions made should be explained as well as details of how cash shortfalls will be financed.
- (g) A detailed monthly Project Cash Flow Statement covering the first two years of the requirement that is the subject of the bid solicitation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures, for the requirement, on a monthly basis. All assumptions made should be explained as well as details of how cash shortfalls will be financed.
2. If the Bidder is a joint venture, the financial information required by the Contracting Authority must be provided by each member of the joint venture.
3. If the Bidder is a subsidiary of another company, then any financial information required by the Contracting Authority in 1. (a) to (f) must be provided by each level of parent company, to and including the ultimate parent company. Provision of parent company financial information does not satisfy the requirement for the provision of the financial information of the Bidder and the financial capability of a parent cannot be substituted for the financial capability of the Bidder itself, unless a duly executed Parental Guarantee is provided with the required information.
4. **Other Information:** Canada reserves the right to request from the Bidder any other information that Canada requires to conduct a complete financial capability assessment of the Bidder.
5. **Confidentiality:** Should the Bidder provide the information required above to Canada in confidence while indicating that the disclosed information is confidential, then Canada will treat the information in a confidential manner as permitted by the *Access to Information Act*, R.S., 1985, c. A-1, Section 20(1) (b) and (c).
6. **Security:** In determining the Bidder's financial capability to undertake this requirement, Canada may consider any security the Bidder is capable of providing, at the Bidder's sole expense (for example, an irrevocable letter of credit from a registered financial institution drawn in favour of Canada, a performance guarantee from a third party or some other form of security, as determined by Canada).

6.2.2 Contract Financial Security

1. Bidders must specify in their bid, which of the following 2 types of Financial Security they will provide: EITHER
- (a) a performance bond (form PWGSC-TPSGC 505) and a labour and material payment bond (form PWGSC-TPSGC 506), each in the amount of 20 percent of the contract price for the Known Work.

Any bond must be issued by one of the bonding companies whose bonds are accepted as security by the government of Canada and which are listed in Treasury Board Contracting Policy, Appendix L, Acceptable Bonding Companies (http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/contracting/contractingpol_l_e.asp). The bond forms mentioned in (a) above are available at: <http://www.tpsgc-pwgscc.gc.ca/acquisitions/text/forms/forms-e.html>

OR

- (b) a security deposit (government guaranteed bonds, bills of exchange, irrevocable standby letters of credit, certified cheque) to the value of 10 percent of the contract price.
- 2. Security deposits in the form of government guaranteed bonds with coupons attached will be accepted only if all coupons that are unexpired, at the time the security deposit is provided, are attached to the bonds. The Contractor must provide written instructions concerning the action to be taken with respect to coupons that will mature while the bonds are pledged as security, when such coupons are in excess of the security deposit requirement.
- 3. The cost to the Bidder of the Contract Financial Security is to be indicated in Annex "I".
- 4. If the Bid is accepted, the Bidder shall be required to provide the Contract Financial Security within five (5) calendar days of Contract Award, or prior to Contract award if Canada so specifies.
- 5. If, for any reason, Canada does not receive, within the specified period, the required Contract Financial Security, Canada may terminate the Contract if it has been awarded, may accept another offer, seek new bids, negotiate a contract or not accept any bids, as Canada may deem advisable. Canada may, in its absolute discretion, require the successful bidder to deliver the Contract Financial Security described herein before Contract award, and in that event may not award a Contract prior to delivery by the bidder of the Contract Financial Security.

6.2.3 Security Deposit Definition

- 1. "security deposit" means
 - (a) a bill of exchange that is payable to the Receiver General for Canada and certified by an approved financial institution or drawn by an approved financial institution on itself; or
 - (b) a government guaranteed bond; or
 - (c) an irrevocable standby letter of credit, or
 - (c) such other security as may be considered appropriate by the Contracting Authority and approved by Treasury Board;
- 2. "approved financial institution" means
 - (a) any corporation or institution that is a member of the Canadian Payments Association;
 - (b) a corporation that accepts deposits that are insured by the Canada Deposit Insurance Corporation or the "Régie de l'assurance-dépôts du Québec" to the maximum permitted by law;
 - (c) a credit union as defined in paragraph 137(6) of the Income Tax Act;
 - (d) a corporation that accepts deposits from the public, if repayment of the deposits is guaranteed by a Canadian province or territory; or
 - (e) the Canada Post Corporation.
- 3. "government guaranteed bond" means a bond of the Government of Canada or a bond unconditionally guaranteed as to principal and interest by the Government of Canada that is:

- (a) payable to bearer;
- (b) accompanied by a duly executed instrument of transfer of the bond to the Receiver General for Canada in accordance with the Domestic Bonds of Canada Regulations;
- (c) registered in the name of the Receiver General for Canada.

4. "irrevocable standby letter of credit"

- (a) means any arrangement, however named or described, whereby a financial institution (the "Issuer"), acting at the request and on the instructions of a customer (the "Applicant"), or on its behalf,
 - i. will make a payment to or to the order of Canada, as the beneficiary;
 - ii. will accept and pay bills of exchange drawn by Canada;
 - iii. authorizes another financial institution to effect such payment, or accept and pay such bills of exchange; or
 - iv. authorizes another financial institution to negotiate, against written demand(s) for payment, provided that the conditions of the letter of credit are complied with.
- (b) must state the face amount which may be drawn against it;
- (c) must state its expiry date;
- (d) must provide for sight payment to the Receiver General for Canada by way of the financial institution's draft against presentation of a written demand for payment signed by the authorized departmental representative identified in the letter of credit by his/her office;
- (e) must provide that more than one written demand for payment may be presented subject to the sum of those demands not exceeding the face amount of the letter of credit;
- (f) must provide that it is subject to the International Chamber of Commerce (ICC) Uniform Customs and Practice (UCP) for Documentary Credits, 2007 Revision, ICC Publication No. 600. Pursuant to the ICC UCP, a credit is irrevocable even if there is no indication to that effect; and
- (g) must be issued (Issuer) or confirmed (Confirmer), in either official language, by a financial institution that is a member of the Canadian Payments Association and is on the letterhead of the Issuer or Confirmer. The format is left to the discretion of the Issuer or Confirmer.

6.3 Accommodation

Bidder shall be responsible to provide accommodation in accordance with item 2 of the Technical Statement of Requirement of Annex A for the duration of the Contract.

6.4 Parking

Bidder shall be responsible to provide parking and services in accordance with item 2 of the Technical Statement of Requirement of Annex A for the duration of the Contract.

6.5 Material and Supply Support *(Not used)*

6.6 Workers' Compensation - Letter of Good Standing

It is mandatory that the Bidder has an account in good standing with the Provincial Workers Compensation Board/Commission.

Upon written request from the Contracting Authority, the Bidder must submit a certificate or Letter of Good Standing from the applicable Workers Compensation Board/Commission. Failure to provide this information will render the bid non responsive.

6.7 Welding Certification

Welding must only be undertaken by a company Certified by the Canadian Welding Bureau (CWB) to the requirements of the following Canadian Standards Association (CSA) standards:

- (a) CSA W47.1, Certification of Companies for Fusion Welding of Steel, section 2;
- (b) CSA W59, Welded steel construction (metal arc welding); and

In addition, welding must be done in accordance with the requirements of the applicable drawings and specifications.

Before the commencement of any fabrication work, and upon request from the Inspection Authority, the Contractor must provide approved welding procedures and/or a list of welding personnel intended to be used in the completion of the work. The list must identify the CWB welding procedure qualifications attained by each of the personnel listed and must be accompanied by a copy of each person's current CWB welding certification.

6.8 Valid Labour Agreement

If the Bidder has a labour agreement, or other suitable instrument, in place with its unionized labour or workforce, it must be valid for the proposed period of any resulting contract.

Upon written request from the Contracting Authority, the Bidder must provide evidence of that agreement or other suitable instrument.

6.9 Work Schedule and Reports *(Not used)*

6.10 Supervision of Fueling and Disembarking Fuel

SACC Manual Clause A9056C (2008-05-12) Supervision of Fueling and Disembarking Fuel

6.11 ISO 9001:2008 - Quality Management Systems

Upon written request from the Contracting Authority, the Bidder must provide its current ISO Registration Documentation indicating its registration to ISO 9001:2008.

Documentation and procedures of bidders not registered to the ISO standards may be subject to a Quality System Evaluation (QSE) by the Inspection Authority before award of a contract.

6.12 Environmental Protection

Upon written request from the Contracting Authority, the Bidder must submit details of its environmental emergency response plans, waste management procedures and/or formal environmental training undertaken by its employees.

6.13 Insurances Requirements

At bids closing date the Bidder must provide a letter from an insurance broker or an insurance company licensed to operate in Canada stating that the Bidder, if awarded a contract as a result of the bid solicitation, can be insured in accordance with the Insurance Requirements specified in Annex "C".

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

1. Requirement

The contractor must:

- a) to carry out the docking and related Work regarding the Canadian Coast Guard Ship (C.C.G.S.) Pierre Radisson in accordance with the associated Technical Specifications attached as Annex A and all related drawings.
- b) carry out any approved unscheduled work not covered in paragraph a) above.

2. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual)(<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

2.1 General Conditions

2030, (2018-06-21), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract. (except for paragraph 26 "*Liability*" which is deleted in its entirety and replaced by the item 7.42 below).

Paragraph 22 "Warranty" of 2030, General Conditions – Higher Complexity – Goods, is amended in the Annex " E " - Warranty.

2.2 Supplemental General Conditions

From beginning to end of work:

Unmanned ship:

1029 (2010-08-16) Ship Repairs, excluding section 08 apply to and form part of the Contract.

On required basis only:

Manned ship:

1029 (2010-08-16) Ship Repairs, excluding section 09 apply to and form part of the Contract.

3. Security Requirement

There is no security requirement associated with this Statement of Work

4. Term of Contract

The contract period is from Contract award date until the end of the warranty period inclusively.

4.1. Work Period – Marine – Contract

Work must commence and be completed as follows:

Start: October 24, 2018, or as per ship availability (at the earliest date)
End: November 26, 2018, or thirty-three (33) days after ship availability (at the earliest date)

The Contractor agrees 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 it has sufficient material and human resources allocated or available to complete the subject work and a reasonable amount of unscheduled work within the Work Period.

5. Authorities

5.1 Contracting Authority

The Contracting Authority for the Contract is:

Michael Woods
Marine Supply Chief
Public Works and Government Services Canada
Québec area – Marine division
1550, avenue D'Estimauville, Québec, (Québec) G1J 0C4,
Quebec, Canada

michael.woods@tpsgc-pwgsc.gc.ca

Phone: (418) 649-2715

Fax: (418) 648-2209

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

5.2 Technical Authority (Will be filled in at contract award)

The Technical Authority for the Contract is:

Name: _____

Title: _____

Telephone: _____

Facsimile: _____

E-mail address: _____

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority; however, the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.2.1 Technical Representative (Will be filled in at contract award)

The Technical Representative for the Contract is:

Name: _____

Title: _____

Telephone: _____
Facsimile: _____
E-mail address: _____

The Technical Representative is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority; however, the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

5.3 Inspection Authority/Inspector

The Inspection Authority for the Contract is:

Same as paragraph 5.2 above.

The Inspection Authority is the representative of the department or agency for whom the Work is being performed under the Contract and is responsible for inspection of the Work and acceptance of the finished work. The Inspection Authority may be represented on-site by a designated inspector and any other Government of Canada inspector who may from time to time be assigned in support of the designated Inspector.

6. Payment

6.1 Basis of Payment - Firm Price

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid the firm price indicated in Annex B. Goods and Services Tax or Harmonized Sales Tax is extra, if applicable. Payment for unscheduled work will be done in accordance with Basis of Payment outlined at Annex B.

6.2 Payment Terms - Progress Payments

1. Canada will make progress payments in accordance with the payment provisions of the Contract, no more than once a month, for cost incurred in the performance of the Work, up to 90 percent of the amount claimed and approved by Canada if:
 - (a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
 - (b) the amount claimed is in accordance with the basis of payment;
 - (c) the total amount for all progress payments paid by Canada does not exceed 90 percent of the total amount to be paid under the Contract;
 - (d) all certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives.
2. The balance of the amount payable will be paid in accordance with the payment provisions of the Contract upon completion and delivery of all work required under the Contract if the Work has been accepted by Canada and a final claim for the payment is submitted.
3. Progress payments are interim payments only. Canada may conduct a government audit and interim time and cost verifications and reserves the rights to make adjustments to the Contract from time to

time during the performance of the Work. Any overpayment resulting from progress payments or otherwise must be refunded promptly to Canada.

6.3 Method of Payment

SACC Manual Clause C6000C (2017-08-17) Limitation of Price
SACC Manual Clause H4500C (2010-01-11) Lien - Section 427 of the Bank Act

7. Invoicing Instructions

7.1 Invoicing Instructions - Progress Payment Claim

The Contractor must submit invoices that contain the information required by the General Conditions 2030(2018-06-21) Part 13.

7.2 Invoicing

Invoice to be made to the name of:

DFO.invoicing-facturation.MPO@canada.ca

Write the name of the contact person:

████████████████████

Electronic Copy to be sent for verification to: michael.woods@tpsgc-pwgsc.gc.ca

7.3 Warranty Holdback

A warranty holdback of **10%** of the total contract price as last amended (applicable taxes excluded) will be applied to the final claim for payment. This holdback will be payable by Canada upon the expiry of the 90 day warranty period(s) applicable to the work. Applicable taxes are to be calculated and paid on the total amount of the claim before the 10% holdback is applied. At the time that the holdback is released, there will be no applicable taxes payable, as it was included in previous payments.

8. Certifications

8.1 Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the entire contract period. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

9. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in _____.

10. Priority of Documents

If there is a discrepancy between the wordings of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- a) the Articles of Agreement;
- b) the Supplemental General Conditions 1029, (2010-08-16), Ship Repairs;

- c) the General Conditions 2030, (2018-06-21), General Conditions - Higher Complexity - Goods
- d) Annex A, Requirement;
- e) Annex B, Basis of Payment;
- f) Annex C, Insurance Requirements;
- g) Annex D, Inspection/Quality Assurance/Quality Control;
- h) Annex E, Warranty;
- i) Annex F, Vessel Custody
- j) the Contractor's bid dated _____

11. Insurance Requirements

The Contractor must comply with the insurance requirements specified in Annex C. The Contractor must maintain the required insurance coverage for the duration of the Contract. Compliance with the insurance requirements will not release the Contractor from or reduce its liability under the Contract.

The Contractor is responsible to decide if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage will be at the Contractor's expense, and for its own benefit and protection.

The Contractor must forward to the Contracting Authority within **five (5)** calendar days after the date of award of the Contract a Certificate of Insurance including details of the insurance coverage, exclusions, deductibles and conditions and confirming that the insurance policy complying with the requirements is in force. The Contractor must, if requested by the Contracting Authority, forward to Canada a certified true copy of all applicable insurance policies.

12. Financial Security

12.1 Contract Financial Security

1. The Contractor must provide one of the following contract financial securities within five (5) calendar days after the date of contract award:
 - (a) a performance bond (form [PWGSC-TPSGC 505](#)) and a labour and material payment bond (form [PWGSC-TPSGC 506](#)), each in the amount of 20 percent of the Contract Price for the Known Work; or
 - (b) a security deposit as defined in clause E0008C in the amount of 10 percent of the Contract Price for the Known Work.

Any bond must be issued by by one of the bonding companies listed in Treasury Board Contracting Policy, [Appendix L](#), Acceptable Bonding Companies, at the following web address:
http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/contracting/contractingpol_1_e.asp

2. Security deposits in the form of government guaranteed bonds with coupons attached will be accepted only if all coupons that are unmaturing, at the time the security deposit is provided, are attached to the bonds. The Contractor must provide written instructions concerning the action to be taken with respect to coupons that will mature while the bonds are pledged as security, when such coupons are in excess of the security deposit requirement.
3. If Canada does not receive the required financial security within the specified period, Canada may terminate the Contract for default pursuant to the Contract default provision.

12.2 Clause of SACC manual

SACC Manual E0008C (2018-06-21) Security Deposit Definition

13. Accommodation

Contractor shall be responsible to provide accommodation in accordance with the Technical Statement of Requirement of Annex A for the duration of the Contract.

14. Parking

Bidder shall be responsible to provide parking spots and services in accordance with the technical Statement of Requirement of Annex A for the duration of the Contract.

15. Sub-contracts and Sub-contractor List

The Contracting Authority is to be notified, in writing, of any changes to the list of subcontractors before commencing the work.

When the Contractor sub-contracts work, a copy of the sub-contract purchase order is to be passed to the Contracting Authority. In addition, the Contractor must monitor progress of sub-contracted work and inform the Inspection Authority on pertinent stages of work to permit inspection when considered necessary the Inspection Authority.

16. Work Schedule and Reports

No later than **five (5)** calendar days after contract award, the preliminary schedule must be revised and expanded as necessary and resubmitted before commencement of the Work.

The Contractor must provide a detailed work schedule showing the commencement and completion dates for the Work in the available work period, including realistic target dates for significant events. During the Work Period the schedule is to be reviewed on an ongoing basis by the Inspection Authority and the Contractor, updated when necessary, and available in the Contractor's office for review by Canada's authorities to determine the progress of the Work.

Production work schedules must be revised and resubmitted before each Progress Meeting. The revised schedules must show the effect of progressed work and approved work arisings. Changes in scheduled completion dates due to unscheduled work will not be accepted except as negotiated under Design Change or Additional Work, Article 26.

17. Insulation Materials - Asbestos Free

All materials used to insulate or re-insulate any surfaces on board the vessel must meet Transport Canada Marine standards, for commercial marine work, and, for all work, be free from asbestos in any form. The Contractor must ensure that all machinery and equipment located below or adjacent to surfaces to be re-insulated are adequately covered and protected before removing existing insulation.

18. Loan of Equipment - Marine

The Contractor may apply for the loan of the Government special tools and test equipment particular to the subject vessel as identified in the Specifications. The provision of other equipment required for the execution of work in the Specifications is the sole responsibility of the Contractor.

Equipment loaned under this provision must be used only for work under this Contract and may be subject to demurrage charges if not returned on the date required by Canada. In addition, equipment loaned under the above provision must be returned in a like condition, subject to normal wear and tear.

A list of Government equipment that the Contractor intends to request must be submitted to the Contracting Authority within ten (10) calendar days of Contract Award to permit timely supply or for

alternate arrangements to be made. The request must state the time frame for which the equipment is required.

19. Trade Qualifications

The Contractor must use qualified, certificated (if applicable) and competent trades people and supervision to ensure a uniform high level of workmanship. The Inspection Authority may request to view and record details of the certification and/or qualifications held by the Contractor's trades' people. This request should not be unduly exercised but only to ensure qualified trades people are on the job

20. Material and Supply Support *(Not used)*

21. ISO 9001:2008 - Quality Management Systems

21.1 In the performance of the Work described in the Contract, the Contractor must comply with the requirements of:

ISO 9001:2008 - Quality management systems - Requirements, published by the International Organization for Standardization (ISO), current edition at date of submission of the Contractor's bid with the exclusion of the following requirement: 7.3 Design and development.

It is not the intent of this clause to require that the Contractor be registered to the applicable standard; however, the Contractor's quality management system must address each requirement contained in the standard.

21.2 Assistance for Government Quality Assurance (GQA):

The Contractor must provide the Inspection Authority with the accommodation and facilities required for the proper accomplishment of GQA and must provide any assistance required by the Inspection Authority for evaluation, verification, validation, documentation or release of product.

The Inspection Authority must have the right of access to any area of the Contractor's or Subcontractor's facilities where any part of the Work is being performed. The Inspection Authority must be afforded unrestricted opportunity to evaluate and verify Contractor conformity with Quality System procedures and to validate product conformity with contract requirements. The Contractor must make available, for reasonable use by the Inspection Authority, the equipment necessary for all validation purposes. Contractor personnel must be made available for operation of such equipment as required.

When the Inspection Authority determines that GQA is required at a subcontractor's facilities, the Contractor must provide for this in the purchasing document and forward copies to the Inspection Authority, together with relevant technical data as the Inspection Authority may request.

The Contractor must notify the Inspection Authority of non-conforming product received from a subcontractor when the product has been subject to GQA.

22. Quality Control Plan

The Contractor must implement and follow the Quality Control Plan (QCP) prepared according to the latest issue (at contract date) of ISO 10005 Quality management - Guidelines for quality plans, approved by the Inspection and Technical Authorities. The QCP shall describe how the Contractor will conform to the specified quality requirements of the Contract and specify how the required quality activities are to be carried out, including quality assurance of subcontractors. The Contractor must include a traceability matrix from the elements of the specified quality requirements to the corresponding paragraphs in the QCP.

The documents referenced in the QCP shall be made available when requested by the Inspection Authority.

The Contractor must make appropriate amendments to the QCP throughout the term of the contract to reflect current and planned quality activities. Amendments to the QCP must be acceptable to the Inspection and Technical Authorities.

Refer to Annex "D" for further details on the Quality Control Plan requirements.

23. Welding Certification

Welding must only be undertaken by a company Certified by the Canadian Welding Bureau (CWB) to the requirements of the following Canadian Standards Association (CSA) standards:

- (a) CSA W47.1, Certification of Companies for Fusion Welding of Steel, section 2;
- (b) CSA W59, Welded Steel Construction (Metal Arc Welding). And

In addition, welding must be done in accordance with the requirements of the applicable drawings and specifications.

Before the commencement of any fabrication work, and upon request from the Inspection Authority, the Contractor must provide approved welding procedures and/or a list of welding personnel intended to be used in the completion of the work. The list must identify the CWB welding procedure qualifications attained by each of the personnel listed and must be accompanied by a copy of each person's current CWB welding certification.

24. Environmental Protection

The Contractor and its sub-contractors engaged in the Work on a Crown vessel must carry out the Work in compliance with applicable municipal, provincial and federal environmental laws, regulations and industry standards.

The Contractor must have detailed procedures and processes for identifying, removing, tracking, storing, transporting and disposing of all potential pollutants and hazardous material encountered, to ensure compliance as required above.

All waste disposal certificates are to be provided to the Inspection Authority, with information copies sent to the Contracting Authority. Furthermore, additional evidence of compliance with municipal, provincial and federal environmental laws and regulations is to be furnished by the Contractor to the Contracting Authority when so requested.

The Contractor must have environmental emergency response plans and/or procedures in place. Contractor and subcontractor employees must have received the appropriate training in emergency preparedness and response. Contractor personnel engaging in activities which may cause environmental impacts or potential non-compliance situations, must be competent to do so, on the basis of appropriate education, training, or experience.

25. Supervision of Fueling and Disembarking Fuel

SACC Manual Clause A9056C (2008-05-12) Supervision of Fueling and Disembarking Fuel

26. Procedure for Design Change or Additional Work

SACC Manual Clause B5007C (2010-01-11) Design Change or Additional Work

26.1 Price Breakdown:

The Contractor must, upon request, provide a price breakdown for all unscheduled work, by specific activities with trades, person-hours, material, subcontracts and services.

26.2 Pro-rated Prices:

Hours and prices for unscheduled work will be based on comparable historical data applicable to similar work at the same facility, or will be determined by pro-rating the quoted work costs in the Contract when in similar areas of the vessel.

27. Equipment/Systems: Inspection/Test

Refer to Annex D for details on equipment and systems inspections and testing requirements.

28. Inspection and Test Plan

The Contractor shall, in support of their QCP, implement an approved Inspection & Test Plan (ITP).

The Contractor shall provide at no additional cost to the Crown, all applicable test data, all Contractor technical data, test pieces and samples as may reasonably be required by the Inspection Authority to verify conformance to contract requirements. The Contractor shall forward at his expense such technical data, test data, test pieces and samples to such location as the Inspector may direct.

Refer to Annex "D" for details on Inspection and Test Plan Requirements.

29. Vessel Custody

1. This work is going to take place with the vessel "out of commission" and therefore in the "care, control and custody" of the Contractor.
2. An "ACCEPTANCE CERTIFICATE - ASSUMPTION OF CUSTODY OF FEDERAL GOVERNMENT SHIPS BY SHIPYARDS" Appendix 1 of Annex "F" must be completed as required and a copy passed to the Inspection Authority.
3. To facilitate this turnover, representatives of the Contractor and Canada must confirm the condition of the vessel.
4. A vessel condition report must be appended to the above noted certificate and must be accompanied by colour photographs or videos in either conventional or digital format.
5. When the vessel is to be returned to the "care, control and custody" of Canada, an "ACCEPTANCE CERTIFICATE - RESUMPTION OF CUSTODY OF FEDERAL GOVERNMENT SHIPS BY THE CLIENT DEPARTMENT" Appendix 2 of Annex "F" must be completed and a signed copy passed to Canada for distribution.

30 a. Vessel Unmanned Refits – From beginning to end of Work

The vessel will be unmanned during the work period and will be considered to be out of commission. The vessel during that period will be in the care or custody of the Contractor and under its control.

Note: Although the vessel is deemed to be unmanned as defined by Annexe F – Vessel's Custody, consider 12 crew members on board from 6:00 am to 6:00 pm, 7 days a week for the entire period of work, including dinner periods and supper.

30 b. Vessel Manned Refits - On a required basis only

1. The vessel will be manned during the work period and will be considered to be in commission. The vessel during that period will remain in the care or custody of Canada and under its control.
2. Firefighting equipment must be readily accessible and made available by the Contractor should a fire emergency arise. The Contractor must take adequate precautions when burning or welding is carried out in compartments or other confined areas of the vessel.

31. Pre-Refit Meeting

A Pre-Refit meeting will be convened and chaired by the Contracting Authority at the Contractor's facility before the commencement of the work period.

32. Meetings

Progress meetings, chaired by the Contracting Authority, will take place at the Contractor's facility as and when required, generally once a month. Interim meetings may also be scheduled. Contractor attendees at these meetings will, as a minimum, be its Contract (Project) Manager, Production Manager (Superintendent) and Quality Assurance Manager. Progress meetings will generally incorporate Technical meetings to be chaired by the Technical Authority.

33. Outstanding Work and Acceptance

The Inspection Authority, in conjunction with the Contractor, will prepare a list of outstanding work items towards the end of the vessel Work Period. This list will form the annexes to the formal acceptance document for the vessel. A Contract Completion Meeting will be convened by the Inspector on the work completion date to review and sign off the Acceptance Document. In addition to any amount held under the Warranty Holdback Clause (see section 7.3 above), a holdback of twice the estimated value of outstanding work will be held until completion of said work.

The PWGSC-TPSGC 1205 Acceptance Document is to be completed and distribution is to be made by the Public Works and Government Services Canada Inspection Authority as follows:

- (a) original to the PWGSC Contracting Authority
- (b) one copy to the Technical Authority
- (c) one copy to contractor

34. Licensing

The Contractor must obtain and maintain all permits, licenses and certificates of approval required for the work to be performed under any applicable federal, provincial or municipal legislation. The Contractor is responsible for any charges imposed by such legislation or regulations. Upon request, the Contractor must provide a copy of any such permit, license or certificate to Canada.

35. Hazardous Waste - Vessels

1. The Contractor acknowledges that sufficient information has been provided by Canada with respect to the location and estimated amount of hazardous materials such as asbestos, lead, PCBs, silica or other hazardous materials or toxic substances.
2. The price includes all costs associated with the removal, handling, storage, disposal and/or working in the vicinity of hazardous materials such as asbestos, lead, PCBs, silica and other hazardous materials or toxic substances on board the vessel, including those costs resulting from

the need to comply with applicable laws and regulations in relation to the removal, handling, disposal or storage of hazardous materials or toxic substances.

3. The completion date for the Work takes into account the fact that the removal, handling, storage, disposal and/or working in the vicinity of hazardous materials such as asbestos, lead, PCBs, silica and other hazardous materials or toxic substances may be affected by the need to comply with applicable laws or regulations and that this will not be considered to be an excusable delay.

36. Government Site Regulations

SACC Manual Clause A9068C (2010-01-11), Government Site Regulations

37. Scrap and Waste Material

SACC Manual Clause A9055D (2010-08-16), Scrap and Waste Material

38. Stability and Weight Management

SACC Manual Clause B6100C (2008-05-12), Stability and Weight Management

39. Vessel - Access by Canada

SACC Manual Clause A9066C (2008-05-12), Vessel - Access by Canada

40. Title to Property - Vessel

SACC Manual Clause A9047C (2008-05-12), Title to Property - Vessel

41. Defence Contract

SACC Manual Clause A9006C (2012-07-16) Defence Contract

42. Limitation of Contractor's Liability for Damages to Canada

1. This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees.
2. Whether the claim is based in contract, tort, or another cause of action, the Contractor's liability for all damages suffered by Canada caused by the Contractor's performance of or failure to perform the Contract is limited to \$10 million per incident or occurrence to an annual aggregate of \$20 million for losses or damage caused in any one year of carrying out the Contract, each year starting on the date of coming into force of the Contract or its anniversary. This limitation of the Contractor's liability does not apply to nor include:
 - (a) Any infringement of intellectual property rights;
 - (b) Any breach of warranty obligations;
 - (c) Any liability of Canada to a third party arising from any act or omission of the Contractor in performing the Contract; or
 - (d) Any loss for which the policies of insurance specified in the Contract or any other policies of insurance held by the Contractor would provide insurance coverage.

3. Each Party agrees that it is fully liable for any damages that it causes to any third party in connection with the Contract, regardless of whether the third party makes its claim against Canada or the Contractor. If Canada is required, as a result of joint and several liability, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada for that amount.
4. The Parties agree that nothing herein is intended to limit any insurable interest of the Contractor nor to limit the amounts otherwise recoverable under any insurance policy. The Parties agree that to the extent that the insurance coverage required to be maintained by the Contractor under this Contract or any additional insurance coverage maintained by the Contractor, whichever is greater, is more than the limitations of liability described in sub article (2), the limitations provided herein are increased accordingly and the Contractor shall be liable for the higher amount to the full extent of the insurance proceeds recovered.
5. If, at any time, the total cumulative liability of the Contractor for losses or damage suffered by Canada caused by the Contractor's performance of or failure to perform the Contract, excluding liability described under subsection 2(a), (b), (c) and (d) exceeds \$40 million, either Party may terminate the Contract by giving notice in writing to the other Party and neither Party will make any claim against the other for damages, costs, expected profits or any other such loss arising out of the termination. However, no such termination or expiry of the Contract shall reduce or terminate any of the liabilities that have accrued to the effective date of the termination but which liabilities are subject to the limitations as specified in sub-article (1) through (4) above.
6. The date of termination pursuant to this Article, shall be the date specified by Canada in its notice to terminate, or, if the Contractor exercises the right to terminate, in a notice to the Contractor from Canada in response to the Contractor's notice to terminate. The date of termination shall be in Canada's discretion to a maximum of 12 months after service of the original notice to terminate served by either Party pursuant to sub-article 5, above.
7. In the event of a termination under this Article, the Contract will automatically remain in force subject to all of the same terms and conditions until the date of termination and the Contractor agrees that it will be paid in accordance with the applicable provisions as set out in the Basis of Payment, Annex B and that the Contractor's liability remains as specified in subarticles (1) through (4), above.
8. Nothing shall limit Canada's other remedies, including Canada's right to terminate the Contract for default for breach by the Contractor of any of its obligations under this Contract, notwithstanding that the Contractor may have reached any limitation of its liability hereunder.

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
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qc1037
CCC No./N° CCC - FMS No/ N° VME

ANNEX A

REQUIREMENT - SPECIFICATION

See electronic Annex.

ANNEX B

BASIS OF PAYMENT FIRM PRICE

Remark to Bidder: Annex B will form the Basis of Payment for the resulting contract and should not be filled in at the bid submission stage. See annex 'I' – Financial Bid Presentation Sheet.

B1 Contract Firm Price

A)	Known Work For work as stated in Clause 1.a) of the contract, specified in Annex "A" and detailed in the attached Price Per Item Sheet Appendix 1 of Annex "I", for a FIRM PRICE of:	\$ _____
B)	Total Firm Price :	\$ _____

B2 Unscheduled Work

Payment for Unscheduled Work:

The Contractor will be paid for unscheduled work arising, as authorized by Canada. The authorized unscheduled work will be calculated as follows:

Number of hours (to be negotiated) X \$_____, being the Contractor's firm hourly charge-out labour rate which includes overhead and profit, plus net laid-down cost of materials to which will be added a mark-up of ten (10) percent, plus Goods and Services Tax or Harmonized Sales Tax, if applicable, calculated at five (5) percent of the total cost of material and labour. The firm hourly charge-out labour rate and the material mark-up will remain firm for the term of the Contract and any subsequent amendments.

- B2.1:** Notwithstanding definitions or usage elsewhere in this document, or in the Bidder's Cost Management System, when negotiating *Hours* for unscheduled work, PWGSC will consider only those hours of labour directly involved in the production of the subject work package. Elements of *Related Labour Costs* identified in B2.2 below, will not be negotiated, but will be included in the firm hourly Charge-out Labour Rate in accordance with paragraph B2.2
- B2.2:** Allowance for *Related Labour Costs* such as: Management, Direct Supervision, Purchasing and Material Handling, Quality Assurance and Reporting, First Aid, Gas Free Inspecting and Reporting, and Estimating will be included as *Overhead* within the *firm hourly Charge-out Labour Rate* entered in line B2 above.
- B2.3:** The 10% mark-up rate for materials will also apply to subcontracted costs. The mark-up rate includes any allowance for material and subcontract management not allowed for in the Chargeout Labour Rate. The Contractor will not be entitled to a separate labour component for the purchase and handling of materials or subcontract administration.

B3 Overtime

No overtime work shall be compensated for under the Contract unless authorized in advance and in writing by the Contracting Authority. Any request for payment must be accompanied by a copy of the overtime authorization and a report containing such details as Canada may require with respect to the overtime work performed. Compensation for authorized overtime will be calculated in the following manner:

- a. For Known Work, the Contractor will be paid the original contract price plus agreed overtime hours paid at the following premium rates;
- b. For *Unscheduled Work*, the Contractor will be paid for agreed overtime hours paid at the *firm hourly Charge-out Labour Rate* above plus the following premium rates:

Time and one half: \$ _____ per hour; *or,*

Double time: \$ _____ per hour

The above premiums rates shall be calculated as follows:

Premium for time and one half:

½ (that portion of the firm Hourly Charge-out Labour Rate in B2 that is directly attributable to salary cost plus related certified fringe benefits) times 7.5% (representing profit)

Premium for double time:

½ (that portion of the *Unscheduled Work* firm Charge-out Labour Rate in B2 that is directly attributable to salary cost plus related certified fringe benefits) times 7.5% (representing profit)

These premiums will remain firm for the duration of the Contract, including all amendments and are subject to audit by Canada, and to retroactive adjustment if Canada discovers that the premiums have not been calculated in accordance with the formulae, above.

B4 Daily Services Fee

In the event of a delay in the performance of the Work that lengthens the Work Period beyond the date specified in this Contract, and if such delay is recognized and agreed upon by the Contracting Authority as being attributable to Canada, Canada agrees to pay the Contractor the daily services fee, described below, for each day of such delay. This fee shall be the sole liability of Canada to the Contractor for the delay.

The firm daily services fee is:

- (a) For a working day in drydock: \$ _____
- (b) For a non-working day in drydock: \$ _____
- (c) For a working day alongside: \$ _____
- (d) For a non-working day alongside: \$ _____

The above fees shall include but not be limited to, all aspects of the following costs: Administrative Support, Production Services, Quality Assurance, Material Support, Planned Maintenance and Ship Services, and all other resources and direct costs needed to maintain the Vessel at the Contractor's facility, including all items listed in **B5**. These fees are firm and not subject to any additional charges for mark-up or profit.

B5 Cost of all Services is Included in Contract Price

All charges, fees expenses and disbursements incidental to the carrying out of the Work, including all items described in Supplemental General Conditions 1029 (2010-08-16) Ship Repair, section (07), are included in the Contract Price for the Work, including, without limitation:

1. **Services:** include all costs for ship services such as water, steam, electricity, etc., required for vessel maintenance for the duration of the Contract.
2. **Docking and Undocking** include:
 - (a) all costs resulting from drydocking, wharfage, security, shoring, shifting and/or moving of the vessel within the Contractor's facility;
 - (b) the cost of services to tie up the vessel alongside and to cast off.

Unless specified otherwise, the vessel will be delivered by Canada to the Contractor's facility alongside a mutually agreed safe transfer point, afloat and upright, and the Contractor will do the same when the Work is completed.

3. **Field Service Representatives/Supervisory Services:** include all costs for field service representatives/supervisory services including manufacturers' representatives, engineers, etc.
4. **Removals:** include all costs for removals necessary to carry out the Work and will be the responsibility of the Contractor whether or not they are identified in the specifications, except those removals not apparent when viewing the vessel or examining the drawings. The Contractor will also be responsible for safe storage of removed items and reinstalling them on completion of the Work. The Contractor will be responsible for renewal of components damaged during removal.
5. **Sheltering, Staging, Cranage and Transportation:** include the cost of all sheltering, staging including handrails, cranage and transportation to carry out the Work as specified.

The Contractor will be responsible for the cost of any necessary modification of these facilities to meet applicable safety regulations.

ANNEX C

INSURANCE REQUIREMENTS

C.1 Ship Repairers' Liability Insurance – G5001C (2018-06-21)

1. The Contractor must obtain Ship Repairer's Liability Insurance and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$10,000,000 per accident or occurrence and in the annual aggregate.
2. The Ship Repairer's Liability insurance must include the following:
 - a. Additional Insured: Canada is added as an additional insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada as additional insured should read as follows: Canada, represented by Public Works and Government Services Canada.
 - b. Waiver of Subrogation Rights: Contractor's Insurer to waive all rights of subrogation against Canada as represented by Fisheries and Oceans Canada – Canadian Coast Guard and Public Works and Government Services Canada for any and all loss of or damage to the vessel, however caused.
 - c. Notice of Cancellation: The Contractor will provide the Contracting Authority thirty (30) days prior written notice of policy cancellation or any changes to the insurance policy.
 - d. Contractual Liability: The policy must, on a blanket basis or by specific reference to the contract, extend to assumed liabilities with respect to contractual provisions.
 - e. Cross Liability/Separation of Insureds: Without increasing the limit of liability, the policy must protect all insured parties to the full extent of coverage provided. Further, the policy must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.

C.2 Commercial General Liability Insurance – G2001C (2018-06-21)

1. The Contractor must obtain Commercial General Liability Insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$10,000,000 per accident or occurrence and in the annual aggregate.
2. The Commercial General Liability policy must include the following:
 - a) Additional Insured: Canada is added as an additional insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada should read as follows: Canada, as represented by Public Works and Government Services Canada.
 - b) Bodily Injury and Property Damage to third parties arising out of the operations of the Contractor.
 - c) Products and Completed Operations: Coverage for bodily injury or property damage arising out of goods or products manufactured, sold, handled, or distributed by the Contractor and/or arising out of operations that have been completed by the Contractor.

- d) Personal Injury: While not limited to, the coverage must include Violation of Privacy, Libel and Slander, False Arrest, Detention or Imprisonment and Defamation of Character.
- e) Cross Liability/Separation of Insureds: Without increasing the limit of liability, the policy must protect all insured parties to the full extent of coverage provided. Further, the policy must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.
- f) Blanket Contractual Liability: The policy must, on a blanket basis or by specific reference to the Contract, extend to assumed liabilities with respect to contractual provisions.
- g) Employees and, if applicable, Volunteers must be included as Additional Insured.
- h) Employers' Liability (or confirmation that all employees are covered by Worker's compensation (WSIB) or similar program)
- i) Broad Form Property Damage including Completed Operations: Expands the Property Damage coverage to include certain losses that would otherwise be excluded by the standard care, custody or control exclusion found in a standard policy.
- j) Notice of Cancellation: The Contractor will provide the Contracting Authority thirty (30) days prior written notice of policy cancellation or any changes to the insurance policy.
- k) If the policy is written on a claims-made basis, coverage must be in place for a period of at least 12 months after the completion or termination of the Contract.
- l) Owners' or Contractors' Protective Liability: Covers the damages that the Contractor becomes legally obligated to pay arising out of the operations of a subcontractor.
- m) Sudden and Accidental Pollution Liability (minimum 120 hours): To protect the Contractor for liabilities arising from damages caused by accidental pollution incidents.

C.3 Limitation of Contractor's Liability for Damages to Canada – N0001C (2008-05-12)

1. This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees.
2. Whether the claim is based in contract, tort, or another cause of action, the Contractor's liability for all damages suffered by Canada caused by the Contractor's performance of or failure to perform the Contract is limited to \$10 million per incident or occurrence to an annual aggregate of \$20 million for losses or damage caused in any one year of carrying out the Contract, each year starting on the date of coming into force of the Contract or its anniversary. This limitation of the Contractor's liability does not apply to nor include:
 - a) any infringement of intellectual property rights; or
 - b) any breach of warranty obligations.

Solicitation No. - N° de l'invitation
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3. Each Party agrees that it is fully liable for any damages that it causes to any third party in connection with the Contract, regardless of whether the third party makes its claim against Canada or the Contractor. If Canada is required, as a result of joint and several liability, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada for that amount.

ANNEX D

INSPECTION/QUALITY ASSURANCE/QUALITY CONTROL

D.1 Inspection and Test Plan (ITP):

1. The Contractor must prepare an Inspection and Test Plan (ITP) comprising individual inspection and test plans for each specification item of this project, in accordance with the Quality Standard and its Quality Control Plan. The ITP must be submitted to the Inspection Authority for review and amended by the Contractor to the satisfaction of the Inspection Authority.
 - (a) Each ITP must contain all inspection points identified in the Technical Specification highlighting any mandatory points that must be witnessed by the Inspection Authority and other "hold" points imposed by the Contractor to ensure the quality of the work.
 - (b) Milestone delivery date for the ITP is given in the Contract, however individual ITPs should be forwarded for review as developed.

2. Coding:

- (a) Each Inspection and Test Plan (ITP) is to be coded for identification clearly demonstrating a systematic approach similar to the following (Contractor's system should be defined in its Quality Control Plan):
 - (i) Prefixes for Inspections, Test and Trials:

Prefix "1" is a Contractor inspection, i.e. 1H-10-01, 1H-10-02;

prefix "2" is a Contractor post repair test, i.e. 2H-10-01; and

prefix "3" is a Contractor post repair trial, i.e. 3H-10-01.
 - (b) Specification items followed by assigned sequence numbers for inspection processes within each Specification Item; and
 - (c) Cross reference to a verification document number

3. Inspection and Test Plan Criteria:

Inspection criteria, procedures and requirements are stated in the specifications, drawings, technical orders and reference standards invoked by the Specifications. Test and trial documentation may also be included or referenced in the Specifications. An individual Inspection and Test Plan (ITP) is required for each Specification item.

- (a) All ITPs must be prepared by the Contractor in accordance with the above criteria, its Quality Plan, and must provide the following reference information:
 - (i) the ship's name;
 - (ii) the Specification item number;
 - (iii) equipment/system description and a statement defining the parameter which is being inspected;

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- (iv) a list of applicable documents referenced or specified in the inspection procedure;
 - (v) the inspection, test or trial requirements specified in the Technical Specification;
 - (vi) the tools and equipment required to accomplish the inspection;
 - (vii) the environmental conditions under which the inspections are to be conducted and the tolerances on the inspection conditions;
 - (viii) a detailed step-by step procedure of how each inspection is to be performed, conformance parameters, accept/reject criteria and recording of results, deficiencies found and description of corrective action(s) required;
 - (ix) name and signature of the person who prepared the plan, date prepared and amendment level; and,
 - (x) names and signatures of the persons conducting and witnessing the inspection, test or trial.

4. Contractor Imposed Testing:

Tests and trials in addition to those given in the Technical Specification must be approved by the Inspection Authority.

- (a) Amendments: Amendment action for the Inspection and Test Plans must be ongoing throughout the refit and reflect the inspection requirements for unscheduled work. Amendments must be submitted as developed, but not less frequently than once every second week.

D.2 Conduct of Inspection

1. Inspections must be conducted in accordance with the ITP.
2. The Contractor must provide its own staff or subcontracted staff to conduct inspections, tests and trials; excepting that Technical Authority or Inspection Authority personnel may be designated in the specifications, in which case the Contractor must ensure that its own staff are provided in support of such inspection/test/trial.
3. The Contractor must ensure that the required conditions stated in the ITP prevail at the commencement of, and for the duration of, each inspection/test/trial.
4. The Contractor must ensure that personnel required for equipment operation and records taking during the inspection/test/trial are briefed and available at the start and throughout the duration of the inspection/test/trial. Tradesmen or FSRs who may be required to effect minor changes or adjustments in the installation must be available at short notice.
5. The Contractor is to coordinate the activities of all personnel taking part in each inspection/test/trial and ensure that safe conditions prevail throughout the inspection/test/trial.

D.3 Inspection Records and Reports

1. The Contractor on the inspection record, test or trials sheets as applicable must record the results of each inspection. The Contractor must maintain files of completed inspection records consistent with the Quality Standard and its Quality Plan for this project.

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2. The Contractor's QC representative (and the FSR when required) must sign as having witnessed the inspection, test or trial on the inspection record. The Contractor must forward originals of completed inspection records, together with completed test(s) and/or trials sheets to the Inspection Authority as they are completed.
 3. Unsatisfactory inspection/test/trial results, for which corrective action cannot be completed during the normal course of the inspection/test/trial, will require the Contractor to establish and record the cause of the unsatisfactory condition to the satisfaction of the Inspection Authority. Canada representatives may assist in identification where appropriate.
 4. Corrective action to remove cause of unsatisfactory inspections must be submitted to the Inspection Authority in writing by the Contractor, for approval before affecting such repairs and rescheduling of the unsatisfactory inspection/test/trial. Such notices must be included in the final records passed to the Inspection Authority.
 5. The Contractor must undertake rectification of defects and deficiencies in the Contractor's installation or repair as soon as practicable. The Contractor is responsible to schedule such repairs at its own risk.
 6. The Contractor must reschedule unsatisfactory inspections after any required repairs have been completed.
 7. Quality Control, Inspection and Test records that substantiate conformance to the specified requirements, including records of corrective actions, must be retained by the Contractor for three (3) years from the date of completion or termination of the Contract and must be made available to the Inspection Authority upon request.

D.4 Inspection and Trials Process

1. Drawings and Purchase Orders
 - (a) Upon receipt of two (2) copies of each drawing or purchase order, the designated Inspection Authority will review its content against the provisions of the Specifications. Where discrepancies are noted, the Inspection Authority will formally advise all concerned, in writing using a Discrepancy Notice. The resolution of any such discrepancy is a matter for consultation between the Contractor and other Crown Authorities.

The Inspection Authority is NOT responsible for the resolution of discrepancies.

2. Inspection
 - (a) Upon receipt and acceptance of the Contractor's ITP, inspection will consist of a number of Inspection Points supplemented by such other inspections, tests, demonstrations and trials as may be deemed necessary by the Inspection Authority to permit him to certify that the work has been performed in compliance with the provisions of the Specifications. The Contractor must be responsible for notifying the designated Inspection Authority of when the work will be available for inspection, sufficiently in advance to permit the designated Inspection Authority to arrange for the appropriate inspection.
 - (b) The Inspection Authority will inspect the materials, equipment and work throughout the project against the provisions of the Technical Specification and, where non-conformances are noted, will issue appropriate **INSPECTION NON-CONFORMANCE REPORTS**.

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- (c) The Contract requires the implementation of a Quality Assurance/Quality Control system, so the Inspection authority must require that the Contractor provide a copy of its internal inspection report pertaining to a work item before conducting the requested inspection. If third party inspections are required by the Contract (e.g. inspections by a certified CWB 178.2 welding inspector), the reports of these inspections must be required before the Work is inspected by the Inspection Authority.
- (d) The QA/QC system is a requirement, so if the documentation is presented to the Inspection Authority before an inspection stating that the Work is satisfactory but the Inspection Authority finds that the Work has not been satisfactorily inspected, the Inspection Authority must issue an Inspection Non-conformance Report against the Work and another against the failure of the Contractor's QA/QC system.
- (e) Before carrying out any inspection, the Inspection Authority must review the requirements for the Work and the acceptance and/or rejection standards to be applied. Where more than one standard or requirement is called up and they are potentially conflicting, the Inspection Authority must refer to the order of precedence in the Contract to determine the standard or requirement to be applied.
3. Inspection Non-conformance report
- (a) An Inspection Non-conformance report will be issued for each non-conformance noted by the Inspection Authority. Each report will be uniquely numbered for reference purposes, will be signed and dated by the Inspection Authority, and will describe the non-conformance.
- (b) When the non-conformance has been corrected by the Contractor and has been re-inspected and accepted by the Inspection Authority, the Inspection Authority will complete the Report by adding an applicable signed and dated notation.
- (c) At the end of the project, the content of all Inspection Non-conformance Reports which have not been signed-off by the Inspection Authority will be transferred to the Acceptance Documents before the Inspection Authority's certification of such documents.
4. Tests, Trials, and Demonstrations
- (a) To enable the Inspection Authority to certify that the Work has been performed satisfactorily, in accordance with the Contract and Specifications, the Contractor must schedule, co-ordinate, perform, and record all specified Tests, Trials and Demonstrations required by the Inspection Authority.
- (b) Where the Specifications contain a specific performance requirement for any component, equipment, sub-system or system, the Contractor must test such component, equipment, sub-system or system to the satisfaction of the Inspection Authority, to prove that the specified performance has been achieved and that the component, equipment, sub-system or system performs as required by the specifications.
- (c) Tests, trials and demonstrations must be conducted in accordance with a logical, systematic schedule which must ensure that all associated components and equipment are proven before sub-systems demonstration or testing, and that sub-systems are proven before system demonstration or testing.

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- (d) Where the Specifications do not contain specific performance requirements for any component, equipment, sub-system or system, the Contractor must demonstrate such component, equipment, sub-system or system to the satisfaction of the Inspection Authority.
 - (e) The contractor must submit its Test and Inspection Plan as indicated in section D.1 above.
 - (f) The Contractor must co-ordinate each test, trial and demonstration with all interested parties, including the Inspection Authority; Contracting and Technical Authorities; regulatory authorities; Classification Society; Sub-contractors; etc. The Contractor must provide the Inspection Authority and other Crown Authorities with a minimum of **five working days**' notice of each scheduled test, trial, or demonstration.
 - (g) The Contractor must keep written records of all tests, trials, and demonstrations conducted.
 - (h) The Contractor must in all respects be responsible for the conduct of all tests and trials in accordance with the requirements of the Contract.
 - (i) The Inspection Authority and the Technical Authority reserve the right to defer starting or continuing with any sea trials for any reasonable cause including but not limited to adverse weather, visibility, equipment failure or degradation, lack of qualified personnel and inadequate compliance with safety standards.

ANNEX E

WARRANTY

General Conditions 2030 (2018-06-21) - Higher Complexity Goods, are hereby amended by deleting section 2030 22 (2014-09-25), Warranty and replacing it as follows:

E.1 Section 22 Warranty

1. At the discretion of the Minister, the Contractor will replace or make good at its own expense any finished work, excluding Government Issue incorporated therein, which becomes defective or which fails to conform to contract requirements as a result of faulty or inefficient manufacture, material or workmanship.

2. Notwithstanding prior acceptance of the finished work, and without restricting any other term of the Contract or any condition, warranty or provision implied or imposed by law, the Contractor hereby warrants that the following shall be free from all defects and shall conform with the requirements of the contract:

- (a) The painting of the underwater portion of the hull for a period of three hundred and sixty-five (365) days commencing from the date of undocking, except that the Contractor will only be liable to repair and/or replace to a value to be determined as follows:

Original cost to Canada of the underwater painting Work, divided by three hundred and sixty-five (365) days and multiplied by the number of days remaining in the warranty period. The resultant would represent the "Dollar Credit" due to Canada from the Contractor.

- (b) All other painting Work for a period of three hundred and sixty-five (365) days commencing from the date of acceptance of the Work;
- (c) All parts and material provided by the Contractor for a period of three hundred and sixty-five (365) days commencing from the date of acceptance of such parts or material;
- (d) All other items of Work for a period of ninety (90) days commencing from the date of acceptance of the Work, except that:
 - (i) the warranty on the Work related to any system or equipment not immediately placed in continuous use or service shall extend for a period of ninety (90) days from the date of acceptance of the vessel;
 - ii) for all outstanding defects, deviations, and Work items listed on the Acceptance Document at Delivery, the Warranty will be ninety (90) days from the subsequent date of acceptance for each item.

3. If more than one warranty period applies, in accordance with the above, to any Work, then the warranty shall be for the longest period.

4. The Contractor agrees to pass to Canada, and exercise on behalf of Canada, all warranties on the Materials supplied or held by the Contractor which exceed the periods indicated Above.

E.2 Warranty Procedures

E2.1 Scope

- a. The following are the procedures which suit the particular requirements for warranty considerations for a vessel on completion of a refit.

E2.2 Definition

- a. There are a number of definitions of "warranty" most of which are intended to describe its force and effect in law. One such definition is offered as follows:

"A warranty is an agreement whereby the vendor's or manufacturer's responsibility for performance of its product is extended for a specific period of time beyond the date at which the title to the product passes to the buyer."

E2.3 Warranty Conditions

- a. General Conditions 2030, Higher Complexity - Goods are augmented by clauses incorporated into the subject Contract.
- b. The warranty periods may be stated in more than one part.
 - i. 90 days commencing from the day the PWGSC 1205 Acceptance Document is signed for workmanship provided by the contractor for the refit work specified;
 - ii. 365 days from the date of undocking the vessel for the specified areas of underwater paint and topside painting;
 - iii. 365 days commencing from the day the PWGSC 1205 Acceptance Document is signed for parts and material provided by the contractor for the refit work specified;
 - iv. Any other specific warranty periods that may be required in the contract or offered by the Contractor.
- c. The foregoing does not cover the disposition of other deficiencies that will be directly related to Technical Authority problem areas of the following nature:
 - i. items becoming unserviceable that were not included in the refit specification;
 - ii. refit specifications or other related documentation requiring amendments or corrections to increase viability; and
 - iii. work performed that is directly related to the Technical Authority.

E2.4 Reporting Failures With Warranty Potential

- a. The initial purpose of a report of a failure is to facilitate the decision as to whether or not to involve warranty and to generate action to effect repairs. Therefore in addition to identification, location data, etc. the report must contain details of the defect. Warranty decisions as a general rule are to be made locally and the administrative process is to be in accordance with procedures as indicated.
- b. These procedures are necessary as invoking a warranty does not simply mean that the warrantor will automatically proceed with repairs at his expense. A review of the defect may well result in a disclaimer of responsibility, therefore, it is imperative that during such a review the Department is directly represented by competent technical authority qualified to agree or disagree with the warrantor's assertions.

E2.5 Procedures

- a. Immediately it becomes known to the Ship's Staff that an equipment/system is performing below accepted standards or has become defective, the procedures for the investigation and reporting are as follows:
- i. The vessel advises the Technical Authority when a defect, which is considered to be directly associated the refit work, has occurred.
 - ii. On review of the Specification and the Acceptance Document, the Technical Authority in consort with Ship's Staff is to complete the Tombstone Data and section 1 of the Warranty Claim Form and forward the original to the Contractor for review with a copy to the PWGSC Contracting Authority. If the PWGSC Contracting or Inspection Authority is unable to support warranty action, the Defect Claim Form will be returned to the originator with a brief justification. (It is to be noted that in the latter instance PWGSC will inform the Contractor of its decision and no further action will be required of the Contractor.

Warranty defect claims may be forwarded in hard copy, by fax or by e-mail whichever format is the most convenient.

- iii. Assuming the Contractor accepts full responsibility for repair, the Contractor completes Section 2 and 3 of the Warranty Claim Form, returns it to the Inspection Authority who confirms corrective action has been completed, and who then distributes the form to the Technical Authority and the PWGSC Contracting Authority.
- b. In the event that the Contractor disputes the claim as a warranty defect, or agrees to share, the contractor is to complete Part 2 of the Warranty Claim Form with the appropriate information and forward it to the Contracting Authority who will distribute copies as necessary.
- c. When a warranty defect claim is disputed by the Contractor, the Technical Authority may arrange to correct the defect by in-house resources or by contracting the work out. All associated costs must be tracked and recorded as a possible charge against the contractor by PWGSC action. Material costs and man-hours expended in correcting the defect are to be recorded and entered in Section 5 of the warranty defect claim by the Technical Authority who will forward the warranty defect claim to the PWGSC Contracting Authority for action. Defective parts of equipment are to be retained pending settlement of claim.
- d. Defective equipment associated with potential warranty should not normally be dismantled until the contractor's representative has had the opportunity to observe the defect. The necessary work is to be undertaken through normal repair methods and costs must be segregated as a possible charge against a contractor by PWGSC action.

E2.6 Liability

- a. Agreement between the Contracting Authority, Inspection Authority, Technical Authority and the Contractor will result in one of the following conditions:
 - i. The contractor accepts full responsibility for costs to repair or overhaul under the warranty provisions of the contract;
 - ii. The Technical Authority accepts full responsibility for repair and overhaul of item concerned; or
 - iii. The Contractor and the Technical Authority agree to share responsibility for the costs to repair or overhaul the unserviceable item, in such cases the PWGSC Contracting Authority will negotiate the best possible sharing arrangement.
- b. In the event of a disagreement as in paragraph 5c, PWGSC will take necessary action with the contractor while the Technical Authority informs its Senior Management including pertinent data and recommendations.
- c. The total cost of processing warranty claims must include accommodation and travel costs of the contractor's employees as well as equipment/system down time and operational constraints. Accordingly, the cost to remediate the defect, in man-hours and material, will be discussed between the Contracting/Inspection Authorities and the Technical Authority to determine the best course of action.

E2.7 Alongside Period For Warranty Repairs and Checks

- a. If at all possible, an alongside period for the vessel is to be arranged just before the expiration of the 90 day warranty period. This alongside period is to provide time for warranty repair and check by the contractor.
- b. In respect to the underwater paint, should it become defective during the associated warranty period the contractor is only liable to repair to a value determined as follows:

“Original cost to Canada for painting and preservation of the underwater section of the hull, divided by three hundred and sixty-five (365) days and multiplied by the number of days remaining in the three hundred and sixty-five (365) days warranty period. The resultant would represent the ‘Dollar Credit’ due to Canada from the Contractor.”
- c. The Underwater paint system, before expiration of the warranty, should be checked by divers. The Technical Authority, is to arrange the inspection and inform the Contracting Authority of any adverse results.

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

Appendix 1 of Annex E



Public Works and
Government
Services Canada

Travaux publics et Services
gouvernementaux Canada

Warranty Claim Réclamation De Garantie

Vessel Name – Nom de navire	File No. – N° de dossier	Contract No. - N ° de contrat
Customer Department – Ministère client		Warranty Claim Serial No. Numéro de série de réclamation de garantie
Contractor – Entrepreneur		<u>Effect on Vessel Operations</u> <u>Effet sur des opérations de navire</u> Critical Degraded Operational Non-operational Critique Dégradé Opérationnel Non-opérationnel

1. Description of Complaint – Description de plainte

Contact Information – l'information de contact

Name – Nom

Tel. No. - N ° Tél

Signature – Signature

Date

2. Contractor's Investigative Report – Le rapport investigateur de l'entrepreneur

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

3. Contractor's Corrective Action – La modalité de reprise de l'entrepreneur

Contractor's Name and Signature – Nom et signature de l'entrepreneur
Corrective Action - Date de modalité de reprise

Date of

Client Name and Signature - Nom et signature de client
Date

4. PWGSC Review of Warranty Claim Action – Examen d'action de réclamation de garantie par TPSGC

Signature – Signature

Date

ANNEX F

VESSEL CUSTODY

F1 Vessel Custody

1. This work is going to take place with the vessel "out of commission" and therefore in the "care, control and custody" of the Contractor.
2. An "ACCEPTANCE CERTIFICATE - ASSUMPTION OF CUSTODY OF FEDERAL GOVERNMENT SHIPS BY SHIPYARDS" (attached as Appendix 1 to this Annex F) shall be completed as required and a copy passed to the Inspection Authority.
3. To facilitate this turnover, representatives of the Contractor and Canada shall confirm the condition of the vessel.
4. A vessel condition report shall be appended to the above noted certificate and shall be accompanied by colour photographs or videos in either conventional or digital format.
5. When the vessel is to be returned to the "care, control and custody" of Canada, an "ACCEPTANCE CERTIFICATE - RESUMPTION OF CUSTODY OF FEDERAL GOVERNMENT SHIPS BY THE CLIENT DEPARTMENT" (Attached as appendix 2 to this Annex F) shall be completed and a signed copy passed to Canada for distribution.

UNMANNED REFIT:

During the majority of the contract period, the vessel shall be **unmanned**. As a result, the ship shall be placed in the care and custody of the Contractor as described in the Technical Specification. However, access to the vessel shall not be denied to CCG, PWGSC and TCMSB personnel by the Contractor. Every effort will be taken to ensure that vessel access by these personnel shall not interfere or conflict with the Contractor's work.

Cleaning: Contractor to ensure that all spaces, compartments and areas of the ship are "**as clean as found**" when work is completed. The cost of clean-up work shall be included in the quote for each specification item.

CCG / PWGSC Offices: notwithstanding the fact that the vessel will be unmanned, the Contractor shall respect the directives included in the Technical Specification in regard to the protection and the layout of the cabins onboard the vessel.

Parking: Sufficient parking for CCG and PWGSC representatives shall be provided conveniently close to the berthed or docked vessel. The available parking should be sufficient for a maximum of **six (6)** vehicles at any given time.

GENERAL (UNMANNED):

The services as described in item 2 of the Technical Statement of Requirement, shall be supplied, fitted and/or connected upon formal handover to the Contractor, and maintained **throughout the period that the ship is under the Contractor's control**. Contractor to be responsible for any additional disconnections and re-connections required when the ship is moved between dock / slipway and any berth at the Contractor's premises. The Contractor is to quote a global price and daily rates for these services according to his proposed schedule which will determine the planned length of time that the vessel is under his control.

Care and Custody: During the contract period, the ship shall be placed in the custody of the Contractor who shall be responsible for all safety and security matters pertaining to the vessel. As the ship will not be de-stored, the Contractor shall provide whatever security arrangements are required to safeguard CCG and DFO equipment and material that remains onboard during the contract period.

Security Watches: During the contract period, the Contractor shall provide and maintain a continuous, **24 hour-per-day, 7 day-per-week** security watch consisting of at least **one (1)** mobile security patroller. The patroller are to provide mobile safety and security checks throughout the vessel. The patrols shall be adequate to ensure integrity against personal injury, fire and flood in accordance with Part II of the Canada Labour Code, as well as to ensure that the ship remains free from damage and/or theft resulting from unauthorized entry or activity.

Turnover: The turnover of the ship to and from the Contractor shall be carried out on a compartment-by-compartment basis with a Contractor's Representative and the Chief Engineer (or Representative) in attendance.

As part of the initial turnover, the Contractor shall provide the services of a qualified photographer (who is to be identified as a Sub-contractor) to accompany the abovementioned persons and take a minimum of **six (6)** digital colour photographs of each compartment and passageway: **one (1)** each looking forward, aft, port, starboard, up and down. The Contractor shall supply **two (2)** sets of printed copies of the photographs, bound and organized by deck level and compartment name, to the Chief Engineer within **seven (7)** days of the ship's arrival at the Contractor's facilities.

In addition to the photographs, the Contractor is to prepare compartment inspection sheets for each space for signature at the time of turnover. After sign-off, copies of the inspection sheets are to be given to the Chief Engineer and placed on the door of each compartment or in each passageway.

On completion of the photographic survey and compartment inspections, and once the inspection sheets have been posted, the Chief Engineer shall provide the Contractor's Representative with keys as required for access to all areas of the ship's interior spaces. Turnover to the Contractor shall be finalized by completion of an "Assumption of Custody Certificate" to be supplied by CCG.

When custody is returned to CCG, a "Resumption of Custody Certificate" shall be completed after completion of a second compartment inspection survey and return of all keys to the Chief Engineer.

The Contractor shall be responsible for the safe transfer of the ship between its pre/post-docking berth and its docking blocks. During docking and undocking of the ship, radio contact is to be maintained between the vessel's Commanding Officer and the Contractor's Docking Officer **if the vessel is crewed at these times**. If the ship is unmanned at the docking and undocking, the safe movement of the ship shall be the sole responsibility of the Contractor.

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

APPENDIX 1 OF ANNEX F

ACCEPTANCE CERTIFICATE
ASSUMPTION OF CUSTODY OF FEDERAL GOVERNMENT SHIPS
BY SHIPYARDS

TURNOVER OF CUSTODY of CCGS _____

Contract Serial Number : _____

I, _____ (Contractor's Representative) on behalf of _____
_____ take over the responsibility for the said Vessel from the Department
of Fisheries and Oceans. This take over of responsibilities is effective at _____, Province
of _____ on the _____ day of _____, 2018, at _____ hours.

(Signature - Contractor's Representative)

(Witness)

I, _____ (Vessel's Master or Chief Engineer) on behalf of the Department of
Fisheries and Oceans, turn over the custody and responsibility for the said Vessel to the
Contractor. This turn-over effective at _____, Province of _____ on the _____
day of _____, 2018, at _____ hours.

(Signature - Vessel's Master)

(Witness)

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

APPENDIX 2 OF ANNEX F

ACCEPTANCE CERTIFICATE
RESUMPTION OF CUSTODY OF FEDERAL GOVERNMENT SHIPS
BY THE CLIENT DEPARTMENT

RESUMPTION OF CUSTODY of CCGS _____

Contract Serial Number : _____

I, _____ (Contractor's Representative) on behalf of _____
_____ turn-over the responsibility for the said Vessel to the Department of
Fisheries and Oceans. This turn-over effective at _____, Province of _____ on
the _____ day of _____, 2018, at _____ hours.

(Signature - Contractor's Representative)

(Witness)

I, _____ (Vessel's Master or Chief Engineer) on behalf of the Department of Fisheries
and Oceans, accept the resumption of custody and responsibility for the said Vessel from the
Contractor. This turn-over effective at,
_____ Province of _____ on the _____ day of _____, 2018, at _____ hours.

(Signature - Vessel's Master)

(Witness)

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

ANNEX G

SECURITY REQUIREMENTS CHECK LIST

(Not used)

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

ANNEX H

PROJECT MANAGEMENT SERVICES

(not used)

ANNEX I

FINANCIAL BID PRESENTATION SHEET

I0 Proposed Docking Facility Location: _____

I1 Price for Evaluation

A)	Known Work For work as stated in Clause 1.2 (i) a), specified in Annex "A" and detailed in the attached Price Per Item Sheet, Appendix 1 of Annex "I", for a FIRM PRICE of:	\$ _____
B)	Unscheduled Work <i>Contractor Labour Cost.</i> Estimated labour hours at a firm <i>hourly Charge-out Labour Rate</i> , including overhead and profit for evaluation purpose only: 3 000 person hours X \$ _____ per hour for a PRICE of : <i>See Note I2.1 and I2.2 below.</i>	\$ _____
C)	Daily Service Fees for evaluation purpose only <i>As per Clause I4 below</i> i) Eight (8) in drydock working days X \$ _____ /firm daily service fee = \$ _____; plus ii) Four (4) in drydock non-working days X \$ _____ /firm daily service fee = \$ _____ iii) Eight (8) alongside working days X \$ _____ /firm daily service fee = \$ _____; plus iv) Four (4) alongside non-working days X \$ _____ /firm daily service fee = \$ _____	\$ _____
D)	Vessel Transfer Cost <i>As per paragraph I6 below</i>	\$ _____
E)	Cost of Financial Security	\$ _____
F)	EVALUATION PRICE Applicable taxes excluded [A + B + C + D + E]: <p style="text-align: right;">TOTAL EVALUATION PRICE of :</p>	\$ _____

I2 Unscheduled Work

The Contractor will be paid for unscheduled work arising, as authorized by the Minister, calculated in the following manner:

"Number of hours (to be negotiated) X \$ _____ your firm *hourly Charge-out Labour Rate* which includes *Overhead* and profit, plus net laid-down cost of materials to which shall be added a **10% mark-up**, plus Applicable Taxes. The firm *hourly Charge-out Labour Rate* and the material mark-up will remain firm for the duration of the Contract and any subsequent amendments thereto."

- I2.1:** Notwithstanding definitions or useage elsewhere in this document, or in the Bidder's Cost Management System, when negotiating *Hours* for unscheduled work, PWGSC will consider only those hours of labour directly involved in the production of the subject work package.
Elements of Related Labour Costs identified in I2.2 below, will not be negotiated, but will be compensated for in accordance with paragraph I2.2 It is therefore incumbent upon the Bidder to enter values in the above table which will result in fair compensation, regardless of the structure of their Cost Management System.
- I2.2:** Allowance for *Related Labour Costs* such as: Management, Direct Supervision, Purchasing and Material Handling, Quality Assurance and Reporting, First Aid, Gas Free Inspecting and Reporting, and Estimating will be included as *Overhead* for the purposes of determining the *Charge-out Labour Rate* entered in line I2 above.
- I2.3:** The **10% mark-up** rate for materials will also apply to subcontracted costs. The mark-up rate includes any allowance for material and subcontract management not allowed for in the Chargeout Labour Rate. The Contractor will not be entitled to a separate labour component for the purchase and handling of materials or subcontract administration.

I3 Overtime

No overtime work shall be compensated for under the Contract unless authorized in advance and in writing by the Contracting Authority. Any request for payment must be accompanied by a copy of the overtime authorization and a report containing such details as Canada may require with respect to the overtime work performed. Compensation for authorized overtime will be calculated in the following manner:

- a. For Known Work, the Contractor will be paid the original contract price plus agreed overtime hours paid at the following premium rates;
- b. For Unscheduled Work, the Contractor will be paid for agreed overtime hours paid at the quoted *Charge-out Labour Rate* plus the following premium rates:

Time and one half: \$ _____ per hour; or,

For Double time: \$ _____ per hour

The above described premiums will be calculated as follows:

Premium for time and one half:

½ (that portion of the firm Hourly Charge-out Labour Rate in I2 that is directly attributable to salary cost plus related certified fringe benefits) times 7.5% (representing profit)

Premium for double time:

(that portion of the Unscheduled Work firm Charge-out Labour Rate in I2 that is directly attributable to salary cost plus related certified fringe benefits) times 7.5% (representing profit)

These premiums will remain firm for the duration of the Contract, including all amendments and are subject to audit by Canada, and to retroactive adjustment under the Contract if Canada discovers that the premiums have not been calculated in accordance with the formulae, above.

I4 Daily Services Fee

In the event of a delay in the performance of the Work that lengthens the Work Period beyond the date specified in this Contract,, and if such delay is recognized and agreed upon by the Contracting Authority as being attributable to Canada, Canada agrees to pay the Contractor the daily services fee, described below, for each day of such delay. This fee shall be the sole liability of Canada to the Contractor for the delay.

The firm daily services fee is:

- (a) For a working day in drydock: \$ _____
- (b) For a non-working day in drydock: \$ _____
- (c) For a working day alongside: \$ _____
- (d) For a non-working day alongside: \$ _____

The above fees shall include but not be limited to, all aspects of the following costs: Administrative Support, Production Services, Quality Assurance, Material Support, Planned Maintenance and Ship Services, and all other resources and direct costs needed to maintain the Vessel at the Contractor's facility, **including all items listed in I5**. These fees are firm and not subject to any additional charges for mark-up or profit.

I5 Cost of all Services is Included in Contract Price

All charges, fees expenses and disbursements incidental to the carrying out of the Work, including all items described in Supplemental General Conditions 1029 (2010-08-16) Ship Repair, section (07), are included in the Evaluation Price for the Work, including, without limitation:

1. **Services:** include all costs for ship services such as water, steam, electricity, etc., required for vessel maintenance for the duration of the Contract.
2. **Docking and Undocking** include:
 - (a) all costs resulting from drydocking, wharfage, security, shoring, shifting and/or moving of the vessel within the successful Bidder's facility;
 - (b) the cost of services to tie up the vessel alongside and to cast off.

Unless specified otherwise, the vessel will be delivered by Canada to the successful Bidder's facility alongside a mutually agreed safe transfer point, afloat and upright, and the successful Bidder will do the same when the Work is completed.

3. **Field Service Representatives/Supervisory Services:** include all costs for field service representatives/supervisory services including manufacturers' representatives, engineers, etc.

4. **Removals:** include all costs for removals necessary to carry out the Work and will be the responsibility of the Contractor whether or not they are identified in the specifications, except those removals not apparent when viewing the vessel or examining the drawings. The successful Bidder will also be responsible for safe storage of removed items and reinstalling them on completion of the Work. The successful Bidder will be responsible for renewal of components damaged during removal.
5. **Sheltering, Staging, Cranage and Transportation:** include the cost of all sheltering, staging including handrails, cranage and transportation to carry out the Work as specified.

The successful Bidder will be responsible for the cost of any necessary modification of these facilities to meet applicable safety regulations.

16 Vessel Transfer Costs

1. The Evaluation Price shall include the cost for transferring the vessel from its home port to the shipyard/ship repair facility where the majority of the Work will be undertaken and the cost of returning the vessels to their home port following completion of the Work, in accordance with the following:
 - (a) The bidder shall enter on Line **10**, the location of the shipyard/ship repair facility where it proposes to undertake the Work. The applicable vessels' transfer costs provided under section 3. of this clause shall be entered into table I1.
 - (b) Should the list in section 3. of this clause not provide the shipyard/ship repair location where the bidder intends to undertake the Work, then the bidder must advise the Contracting Authority, in writing, no later than **five calendar days** prior to the bid closing date, of its proposed location for undertaking the Work. The Contracting Authority will acknowledge to the bidder, in writing, no later than **three calendar days** prior to the bid closing date, the location of the shipyard/ship repair and confirm the applicable vessel transfer cost.

A Bid that specifies a location for undertaking the Work which is not in the list under section 3. of this clause, and for which a notification in writing has not been received by the Contracting Authority five days prior to the bid closing date, shall be deemed to be non-responsive.

2. Transfer costs, in this case, are based on using a government delivery crew and include the fuel cost at the vessel's most economical speed of transit and crew transportation costs for the delivery crew based on the location of the vessel's home port and the shipyard/ship repair facility.
3. Round trip transfer costs applicable to the following facilities are:

Company	City	Unmanned Transfer Cost
Davie Inc.	Levis, QC	0,00 \$
Irving Shipbuilding Inc. (Halifax Shipyard)	Halifax, NS	43 639,00 \$
NewDock- St-John's Dockyard Ltd.	St. John's, NF	120 765,00 \$
Verreault Navigation Inc.	Les Méchins, QC	46 160,00 \$

Appendix 1 of Annex I

A) KNOWN SCHEDULED WORK

PRICE PER ITEM SHEET		
Item	Description	Firm Price
1	GENERAL NOTES	_____ \$
2	GENERAL TECHNICAL	_____ \$
3	DOCUMENTS	_____ \$
4	TESTS, DOCK TRIALS AND SEA TRIALS	_____ \$
5	BERTHING, MOORING, DRY-DOCKING AND REFLOATING	_____ \$
6	Not used	N/A
7	SERVICES	_____ \$
8	ADDITIONAL WORK	N/A
9	HULL CLEANING AND INSPECTION	_____ \$
10	HULL WELDING INSPECTION AND REPAIRS	_____ \$
11	HULL CLEANING AND PAINTING	_____ \$
12	HULL PAINTING ABOVE THE WATERLINE	_____ \$
13	FREEBOARD, DRAFT, AND SYMBOLIZATION MARKINGS	_____ \$
14	GRIDS, SEA CHEST AND SEA BAYS	_____ \$
15	CATHODIC PROTECTION SYSTEMS	_____ \$
16	PROPELLERS Price Excluding optional item(s) at table: B) OPTIONAL SCHEDULED WORK	_____ \$
17	MECHANICAL SEALS	_____ \$
18	TAILSHAFT STEADY BEARING	_____ \$
19	MUFF COUPLINGS	_____ \$
20	TAILSHAFTS AND STERN TUBES	_____ \$
21	BOW THRUSTER SERVICING	_____ \$
22	RUDDER AND RUDDER STOCK Price Excluding optional item(s) at table: B) OPTIONAL SCHEDULED WORK	_____ \$
23	SPRINKLER SYSTEM PIPING INSPECTION	OPTIONAL SCHEDULED WORK
24	OVERHAUL OF CIRCUIT BREAKERS	OPTIONAL SCHEDULED WORK
25	HULL VALVES	_____ \$
A) KNOWN SCHEDULED WORK – TOTAL FIRM PRICE		_____ \$

B) OPTIONAL SCHEDULED WORK

PRICE PER ITEM SHEET		
Item	Description	Firm Price
16	PROPELLERS (Optional work only)	_____ \$
22	RUDDER AND RUDDER STOCK (Optional work only)	_____ \$
23	SPRINKLER SYSTEM PIPING INSPECTION	_____ \$
24	OVERHAUL OF CIRCUIT BREAKERS	_____ \$
B) OPTIONAL SCHEDULED WORK – TOTAL FIRM PRICE		_____ \$

Solicitation No. - N° de l'invitation
F3019-18N228/A
Client Ref. No. - N° de réf. du client
F3019-18N228

Amd. No. - N° de la modif.
File No. - N° du dossier
QCL-8-41094

Buyer ID - Id de l'acheteur
qc1037
CCC No./N° CCC - FMS No/ N° VME

Note: PWGSC reserves the right to exercise all the options or partial options.

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Annex A of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment. The Contracting Authority may exercise the option within **10 days** after beginning of work by sending a written notice to the Contractor

TOTAL (A) SCHEDULED WORK	TOTAL (B) OPTIONAL SCHEDULED WORK	TOTAL KNOWN WORK FIRM PRICE ((A) + (B))
_____ \$	_____ \$	_____ \$

Remark to Bidders:

Canada may reject the bid if any of the prices submitted do not reasonably reflect the cost of performing the part of the work to which that price applies.

Annex J

A) KNOWN SCHEDULED WORK

PRICING DATA SHEETS		
Item	Description	Firm Price
A) KNOWN SCHEDULED WORK		
1	GENERAL NOTES (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$
	1.6 Facilities for use by personnel of Canada	
	1.6.1 a) Two (2) lockable offices = _____ \$	
	1.6.1 b) Conference room = _____ \$	
	1.6.1 g) Three direct-line telephones = _____ \$	
	1.6.1 h) Telephone line services = _____ \$	
	1.6.1 j) High-speed Internet connection = _____ \$	
	1.6.1 k) Colour printer = _____ \$	
	1.6.2 a) Nearby Washroom facilities = _____ \$	
	1.6.2 b) Six (6) parking spaces = _____ \$	
	Total firm price for item 1.6	_____ \$
	Total firm price for item 1	_____ \$
2	GENERAL TECHNICAL (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$
	2.10 Cleanup	
	2.10.3 Pumping and disposal (bilge waste) (Final amount prorated) Price _____ \$ /L x 5 000L	_____ \$
	2.10.3 Pumping and disposal (bilge waste) (Final amount prorated) (For info only) Price _____ \$ /L x 100L = _____ \$	N/A
	Total firm price for item 2.10	_____ \$
	Total firm price for item 2	_____ \$
3	DOCUMENTS	_____ \$
4	TESTS, DOCK TRIALS AND SEA TRIALS (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$
	4.3.2 Sea trials (8 hours) Hourly rate: Price _____ \$ / Hour x 8 hours	_____ \$
	Total firm price for item 4	_____ \$
5	BERTHING, MOORING, DRY-DOCKING AND REFLOATING (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$

	5.1 Berthing and Mooring		_____ \$
	5.2 Dry docking (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)		_____ \$
	5.2.1.20 (For info only) Unit price for additional block displacement requested by Canada Unit price for each additional block displacement = _____ displacement x 10 displacements = _____ \$	N/A	
	Total firm price for item 5.2		_____ \$
	5.3 Numbering		_____ \$
	5.4 Undocking		_____ \$
	Total firm price for item 5		_____ \$
6	Not used		N/A
7	SERVICES (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)		_____ \$
	7.2 Temporary Protection of Decks and Bulkheads		
	Price _____ m2 x 650 m2 = _____ \$		
	Total firm price for item 7.2		_____ \$
	7.3 Electrical Power 600 VAC three phase, 300 amps, 60 Hz.		
	Connect		_____ \$
	Disconnect		_____ \$
	Service (500 000 KW-hr) (Final amount prorated) Price _____ \$ / KW-hr X 500 000 KW-hr		_____ \$
	Total firm price for item 7.3		_____ \$
	7.4 Heating		_____ \$
	7.5 Fresh Water And Firemain Seawater Services (Final amount prorated)		
	7.5.2 a) Potable water - Connect		_____ \$
	7.5.2 a) Potable water - Disconnect		_____ \$
	7.5.2 a) Service / day (8 tons / day) : _____ \$ / ton x 8 tons X 33 days		_____ \$
	7.5.2 b) Non-Potable water - Connect		_____ \$
	7.5.2 b) Non-Potable water - Disconnect		_____ \$
	7.5.2 b) Service / day Price _____ \$ / ton x 130 tons x 33 days		_____ \$
	7.5.3 Sea water (with AC working) (Final amount prorated) Price _____ \$ / m³ x 3400 m³ x 33 days		_____ \$
	7.5.3 Sea water (without AC working) (Final amount prorated) Price _____ \$ / m³ x 130 m³ x 33 days		_____ \$
	Total firm price for item 7.5		_____ \$

	7.6 Overboard Discharge / Drainage Connections Connect = _____ \$ Disconnect = _____ \$	_____ \$	
	7.7 Black Water and Grey Water (Final amount prorated)		
	Pumping and disposing black water and grey water (400 m³) (Final amount prorated) Price _____ \$ / m³ x 400 m³	_____ \$	
	Total firm price for item 7.7		_____ \$
	7.8 Oily Bilge Water		
	7.8.1 Pumping and disposing 20,000 litres of oily bilge water from the ship's bilges (Final amount prorated) Price _____ \$ / m³ x 20 000 L	_____ \$	
	7.8.1 Pumping and disposing 1 000L litres of oily bilge water from the ship's bilges (Final amount prorated) Price _____ \$ / m³ x 1 000 L = _____ \$	N/A	
	Total firm price for item 7.8		_____ \$
	7.9 Garbage Removal (Final amount prorated) Service / (8 cubic yards) _____ \$ / day X 33 days		_____ \$
	7.10 Cranes and Scaffolding		
	7.10.1 Provide the services of a 5-tonne crane from the shipyard with operator (Final amount prorated) Price _____ \$ / hr x 33 hours	_____ \$	
	7.10.3 Provide a price for general services of a powered platform (cherry picker) (Final amount prorated) Price _____ \$ / hr x 33 hours	_____ \$	
	Total firm price for item 7.10		_____ \$
	7.11 Clean Up		_____ \$
	7.12 Vessel Security (Final amount prorated) Service / day _____ \$ X 33 days		_____ \$
	7.13 Vermin Protection		_____ \$
	Total firm price for item 7		_____ \$
8	ADDITIONAL WORK		N/A
9	HULL CLEANING AND INSPECTION (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items below. In case the fees are not distributed an amount must be indicated in the price box.)		_____ \$
	9.1.3 Cost of motorised platform for inspection (Final amount prorated) Price _____ \$/ hour x 6 hours		_____ \$
	Total firm price for item 9		_____ \$
10	Hull Welding Inspection and Repairs (Price Excluding sub item(s) below)		

	(Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$	
	10.3.5 Welding joints (Final amount prorated) _____ \$/ feet x 9 000 linear feet =	_____ \$	
	10.4.2 Radiographic Inspection Price _____ \$/ film radiographic x 8 films	_____ \$	
	10.4.2 Radiographic Inspection Price _____ \$/ Ultrasound x 8 Ultrasounds	_____ \$	
	Total firm price for item 10	_____ \$	
11	HULL CLEANING AND PAINTING (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$	
	11.3.4 General Preparation		
	11.3.4.14 Temporary shelter	_____ \$	
	Total firm price for item 11.3.4	_____ \$	
	11.3.5 Preparation of Underwater Hull and Rudder Trunk Shaft Surfaces for Coating Application		
	11.3.5.3 Price to repair 1225,6 m2 of damaged hull surfaces (Final amount prorated) Surface Preparations: 1225,6 m ² x _____ \$/ m ²	_____ \$	
	11.3.5.15 Application of a strip-coat using brush (Final amount prorated) Application : 80 m ² x _____ \$/ m ²	_____ \$	
	Total firm price for item 11.3.5	_____ \$	
	11.3.6 Application of hull epoxy Coating (ERA174-CGuard Red) (Final amount prorated) Application : 314,5 m ² x _____ \$/ m ²	_____ \$	
	11.3.7 Application of Black Coating (ERA163-Black) (Final amount prorated) Application : 911,1 m ² x _____ \$/ m ²	_____ \$	
	11.3.8 Additional Recommendations and Requirements		
	11.3.8.1 Replace the concrete in 96 welding plugs Price _____ \$/plug x 96 plugs	_____ \$	
	11.3.8.4 Services of field service representative of paint manufacturer	_____ \$	
	Total firm price for item 11.3.8	_____ \$	
	11.5.3 Provide a new docking plan	_____ \$	
	Total firm price for item 11	_____ \$	
12	HULL PAINTING ABOVE THE WATERLINE (1000 m2) (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case		

	the fees are not distributed an amount must be indicated in the price box.)	_____ \$	
	12.2.3 Sandblasting (15%) (Final amount prorated) Price _____ \$ /m2 x 150 m2	_____ \$	
	12.2.4 Price per square metre for preparation of external steel surfaces of the hull (Final amount prorated) Price _____ \$ / m2 x 150 m2	_____ \$	
	12.2.6 De-polishing using mechanical equipment (850 m2)	_____ \$	
	12.2.8 Supply and apply two base coats of red oxide, self-priming, epoxy coating (FPL274/A5FL) (all bare metal surfaces = 150 m2) (Final amount prorated) Price _____ \$ / m2 x 150 m2	_____ \$	
	12.2.8 Supply and apply two thick coats of an acrylic polyurethane coating red Coast Guard (RAL 3000) over the entire surface. (1000 m2) (Final amount prorated) Price _____ \$ / m2 x 1000 m2	_____ \$	
	Total firm price for item 12	_____ \$	
13	FREEBOARD, DRAFT, AND SYMBOLIZATION MARKINGS	_____ \$	
14	GRIDS, SEA CHEST AND SEA BAYS (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$	
	14.3.1.2 Open all access grids and manholes for sea chests and sea bays	_____ \$	
	14.3.1.3 Supply and install two (2) zinc anodes, 15 lbs each	_____ \$	
	14.3.1.4 Inspect 28 extensions from the seawater boxes	_____ \$	
	14.3.1.5 Clean all sea chests and sea bays	_____ \$	
	14.3.1.6 Price to mechanically clean and apply paint (50 m2)		
	14.3.1.6 Price to mechanical clean a surface of 50 m² (538 ft²) Price _____ \$ / m2 x 50 m2 = _____ \$		
	14.3.1.6 Price to paint a surface of 50 m² (538 ft²) Price _____ \$ / m2 x 50 m2 = _____ \$		
	Total firm price for item 14.3.6	_____ \$	
	14.3.1.8 Open and clean the six (6) sea water suction strainers (2 strainers per engine room and motor propulsion room)	_____ \$	
	Total firm price for item 14.3	_____ \$	
	Total firm price for item 14	_____ \$	
15	CATHODIC PROTECTION SYSTEMS (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case		

	the fees are not distributed an amount must be indicated in the price box.)	_____ \$	
	15.3.1 Preparation Provide the service of an FSR from the manufacturer EMCS for the inspection and the calibration of the system. Mobilisation / Demobilisation : ((For info : ___ hrs expected for travel time per visit; Travel fees : _____ \$ per visit; meals: _____ \$/day; room: _____ \$/day) Hourly rate _____ \$/hr weekday x 12 hrs/day x ___ days = _____ \$ Hourly rate _____ \$/hr weekend day of public holiday x 12 hrs/day x ___ days = _____ \$ Materials supplied by sub-contractor = _____ \$ 1st task = _____ \$ (7 full days on site))	_____ \$	
	15.3.2 Anodes inspection (Cathelco system)	_____ \$	
	Total firm price for item 15.3	_____ \$	
	Total firm price for item 15	_____ \$	
16	PROPELLERS (Price Excluding sub item(s) below) Price Excluding optional item(s) at table: B) OPTIONAL SCHEDULED WORK (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)	_____ \$	
	16.3.1 Inspection of Propellers		
	16.3.1.1 Rope Guards Price Excluding optional item(s) at table: B) OPTIONAL SCHEDULED WORK	_____ \$	
	16.3.1.4 Work on Propellers	OPTIONAL SCHEDULED WORK	
	Total firm price for item 16.3.1	_____ \$	
	16.3.2 Propeller Removal	_____ \$	
	16.3.3 Propeller fitting		
	16.3.3.2 Fits using Prussian blue on each propeller (Final amount prorated) Unit price per Prussian blue fit = _____ \$ / fit x 12 fits		
	Total firm price for item 16.3.3	_____ \$	
	16.3.4 Proeller Installation	_____ \$	

	16.3.5 Fabrication of Rope Guards	OPTIONAL SCHEDULED WORK		
	16.3.5 Installation of Rope Guards	_____ \$		
	16.3.6 Transport (Optional)	OPTIONAL SCHEDULED WORK		
	Total firm price for item 16.3		_____ \$	
	Total firm price for item 16		_____ \$	
17	MECHANICAL SEALS (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)		_____ \$	
	17.1.2 Service Technician Obtain the services of 2 FSR from Thordon to supervise the installation of the new mechanical seal Mobilisation / Demobilisation : (For info : ___ hrs expected for travel time per visit; Travel fees : _____ \$ per visit; meals: _____ \$/day; room: _____ \$/day) Hourly rate _____ \$/hr weekday x 12 hrs/day x ___ days = _____ \$ X 2 FSR's = _____ \$ Hourly rate _____ \$/hr weekend day of public holiday x 12 hrs/day x ___ days = _____ \$ X 2 FSR's = _____ \$ Materials supplied by sub-contractor = _____ \$ 1st task = _____ \$ (7 full days on site))		_____ \$	
	Total firm price for item 17.1		_____ \$	
	17.3.1 Disassembly of the 2 existing mechanical seals			
	17.3.1.1 Disassemble the two Maneseal mechanical seals = _____ \$			
	17.3.1.1 Pack and Ship = _____ \$			
	Total firm price for item 17.3.1		_____ \$	
	17.3.2 Installation of the 2 new mechanical seals		_____ \$	
	Total firm price for item 17.3		_____ \$	
	17.4.2 Trials		_____ \$	
	Total firm price for item 17.4		_____ \$	
	Total firm price for item 17		_____ \$	
18	TAILSHAFT STEADY BEARING (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)		_____ \$	

	<p>18.3.1 Service Technician</p> <p>Retain the services of a SKF technician to oversee the removal and inspection of the Cooper bearing.</p> <p>Mobilisation / Demobilisation : ((For info : ___ hrs expected for travel time per visit; Travel fees : ___ \$ per visit; meals: ___ \$/day; room: ___ \$/day)</p> <p>Hourly rate ___ \$/hr weekday x 12 hrs/day x ___ days = ___ \$</p> <p>Hourly rate ___ \$/hr weekend day of public holiday x 12 hrs/day x ___ days = ___ \$</p> <p>Materials supplied by sub-contractor = ___ \$</p> <p>1st task = ___ \$ (3 full days on site))</p>			
18.3.2 Matériels				
18.3.4 Removal and Insatallation				
Total firm price for item 18.3				
Total firm price for item 18				
19	<p>MUFF COUPLINGS (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)</p>			
19.3.2 Interference items				
<p>19.3.14 Price for 12 adjustments (fits) with Prussian Blue (Final amount prorated) Unit price per Prussian blue fit = ___ \$ / fit x 12 fits</p>				
Total firm price for item 19				
20	<p>TAILSHAFTS AND STERN TUBES (Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)</p>			
20.3.1 General				
<p>20.3.1.3 Work while the vessel is still afloat = ___ \$</p>				
Total firm price for item 20.3.1				
20.3.3 Tailshaft removal and inspection				
20.3.3.9 Liner machining				
20.3.3.13 Essaie d'étincellement				
20.3.4 Stern tubes bearings				
<p>20.3.4.4 10 Kg of epoxy metal repair compound (Montant final établi au prorata) Prix ___ \$ / Kg x 10 Kg = ___ \$</p>				

	Prix ferme pour l'article 20.3.4	_____ \$	
	20.3.5 Reinstallation	_____ \$	
	Total firm price for item 20.3	_____ \$	
	20.4.1 Trials	_____ \$	
	20.4.1.1 Trials using tuning gears = _____ \$		
	20.4.1.1 Trials using Main Engines = _____ \$		
	Total firm price for item 20.4.1	_____ \$	
	20.4.2 Additional measurements	_____ \$	
	20.4.3 Sea Trials	_____ \$	
	Total firm price for item 20.4	_____ \$	
	Total firm price for item 20	_____ \$	
21	BOW THRUSTER SERVICING		
	Dockyard: Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X _____ hours = \$ _____ Name(s) Sub-Contractor(s) : _____ Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X _____ hours = \$ _____		_____ \$
22	RUDDER AND RUDDER STOCK		
	(Price Excluding sub item(s) below) (Bidders can enter \$0.00 or indicate 'included' if the fees for this item are distributed in each of the items bellow. In case the fees are not distributed an amount must be indicated in the price box.)		_____ \$
	22.3.1 Preliminary Measurements	_____ \$	
	22.3.2 Removal of the Rudder Stock and Rudder	OPTIONAL SCHEDULED WORK	
	22.3.3 Maintenance of Rudder Grease Lines and Rudder Trunk De-Icing Line	_____ \$	
	22.3.4 Rudder Condition Check		
	22.3.4.1 Remove the upper drain plug	_____ \$	
	22.3.4.1 Hydrostatic test	OPTIONAL SCHEDULED WORK	
	22.3.4.2 Application of a bituminous coating	OPTIONAL SCHEDULED WORK	
	22.3.4.3 Work on Pintles and Gudgeons	OPTIONAL SCHEDULED WORK	
	22.3.4.4 Check the alignment of the Pintles' housing holes	OPTIONAL SCHEDULED WORK	
	22.3.4.5 Re-installation of pintles	OPTIONAL SCHEDULED WORK	

	Total firm price for item 22.3.4	_____ \$	
	22.3.5 Stock and Tiller Measurements and Crack Detection	OPTIONAL SCHEDULED WORK	
	22.3.6 Stern Frame Machining and Sleeve Replacement	OPTIONAL SCHEDULED WORK	
	22.3.7 Steady Bearing Machining	OPTIONAL SCHEDULED WORK	
	22.3.8 Carrier Bearing Machining	OPTIONAL SCHEDULED WORK	
	22.3.9 Rudder Stock Reinstallation	OPTIONAL SCHEDULED WORK	
	22.3.10 Rudder Reinstallation	OPTIONAL SCHEDULED WORK	
	Total firm price for item 22.3	_____ \$	
	Total firm price for item 22	_____ \$	
23	SPRINKLER SYSTEM PIPING INSPECTION		OPTIONAL SCHEDULED WORK
24	FIVE-YEAR INSPECTION OF THE MAIN PROPULSION CIRCUIT BREAKERS		OPTIONAL SCHEDULED WORK
25	HULL VALVES Dockyard: Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X _____ hours = \$ _____ Name(s) Sub-Contractor(s) : _____ Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X _____ hours = \$ _____		_____ \$
A) KNOWN SCHEDULED WORK – TOTAL FIRM PRICE			_____ \$

B) OPTIONAL SCHEDULED WORK

PRICE PER ITEM SHEET				
Item	Description			Firm Price
16	PROPELLERS			
	16.3.1.4 Work on Propellers			
	Handling and Transport Loaded into a truck and sent for reconditioning to a qualified service provider			

	Price _____ \$ transport and handling of one (1) propeller = _____ \$ Price _____ \$ transport and handling of two (2) propellers = _____ \$ Propeller Polishing = Price _____ \$ polishing one propeller _____ \$ x 2 propellers = _____ \$ Balancing propellers = Price _____ \$ to balance one (1) propeller _____ \$ x 2 propellers = _____ \$	_____ \$		
	16.3.5 Fabrication of Rope Guards Price per rope guard _____ \$ x 2 rope guards	_____ \$		
	16.3.6 Transport Provide the the transportation of a new propeller from the Port of Québec to the site and the return of the used propeller to the Port of Québec.	_____ \$		
	Total firm price for item 16.3		_____ \$	
	Total firm price for item 16			_____ \$
22	RUDDER AND RUDDER STOCK			
	22.3.2 Removal of the Rudder Stock and Rudder	_____ \$		
	22.3.4.1 Hydrostatic test	_____ \$		
	22.3.4.2 Application of a bituminous coating	_____ \$		
	22.3.4.3 Work on Pintles and Gudgeons	_____ \$		
	22.3.4.4 Check the alignment of the Pintles' housing holes	_____ \$		
	22.3.4.5 Re-installation of pintles	_____ \$		
	Total firm price for optional item 22.3.4		_____ \$	
	22.3.5 Stock and Tiller Measurements and Crack Detection	_____ \$		
	22.3.6 Stern Frame Machining and Sleeve Replacement	_____ \$		
	22.3.7 Steady Bearing Machining	_____ \$		
	22.3.8 Carrier Bearing Machining	_____ \$		
	22.3.9 Rudder Stock Reinstallation	_____ \$		
	22.3.10 Rudder Reinstallation	_____ \$		
	Total firm price for optional item 22			_____ \$
23	SPRINKLER SYSTEM PIPING INSPECTION			
	Dockyard: Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X _____ hours = \$ _____ Name(s) Sub-Contractor(s) : _____ Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X 200 hours = \$ _____			

Solicitation No. - N° de l'invitation
 F3019-18N228/A
 Client Ref. No. - N° de réf. du client
 F3019-18N228

Amd. No. - N° de la modif.
 File No. - N° du dossier
 QCL-8-41094

Buyer ID - Id de l'acheteur
 qc1037
 CCC No./N° CCC - FMS No/ N° VME

	23.3.7 Price for sampling the deposits = _____ \$ 23.3.8 Price per X-Ray _____ \$ / X-Ray x 20 X-Rays = _____ \$	_____ \$
24	OVERHAUL OF CIRCUIT BREAKERS Dockyard: Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X _____ hours = \$ _____ Name(s) Sub-Contractor(s) : _____ Mobilisation / Demobilisation = \$ _____ Materials, equipment and consumables = \$ _____ Labour ; \$ _____ /hour X 200 hours = \$ _____	_____ \$
B) OPTIONAL SCHEDULED WORK – TOTAL FIRM PRICE		_____ \$

Remark to Bidders:

Canada may reject the bid if any of the prices submitted do not reasonably reflect the cost of performing the part of the work to which that price applies.

ANNEX K

OEM DATA SHEET

1.1 OEM certified FSR

- 1.1.1 **At every mention of a requirement for an OEM certified technician in the specification, the following text is hereby included:**
- 1.1.2 The presence of OEM – certified technician is required while installing new equipment on board, testing and commissioning, certifying that the equipment is installed and working according to the OEM specifications and the equipment warranty is valid. One person, FSR, is required unless otherwise specified.
- 1.1.3 The FSR presence on-site, is to verify and validate the conformity of the equipment installation, conduct and supervise preliminary verifications and tests, commissioning the equipment to confirm its normal operation and performance according to the OEM standards. The FSR must complete a report of the installation, modifications, tests and commissioning results. Contractor must coordinate the presence of the ABS inspector at major milestone to confirm the certification when mandatory with the newly installed equipment. Thorough the specification the requirement of an OEM (original equipment manufacturer) – certified technician, or FSR (field service representative), or TCC (technician certified for Caterpillar), or WCT etc. is mentioned and requested. Basically, the technician must be an authorized certified specialist by the OEM to perform such work. In each section of the specification related to the FSR presence, some in-depth work description is made related to the each specific equipment, when needed.
- 1.1.4 The minimum FSR on-site presence is detailed in each case, excluding all travel time if not specified otherwise. All quotes must confirm working days 12 hours/day on weekdays, optional for weekend or public holidays. Expected travel time, travel fees (transportations, meals, room) must be detailed in the quote and separated cost from the on-site working days.
- 1.1.5 The Contractor's responsibility will be to coordinate the just on-time presence of the FSR, if however the FSR presence is not well schedule the Contractor will have to cover travel and daily cost due to the lack of coordination.
- 1.1.6 Shorter or longer FSR on-site presence will be discussed and negotiate between the Contractor and the government authority, before any modifications to the specifications.

Description	Technical references within the bid documents (page #, paragraph, etc.)
Section to complete by Bidders with regards to certified FSR as indicated in Annex A.	
<p>Item 11</p> <p>Provide the service of a field service representative of paint manufacturer for expert advice and to ensure that the conditions required for preparation, mixing and application of the coating are met</p>	To provide with bid
<p>1.The bidder must provide a letter or certificate proving that the field service representative of paint manufacturer supervising the work performed on these equipment is certified by the paint manufacturer</p>	
<p>Item 15</p> <p>Provide the service of an FSR from the manufacturer EMCS for the inspection and the calibration of the system.</p>	To provide with bid
<p>1.The bidder must provide a letter or certificate proving that the technician supervising the work performed on these equipment is certified by EMCS.</p>	
<p>Item 17</p> <p>Retain the services of two (2) FSR from Thordon to supervise the installation of the new mechanical seal.</p>	To provide with bid

<p>1.The bidder must provide a letter or certificate proving that the technicians supervising the work performed on these equipment is certified by Thordon.</p>	
<p>Item 18</p> <p>Retain the services of a SKF technician to oversee the removal and inspection of the Cooper bearing.</p>	<p>To provide with bid</p>
<p>1.The bidder must provide a letter or certificate proving that the technician supervising the work performed on these equipment is certified by SKF.</p>	

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Annex A

Statement of Work (SOW)

Dry Dock refit Fall 2018

CCGS Pierre Radisson



Fisheries & Oceans Canada/Canadian Coast Guard
Integrated Technical Services/Marine Engineering

101 Champlain Boulevard
Québec, QC
G1K 7Y7

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1.0	GENERAL NOTES	3
2.0	GENERAL TECHNICAL	14
3.0	DOCUMENTS	25
4.0	TESTS, DOCK TRIALS AND SEA TRIALS	34
5.0	BERTHING, MOORING, DRY-DOCKING AND REFLOATING.....	39
6.0	Not used.....	47
7.0	SERVICES	48
8.0	ADDITIONAL WORK	56
9.0	HULL CLEANING AND INSPECTION.....	57
10.0	HULL WELDING REPAIRS	58
11.0	HULL CLEANING AND PAINTING	61
12.0	HULL PAINTING ABOVE THE WATERLINE	70
13.0	FREEBOARD, DRAFT, AND SYMBOLIZATION MARKINGS.....	73
14.0	GRIDS, SEA CHEST AND SEA BAYS.....	75
15.0	CATHODIC PROTECTION SYSTEMS.....	77
16.0	PROPELLERS.....	81
17.0	MECHANICAL SEALS	87
18.0	TAILSHAFT STEADY BEARING.....	88
19.0	MUFF COUPLINGS.....	89
20.0	TAILSHAFTS AND STERN TUBE.....	93
21.0	BOW THRUSTER SERVICING	101
22.0	RUDDER AND RUDDER STOCK.....	102
23.0	Sprinkler system piping inspection (optional).....	108
24.0	OVERHAUL OF CIRCUIT BREAKERS (OPTIONAL)	111
25.0	HULL VALVES	115

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1.0 GENERAL NOTES

1.1 Introduction

- 1.1.1 These project requirements are provided to the Contractor to define the objectives, performance, engineering standards and requirements for the refit of the CCGS Pierre Radisson for the Canadian Coast Guard, Department of Fisheries and Oceans Canada.
- 1.1.2 It is the Contractor's responsibility to ensure that:
- a) The execution of the work specified herein meets the requirements described and those of Regulatory Bodies.
 - b) All items and equipment supplied are deemed necessary to ensure the seaworthiness and safe operation of the vessel, as required for a vessel of this class.
- 1.1.3 Sections of this Specification package define the individual work items for which the Contractor must address as part of the refit project for the CCGS Pierre Radisson.
- 1.1.4 The crew will not be on board the ship during the work period, except for the first week after the ship arrives at the Contractor's facilities, and approximately two weeks before the end of the work. The ship must be habitable during these periods, and include accommodations, galley services, sewage systems, potable water, and the ship's alarm and monitoring system. During these periods, unless otherwise specified, there will be 22 crew members. The custody of the vessel will be assumed by the crew when the full crew will be onboard.

1.2 General Particulars of Ship

Name:	CCGS Pierre Radisson
Type:	Type 1200 Medium Icebreaker
Ice class:	Lloyd's Register 100A1 Ice Class 1A Super LMC Arctic Shipping Pollution Prevention Regulations
Arctic class:	4
Year built:	1978
Class of voyage:	Unlimited - more than 200nm
Builder:	Burrard Yarrows Corporation, Vancouver, BC
Main dimensions:	
Overall length:	98.33 m (322' 7 ¼")

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Moulded breadth: 19.51 m (64')

Draft (full load): 7.131 m (23' 4 ¾")

Gross tonnage: 5910.42 gross tons,

Net tonnage: 1677.91 net tons

Propulsion system:

Six ALCO 251F, V16 cylinder diesel engines, 2200 kW each.

Two DC electric propulsion motors, 5073 kW each

1.3 Maximum Displacement

1.3.1 For planning purposes, the ship's displacement should not exceed 7500 long tons with a mean draft of 21 feet 9 inches in Sea water or 22 feet 3 inches in Fresh water.

1.4 Technical Data Package

1.4.1 The following documents make up the technical data package and define the scope of work for the CCGS Pierre Radisson VLE project:

- Technical specifications (This Specification document and appendixes)
- Design plans – electronic format
- Applicable CCG Standards and Guidelines – electronic format
- DFO 5847 – Paint and Hull Coating Standard
- DFO 9415 – Welding of Aluminum and Aluminum Alloys
- DFO 5737 – Fleet Safety Manual
- 30-000-000-ES-TE-001 – Colour Coding Standard for Piping Systems
- Asbestos Report – Hazardous Materials Management - CCGS Pierre Radisson, produced by HazMat in January 2015
- 141-19427-23 Gestion des matières dangereuses
- Q04-25193-1.1 The Pinchin Group
- Pierre Radisson coating scheme
- CT-043-EQ-EG-0001-E CCG Welding specification

1.4.2 Additional standards that apply to these Specifications:

- ASTM F1321-92 (2004) – Standard Guide for Conducting a Stability Test (Lightweight Survey and Inclining Experiment) to determine the Light Ship Displacement and Centers of Gravity of a Vessel
- ASTM G82-95 (2003) – Standard Guide for Development and Use of a Galvanic Series for Predicting Galvanic Corrosion Performance
- CAN/CGSB-1.193-99 – High-Build Epoxy Marine Coating

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- CAN/CGSB 1.61-2004 – Exterior and Interior Marine Alkyd Enamel
- CAN/CGSB 3-GP-11D – Naval Distillate Fuel, 2002-11-01
- CAN/CGSB 4.155-M88 – Flammability of Soft Floor Coverings - Sampling Plans
- CAN/CGSB 51.53-95 – Poly(Vinyl Chloride) Jacketing Sheet, for Insulated Pipes, Vessels and Round Ducts
- CAN/ULC-S102-03 – Surface Burning Characteristics of Building Materials and Assemblies
- CAN/ULC-S109-03 – Flame Tests of Flame-Resistant Fabrics and Films
- Canada Shipping Act, Machinery and Hull Regulations relating to a Research Vessel having general particulars as specified under Section 1.2
- CSA C22.1 SB-06 – Canadian Electrical Code, 1st part: Safety Standard for Electrical Installations
- CSA C22.2 – No 0-M91 (R2006) – Canadian Electrical Code, 2nd part – General Requirements
- CSA CAN3-Z299.3-85 (R2002) – Quality Assurance Program – Category 3
- CSA W47.1 039 – Certification of Companies for Fusion Welding of Steel
- CSA W47.2-11 M1987 (R2015) – Certification of Companies for Fusion Welding of Aluminum
- CSA W59-13 Welded steel construction
- CSA W178.2-14 Certification of welding inspectors
- IEC 60092-504 3rd edition: 2001 – Electrical Installations in Ships - Part 504: Special Features – Control and Instrumentation
- CAN/CSA-C22.2 No 60529-05 Degrees of Protection Provided by Enclosures (IP Code)
- IEC 60533 Second Edition – Electrical and Electronic Installations in Ships - Electromagnetic Compatibility
- IEEE 45 STD -2002 – Recommended Practice for Electrical Installations Shipboard
- IEEE STD 315-1975 (1993) – Graphic Symbols for Electrical and Electronics Diagrams
- ISO 4405:1999 – Hydraulic fluid power – Fluids – Method for coding the level of contamination by solid particles
- ISO 18413:2002 – Hydraulic fluid power – Cleanliness of parts and components – Inspection document and principles related to contaminant collection, analysis, and data reporting
- ISO/TR 10949:2002 – Hydraulic fluid power – Component cleanliness – Guidelines for achieving and controlling cleanliness of components from manufacture to installation
- ISO/TS 16431:2002 – Hydraulic fluid power – Verification of cleanliness
- ISO 15748-1:2002 – Ships and marine technology – Potable water supply on ships and marine structures – Part 1: Planning and design
- ISO 15748-2:2002 – Ships and marine technology – Potable water supply on ships and marine structures – Part 2: Method of calculation
- ISO 2081:1986 – Metallic coatings – Electroplated coatings of zinc on iron or steel
- Lloyd's Classification Society Rules for the Classification of Ships
- SOR/2010-120 – Marine Occupational Safety and Health Regulations

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- PMBoK Guide 5th edition – Project Management Institute Guidelines to Project Management
- Provincial Department of Labor Industrial Health Regulations respecting removal and disposal of Asbestos
- SNAME – Rules/Guidelines for Shop and Installation Trials – latest edition
- SNAME (3-47)*1989 – Rules/Guidelines for Sea Trials – latest edition
- SOLAS – Recommendations
- TP 11469 E – Guide to Structural Fire Protection
- TP 127 E (2002) – Ships Electrical Standards
- TP 11469 E – Guide to Structural Fire Protection – 1993
- TP 1861 E – Standards for Navigation Lights, Shapes, Sound Signal Appliances and Radar Reflectors (1991)
- TP 2072 E – Deck Cargo Safety Code (1974)
- TP 7301 – Stability, Subdivision and Load Line Standards (1975)
- Transport Canada Marine Safety Bulletin 06/1989 – “Grounding Safety in Drydock”
- UL 1309 – Standard for Safety for Marine Shipboard Cable

1.4.3 Transport Canada (TP) publications are available at the following address:

<http://www.tc.gc.ca/eng/marinesafety/tp-menu-515.htm>

1.4.4 CGSB Standards and publications are available at the following are available at the following address:

<http://www.scc.ca/>

1.4.5 ULC Standards and publications are available at the following address:

<http://canada.ul.com/>

1.4.6 The standards of the Canadian Standards Association are available at the following address:

<http://www.csagroup.org/global/en/services/codes-and-standards>

1.4.7 The standards of the International Standards Organization are available at the following address:

<http://www.iso.org/iso/home.html>

1.4.8 The standards and publications of the Institute of Electrical and Electronics Engineers are available at the following address:

<http://www.standards.ieee.org>

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1.4.9 The standards of the British Standards Institution are available at the following address:

<http://www.bsi-global.com>

1.4.10 The standards of the American National Standards Institute are available at the following address:

<http://www.ansi.org>

1.4.11 The standards of the American Society for Testing and Materials are available at the following address:

<http://www.astm.org>

1.4.12 The standards of the American Society of Mechanical Engineers are available at the following address:

<http://www.asme.org>

1.4.13 The rules and guidelines of the Society of Naval Architects and Marine Engineers are available at the following address:

<http://www.sname.org>

1.4.14 The guidelines of the Project Management Institute are available at the following address:

<http://pmi.org>

1.5 Meeting room and Project Meetings

1.5.1 The Contractor must invite and inform CCG personnel of daily production meetings. The Inspection Authority will usually participate in these meetings and will discuss production and inspection activities.

1.5.2 The Contractor must provide a room for progress meetings. These meetings will be held every four weeks, or more often, in accordance with the directives of the Contracting Authority.

1.6 Facilities for use by personnel of Canada

1.6.1 The Contractor must make office spaces available to CCG and PWGSC personnel that meet the following requirements:

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- a) Two lockable offices that are at least 200 ft² each;
 - b) A furnished conference room that can accommodate 10 people, including a large table and chairs for 10 people; the conference room must also be equipped with a 4 x 6 foot white board on one wall.
 - c) Four normal-sized desks with lockable drawers;
 - d) Eight desk chairs in addition to those in the conference room;
 - e) A filing cabinet with four (4) lockable drawers;
 - f) Two sets of keys must be provided for each lockable door, office, and filing cabinet;
 - g) Three direct-line telephones, one (1) of which must be in the conference room; this telephone should be "hands-free" for conference calls;
 - h) All telephone lines must be available 24 hours a day, ensuring communication with the outside at all times. Detailed billing of long distance calls will be sent to the attention of the CCG Technical Services representative. The Contractor must disconnect these three (3) lines once the work is complete.
 - i) A list of the telephone numbers for the shipyard, fire and police services and emergency numbers must be provided upon the ship's arrival to the shipyard.
 - j) High-speed Internet connection via WiFi or three (3) LAN connections;
 - k) A printer with copy, scanner, and fax functions, that can handle sheets measuring 8.5 x 11 in., 8.5 x 14 in., and 11 x 17 in. The photocopier must be equipped with an automatic paper feeding mechanism and be serviceable within two (2) hours in the event of a breakdown.
 - l) The offices must be equipped with heating, air conditioning and lighting system, in accordance with provincial health and occupational regulations.
- 1.6.2 The following must be provided on the Contractor's site:
- a) Washroom facilities must be located nearby;
 - b) Six parking spaces must be made available to Canada personnel. The spaces should be clearly marked. If necessary, passes must be provided to regular Canada project personnel;
 - c) All of the aforementioned equipment and facilities must be in good condition, to the satisfaction of Canada;
 - d) Canada must have access to the facilities listed above 7 days a week, including at night, from 14 days following the awarding of the contract and up to 14 days after the work is accepted.

1.7 Initial Inspection

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1.7.1 In collaboration with the Technical Authority and the Inspection Authority, the Contractor must perform an inspection of the condition of the vessel, the operation of equipment and the systems. The Parties taking part in the assessment must sign the report. This must be performed before the Contractor assumes responsibility for the vessel. The Contractor is responsible for providing a photographic survey inspection to the Inspection Authority and to the Technical Authority.

1.8 Government Property

1.8.1 General

1.8.1.1 All materials and equipment removed from the vessel by the Contractor remain the property of Canada, unless the project requirements explicitly provide for their disposal.

1.8.1.2 The Contractor must keep and maintain these materials and equipment in their original condition while awaiting instructions from the Technical Authority.

1.8.1.3 The Contractor may obtain the approval of the Technical Authority to dispose of the materials and equipment, whose market value is void after being removed from the vessel.

1.8.2 Categorization

1.8.2.1 Any property of Canada that must be removed from the vessel either temporarily or permanently must be placed in one of the following three categories:

a) Category A:

These items must be permanently removed from the vessel and remain the property of Canada. The Contractor must store and protect these parts from weather, physical damage, or loss. The Contractor must store these parts on pallets, platforms, or containers adapted for shipping until Canada has inspected them and has accepted to take charge and store them. The Contractor is responsible for storing these parts for Canada for the duration of the contract period. It is the responsibility of Canada to remove these parts from the Contractor's premises.

b) Category B:

These items remain the property of Canada and must be temporarily removed from their location on board the vessel during the contract work. They must be returned to their original location on board the vessel before it leaves the Contractor's facility. The Contractor must protect these items from weather, physical damage, or loss.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

These items must be stored to allow movement of the items to permit access for inspection, refurbishment and/or maintenance of these items as necessary. The Contractor must take care not to damage the equipment and the materials.

Category C:

Upon removal, these items become the property of the Contractor, who must dispose of them in accordance with all applicable laws, rules, and regulations.

1.8.2.2 Prior to removal of any item from the vessel, the items must be clearly identified with wire tags clearly indicating if it belongs to Category A, B, or C, in accordance with the instructions of the Technical Authority.

1.8.2.3 This requirement is in addition to those concerning any spare parts required for regulatory purposes. All such spare parts must be supplied packaged and individually identified with the description of the equipment, the model number, and the catalogue/part number.

1.9 Spare Parts

1.9.1 All new equipment that is procured by the Contractor for installation on the vessel must be supplied complete with sufficient manufacturer's recommended original spare parts (OEM) for six months or 2,000 hours of operation whichever is greater or unless otherwise specified by the Technical Authority.

1.9.2 All system spares must be provided in a spare parts list supplied by the Contractor in an electronic MS Excel spreadsheet format. The spreadsheet must identify, for each component of a system, the number of spare parts recommended in the previous paragraph. The list must include the following fields:

- a) The supplier;
- b) The manufacturer;
- c) The manufacturer's part number;
- d) The unit price;
- e) The definition of the quantities (unit, case, etc.);
- f) The recommended number;
- g) The associated system/equipment

1.9.3 An electronic copy of the spare parts list must be submitted to both the Inspection Authority and the Technical Authority.

1.9.4 The Contractor must notify the Inspection Authority and the Technical Authority when such spare parts have been received.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1.9.5 The Contractor must store the spare parts in accordance with the manufacturer's requirements and ensure that they are protected from weather, physical damage, or loss.

1.10 Project Management

1.10.1 Introduction

1.10.1.1 As part of this project, project management refers to the management needs for ensuring the integration of both upstream and downstream activities and sub-activities, technical control, and management of deadlines required for the refit project of the CCGS Pierre Radisson. The Contractor must provide, during the preparatory meeting for the refit, a draft of a Gantt bar chart in a MS Project 2013.

1.10.2 Project Action Plan (PAP)

1.10.2.1 The Contractor must document the management of the project work in a PAP, and must update this plan every month or more frequently as required by the Contracting Authority.

1.10.2.2 As a minimum, the PAP must include organization structure charts, a schedule, support schedules, subcontractor schedules and work, and delivery dates for Government and Contractor furnished equipment (GFE and CFE).

1.10.2.3 The monthly updates to the PAP must include schedule updates, a progress report, and review meetings. The components of the PAP and the updates are described in the following sub-sections.

1.10.3 Project Integration Management

1.10.3.1 Included with its bid, the Contractor must provide an organization chart of the entire project, indicating all key personnel and subcontractors. In addition, the Contractor must identify, in whole or in part, the work attributed of the subcontractors.

1.10.4 Change Management Log

1.10.4.1 The Contractor must provide a Change Management Log that must be used for the duration of the project to manage changes to the project.

1.10.4.2 The Change Management Log must track project issues using the following criteria:

- a) Individual tracking number;

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- b) Identification in the Specifications section;
- c) Date issue was raised;
- d) Expected resolution date;
- e) Date issue was resolved;
- f) Date resolution is accepted by the Inspection Authority;
- g) Brief note of resolution on issue;
- h) Individual who raised the issue;
- i) Individual assigned to resolve issue;
- j) Risk factor.

1.10.5 Risk management

1.10.5.1 Using an MS Excel spreadsheet, the Contractor must prepare a risk management plan of emerging risks, and classify them according to their impact on the work and the production schedule. Mitigation strategies must be developed for all high risks. This risk management plan must be updated at least every two weeks and submitted to both the Technical and Contracting Authorities. The Risk Management Plan must be included in the monthly progress meetings record of decisions.

1.10.6 Scheduling

1.10.6.1 The MS Project file must contain a minimum of the following planning elements:

- a) The Work Breakdown Structure (WBS) on at least three or more levels for each section of the Specification package. More specifically, the WBS must include the strip outs, production, assembly, installation, bench testing, system commissioning and tests and trials, the expected and required resources, and the necessary sea trials;
- b) Predecessors and successors;
- c) The start and end dates for each item;
- d) The critical path to the acceptance of the work;
- e) The subcontractors' schedules up to the same level;
- f) Long lead items and GFE;

1.10.6.2 The Contractor must update the schedules for each progress meeting and present the updates to the Contracting Authority, the Inspection Authority, and the Technical Authority.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1.10.6.3 The schedules must identify all work in the project, main milestones, and all interrelationships between the tasks. The schedules must be baseline.

1.10.6.4 The initial schedule must be delivered 21 calendar days after the contract is awarded.

1.10.6.5 A schedule of milestones must be provided in the bidder's presentation.

1.10.6.6 The Guide to the Project Management Body of Knowledge, 5th edition, must be used as a reference for planning.

1.10.7 Project reports

1.10.7.1 Three (3) working days before the progress review meeting, the Contractor must provide a progress report, in which the project's progress, costs, and performance are described in the introduction. The deadlines, costs, and performance will then be examined in detail to clearly demonstrate the value earned through the IPC and the IPS. The report must indicate significant risks for the program, and the measures taken to resolve them. The risk analysis must identify any impact on the project's completion and determine the measures taken to make up for the delays that may affect the completion date of the contract. The report must be submitted on paper during the meeting, and sent electronically beforehand.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

2.0 GENERAL TECHNICAL

2.1 Equipment Operating Conditions

2.1.1 All new machinery and equipment supplied and installed must be designed to operate under the following conditions:

- a) Outside air temperatures: From -40°C to 35°C ;
- b) Water temperature: From 0°C to 30°C ;
- c) Wind speed: 80 knots;
- d) Sea state: 10 on the Beaufort scale;
- e) Ship inclination of up to 35 degrees roll on either side with a cycle frequency of 10 seconds;
- f) Pitch of 10 degrees with a cycle frequency of 5 seconds and a maximum linear acceleration of 1 g;
- g) Permanent list of 25 degrees to port or starboard, and a permanent trim of 10 degrees fore and aft.

2.1.2 Equipment below Decks:

All equipment must be capable of its intended operation at the ambient conditions of 95% relative humidity at temperatures up to 50 degrees Celsius.

2.1.3 Equipment above Deck:

Equipment must be protected by a shelter and be capable of its intended operation on the upper deck. The equipment must also be protected from sea spray.

2.1.4 Electronic equipment compartments:

2.1.4.1 Compartments containing electronic equipment must be provided with a system(s) to maintain the following interior conditions:

Manned Compartments:

- Room temperature : from 20°C to 25°C
- Relative humidity: From 5 to 70%
- Noise level: 65 dBA.

2.1.4.2 Unmanned Compartments:

- Room temperature: from 20°C to 25°C
- Relative humidity: From 40 to 70%
- Noise level: 80 dBA.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

2.1.5 Vibration

2.1.5.1 All onboard equipment, structures, cables and other accessories must be mounted so as to be capable of performing their intended operation under the following conditions:

Shipboard vibrations:

- a) Up to 13.2 Hz with a displacement amplitude of +/- 1 mm;
- a) From 13.2 to 80 Hz with an amplitude of acceleration of ± 0.7 g with a maximum acceleration of 1 g;
- b) Natural frequencies of equipment supports or equipment parts must not be within the 0 to 80 Hz range, except where they cannot be kept outside of this range by constructional design methods, the vibrations must be damped so that undue amplification is avoided

2.2 Protection of Personnel

2.2.1 General

2.2.1.1 The Contractor must make sure to eliminate all rough edges, points, sharp corners and protrusions created during the conduct of work.

2.2.1.2 Smoking on board the vessel is prohibited.

2.2.2 Hot work

2.2.2.1 The Contractor must take the following precautions when hot work is required:

- a) Degassing of compartments must be certified by an accredited marine chemist or other qualified person. The Contractor must submit copies of all certificates to the Inspection Authority before starting work. The certificates must specify "Safe for persons" or "Safe for hot work," as applicable. The Contractor must post a copy of all certificates at the entrance of the affected spaces;
- b) Protective material must be used to prevent the spread of sparks, protecting electrical cables, machinery and other services;
- c) A fire watch must be provided in each space where welding, grinding and burning are performed and in all adjacent spaces. The persons undertaking this fire watch must be equipped with a fire extinguisher and trained in its correct use. They must maintain a watch at their designated location for at least thirty (30) minutes after completion of hot work.

2.2.2.2 Any hot work carried out onboard the vessel during the contract period must be performed in accordance with the procedures adopted by the

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

shipyard. The Contractor shall demonstrate that its procedure exists and is in line with expectations of the IA.

2.2.3 Confined Space Entry

2.2.3.1 The Contractor must provide a copy of the "Gas Free" certificate from a certified marine chemist or other qualified personnel to the Inspection Authority prior to beginning work. The certificates must specify "Safe for persons" or "Safe for hot work."

2.2.3.2 Any entry into confined spaces during the contract period must be conducted in accordance with during the contract period must be performed in accordance with the procedures adopted by the shipyard. The Contractor shall demonstrate that its procedure exists and is in line with expectations of the IA.

2.2.4 Rotating Machinery

2.2.4.1 New machinery installed must be equipped with a protective device to prevent any contact with rotating elements.

2.2.5 Electrical Equipment

2.2.5.1 When working on electrically operated equipment, electrical lock-outs must be used to isolate the equipment and electrical caution tags must be posted at the main power and distribution panel on those switches supplying the equipment under maintenance. Verification must be made at the terminals to ensure power is not present.

2.2.5.2 All electrical lockout requirements onboard the vessel during the contract period must be in accordance with the CCGFSMS procedures and individual shipboard work instructions. The Contractor's Standard Operating Procedures (SOPs) may replace this requirement after review and acceptance of these SOPs by the Contracting Authority and the Technical Authority.

2.2.6 Working Aloft and Fall Protection

2.2.6.1 Any work aloft must be conducted in accordance with the procedures adopted by the shipyard. The Contractor shall demonstrate that its procedure exists and is in line with expectations of the IA. procedures and with individual shipboard work instructions. The Contractor's Standard Operating Procedures (SOPs) may replace this requirement after review

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

and acceptance of these SOPs by the contracting authority and the Technical Authority.

2.2.7 Asbestos

Prior Information and Cautions

2.2.7.1 The Canadian Coast Guard has detected the presence of various materials containing non-friable asbestos that has been stored on board the CCGS Pierre Radisson. An inventory report of materials containing asbestos, indicating the locations and quantities of materials is available for consultation from the Technical Authority. In addition, a study was conducted on the vessel in January 2015 and is included with these Specifications. The studies on the vessel's materials (WSP and the one from Le Groupe Gesfor Poirier, Pinchin) list the type of asbestos, quantities and locations where asbestos and other hazardous materials are found.

2.2.7.2 The Contractor must become familiar with the content of this report and attest to its content by filing its bid along with Appendix J of the Call for Tenders.

2.2.7.3 The Contractor is responsible to ensure that its employees, subcontractors and the employees of subcontractors are informed of the presence of various materials containing non-friable asbestos onboard the CCGS Pierre Radisson.

2.2.7.4 It is prohibited to use new materials or to reuse materials containing asbestos. If necessary, any handling of material containing asbestos must be done by trained and certified personnel. The Contractor must provide the certificates of certified personnel to the Inspection Authority prior to beginning any handling or work.

2.2.7.5 It is the Contractor's responsibility to eliminate all material containing asbestos in a safe manner and it must provide the Inspection Authority with copies of certificates pertaining to the disposal of material containing asbestos, in accordance with federal, provincial and municipal regulations.

2.3 Workplace Hazardous Materials Information System (WHMIS)

2.3.1 The Technical Authority will provide the Contractor with a list all hazardous materials onboard the vessel in accordance with the WHMIS.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

2.3.2 The Technical Authority will also provide the Contractor with Material Safety Data Sheets (MSDS) for the hazardous materials onboard the vessel.

2.3.3 The Contractor is responsible for all Contractor supplied products and materials used aboard the vessel. The Contractor must inform the Technical Authority and the Inspection Authority of the use of such material and provide a copy of the Material Safety Data Sheets.

2.4 Protection of Equipment

2.4.1 The Contractor must take measures to ensure that all surfaces, and items of material or equipment installed on the vessel, finished surfaces, final color coats, and other finished work must be protected against damage, soiling or contamination.

2.4.2 The Contractor must ensure that electrical and electronic equipment and components are protected against direct or indirect physical damage and against the effects of temperature or other adverse environmental conditions, throughout the duration of the contract.

2.4.3 All surfaces, equipment, furniture and decor included in the work, which have been damaged, must be repaired to their original condition or replaced by the Contractor, at no cost to Canada.

2.4.4 All openings in machinery and/or systems must be kept covered by inserts, covers, plugs or blanks at all times until reconnected.

2.4.5 The Contractor must obtain and follow the directions of its suppliers or subcontractors regarding any special protection required the equipment they provide. These instructions must be transmitted to the Technical Authority and to the Inspection Authority.

2.4.6 The Contractor must ensure that the vessel's machinery, equipment and systems are protected against all hazards, including damage from ongoing work, corrosion, sandblasting (directly or indirectly), paint overspray, hot work, adverse temperatures or other environmental conditions and contaminants.

2.5 Access to Vessel and Equipment

2.5.1 Restricted Access Areas:

- a) The Contractor's and subcontractor's personnel may not access the following areas, except to perform work provided for this Specification package: cabins, offices, wheelhouse, control room, gymnasium, public toilets, cafeteria, dining room and lounges. The Contractor must cover all floor carpets before starting the

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

work. The Contractor must prohibit its employees from bringing their meals onto the vessel,

2.5.2 Installation and Removal Routes

2.5.2.1 If the Contractor intends to modify the vessel's structure to simplify a removal or an installation, it must first obtain the approval of the Technical Authority and the Inspection Authority.

2.5.2.2 All items and equipment that must be removed and reinstalled for the completion of specified work, or to allow access to certain locations, must be inspected before and after their removal/reinstallation by both the Contractor and the Inspection Authority.

2.5.2.3 Unless otherwise indicated, all items constituting an obstacle that are protected, removed or damaged during an overhaul, removal or installation, including insulation and heat-insulating coatings, must be returned to their original condition upon completion of the work.

2.5.3 Penetrations

2.5.3.1 Sealing of redundant penetrations must be performed in a manner acceptable by TCMS (Transport Canada Marine Safety). The Contractor must notify the Inspection Authority of any such penetrations that have been sealed and provide copies of all TCMS documentation.

2.5.4 Access for Maintenance

2.5.4.1 The layout of machinery and equipment must be designed so as to allow easy access for inspection, maintenance and repair without disturbing other machinery, structures or pieces of equipment. Provisions must be made for removal of machinery components.

2.6 Assembly of System Components and Equipment

2.6.1 Securing Arrangements of System Components and Equipment.

2.6.1.1 All new and existing systems, equipment and components installed or disturbed as a result of work, must be secured to prevent damage caused by the operating conditions of the vessel.

2.6.1.2 The Contractor must follow manufacturers' recommendations for installation arrangements. If this information is not available, securing arrangements must be approved based on the regulatory requirements prior to the Contractor commencing the securing activities.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

2.6.1.3 The Contractor must respect the manufacturer's torque specifications. If the manufacturer does not provide this information, standard SAE bolt and nut torques must be used.

2.6.2 Cleaning

2.6.2.1 The Contractor must ensure that once the installation has been completed, assembled parts and equipment are cleaned to eliminate stains, spatter or excess solder, weld metal, metal shards or any other foreign matter. This includes any particles that could loosen or become dislodged during the normal expected life of the equipment. All corrosive material must be removed. This cleaning must take place before final assembly of the equipment parts. Any disturbed paint must be repaired prior to closing machinery.

2.6.3 Damaged Items

2.6.3.1 Panels, covers, components and equipment damaged by the Contractor must be repaired to their original condition or replaced at no cost to Canada.

2.7 Welding

2.7.1 General

2.7.1.1 All welds must comply with the CSA standard W59 "Welded Steel Construction (Metal Arc Welding) (Metric)." The Contractor must provide a copy of the welders' certificates.

2.7.1.2 The contractor shall provide a third party level 2 welding inspector certified under CSA 178.2-14 for the inspection of the welding processes. The inspector shall prepare sign and deliver to CCG a welding inspection report according to CSA 178.2-14.

2.7.1.3 The Contractor must submit CWB stamped welding specifications and weld procedure data sheets to TCMS where required. Welding procedures for joining pipe connections must be recorded and approved by CWB in accordance with ASME section IX.

2.7.1.4 All aluminium welding must conform to the requirements of CSA standard W47.2 (Certification of Companies for Fusion Welding of Aluminium). The Contractor must provide a copy of the welders' certificates.

2.7.2 Removal of Attachments

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

2.7.2.1 Temporary cleats, lifting eyes, and fasteners used during maintenance of structures must be removed by burning or grinding, and any remaining irregularities must be ground flush with the surface of the parent plate. Any damaged paint must be repaired.

2.7.3 Weld Design Requirements

2.7.3.1 The size, length and details of welds must be approved by ABS.

2.8 Painting

2.8.1 General

2.8.1.1 The Contractor must prepare a painting schedule and present it to the Technical Authority and to the Inspection Authority for review and acceptance. The painting schedule must list all areas and compartments on the vessel affected by the project work and indicated the proposed paint type, painting scheme, surface preparation, type of coating, number of coats, thickness and colors. All paint used must be compatible with the existing paint on the vessel. CCG may require chemical expertise to demonstrate the compatibility of a new coating with the existing coating on the vessel. The expertise must be confirmed by a chemist. The cost of the expertise will be borne by the contractor.

2.8.1.2 All pipe markings must comply with the standard CGFM 308-00-03, Color Coding Standard for Piping Systems.

2.8.1.3 All new and disturbed steel and aluminum work must be painted in accordance with publication DFO 5847 and with the paint manufacturer's specifications.

2.8.1.4 All paint must be suitable for use in the marine environment and comply with standards CAN/CGSB 1.61-2004 – Enamel Alkyd Exterior and Interior Marine Paint and CAN/CGSB 1.193-99 – Epoxy Resin Coatings, Marine. Paints, varnishes and other coatings used on interior surfaces must be included in the list of TCMS approved products, TP 438.

2.8.1.5 Each coat of paint must be of a different shade to indicate proper coverage, and must be completely dry before application of subsequent coats. At minimum, the first coat of primer must be applied by brush or airless spray.

2.8.1.6 The final topcoats must be protected from dirt or damage until the vessel is delivered to Canada. The Contractor must ensure that furnishings and

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

equipment liable to more serious damage due to overspray are adequately protected during the painting process.

2.8.1.7 Without limitation, the following elements must NOT be painted otherwise they will have to be replaced at the contractor's expense. .
When in doubt, the Contractor must consult the Inspection Authority:

- screw threads;
- grease fittings;
- bronze pins;
- door screens;
- nameplates;
- gaskets;
- stainless steel or monel metal fittings;
- machined surfaces;
- instrumentation;
- interior gratings;
- electrical wires, insulation and fittings;
- electrical panels;
- rubber seals on watertight doors and hatches;
- fire door seals;
- Hydraulic hoses;
- in general, all working parts or other exceptions stipulated by the Inspection Authority.

2.8.2 Heavy Metal Based Coatings

2.8.2.1 Paint containing lead, mercury or copper must not be used.

2.8.3 Requirements for Paint Equivalents

2.8.3.1 If the Contractor would like to use paint from a different manufacturer, it must demonstrate to the AT and/or the IA that all characteristics and technical specifications of the proposed paint is the equivalent of the specified paint. Where partial repairs (touch ups) are required, the Contractor must use the same type of paint already in service, as to ensure good adherence thereof.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

2.9 Identification

2.9.1 Nameplates

2.9.1.1 Nameplates must be affixed to all new equipment, compartments, doors and closures.

2.9.1.2 All nameplates must be written in both official languages.

2.9.1.3 Lettering must be clear and concise while minimizing the use of abbreviations. Primary information must be given in larger size lettering than secondary information.

2.9.2 The type of nameplate must correspond to the location on the vessel as specified below:

- a) Plastic must be used in accommodation and navigation spaces where the nameplate is not exposed to mechanical damage and does not risk being covered by ice, paint, oil, grease or dirt.
- b) Plastic nameplates must be laminated phenolic rigid type with machine engraved lettering and secured using stainless steel or brass screws. Unless otherwise indicated, nameplate must have white lettering on a black background for normal signs and white lettering on a red background for warning or emergency signs.
- c) Laminated plastic nameplates, black with white core engraved through to the center core, must be provided for all devices secured to the exterior surfaces the distribution panels/switchboard.
- d) Nameplates must be secured to the distribution panel/switchboard with machine screws. New nameplates to be fitted on the existing distribution panel/switchboard must be consistent in size and lettering with those already fitted. Nameplates for feeder circuits must identify each circuit by name and number and the fuse size and/or trip element rating.
- e) Warning or caution nameplates must be in laminated plastic; red with white core engraved through to the center core. They must indicate the circuit breakers provided with trip coils requiring completion of remote circuits prior to being operated, as well as those having a potential power source connected to both sides, or to any other potentially hazardous condition.
- f) Engraved metal, stainless steel or brass nameplates must be used in machinery spaces and where exposed to weather. Engraved metal nameplates must have lettering accentuated by means of black wax and secured with stainless steel or brass machine screws.
- g) Before ordering or manufacturing nameplates, a complete drawing list of nameplate must be submitted, specifying the size of the plates, the size of the lettering and their

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

inscription, for review and acceptance by the Inspection Authority and the Technical Authority.

2.9.3 Key Tags

2.9.3.1 Plastic labels must be provided for all new keys. Tags must be marked to identify the space or the item they lock. The description must be identical to that used for the identification nameplate for the space or the equipment. The complete list of new keys and labels must be submitted to the Inspection Authority and to the Technical Authority.

2.9.3.2 All new keys and tags must be turned over to the Technical Authority as part of the acceptance of the vessel.

2.9.4 Safety Related Signs

2.9.4.1 All new signs must be written in both official languages, French first.

2.9.4.2 Painted signs for muster station directions, fire stations, emergency equipment, etc., must be provided and installed in accordance with ABS approval.

2.9.4.3 The Contractor must prepare and present a drawing indicating the location, type and size of lettering for all signs. This drawing must be submitted to ABS for approval prior to fabrication or installation of the signs.

2.10 Cleanup

2.10.1 The Contractor must ensure cleanliness of the vessel. Debris and waste must be removed from the vessel and disposed of at the end of each work day.

2.10.2 Special attention must be given to hazardous materials, such as flammable products and toxic wastes. They must be disposed of in accordance with federal, provincial and municipal regulations.

2.10.3 Upon the arrival, the bilge in the machinery spaces will be cleaned to allow hot work. Cleaning must include pumping and disposal of bilge water, and cleaning bilges to remove grease, oil and contaminants. The disposal of additional waste performed by the shipyard, must comply with all federal, provincial and municipal regulations. Disposal certificates must be submitted to the Inspection Authority and to the Technical Authority within 24 hours after any disposal or any transfer from the vessel. The Contractor must submit a fixed price for disposal of 5,000 litres of bilge waste and a unit price per 100 litres. The Contractor must submit a fixed price

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

for disposal of 100 kg of solid waste. The PWGSC Form 1379 must be submitted to adjust the cost of bilge waste disposal up or down, as appropriate.

2.10.4 Vessel cleanliness must extend to the bilge areas which must be maintained free of oil, water, and debris for the duration of the project.

2.10.5 Prior to acceptance by the Coast Guard, the Contractor must thoroughly clean all areas of the vessel to return them to their original condition, including all bilge areas.

3.0 DOCUMENTS

All documents provided by the Contractor must become the property of Canada. This also includes all electronic media. Electronic media must not be protected to prevent making additional copies for internal use. All documents provided by the Contractor, as indicated in this section, must be submitted in both official languages (French and English) to the TA and the IA.

3.1 Drawings

3.1.1 General

3.1.1.1 The Contractor must provide all drawings & diagrams necessary for the design and execution of work on the new or modified systems, including drawings & technical manuals produced by the manufacturers or the subcontractors.

3.1.1.2 All new drawings must be submitted as individual files compatible to DWG (AutoCAD Version 2013). The files must be provided to the TA on a DVD storage media, clearly identified with the title and number of the project.

3.1.1.3 The drawings must provide a complete and detailed visualization of all new or modified systems (Electrical & mechanical). The drawings must include all the information so that a qualified technician can conduct a quick, complete and specific search in case of malfunction or for any other reasons.

Generally, the drawings must include or describe all of the following elements:

- a) Detailed cover page and index;
- b) Abbreviations and symbols used;
- c) Identification and specification of equipment;
- d) Location, physical representation and mechanical dimension;

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- e) Block diagrams, overview of the systems;
- f) Electrical circuits: Controls, power, cables and wiring;
- g) All other references or details required to understand the system

3.1.1.4 It is the responsibility of the Contractor to update or redraw all original vessel drawings affected by the modernization project. Changes made to the old drawings must be denoted in a different colour or style. If more than 50% of an original diagram is changed, the diagram must be redrawn in full, compatible to DWG (AutoCAD) format. Although some original diagrams are kept in a series, this should not prevent all drawings from being homogenous in presentation, numbering and method of interpretation.

3.1.1.5 The Contractor must have an effective method to produce and update drawings throughout the work period. The Contractor must maintain an up-to-date list of drawings & revisions, and must provide this list to the TA at the monthly progress meeting. This list must include a column of all drawings sent to ABS for approval.

3.1.1.6 The Contractor must provide the Inspection Authority and Technical Authority all drawings required by or generated by subcontractors.

3.1.1.7 A final version of the "As Fitted" drawings must be provided at the end of the project. DWG (AutoCAD) files must not be electronically protected, and the CCG must be able to modify all elements as needed in any future changes.

3.1.2 Conceptual design drawings

3.1.2.1 The Canadian Coast Guard provides all technical reference drawings to the Contractor for reference purposes only. The Contractor must produce working drawings and ensure that all of these drawings receive relevant regulatory approval. The Contractor must note that the reference drawings provided are not all "As Fitted" drawings. The Contractor must physically verify each element affected, as well as all dimensions required for the work.

3.1.3 Working drawings

3.1.3.1 The Contractor must prepare the details of the project working drawings in accordance with the requirements of the regulatory agency. All changes must be included in the revisions of working drawings.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

3.1.3.2 Working drawings must clearly indicate the materials or equipment being supplied, all construction details, precise dimensions, capacity, operating characteristics and performance. Each working drawing must include a unique identification number, and blocks of numbers must be used to identify the various elements of the specification items. When multiple working drawings are required, each drawing must indicate the total number of sheets within the series.

3.1.3.3 Each working drawing for non-catalogue items must be prepared specifically for this project. Working drawings and brochures for catalogue items must be clearly marked to show the items being supplied.

3.1.3.4 The Contractor must approve all working drawings and indicating:

- a) The drawing's compliance with all specification requirements has been verified;
- b) The equipment has been coordinated with the other equipment to which it is attached or connected;
- c) All dimensions have been verified to ensure the correct installation of equipment within the available space.

3.1.4 Working drawings – Submission for Review by PWGSC and CCG for review

3.1.4.1 The Contractor must submit to the Technical Authority and Inspection Authority by email or other electronic means the working drawings, shop drawings and schedules required for the work. The TA may request up to three paper copies of these drawings. Drawings must be submitted at least 10 business days before the start of the work for the affected drawings. The Inspection Authority and Technical Authority must verify specification compliance and, as needed, share their comments with the Contractor within five business days. The Contractor must make all necessary amendments and return and return the revised version of the drawing, with revision dates and revision numbers, to the Technical Authority, in the following two working days.

3.1.4.2 Reviewed drawings must not be modified in any way without written authorization from the Technical Authority. In the event of subsequent revisions to drawings already reviewed the entire drawing (all sheets, revised or not) must be resubmitted for review.

3.1.4.3 Space must be provided on the working drawings for review dates and signatures of the Inspection Authority and the Technical Authority.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

3.1.4.4 Drawings submitted for review, unless otherwise specified, must be in the form of original drawings. Printed manufacturer's data sheets for standard components are acceptable as long as the pertinent characteristics are identified and relate to specified items.

3.1.5 Working drawings – Submission for ABS approval

3.1.5.1 The Contractor must submit to ABS copies, as necessary, of working drawings, ship drawings and/or layout drawings, schedules and calculations required for approval by ABS.

3.1.5.2 The Contractor is responsible for ensuring that working drawings are approved by ABS before beginning work on any section of these specifications that must be approved by ABS.

3.1.5.3 Space must be provided on all working drawings for ABS approval stamps. This space must be clear of all technical information and must not be on the back of any sheets.

3.1.5.4 The Contractor must communicate with the respective ABS approval office to determine the quantities and types of materials required for approval purposes.

3.1.5.5 The Contractor must submit one copy of the original stamped drawing and three copies of all ABS approved drawings to the Technical Authority.

3.1.5.6 The Contractor must provide the Technical Authority with a DVD containing all ABS approved drawings compatible to PDF format.

3.1.6 "As Fitted" drawings

3.1.6.1 Upon completion of work, the Contractor must transfer all mark-ups from the working drawings to a final revision of all vessel drawings affected by the project work. These drawings must become the "As fitted" drawings for the project work.

3.1.6.2 After acceptance of the ship, the Contractor must provide the following:

- a) four copies on standard ANSI paper of the latest revision of each of the "As Fitted" drawings;
- b) the latest revision of each "As Fitted" drawing, compatible to AutoCAD 2013 DWG format, containing a detailed, up-to-date, MS Excel-format list of the files for each DVD;
- c) All drawings must become the property of the Government of Canada.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

3.1.6.3 If no AutoCAD drawing files are produced then scanned files (raster format) must be supplied to the Technical Authority compatible to PDF format.

3.1.6.4 The "As Fitted" drawings must be delivered within 15 days after completion of the sea trials.

3.1.7 Framed drawings

3.1.7.1 The following drawings, modified as "As Fitted" drawings, must be printed, framed and mounted on board the ship at the locations designated by the Technical Authority:

- General Arrangement Drawings, plan view of all decks and profile view;
- Capacity plan;
- Fire Fighting Systems and Life Saving Equipment.

3.2 Manuals and Registers

3.2.1 General

3.2.1.1 Instruction Manuals and Registers must be bound in a hardcover three-ring, D-ring binder with positive locking mechanisms capable of holding 8 1/2" by 11" sheets. Larger drawings and documents must be concertina folded to suit. The following information must be printed on the cover:

- CCGS Pierre Radisson – Vessel Life Extension;
- Specification identification number;
- Identification of equipment or systems;
- equipment manufacturer;
- Revision number and date.

3.2.1.2 All sections of the manuals must be equipped with plastic tabbed indices. Major equipment components must be subdivided into separate sections in the manuals.

3.2.1.3 A main index must be provided at the beginning of each binder indicating all items included in each section.

3.2.1.4 A list of names, addresses and telephone numbers of contacts associated with equipment manufacturers must accompany the document for consultation after the completion of the project for maintenance and information data purposes.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

3.2.1.5 A copy of the final and approved "As Fitted" drawings must be included in the maintenance manual.

3.2.1.6 The Contractor must provide the Technical Authority with two paper copies of all manuals and data sheets in English and in French (1 copy each) for the equipment components supplied by the Contractor prior to the completion of the contract.

3.2.1.7 The Contractor must submit four copies of all manuals and data sheets to the Technical Authority on individual DVDs compatible to PDF format, prior to the completion of the contract.

3.2.2 Operating manuals – "As Fitted"

3.2.2.1 The operating manuals must include the following:

- a) A general description of the equipment's operating sequence in English and French;
- b) A detailed equipment start-up procedure in English and French;
- c) Schematic wiring diagram for the fitted equipment;
- d) All pertinent equipment performance criteria;
- e) When systems are accompanied by software or hardware, a user manual must include the following:
 - Full software documentation manual for the system, in CD-ROM format, such that Canada may revise the programs without recourse to the Contractor.
 - The minimum software documentation must include:
 - i. System level diagrams describing the overall scheme of the software/hardware system;
- f) The functional specifications describing in detail the functional capabilities of the system and of each software component;
- g) The list of project-specific programs, including all comments describing the particularities of the code functions;
- h) All listings, files, manuals and associated documentation material must be delivered to and become property of Canada.

3.2.2.2 The Contractor must supply the number of paper copies and electronic copies of the operating manuals.

3.2.3 Maintenance manuals – "As Fitted"

3.2.3.1 These manuals must include the following:

- 1) The manufacturer's maintenance instructions for each piece of equipment requiring maintenance;

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 2) The instructions must include installation instructions, part numbers, parts lists, master drawings and exploded views with part identification for all mechanical, electrical, and electronic parts, name of suppliers;
- 3) A list summarizing each piece of equipment requiring lubrication, indicating the name of equipment item, location of all points of lubrication, type of lubrication recommended, and the frequency of lubrication;
- 4) Troubleshooting sections must be included for all equipment in the maintenance manual under a separate header.

3.2.3.2 The Contractor must supply the number of paper copies and electronic copies of the maintenance manuals as indicated in the section 6.2.1 above.

3.2.4 Tests/Trials and Inspections Registers

3.2.4.1 Tests, trials, calibration values, measurements, readings and inspections must be clearly presented in tabular form, with two hard copies provided to Canadian Coast Guard Technical Services: one to the Chief Engineer and one to the Technical Authority. This report must be submitted in PDF format compatible. It must be divided by specification number, with page numbers and dates. Tests, trials and inspections must be performed to the satisfaction of the CCG Inspection Authority and the Transport Canada inspector before the end of the contract. This requirement must in no event abrogate the obligation to provide, in the shortest time possible, a hard copy of the measurements and test results to the Inspection Authority, to be assessed and evaluated in regards to the expectations towards the Contractor.

3.2.4.2 The Contractor must prepare a separate binder, to assemble all tests, trials and inspections. The binder must be indexed for each test, trial and inspection conducted.

3.2.4.3 The Contractor must maintain a complete and accurate register of all tests, trials and inspections conducted during the work. This must include tests, trials and inspections conducted at subcontractors' facilities. These registers must include all relevant documentation, test procedures, associated test sheets, including shop test data, trial and inspection data, as well as observation results.

3.2.4.4 The originals of tests, trials and inspections registers must be signed by ABS, the Contractor and where applicable, the subcontractor and/or Field Service Representative who witnessed the tests.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

3.2.4.5 Tests and inspections carried out for the specific purpose of satisfying the ABS requirements for the Ship Inspection Reporting System (SIRS) update of the vessel must be recorded and signed on documents meeting the requirements of ABS, to clearly indicate which piece of equipment or system with associated field number was tested and the results of tests performed. All copies of the documents must be dated and signed by the ABS inspector present and by the Contractor.

3.2.5 Certificate Register

3.2.5.1 The Contractor must prepare a separate binder for the documentation of all Certificate records. The binder must be indexed for each element or piece of equipment for which Certificate records are available.

3.2.5.2 The Contractor must maintain a complete and accurate register of all certificate records for the work performed. Certificates records must be up-to-date and correspond to the type of equipment installed by the Contractor. When certificates of approval from a Classification Society are required, the Contractor must ensure that they are inserted within the Certificate register binder. When manufacturers provide equipment certificates in operating manuals, copies of these certificates must also be indexed in the Certificate register binder. The Contractor must also obtain and index all certificates issued by its subcontractors.

3.2.5.3 The Contractor must provide the number of paper copies and electronic copies of the tests, trials and inspection records.

3.2.5.4 NOTE: Where original certificates are provided, especially ABS certificates, one of the three paper copies submitted must be the original document.

3.3 Photographs and Images - General

3.3.1 Initial photographs and images

3.3.1.1 The entire ship must be photographed with sufficient detail to identify specific parts and/or components.

3.3.1.2 The Contractor must meet this requirement in conjunction with Section 1.10 of this Specification package and the conditions for custody of the ship in Appendix I of the contract.

3.3.1.3 The Contractor must provide two (2) copies of all initial digital images in JPEG format on individual DVDs to the Inspection Authority and the

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Technical Authority at the first progress meeting, after the delivery of the vessel to the Contractor's facilities.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

4.0 TESTS, DOCK TRIALS AND SEA TRIALS

4.1 General Requirements

- 4.1.1 The Contractor must demonstrate that the completed work and equipment comply with the performance requirements described in this Specification package or those of the equipment suppliers. The Contractor must develop test and trial procedures, and must conduct all tests and trials required by this Specification package, by manufacturers or by regulatory bodies in order to obtain all appropriate certificates required for the ship. The Contractor must obtain all necessary certificates for the vessel to ensure that the vessel is fully certified and seaworthy, for a vessel of its class, prior to the completion of the contract.
- 4.1.2 The Contractor must prepare the trials schedule showing dates, sequence, procedures and duration of each trial or set of trials. This schedule, including the proposed trial record sheets for all trials, must be submitted to the Technical Authority and the Inspection Authority for review and approval 20 business days prior to the start of any tests and trials.
- 4.1.3 The Contractor must coordinate the testing schedule with ABS classification society and Health Canada (HC) to ensure their participation, where applicable. The Contractor must ensure the availability of a Field Service Representative (FSR) or obtain written authorization from the manufacturer before initial start-up of the installed or modified equipment.
- 4.1.4 The Inspection Authority must be present for all tests, as well as ABS, FSR or subcontractors, where applicable.
- 4.1.5 Tests must follow the recommended procedures described below. Any defects must be corrected to the satisfaction of the Inspection Authority, ABS and the attending FSR on. Once defects are corrected, the tests and trials must be repeated to the satisfaction of the Inspection Authority, and where necessary ABS.
- 4.1.6 Upon completion of each specification item, the Contractor must notify the IA and ABS (as required) so they can inspect the work prior to final acceptance of each specification item or reassembly of equipment/components. Failure to notify the IA does not absolve the Contractor from its responsibility to provide the opportunity to inspect any completed item in accordance with regulatory and contract requirements.
- 4.1.7 Inspections completed by the Inspection Authority do not in any way, replace those inspections required by ABS and/or HC.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 4.1.8 Shop testing, dock and sea trials must be to the standards required by ABS. Where ABS has no requirements for shop test procedures, the Contractor must adhere to SNAME guidelines of this Specification package. The minimum standard for all electrical dock and sea trial must comply with ABS, TP127E and IEEE 45-2002. All electronic equipment static tests must be completed prior to seal trials, with only the operational tests to be carried out at sea.
- 4.1.9 Hydrostatic testing of piping and components forming part of any system must be completed prior to any operational testing of the system. The Contractor must have on hand signed and witnessed test sheets showing the results of hydrostatic tests prior to the operational tests of a system. As a minimum, the Inspection Authority must be notified when any components are being hydrostatically tested.
- 4.1.10 The Contractor must provide the Technical Authority with a complete list of disturbed services and ship's that require functional and operational tests prior to the completion of each specification requirement. The Contractor must develop specific test procedures to test the operational and functional condition of each of the disturbed services and/or ship's systems. The Contractor must submit the list of disturbed services and ship's systems and the associated specific test procedures for review to the Inspection Authority and Technical Authority twenty (20) working days prior to the testing of these systems.

4.2 Mechanical and Piping Systems

- 4.2.1 All piping systems and sub-assemblies fabricated by the Contractor must be hydrostatically tested to 1.5 times the system's working pressure and proven tight to the satisfaction of the Inspection Authority prior to installation onboard the ship.
- 4.2.2 Machinery and equipment must not be exposed to pressures higher than the maximum allowable operating pressure during system pressure tests. Valves at the components may be closed, or the connection blanked off to protect such components from excessive pressure. Where there any flanged joints in the piping between a tank isolating valve and the open end of the tail pipe, or where a tank isolating valve has not been installed, the flanged joint next to the open end of the tailpipe must be temporarily blanked off so the system may be pressure tested up to that point. Instruments, pressure switches and other components that may be damaged by excessive pressure must be removed or otherwise protected during hydrostatic testing.
- 4.2.3 For tests, calibrated pressure gauges must be installed at the connections provided in the gauge piping for this purpose. During the tests, readings of installed gauges

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

must be checked with the calibrated test gauges. Installed pressure gauges must be adjusted where necessary, to indicate the correct pressure. The Contractor must provide all calibration certificates for all instrumentation used for the testing of systems to the Inspection Authority and Technical Authority.

- 4.2.4 When the duration of a pressure test is not specified, the test pressure must be maintained for a sufficient length of time to permit a thorough examination of the system for leaks, to the satisfaction of the Inspection Authority.
- 4.2.5 Relief and safety valves and all other components installed to limit the operating pressure of a system must be removed, blanked, or bypassed where necessary, in order to build up the required pressure for the test. After a system has satisfactorily passed these tests, all components previously removed must be reinstalled and tested under pressure to ensure they are operating at their approved set pressures. Set pressures, as indicated on identification plates of these components must conform to the approved set pressures.
- 4.2.6 All components required for the safe operation of the system must be examined and adjusted during the operating tests to demonstrate that they comply with the requirements specified and approved for the system. Operating testing must demonstrate that the design and installation of the piping adequately meets the service requirements.
- 4.2.7 Components, such as spring clamps, must be adjusted where necessary. Flexible piping connections slip joints, expansion joints and noise isolation pipe fittings must be checked for satisfactory operation while the system in which they are installed is being operated.
- 4.2.8 Where pumps or ejectors have suctions from tanks or compartments, the operating test must demonstrate the system's ability to remove the service liquid down to the level of the open end of the suction line.
- 4.2.9 Open systems such as vent lines, overflows and deck drains must be tested for unobstructed flow. This test must be conducted using a compressed air or water not exceeding 690 kPa (100 psi). Manual pump systems, portable drainage facilities and other various systems must undergo an operating test, as well as the specified pressure test. Pressure tests must precede operating testing.
- 4.2.10 All systems must undergo visual inspection and must be leak free during the specified tests.
- 4.2.11 All pressure and operating tests must be completed before system trials.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 4.2.12 Where tanks have been opened for the purpose of conducting work, they must be cleared, cleaned and inspected by the Inspection Authority prior to being closed. Failure to notify the Inspection Authority does not absolve the Contractor of its responsibility of providing the opportunity to inspect any completed items.
- 4.2.13 Inspections completed by the Inspection Authority do not in any way, replace those inspections required by ABS.
- 4.2.14 Upon completion of the inspection, new gaskets must be installed on all tank covers prior to closing. The Contractor is responsible for producing a register using an MS Excel spreadsheet, containing the signatures of those responsible for each inspection of each task to be inspected in the tanks. This register must include signature spaces for the Inspection Authority (CCG), ABS inspector and the Contractor responsible representative attesting that all work and inspections have been completed.
- 4.2.15 Where work has been conducted in or on any structural part of a tank, that tank must be subjected to a hydrostatic pressure test at a water column height of 8 ft. (2.5 m). The hydrostatic pressure test must be witnessed by the Inspection Authority and ABS. Hydrostatic pressure tests must be documented.

4.3 Ship Performance Sea Trials

- 4.3.1 In addition to dock trials commissioning tests of individual ship's systems specified with in this Specification package, the Contractor must perform a full set of sea trials in accordance with the "Guide for Sea Trials" as published by SNAME. The Contractor must develop all sea trial procedures and data sheets. The sea trial procedures with attached data sheets, must be submitted to the Inspection Authority and Technical Authority for review and approval 20 days before the start of sea trials.
- 4.3.2 After the refloating of the ship and once all the work in this Specification package has been completed, sea trials of a minimum of 8 hours must be performed. The Contractor must also provide an hourly rate, in its bid, permitting the price of these trials to be adjusted (up or down) in order to ensure they meet the regulation requirements of this Specification package.
- 4.3.3 The sea trials must be completed over the course of one day. The Contractor must provide four shipyard personnel, including one supervisor, for the duration of the trials in order to make all necessary adjustments.
- 4.3.4 Where necessary, the Contractor must organize and assume all docking costs associated with the sea trials. The Contractor must provide the necessary resources

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

required for handling the ship's mooring lines and any tugs required for the ship's departure from and return to the dock.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

5.0 BERTHING, MOORING, DRY-DOCKING AND REFLOATING

5.1 Berthing and Mooring

- 5.1.1 The Contractor must provide all materials and labour required to manoeuvre, dry-dock, and fit out a ship. Details of the berthing and mooring facilities must be included in the Bidder's proposal.
- 5.1.2 The Contractor must be responsible for docking and mooring of the ship for the duration of the contract period. The Government of Canada must have free access to the ship at all times.
- 5.1.3 The ship must be located at the Contractor's facilities for the duration of the contract.
- 5.1.4 The depth of water must be sufficient to prevent the ship from touching bottom during any tidal or low water conditions. The Contractor must ensure that there is sufficient water under the keel to allow propulsion system testing during dock trials.
- 5.1.5 The Contractor must supply all mooring lines and labour required for docking/undocking, mooring, dock trials, refloating of the ship and casting off of the vessel. The Contractor may use the ship's mooring lines to tie up the vessel upon arrival, but must be immediately replace these and remove the vessel's lines to storage.
- 5.1.6 The Contractor must supply all material and labour required to dock and undock the vessel including any vessel movements, provisions for tugs, and line handling personnel.
- 5.1.7 The Contractor must supply and install a gangway fitted with a safety net in compliance with the Canada Labour Code for as long as the ship is docked at/in its facilities. The Contractor is responsible for the safety of the gangway.

5.2 Dry Docking

5.2.1 General

- 5.2.1.1 The ship will be delivered to the entrance of the shipyard. The Contractor is responsible for docking the ship at the wharf adjacent to the dry dock, including the installation and removal of a gangway (Contractor supplied), regardless of the ship's arrival and departure times. This also applies to any docking/undocking as required for sea trials.
- 5.2.1.2 The Contractor must supply all labor, materials, equipment and resources necessary for handling the ship's mooring lines and tug assistance as

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

required to perform the docking and refloating of the vessel, as well as any other movements required throughout the duration of the contract period. The Contractor must be responsible for any associated fee.

- 5.2.1.3 The Contractor must note that the ship will require a period of 24 hours, both before after dry docking, to allow for ballasting and fuel transfer operations necessary to obtain the desired trim of the vessel for dry docking. The Contractor must supply a written document confirming the date and time of entry/exit from the dry dock, as well as the availability of the adjacent wharf.
- 5.2.1.4 The Contractor's bid package must include proof that the docking facility is certified to dry docking a ship with these particulars.
- 5.2.1.5 The stability books are included in the Technical Data Package provided to bidders.
- 5.2.1.6 A docking plan is available upon request to the Technical Authority. The Contractor must make a copy and return the original to the Technical Authority.
- 5.2.1.7 The Contractor must supply all labour, materials and facilities necessary for dry docking and refloating the ship as required to conduct the work described in this Specification package.
- 5.2.1.8 The blocking plan from the last dry dock (2017) will be provided to the shipyard by the Technical Authority during the first contractual meeting or before the ship arrives at the shipyard. The Contractor must make a copy and return the original to the Technical Authority.
- 5.2.1.9 The Contractor must prepare a new blocking plan, offsetting the blocks relative to the measurements indicated on the 2016-17 plan in order to permit sandblasting of the hull and application of paint in those areas where the ship rested on keel blocks in 2016-17.
- 5.2.1.10 The new blocking plan must indicate the location of all keel blocks in relation to the respective frames to serve as a reference for the next dry docking, permitting work to continue on the hull in the areas covered by blocks during this dry docking.
- 5.2.1.11 The new blocking plan must be submitted to the Technical Authority and the Inspection Authority for approval before the Contractor prepares the dry dock.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 5.2.1.12 Before the dry docking of the ship, the Contractor must arrange an inspection with the Inspection Authority to verify the blocks and their alignment. A report of the alignment readings must be submitted to the Inspection Authority.
- 5.2.1.13 The Contractor must prepare the blocks and any shoring required to maintain the true alignment of the ship's hull and machinery throughout the dry-docking period. The Contractor must dock and undock the ship and plan sufficient lay days to carry out the work described in this document, with a sufficient margin to perform unexpected work.
- 5.2.1.14 The Contractor must include in its bid, the total number of lay days and the unit cost per lay day.
- 5.2.1.15 The Contractor is responsible for recording all tank soundings, draft, trim and list of the ship, and must perform the stability calculations required to properly dock the ship. These calculations must be forwarded to the Technical Authority and Inspection Authority two (2) business days prior to dry docking the vessel.
- 5.2.1.16 The ship must be docked so that all docking plugs, transducers, anodes and sea inlet grids are clear and accessible. Blocks supporting the keel and hull that prevent removal of the drain plugs from tanks will have to be moved, as well as those preventing access to seawater intake and sea chest grates.
- 5.2.1.17 The Contractor must not place blocks under the echo sounder transducer plates located between frames 138 and 140, port and starboard, nor under the Doppler sonar transducer plates located between frames 155 and 156.
- 5.2.1.18 There must be a minimum clearance of 1.3 m (4 ft) under the keel.
- 5.2.1.19 In the event that hull fittings are covered, the Contractor must be responsible for all labour and equipment required for making alternative arrangements to drain tanks and/or move blocks to gain access to areas of specified work.
- 5.2.1.20 All misplaced blocks, not corresponding to the new blocking plan provided by the Contractor, must be moved at the Contractor's expense. If the CCG requires other blocks to be moved for other reasons, the Contractor must provide a unit price for additional block displacement.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 5.2.1.21 The Contractor must supply and install gangways compliant with the Canada Labour Code as long as the ship is in dry dock. The ship must be equipped with two separate and independent accesses at all times. One gangway must be installed at the front of the ship on the port or starboard side and the other must be installed at the aft of the ship on the opposite side of the forward gangway. The gangways must be safe and structurally adapted for the passage of the ship's crew and workers, in accordance with Section 2 of the Maritime Occupational Health and Safety Regulations. The gangways must be well lit at night. The gangways must be placed at both ends of the ship, in accordance with the Technical Authority's directives. The Contractor is responsible for the safety of the gangways.
- 5.2.1.22 Once the ship is properly resting on the blocks, the Contractor must immediately remove the ballast tank drain plugs and drain these tanks. The position of these plugs is indicated on the 2017 blocking plan. The drain plugs must be clearly labelled as they are removed to insure they are reinstalled in their respective positions. Once the drain plugs have been removed, the Contractor must give them to the CCG Inspection Authority, who will be responsible for their storage.
- 5.2.1.23 The Contractor must be responsible for the safe transfer of the ship to the berth or mooring location where it will stay until the dry docking. During dry docking, radio contact must be maintained between the ship's Commanding Officer or Inspection Authority and the Contractor's docking master. If necessary, the Contractor must include in its bid towing and/or pilotage and icebreaking services. All costs for rope handling and for the certified docking master are the Contractor's responsibility. The Contractor must provide and install a ground cable between the vessel and the dock while it is docked, as per TCMS Ship Safety Bulletin 6/89.
- 5.2.1.24 The Contractor must notify the CCG of all movement or refloating of the ship not required by this Specification package, seven days prior to the start of the operations. The Contractor must supply the CCG and PWGSC authorities with a plan of its intentions. The Contractor will be responsible for all costs associated with these decisions.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

5.2.1.25 Within four hours of dry docking, the bottom of the ship's hull must be pressure washed (5000 psi minimum) with fresh water to remove any marine life/vegetation allowing for a preliminary hull inspection.

5.3 Numbering

5.3.1 The shipyard must supply the necessary material and labour to temporarily number the hull frames and bulkheads to facilitate the external hull inspection. The shipyard will be responsible for keeping the frames numbered throughout the entire dry docking period until the ship is refloated.

5.3.2 Frames must be numbered on each side of the ship, at five-frame intervals, in conformity with the ship's construction drawings. Each number must be accompanied by a line 60 cm in height, on each side of the hull at bilge-level.

5.4 Undocking

5.4.1 Before refloating the ship, the Contractor must obtain the drain plugs from the GCC Inspection Authority and install them in their respective locations using white lead and twine. The Contractor must verify the water tight integrity all tank drain plugs, including those that were not removed, by means of a vacuum box test. If the seal of a previously removed drain plug does not pass the vacuum box test, the Contractor must remove it and add more white lead with twine and redo the test until proven watertight. The CCG Inspection Authority must witness the tests. This requirement applies whenever the contractor floods the dry dock.

5.4.2 Before refloating the ship, the Contractor must verify all grate fasteners for all sea chests, seawater intakes and hull openings to ensure that they are locked in place by welding.

5.4.3 Before undocking the ship, the Contractor must ensure that any protective covers and connections are removed. The Contractor must supply, install and remove, upon completion of work, all fittings and lugs required to perform the work indicated in this Specification package. Where the lugs and/or fittings are installed and removed, the welds must be ground flush with the hull. Any damaged or disturbed paint work must be performed in accordance with the instructions found in the paint section of these Specifications and of those of the paint manufacturer. Paint must be applied in accordance with the ship's colour and external marks diagram.

5.4.4 Before undocking the ship, the Contractor must ensure that all tanks are filled to obtain the same conditions as at docking. The Contractor is responsible for the safe refloating of the ship, taking into consideration any changes in stability resulting

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

from the work carried out in these Specifications. The Contractor must perform the necessary stability calculations required to refloat the ship. These calculations must be submitted to the Inspection Authority and Technical Authority for review, 48 hours prior to flooding the dry dock.

- 5.4.5 Prior to refloating the ship, the Contractor must clean the transducers using a mild soapy fresh water solution to eliminate any contaminants or fouling. The transducers must then be rinsed with fresh water to ensure that there is no residual soap on their exterior surfaces.
- 5.4.6 The Contractor must ensure the safe undocking of the vessel and that no damage to the vessel will be incurred during the undocking process. The Contractor must have a sufficient number of personnel on board to respond in case of water ingress or other problems.
- 5.4.7 Prior to flooding the dry dock, the Contractor must ensure that all ship's side, including valves, are properly closed using a checklist.
- 5.4.8 Prior to the ship's departure, the Contractor must provide the CCG Technical Authority with the documentation required to obtain a certificate of seaworthiness from TCMS.

5.5 Platforms

- 5.5.1 The Contractor must supply the labour and material for the erection of access platforms required to execute the work specified in this Specification package and any additional agreed upon work. Upon completion of the work, the platforms will be disassembled and removed from the ship. The Contractor must include the cost of these preparations must in its bid.

5.6 Equipment

- 5.6.1 The Contractor's bid must include costs for transportation services, installation of gangways and ropes, craning and removal and reinstallation of parts and equipment required for the work.

5.7 Hot Work

- 5.7.1 The Contractor must supply the appropriate type and quantity of fire extinguishers including fire watches, required for all hot work until these surfaces and walls have cooled (see section 2.2.2). The ship's fire extinguishers must not be used except in emergency situations. If the Contractor must use one of the ship's fire extinguishers, it must be refilled and verified by an authorized company. The Contractor must

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

supply fire-retardant protection to protect cable trays, cables, equipment and structure against slag and any hot work by-products.

- 5.7.2 For each day that hot work is planned, the Contractor must submit a hot work permit to the Inspection Authority ensuring that safety measures have been identified and will be applied. If a permit is not available, the Contractor must alternatively submit a request to the Inspection Authority along with the safety measures planned. The Contractor must maintain the fire watch (firefighter) where the hot work took place for up to 30 minutes after stopping.

5.8 Access and Cumbersome Items

- 5.8.1 The Contractor must remove any piping, inspection hole covers, components and equipment where necessary, in order to perform the work and access work spaces. Upon completion of the work, the Contractor must reinstall the removed items with new gaskets, collars, hardware and anti-seize compound to be supplied by the contractor.

5.9 Temporary Lighting and Ventilation

- 5.9.1 The Contractor must supply, install and maintain any temporary lighting and ventilation as required to carry out the work in this Specification package. Upon completion of the work, the Contractor must remove these items.

5.10 Cleanliness

- 5.10.1 The Contractor must ensure that all spaces, compartments and areas of the ship, both interior and exterior, are returned to their original state (upon delivery of the ship). The cost of removing dust, debris and other materials must be included in the bid.

5.11 Certificates Issued by a Chemist

- 5.11.1 The Contractor must provide the Inspection Authority with certificates obtained from a marine chemist or other qualified person in accordance with TCMS Bulletin TP 3177E prior to conducting cleaning, painting or hot work in confined spaces or machinery compartments. These certificates must clearly indicate the type of work permitted and must be renewed in accordance with the regulations in effect. The Contractor must submit one copy to the Inspection Authority, must display one at the entrance of the affected work area.

5.12 Fixed Fire Detection and Extinguishing System (Sprinklers & CO₂)

- 5.12.1 Where work affects the ship's fire detection or extinguishing systems (sprinklers, CO₂), the Contractor must ensure that the ship and its occupants remain protected

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

from any risk of fire. The Contractor may only remove or deactivate one section of these systems at a time, by installing replacement parts throughout the work or by any other means accepted by the IA.

5.13 Coatings

5.13.1 All types of coatings required must be applied in accordance with their manufacturer's instructions and specifications on surface preparation, ambient conditions, drying/curing time, time between each layer, thickness of layers and preparation of coatings.

5.14 Primer

5.14.1 Unless otherwise specified, any new or replaced steel surface or part must be covered with at least two coats, (2.0 mils dry), of a marine primer according to the indication of the Pierre Radisson paint scheme. Unless otherwise specified, the primer must be supplied by the Contractor and the work must be accepted immediately upon completion by the IA. It is prohibited to use paint containing lead. All welds must be de-burred and cleaned before applying any primer.

5.15 Tools

5.15.1 Unless otherwise specified, the Contractor must supply all required tools needed to perform the work, with exception for some specialized tools that will be lent to the Contractor by the Technical Authority. Any tools lent to the Contractor must be recorded and returned upon completion of the work.

5.16 Instructions

5.16.1 The overhaul and installation of all machinery and equipment specified herein must be carried out in accordance with the applicable manufacturer's instructions, drawings and specifications.

5.17 Workmanship

5.17.1 The Contractor must use qualified, certified and competent tradesmen and supervisors to ensure a high quality and standard of work in accordance with ship construction/building standards and to the satisfaction of the Inspection Authority.

5.18 Supervision

5.18.1 During all phases of the contract, the Contractor must supervise the work of its staff and subcontractors. Personnel designated by the Inspection Authority will accompany the Contractor's employees at all times in accommodations and cabin spaces.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

5.19 Smoking

5.19.1 The Public Service Smoking Policy forbids smoking aboard Government of Canada ships. The Contractor must inform and ensure its employees and subcontractors adhere to this policy.

5.20 Halocarbons Policy

5.20.1 The Contractor must be aware of the Coast Guard control policy for halocarbons used on its ships. This policy is in Section 7.D.4 of the Fleet Safety and Security Manual. A copy is included in Appendix A on safety. The Contractor must ensure its employees and subcontractors respect this policy.

5.21 Disposal of Waste Oil and Hydrocarbons

5.21.1 The Contractor must dispose of all waste oil and hydrocarbons or assign the task to subcontractors holding the provincial licences required for disposal of petroleum products. Copies of these licences must be presented on request. Disposal of waste oil and hydrocarbons must be done in accordance with Canadian Coast Guard policy on handling of fuel, oil and waste oil, described in Chapter 7.C.1 of the Fleet Safety and Security Manual.

5.22 Waste Disposal

5.22.1 Disposal of waste generated by sandblasting and mechanical cleaning must be done by the Contractor or by a subcontractor holding a licence from provincial authorities for the disposal of such material. Disposal must be done in compliance with the provincial and municipal regulations. Copies of these licences must be presented on request.

5.23 Standards

5.23.1 All work in this Specification package or, otherwise authorized, carried out aboard the CCGS Pierre Radisson must respect Part 2 of the Canada Labour Code, the provincial regulations in effect, Maritime Occupational Health and Safety Regulations and the provisions of the Canadian Coast Guard Fleet Safety and Security Manual while the ship is in the custody of the CCG.

6.0 Not used

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

7.0 SERVICES

7.1 GENERAL

- 7.1.1 The following services for which unit prices must be submitted, must be provided to the ship while it is at the Contractor's facilities. These prices must cover the entire work period. Unit prices for each service must also be submitted for adjustment purposes based on variations in the duration of services. Services identified with an asterisk (*) will be required both in dry dock and at the Contractor's wharf.
- 7.1.2 The Contractor must supply all equipment, tools and machinery required to perform the work as described in this Specification package. The Contractor cannot make execution of work conditional on provision of equipment or other machinery that is not already included in its firm price by the Government of Canada or by a subcontractor paid by the Government of Canada. Lifting equipment must be properly adapted and of sufficient capacity for its intended use. It must be accompanied by a valid certificate indicating its safe working load, or bare a permanent marking indicating its safe working load.
- 7.1.3 All welded supports or other mountings required in this section must be installed by welders certified by the Canadian Welding Bureau. Upon completion of the work, all supports and mountings used for the work described in this Specification package must be removed from the ship.

7.2 (*) TEMPORARY PROTECTION OF DECKS AND BULKHEADS

- 7.2.1 In order to avoid accumulation of dirt in corridors and to protect floor coverings, the Contractor must supply and install Masonite (1/8 inch thick) on all deck surfaces and of the Main deck, Upper deck, Boat deck, Officers deck, Navigation deck, Bridge and the Control Room. The Contractor must also supply and install Masonite panels in all entries, staircases, the Chief Engineer's, the Engineers offices, the two (2) offices for the Government of Canada representatives, the Crew's Dining Room, the laundry room deck and the rear main deck from the port propulsion room entrance to the steering gear compartment, inclusive. The total area to be covered is approximately 650 m². For adjustment purposes, the Contractor must provide a unit price per square metre (m²).
- 7.2.2 The Contractor must supply and install 48 in. x 1/8 in. thick cardboard on the lower bulkheads of all deck corridors mentioned above. The Contractor must ensure that the cardboard and Masonite panels remain in good condition for the duration of the

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

contract. If the cardboard and Masonite panels become damaged, they must be replaced at the Contractor's expense.

- 7.2.3 Installation of the deck and bulkhead coverings must be done as soon as the ship arrives at the shipyard facilities. The Contractor is responsible upon taking charge of the ship. Upon completion of the work, the Contractor must remove all cardboard and Masonite panels and must remove any remaining adhesive residue on decks and bulkheads. The use of polyethylene covers is prohibited.

7.3 (*) ELECTRICAL POWER

- 7.3.1 The Contractor must supply two electrical power connections (600 VAC, three-phase, 300 amps/connection) for the duration of the contract (docked or in dry dock).
- 7.3.2 The Contractor must supply the material and labour to connect and disconnect as required, two electrical cables for shore power supply, each being 150 feet long with male plugs. These two cables must be connected in parallel onboard ship. Before powering the ship, the Contractor must ensure that power sources supplied have the same phase sequence at the source and on the ship. The nominal load of the ship is between 350 and 400 kilowatts. The ship will provide two, female plugs with two meter long extensions for connection to ship yard's electrical system. These cables must not be shortened. The cables and connections must be Megger-tested before connection.
- 7.3.3 The Contractor must provide a unit price per kilowatt hour which the Contractor must use in its bid to determine a price for a block of 500 000 kilowatt hours. This unit price will also be used to adjust (up or down) the ship's total consumption at the end of the contract period via a PWGSC 1379 form.
- 7.3.4 The Contractor must supply a kilowatt-hour meter and connect it to the ship's power source to track consumption. The Contractor must read the kilowatt-hour meter in the presence of the Technical Authority before connection and disconnection of the power supply to verify the electrical consumption. The meter must be read in the presence of the Technical Authority before and after any movement of the ship.
- 7.3.5 The power supply for which the price is indicated must only be used for the ship.
- 7.3.6 Upon completion of the work and disconnection of the shore power, the shore power adaptors/extensions must be disconnected from the cables and returned to the ship's Electrical Officer.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

7.3.7 NOTE: If the Contractor powers the ship using a diesel generator installed on the deck, it must be responsible for watch keepers and generator fuel.

7.4 HEATING

7.4.1 It is the Contractor's responsibility to ensure that heating and dehumidification are maintained for the duration of the contract. The Contractor is responsible for monitoring the environmental conditions onboard the ship to prevent damage from temperature variations. This must include protection from freezing of all piping systems containing liquids and protection against overheating in any spaces in which electronic equipment is susceptible to damage, such as the electronic equipment room, the wheelhouse and the engine control room. If the ship is shut down and unmanned, cooling water will not be necessary.

7.4.2 The ship's steam systems will be made available to the shipyard for steam production. The monitoring and operation of this system will be under the shipyard responsibility. A CCG engineer will be available to provide advice to the shipyard for the monitoring and operation of this system.

7.5 FRESH WATER AND FIREMAIN SEAWATER SERVICES

7.5.1 The Contractor must supply all material and labour to install necessary connections and supply fresh water necessary to provide the services described hereunder throughout the entire dry docking period. The Contractor must disconnect connections upon completion of work.

7.5.2 The Contractor must supply and install a calibrated flow meter for each domestic water supply line connected to the ship for the duration of the contract. Flow meters must be sized for the service they are intended for. The flow meter calibration records must be presented to the Inspection Authority. All flow meters must be read by the Contractor at the beginning and at the end of the contract period, as well as before and after any vessel movements to or from the fit out wall or the dry dock, in the presence of the Inspection Authority. The following connections are required to service the vessel:

- a) The Contractor must supply and install a 1½ inch hose certified for potable water. The water must come from a source that has recently been certified safe for human consumption by a health services authority from the local municipal or provincial government. The Contractor must supply a valid potable water certificate to the Inspection Authority before making the connection. Potable water must be supplied through a pressure regulator, complete with pressure gauge and isolation valve.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Potable water pressure will be held to fifty (50) psi gauge. Water consumption is approximately 8 tonnes/day. Filling of two potable water tanks (135 m³).

- b) The Contractor must supply a separate and continuous, uninterrupted non-potable water connection, which must pass through a pressure regulator and connected to the ship's fire main. The water supply must be connected immediately after the ship's entry into the dry dock. This water supply must be maintained at a pressure of 690 kPa (100 psi gauge) at all times and must be supplied by one 2.5 inch diameter hose. This installation must include an on-board pressure regulator equipped with a pressure gauge and isolating valve. The Contractor must communicate with the Inspection Authority to determine the exact locations for connecting to the ship. There must be no interruption of this supply while the ship is at the Contractor's facilities. It is the Contractor's responsibility to take all necessary precautions to ensure that lines do not freeze in cold weather. Water will be consumed as needed for firefighting and cleaning purposes. During the summer, air conditioning, refrigeration and air compressor cooling require 3,400 m³ of water per day. In other seasons, without air conditioning, 130 m³ are required per day.

7.5.3 The Contractor must include in its bid, a written price quote per cubic meter consumption of potable water, non-potable water and sea water.

7.5.4 The Contractor must supply separate fresh water for cleaning, testing and rinsing tanks, in accordance with these specifications. The cost of water consumption for these items of this specification package must be assumed by the Contractor.

7.6 OVERBOARD DISCHARGE/DRAINAGE CONNECTIONS

7.6.1 The Contractor must supply all required materials and labour to attach temporary drainage hoses to the overboard discharges as listed below, such as to prevent water from running down the hull and disturbing uncured paint. The Contractor must also supply and install temporary drainage hoses to each of the overboard scuppers in such a manner as to prevent water from running down the hull. All drainage connections must be drained to suitable disposal facilities and/or drains. It is the Contractor's responsibility to take all necessary precautions to ensure that lines do not freeze in cold weather. The Contractor must disconnect and remove all temporary connections upon completion of work.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

OUTLETS	DIMENSIONS	LOCATION
AIR CONDITIONING # 2 and 3	5"	STBD FR-94
AIR CONDITIONING # 4	4"	PORT FR-96
AIR CONDITIONING # 5	3"	PORT FR-36
DOMESTIC REFRIGERATION	3"	PORT FR-36
CARGO REFRIGERATION	3"	STBD FR-36
GREY WATER	4"	PORT FR-59
BLACK WATER	3"	STBD FR-96
BOILER PURGE	3"	PORT FR-96
CONDENSATE DRAIN	5"	STBD FR-96
FORWARD COMPRESSOR	2"	PORT FR-96
AFT COMPRESSOR	3"	PORT FR-96

7.7 BLACK WATER AND GREY WATER

7.7.1 For black and grey water, the Contractor must supply portable tanks or tanks that can be pumped out; the Contractor must be responsible for disposing of this water. All related costs must be included in this item. The Contractor must provide a unit price per cubic meter.

7.8 OILY BILGE WATER

7.8.1 The Contractor must indicate a price for the disposal of approximately 20,000 litres of oily bilge water from the ship's bilges. The Contractor must provide a unit price for each additional 1,000 litres regardless of the proportion. The price specified for this item must be adjusted upward/downward based on Contractor submitted invoices. The quantity stated of this item must only apply to the ship's needs and not to the Contractor's needs as required to complete any work described in this Specification package. The Contractor must provide the Inspection Authority with the name(s) of the company(ies) registered for pumping and disposal of waste oil, and receipts for the elimination of ship hydrocarbons for inclusion in the hydrocarbon service booklet.

7.9 (*) GARBAGE REMOVAL

7.9.1 The Contractor must supply suitably size garbage containers of 8 cubic yard placed on the flight deck beside the gangway for waste from the ship. These containers must be emptied daily.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

7.10 CRANES AND SCAFFOLDING

- 7.10.1 Provide the services of a 5-tonne crane from the shipyard for the ship's general needs, including an operator and all personnel needed to ensure that these operations are carried out safely. The Contractor must provide a price for this service for one (1) hour per working day, giving an average of five (5) hours per week, for the duration of the contract. For adjustment (up or down) purposes, the Contractor must provide an hourly rate for this service. The Contractor must maintain a record of crane usage that must be signed weekly by the Inspection Authority.
- 7.10.2 For the duration of the contract period, crane services must be provided by the shipyard for displacement of parts arising from the work described in this Specification package. This work must be in addition to the specific needs of the ship, and the costs must be included with each item of this Specification package.
- 7.10.3 The Contractor must provide a price for general services of a powered platform (cherry picker). The Contractor must provide a price for this service for one (1) hour per working day, giving an average of five (5) hours per week, for the duration of the contract. For adjustment (up or down) purposes, the Contractor must provide an hourly rate for this service. The Contractor must maintain a record of use that must be signed weekly by the Inspection Authority.
- 7.10.4 The Contractor must supply all labour and materials needed to set up scaffolding, work platforms or shelters required to carry out the inspection of the ship's hull by the TCMS inspector or by the crew, as well as all work performed on the ship's hull. This includes, but not limited to, scaffolding and equipment to access propellers, rudder, rudder trunk, bow thruster and cathodic anodes to be replaced.

7.11 CLEAN UP

- 7.11.1 At the end of the contract, the Contractor must rid the ship of all waste, debris and extraneous materials resulting from work carried out in this Specification package. The ship must be returned to its original state of cleanliness when it was handed over to the Contractor.
- 7.11.2 Upon completion of all work and final cleaning, the Contractor's Quality Assurance (QA) representative and the CCG Technical Authority must complete an inspection together of all compartments and spaces where work was performed by the Contractor. Any defect or damage noted during this visit must be recorded and compared with the digital images taken during the initial inspection (section 1.10).

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

7.11.3 The Contractor must repair any damage or defects resulting from the work carried out, at its own expense.

7.11.4 The Contractor must hire an external housekeeping service to perform a weekly cleaning of the following spaces: CCG representatives offices and washrooms, Chief Engineer, Electrical Officer and Senior Engineer's cabins (including living room/office, bathroom and bedroom), Engineers' office, the crew's dining room (cafeteria) and a shared washroom.

7.12 VESSEL SECURITY

7.12.1 The Contractor must ensure security of the ship while under his care, custody and control.

7.12.2 The Contractor must provide specialized security staff to carry out rounds all spaces, both interior and exterior, of the vessel. In addition to the requirements for hot work, the Contractor must conduct rounds every day at four-hour intervals. These rounds must include a visual inspection of every compartment. The security patroller must be trained and informed of how to immediately take appropriate action upon discovery of any risky or urgent situations for the ship.

7.12.3 When the ship is afloat, the Contractor must make arrangements to prevent damage to the ship due to wind, waves, tides, floods, fire and weather conditions. The Contractor must increase the frequency of security rounds in the event of bad weather conditions.

7.12.4 The Contractor must provide a logbook, to be submitted to the IA, and must be initialed by the security patroller must upon the completion of each round.

7.12.5 The Contractor must implement an alert system to intervene in case of emergency, including personnel qualified to remedy these situations and prevent potential damage to the ship. Damage to the ship due to the Contractor's failure to meet these requirements must be repaired at the Contractor's expense.

7.12.6 The Contractor shall provide certified shipkeeper staff 24 hours per day for the duration of the work period. The shipkeeper staff shall monitor the following systems and related equipment, which the Contractor shall retain in operation for the duration of the work period :

- a) detection and fire extinguishing systems (Sprinkler and fire main)
- b) Electrical distribution system and emergency generator
- c) heating and ventilation systems for the entire vessel

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- d) steam and condensate system
- e) sewage (except during the new system installation spec 40.0)
- f) potable water
- g) non-potable water
- h) alarm and monitoring

7.12.6.1 The shipkeeper qualifications shall meet the TCMS certification requirements to monitor and supervise the aforementioned systems.

7.13 VERMIN

7.13.1 The Contractor must protect the ship from infestation of rats or vermin for the duration of the contract period. The Contractor must exterminate all rats or vermin found on board the ship if they come onboard during the contract period.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

8.0 ADDITIONAL WORK

8.1 GENERAL

- 8.1.1 Additional work must be performed and inspected to the complete satisfaction of the IA and ABS, as required.
- 8.1.2 The Contractor's Quality Assurance Manager must implement an updated inspection plan and agree with the IA on the points to inspect before, during and after each additional work item.
- 8.1.3 The final inspection by the IA is essential for the acceptance of the work. The Contractor must take all necessary measures to provide the IA the opportunity to inspect the additional work.
- 8.1.4 Inspection of an item by the IA does not relieve the Contractor of the inspections required by ABS.

8.2 ADDITIONAL WORK

- 8.2.1 All additional work not described herein but arising from this Specification package and inspections must be negotiated by the PWGSC representative using a 1379 form, and by means of a written specification.
- 8.2.2 This written description of the work required will be provided by the IA to allow PWGSC to obtain a firm price before the commencing the work.
- 8.2.3 Canada reserves the right to cancel, in part or in full, any item of this Specification package if, on the ABS inspector's advice, it is no longer necessary to carry out an inspection due to the good condition of the component.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

9.0 HULL CLEANING AND INSPECTION

- 9.1.1 Within 4 hours of dry docking, the Contractor must clean the entire hull, from the keel to the top of the bulwarks, propellers, rudder trunk, bow thruster, bow thruster tube and rudder using fresh water under pressure (5,000 lb/in² minimum) to remove fouling and any loose material.
- 9.1.2 The IA and ABS inspector will inspect the hull, keel, propellers and rudder as soon as possible after they have been cleaned.
- 9.1.3 The Contractor must supply a motorised platform (cherry picker), including a certified operator, for a period of six hours, to facilitate the inspection.
- 9.1.4 The Contractor must use the unit price for adjustment purposes of the final cost.
- 9.1.5 The Contractor must clearly identify the repairs required by ABS to the hull plate welding butts and seams.
- 9.1.6 Perform the inspection work for the ice belt.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

10.0 HULL WELDING REPAIRS

10.1 SCOPE

10.1.1 The objective of this specification is to determine the amount of work/repairs required to the welded joints of the hull plating (butts and seams), as required by ABS. The extent of the work will be determined during the inspection of the vessel's hull, immediately after dry docking.

10.2 REFERENCES

10.2.1 Drawings and Documents

- 221-H-1 Shell expansion

10.3 TECHNICAL DESCRIPTION

10.3.1 The Contractor must supply all equipment, ventilation, scaffolding, shelters, chain hoists, cherry picker, slings and shackles required to perform the work.

10.3.2 After cleaning the hull, the Contractor must list the weld butts and seams to be repaired, as identified by the ABS inspector.

10.3.3 The welds to be repaired must be chamfered using compressed air arc gouging or grinding, and brought to their original levels using approved welding techniques and materials.

10.3.4 The Contractor must take into account that the following preparations must be implemented before welding the hull:

- Grit blasting of the hull side in accordance with Sa 2½ for a strip of about five (5) cm wide near all welds on the selected plating, until the metal is shiny and clean;
- Removal of all salt deposits, dirt, grease, etc., on the welds;
- Removal of all grit from the welds using vacuuming or compressed air jet. The Contractor must install a shelter made of polyethylene or equivalent in the work areas to prevent rain, snow, ice, or their melted counterparts from rapid cooling the welds;
- Plating welds must be preheated to 93°C (200°F) before welding.

10.3.5 The Contractor must provide a firm price to re-weld approximately 500 linear feet of plating welds (beads) on the port or starboard plating (butts and seams) with 18 welding passes on average to form a bead, for a total of 9,000 feet (2743 m) of linear welding. Provide a unit price per foot of bead for adjustment purposes of the actual final cost using the PWGSC Form 1379. The Contractor must provide in its bid the cost of gouging

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 10.3.6 Welding must produce an excess of about 1 in. (2.54 cm) wide by ¼ in. (6.35 mm) high.
- 10.3.7 The Contractor must ensure before the work that all undercuts and the separation plates are ground smooth.
- 10.3.8 Using the development drawing for the ship's hull plating (221-H-1 Shell expansion), the Contractor must indicate, using thick red marks on both port and starboard sides of the ship, the full extent of the new plating welds carried out during these repairs.
- 10.3.9 Any lugs or supports used for carry out these repairs must be removed and ground flat. All notches left by removal of the lugs must be ground in a V, re-welded and ground flat until the surface is smooth.

10.4 PROOF OF PERFORMANCE

10.4.1 Visual Inspection

The IA, TA and TCMS inspector must do the following:

- Inspect all welds of the hull (port and starboard).
- Inspect the condition of welds on sea water overboard discharges, seawater intakes and any other hull appendages.

10.4.2 Radiographic Inspection

- The Contractor must indicate a fixed price for 8 radiographic films of the welds and a firm price for 8 Ultrasound. The ABS inspector or IA must identify the areas to be filmed. In its bid, the Contractor must indicate a unit price per film. The firm and unit price must include required scaffolding and cranes.
- For radiographic inspection purposes, the surfaces of the welds and of the adjacent base metal must be thoroughly cleaned to allow a clear view of the area of interest (welding area). Visible discontinuities on the radiographic film identified later as surface discontinuities must be repaired and the location must be subject to a new radiographic inspection.

10.5 DELIVERABLES

- 10.5.1 The Contractor must provide the TA with a hard copy and an emailed digital version of the report detailing the work done, defects, repairs performed, measurements and readings taken.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 10.5.2 The Contractor must provide a "marked up" Shell Expansion drawing showing repairs made, as specified in item 15.3.10.
- 10.5.3 The Contractor must provide a report of the repaired weld joints using a copy of drawing 221-H-1 Shell expansion.
- 10.5.4 The Contractor must provide two copies of all radiographic films made.
- 10.5.5 The Contractor must provide a Quality Assurance (QA) report indicating that all areas as defined in this specification have been inspected by the Contractor's QA Department and all areas of defects established by this survey have been identified for remedial action.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

11.0 HULL CLEANING AND PAINTING

11.1 SCOPE

11.1.1 The purpose of this specification is to identify the work required to prepare the ship's hull for painting. The hull must be coated with two components, abrasion resistant epoxy coating, and design for an ice-going vessel. This work also applies to the seawater intake grids and hull markings.

11.2 REFERENCES

11.2.1 Drawings and Documents

- Hull surface _ 06418S21 Rev_C
- Pierre Radisson Coating scheme _ charte de peinture du Pierre Radisson

11.2.1.1 The coating to be applied to the hull of a polar icebreaker must meet the following criteria:

- The product must have been proven for at least 3 years on the hull of a polar icebreaker;
- Must be recognized by Lloyd's Register as a coating with a high resistance to abrasion;
- Must be effective at temperatures as low as -50°C;
- Anticorrosive epoxy coating with minimum 90% solids;
- It must be possible to paint the hull in a single application, with a thickness of at least 30 mils dry;
- Taber abrasion resistance (ASTM D4060¹, 1 kg, CS-17 wheel): maximum weight loss 50 mg;
- Elcometer adhesion value (ASTM D4541²): 1,000 psi min;
- Kinetic coefficient of friction against ice of less than 0.03 at a velocity between 10 and 25 cm/s.
- The coating must be compatible with the actual coating specified in the vessel coating scheme.

11.3 TECHNICAL DESCRIPTION

11.3.1 The epoxy coating designed for ice-going vessel to be applied to the hull of a polar icebreaker must meet the following criteria:

- The product must have been proven for at least 3 years on the hull of a polar icebreaker;
- Must be recognized by Lloyd's Register as a coating with a high resistance to abrasion;
- Must be effective at temperatures as low as -50°C;
- Anticorrosive epoxy coating with minimum 90% solids;
- It must be possible to paint the hull in a single application, with a thickness of at least

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

30 mils dry;

- Taber abrasion resistance (ASTM D4060¹, 1 kg, CS-17 wheel): maximum weight loss 50 mg;
- Elcometer adhesion value (ASTM D4541²): 1,000 psi min;
- Kinetic coefficient of friction against ice of less than 0.03 at a velocity between 10 and 25 cm/s.
- The coating must be compatible with the actual coating specified in the vessel coating scheme.

11.3.2 This includes all submerged parts from the keel to 0.9 m above the load line, including the rudder, rudder stock, the ship's bow covering the anchor pockets, the rudder trunk, seawater intake grids, bow thruster tunnel and its two grates.

11.3.3 A band on the hull 2 m below the load line and 0.9 m above the load line must be painted with a red color (ERA174-CGuard Red) and the rest under this band, including the rudder and rudder trunk tube must be painted with a black color coating (ERA163-Black) on the bare metal only.

11.3.4 General Preparation

11.3.4.1 The following items and locations must be protected so that they are not damaged during sandblasting and the application of coatings. The items to protect include, but are not limited to: accommodations and vents, ventilation intakes, bearings, screw threads, oil grooves, grease points, gears, shafts, universal joints, machined surfaces, name plates, gaskets, electrical insulation, cable troughs, electrical panels and installations, windows, hinges, and all moving parts in general.

11.3.4.2 Air vents and ventilation intakes must be covered with watertight polyethylene film. Cranes, davits and winches must be protected.

11.3.4.3 All fuel and ballast tank drain plugs, including double bottoms tanks, sea chests and cofferdams must be protected during paint application and fully uncovered before refloating the ship. The same must be done for the echo sounder and Doppler transducers.

11.3.4.4 Propellers, propeller shafts, gaskets, shaft sleeves, rudder and rudder stock bearings, bow thruster, echo sounder and Doppler transducers and the anodes must be covered prior to sand blasting and painting, and remain covered until the completion of work. If there is paint on the plugs for the hoisting eyebolts on the hull, it must be removed by sandblasting.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 11.3.4.5 The Contractor must protect the fair lead sand mooring pipes, as well as the six (6) warping rollers during application of the paint system on the plating, then paint apply two coats (2.0 mils dry) of a black paint according to the ship coating scheme .
- 11.3.4.6 After paint application, the Contractor must demonstrate to the IA that the functioning of the Port Colborne fair leads and warping rollers has not been restricted. If so, the Contractor must repair the damage from the painting.
- 11.3.4.7 The portholes near the areas that must be grit blasted and coated must be protected by a fitted rubber protector that fully protects the glass while allowing the porthole frame to be grit blasted.
- 11.3.4.8 All overboard discharges and scuppers must be fitted with a drain plug or spouts to ensure that any active overboard and water run offs is drained clear of the ship's side before sandblasting and coating work starts. The Contractor must plug all drainage scuppers with wooden plugs perforated with a piece of pipe in the center. Seawater intakes must be adequately protected.
- 11.3.4.9 The Contractor must take the necessary measures to assess and prevent water or snow runoff from affecting grit-blasted or newly painted surfaces. These measures must be included in its firm price.
- 11.3.4.10 Water, rain or snow runoff that comes into contact with fresh epoxy coatings can produce an amine blush. The Contractor must clean these areas using an appropriate solvent if this occurs.
- 11.3.4.11 The Contractor must supply and install a temporary shelter covering the ship's entire hull. This shelter must rise above the bulwarks and be ventilated and heated depending on the time of year. It must withstand the elements and be sealed against the ship's hull. The heated and ventilated shelter is mandatory, regardless of the outside temperature or weather conditions. The Contractor must ensure that ventilation is sufficient for drying and meets the health and safety standards for the product applied.
- 11.3.4.12 All coating products must be stored by the Contractor in a space that has been planned based on the material safety data sheets.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

11.3.4.13 It is the Contractor's responsibility to order all coating products in a timely manner and to properly eliminate the used containers and solvents.

11.3.4.14 Contractor is to supply and install a temporary shelter to cover the entire section of ship's hull to be painted. This shelter shall be ventilated and heated. It shall also be able to sustain heavy weather and still keep water away from the hull.

11.3.5 Preparation of Underwater Hull and Rudder Trunk Shaft Surfaces for Coating Application

11.3.5.1 The hull and the rudder trunk shaft must be washed in advance with fresh water, to remove salt and debris from the surface to be treated.

11.3.5.2 Any surface preparation and coating application must follow the manufacturers' recommendations, unless otherwise specified, including recommendations for surface profile, drying time between coats and intervals before finishing coats, drying time once the coating has been applied, wet coat thickness, dry coat thickness and drying time before immersing the coating during flooding of the dry dock. This applies to all coatings used during the work.

11.3.5.3 The Contractor must provide a firm price to repair 1225.6 m² (314.5 m²+ 911.1 m²) of damaged hull surfaces.

11.3.5.4 Indicate a unit price per square metre for preparation of external steel surfaces of the hull. This price must include all costs required to carry out the task.

11.3.5.5 Damaged surfaces must be sandblasted using an abrasive with a minimum size of 80 microns in order to obtain a surface that meets the requirements of Sa 2½ of the Swedish standard SIS 055900, or SSPC-SP-1 (near white).

11.3.5.6 On surfaces where the Inerta coating is still intact, grade the paint toward the bare metal, 15 mm maximum.

11.3.5.7 All coating repairs must be thinned by sanding up to the intact surface. Areas that are soiled, damaged or missed must be retouched or re-coated.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 11.3.5.8 The Contractor must prepare all new steel items to the Sa 2½ standard and apply a coat of a heat resistant zinc silicate pre-construction shop primer, in accordance with the manufacturer's instructions.
- 11.3.5.9 Once the sandblasting is completed and prior to application of paint or primer, dust must be removed from steel surfaces using a jet of dry, oil-free air. No paint must be applied before the surface preparation has been verified by the IA.
- 11.3.5.10 All contaminated areas targeted by the surface preparation must be cleaned with a solvent, in accordance with the standard SSPC-SP 1.
- 11.3.5.11 The profile obtained by grit blasted surfaces must be angular and coarse-grained, from 50 to 75 microns, unless otherwise specified in the coating manufacturer's specifications.
- 11.3.5.12 The profile of any paint or steel surface where the coating must be applied must have a minimum roughness of 3 mils.
- 11.3.5.13 A coating must be applied to the prepared areas before the appearance of instant rust. Otherwise, the operation will be deemed unacceptable and must be repeated at the expense of the Contractor.
- 11.3.5.14 Areas where cleaning is required by the specifications must be checked by the Contractor for chlorides and areas considered unsuitable for coating must be re-washed; the Contractor is responsible for the costs associated with this work.
- 11.3.5.15 The high porosity (pitting) of certain areas of sheet metal and welds has the effect of causing inclusions of air bubbles that yield during drying and expose steel. In order to remedy this situation, the contractor must bid for the application of a black or red epoxy coating strip-coat with brush on the porous joints (pitting) for a surface to be treated of 80 m² and a thickness of the dry film of 12 mils. Application should be made 12 hours prior to spray application.

11.3.6 Application of hull epoxy Coating (ERA174-CGuard Red)

- 11.3.6.1 All coatings must be applied using airless spraying equipment in a well-lit and well-ventilated area. Areas that cannot be spray painted, such as cut-outs and gussets, must be painted using a brush or roller to obtain the indicated dry film thickness (DFT).

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

11.3.6.2 Where this specification indicates the application of a coating to a specific point is required, the finishing coats must completely cover the undercoats.

11.3.6.3 The Contractor must consider a surface of 314.5 m² (50%) to repair, within the load line area (ice belt area), that must be prepared and painted. This surface covers an area of the hull 2.9 m high, being 0.9 m **above** the load line extending to 2 m **below** the load line over the ship's entire perimeter, including the bow and the anchor pockets.

11.3.6.4 Surfaces where Inerta 160 are still intact must be rendered rough and dull (lightly sandblasted), according to the paint manufacturer's (International) recommendations, in order to promote good adhesion of the Inerta paint.

11.3.6.5 The Contractor shall supply and apply the Abrasion Resistant Epoxy Coating, designed for ice navigation, Red Coast Guard (RAL 3000), to a minimum thickness of 0.020 " DFT.

11.3.6.6 The dry film thicknesses (DFT) indicated are the minimum required and must be verified. The Contractor must monitor the surface, the ambient temperature and humidity, and painting may only take place if these conditions comply with the paint manufacturer's instructions. Otherwise, the Contractor must provide a confined area where ambient conditions can be controlled. The Inspection Authority must be able to examine these factors upon request.

11.3.6.7 All precautions must be taken during application of the final layers to ensure that the ship's equipment is protected against excessive paint over spray, more specifically, electronic equipment or others subject to more serious harm in case of excessive over spray.

11.3.6.8 Excessive formation of runs, ridges and sags in the coating must be removed by brush or roller while still wet. If the coating dries, these defects must be removed and sanded, and the Contractor must apply a new coating to the area at its own expense.

11.3.7 Application of Black Coating (ERA163-Black)

11.3.7.1 From two metres below the load line, only the damaged surfaces must be treated, including the seawater intake grids, bow thruster grates, propeller shaft guards (rope guards), rudder and rudder stock. The Contractor must consider an area of 911.1m² (50%) to repair

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

11.3.7.2 The Contractor must lightly sandblast around the damaged surfaces in order to blend this paint system with the previous system.

11.3.7.3 The Contractor must supply and apply two coats of the abrasion resistant epoxy coating designed for ice-going vessels, black color, on all bare metal surfaces to obtain a total thickness of 0.020 in. (DFT).

11.3.7.4 Excessive formation of runs, ridges and sags in the coating must be removed by brush or roller while still wet. If the coating dries, these defects must be eliminated and sanded, and the Contractor must apply a new coating to the area at its own expense and to the satisfaction of the Inspection Authority.

11.3.8 Additional Recommendations and Requirements

11.3.8.1 After sandblasting the rudder, replace the concrete in 96 welding plugs 20 mm x 5 mm x 2.5 mm depth. The Contractor must supply the material and fill all these holes with Speed Crete Blue Line 3900-132, available from W. R. Meadows of Canada Ltd., sold in Montreal, Tel.: (514) 731-6119., or equivalent.

11.3.8.2 Every precaution must be taken after sandblasting to minimize steel oxidation by applying the coating as soon as possible. Clean surfaces with dry, oil-free compressed air before application of the product.

11.3.8.3 It is therefore very important to define the area of steel plating that can be prepared and coated in a period of time during which employees can work non-stop and in which the application conditions are adequate.

11.3.8.4 The Contractor must hire a field service representative of paint manufacturer for expert advice and to ensure that the conditions required for preparation, mixing and application of the coating are met. CCG reserves the option to hire a Nace Inspector to monitor the work .

11.3.8.5 The coating must be applied according to the conditions recommended by the manufacturer.

11.3.8.6 The Contractor must clean, collect and dispose of all sand used to sandblast the ship's hull, including the rudder and rudder trunk. Disposal of the sand must be done in accordance with the environmental standards in place.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

11.3.8.7 The Contractor must provide the magnetic particle tests for the shelter anchors temporarily welded to the hull.

11.4 PROOF OF PERFORMANCE

11.4.1 Inspection

11.4.1.1 The following inspections must be carried out in the presence of the IA:

- Visual inspection of the hull after cleaning;
- Transducer surfaces washed;
- Adequate protection of the parts described in this specification;
- Degree of cleanliness after painting;
- Removal of protective materials after painting.

11.4.1.2 All stripping and coating work must be inspected by the Contractor in accordance with the agreed-upon quality assurance plan, of which a copy must be submitted to the TA, and will be subject to periodic inspection by the IA.

11.4.1.3 The surface profile must be measured in accordance with NACE International RP0287-95.

11.4.1.4 The references below must be used for the coating application inspection procedures:

- SA 2½ or SSPC SP10 – Near White Blast Cleaning of metal;
- SA 2 or SSPC SP6 – Commercial Blast Cleaning;
- SSPC-SP1 – Solvent Cleaning;
- NACE International RP0287-95 – Field Measurement of Surface Profile of Abrasive Blast-Cleaned Steel Surfaces Using a Replica Tape.

11.4.1.5 The Contractor must supply assistance and equipment (cherry picker with operator) required to the CCG representatives and the FSR for inspection of work.

11.5 DELIVERABLES

11.5.1 The Contractor must submit an inspection report from the coating manufacturer's technical service representative.

11.5.2 The Contractor must provide the IA a detailed quality assurance report once the work is completed. This report must include, but not limited to, the inspection

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

reports, dry film thickness (DFT) measurements and condition monitoring data during the coating application.

- 11.5.3 The Contractor must provide a new docking plan indicating the position of each block for the next dry docking.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

12.0 HULL PAINTING ABOVE THE WATERLINE

12.1 GENERAL

12.1.1 The purpose of this item is to prepare and paint the ship's hull, from the load line up to the bulwark, including above the bulwark and where the accommodation ladders are located. These ladders must be removed and reinstalled after the paint system has been applied. The Contractor must demonstrate that they function properly when reinstalled.

12.1.2 The Contractor must supply and apply two base coats of red oxide, self-priming, epoxy coating (FPL274/A5FL), 0.005" to 0.006" (0.13 mm to 0.15 mm) thick, red in colour, on all bare metal surfaces, and then two 0.0015" (0.04 mm) thick coats of a acrylic polyurethane coating red Coast Guard (RAL 3000) over the entire surface. The paint shall be compatible with the existing paint.

12.1 REFERENCES

- Pierre Radisson Coating scheme _ charte de peinture du Pierre Radisson

12.2 TECHNICAL DESCRIPTION

12.2.1 The total surface area of the plating above the waterline is 1000 m², including a 0.9 m encroachment on the red ice-going vessel epoxy band.

12.2.2 The maximum load line (waterline) is represented by welding marks that are located at regular intervals all around the hull of the vessel. On the CCGS Pierre Radisson, these marks are at every 7.1 m, which is the reference for determining the surface areas for the entire hull.

12.2.3 Of this surface, 15% (150m²) must be repaired. The surface must be sandblasted with abrasive sand to obtain a coarse angular surface profile of 75-100 microns, commercial standard SA 2½, Swedish Standard SIS 055900, or SSPC-SP-10 (near white).

12.2.4 The Contractor must indicate a fixed price per square metre for preparation of external steel surfaces of the hull. This price must include all costs required to complete the task.

12.2.5 The Contractor must ensure that all sand used to sandblast the ship's plating is collected and disposed of. Disposal of the sand must be done in accordance with the applicable environmental standards.

12.2.6 The rest of the surface (850 m²) will be roughened using mechanical equipment after cleaning it with a high-pressure water jet (5000 PSI).

12.2.7 Before applying paint all surfaces must be blown off with compressed air.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

12.2.8 The Contractor must supply and apply two base coats of red oxide, self-priming, epoxy coating (FPL274/A5FL), 0.005" to 0.006" (0.13 mm to 0.15 mm) thick, red in colour, on all bare metal surfaces, and then two 0.0015" (0.04 mm) thick coats of a acrylic polyurethane coating red Coast Guard (RAL 3000) over the entire surface.

12.2.9 Mark off the paint in a straight line at the load line and notify the Inspection Authority for approval.

12.2.10 Additional recommendations and requirements:

12.2.10.1 During painting, the Contractor must keep all deck scuppers plugged using perforated wooden plugs.

12.2.10.2 All portholes and windows on the upper deck must be protected during sandblasting and painting work, and uncovered upon completion of the work.

12.2.10.3 The edges of the portholes must be cleaned by sandblasting or mechanically, and painted. The portholes must be protected from any damage that could occur during sandblasting.

12.2.10.4 For the duration of the sandblasting work, all the vessel's vents and ventilation openings must be covered with a watertight polyethylene film to prevent sand from entering the vessel's accommodation and the engine room spaces. All equipment located on the upper deck and boat deck (anchor windlass, mooring winch, crane, davits, etc.) must be covered in the same way. Upon completion of the work the Contractor must remove and dispose of all protective coverings.

12.3 PROOF OF PERFORMANCE

12.3.1 Inspection of the surface preparation must be performed by referring to the following standards:

- Sa 2½ or SSPC SP10 – Near White Blast Cleaning of metal;
- Sa 2 or SSPC SP6 – Commercial Blast Cleaning;
- SSPC-SP1 – Solvent Cleaning;
- NACE International RP0287-95 – Field Measurement of Surface Profile of Abrasive Blast-Cleaned Steel Surfaces Using a Replica Tape.

12.4 DELIVERABLES

12.4.1 The Contractor must provide the technical data sheet for the paint products used.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

13.0 FREEBOARD, DRAFT, AND SYMBOLIZATION MARKINGS

13.1 GENERAL

13.1.1 The purpose of this specification item is to repaint the marking of the hull and freeboard, once the vessel's hull and plating have been painted.

13.2 REFERENCES

13.2.1 06418-SF, Federal Symbolization

13.3 TECHNICAL DESCRIPTION

13.3.1 The freeboard discs, lettering, load lines, and draft marks, fore and aft, port and starboard, must be painted with two coats of white RAL 9003 (PHB000) paint or black RAL9004 (PHY999) that are compatible with the paint coating the vessel's hull and plating. For the draft marks on the Inerta, follow the procedure mentioned in Section 17.2.

13.3.2 List of hull markings to be painted:

- a) The name of the vessel on port and starboard sides, fore and aft, as well as the port of registry;
- b) On both sides of the vessel, the inscriptions "COAST GUARD" AND "GARDE CÔTIÈRE", as well as diagonal white stripes, delineated by black stripes;
- c) The inscription "DANGER" with the symbols for "PROPELLERS" and "BOW THRUSTER" at the aft on both sides;
- d) The inscriptions/lettering of the Canadian flags, CANADA, PÊCHES ET OCÉANS, FISHERIES AND OCEANS, on both sides of the vessel.

13.3.3 Referring to the plans, mark off the limits of the white diagonal and black stripes on the hull, just above the ice belt.

13.4 PROOF OF PERFORMANCE

13.4.1 Inspection of the surface preparation must be performed by referring to the following standards:

- SA 2½ or SSPC – *Near White metal blast cleaning*;
- SA 2 or SSPC SP6 – *Commercial blast cleaning*;
- SSPC-SP1 – *Solvent cleaning*;
- NACE International RP0287-95 – *Field measurement of surface profile of abrasive blast cleaned steel surfaces using replica tape*.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

13.4.2 Freeboard markings must be inspected by the CCG Inspection Authority, referring to the drawings.

13.5 DELIVERABLES

13.5.1 The Contractor must provide the owner a detailed quality assurance report once the work is completed. This report must include, but is not limited to, the inspection reports, dry film thickness (DFT) measurements and condition monitoring data during the coating application.

13.5.2 The Contractor must provide the technical data sheet for the paint products used.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

14.0 GRIDS, SEA CHEST AND SEA BAYS

14.1 SCOPE

14.1.1 The objective of this specification is to do the maintenance of the sea chests and sea bays. The work includes the cleaning-up, touch-up and anode replacement.

14.2 REFERENCES

14.2.1 Reference drawings:

- 221-670-5_01
- 221-670-5_02
- 221-H-101

14.3 TECHNICAL DESCRIPTION

14.3.1.1 Sea bay and sea chest list:

Description	Location
Starboard high suction, Forward engine room	95-97
Starboard low suction, Forward engine room	95-97
Port lower suction, Forward engine room	95-97
Port high suction, Aft engine room	92-95
Port low suction, Aft engine room	92-95
Starboard low suction, Aft engine room	92-95
Port low suction, Propulsion motor room	60-61
Starboard low suction, Propulsion motor room	60-61
Starboard high suction, Propulsion motor room	59-61
Starboard high suction, Submersible pump	58-59
Starboard sea chest, Sprinkler pump	30-31
Port sea chest, Evaporators	120-123
Starboard sea chest, bow thruster compt.	165-166
Port & Stbd sea bay, forward engine room (14 T)	95-97
Port & Stbd sea bay, aft engine room (14 T)	93-95
Port & Stbd sea bay, propulsion motor room (7 T)	55-61

14.3.1.2 The Contractor must open all access grids and manholes for sea chests and sea bays. To gain access to the sea bays, the Contractor must remove any piping blocking the manholes. The contractor must remove the drain plugs to drain the boxes and reinstall them at the end of the

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

work. The drain plugs should be tested with a vacuum box following reinstallation.

14.3.1.3 The following table indicates the sea chests where the Contractor must supply and install two (2) zinc anodes, 15 lbs each.

Description	Location
Starboard high suction, Forward engine room	95-97
Starboard low suction, Forward engine room	95-97
Port low suction, Forward engine room	95-97
Port high suction, Aft engine room	92-95
Port low suction, Aft engine room	92-95
Starboard low suction, Aft engine room	92-95
Port low suction, Propulsion motor room	60-61
Starboard low suction, Propulsion motor room	60-61
Starboard high suction, Propulsion motor room	59-61

14.3.1.4 Remove 28 extensions from the seawater boxes to allow cleaning. The 28 extensions should be cleaned with a high-pressure water jet. Then inspect the condition of each extension and provide a report to the Coast Guard. The contractor must plan to remove all components, equipment and machinery required to remove the 28 extensions.

14.3.1.5 The Contractor must clean all sea chests and sea bays. The internal surfaces must be cleaned using a high-pressure water jet at 5,000 lb/in.² (240 kPa).

14.3.1.6 For bidding purposes, the Contractor must provide a price to mechanically clean a surface of 50 m² (538 ft²) using a mechanical brush, followed by application of one coat of coating compatible with the vessel paint scheme, with a dry coat thickness of 0.15 mm (0.006 in.). For adjustment purposes of the final cost, the Contractor must also provide a unit price per square metre (m²).

14.3.1.7 The Contractor must close all sea bay and sea chest manholes. Manhole covers must be closed using new gaskets, bolts, nuts, and washers to be supplied by the Contractor. The holes of the perforated grids must be mechanically reamed to their original diameter. The perforated grid covers must be closed with new corrosion-resistant bolts and tack welded. All fasteners must receive an application of anti-seize compound. There are 120 countersunk bolts, ¾ in. (1.9 cm) by 5 in. (12.7

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

cm) long. Nuts welded on the interior must be removed and replaced with new nuts welded in the same locations. Six bolts must be shortened. Nuts and bolts must be supplied by the Contractor.

14.3.1.8 The Contractor must open and clean the six sea water suction strainers (2 strainers per engine room and motor propulsion room). The internal surfaces and the cover of the strainers must be mechanically cleaned. Apply two coats of paint compatible with the vessel paint scheme, black paint. All strainers must be closed using new gaskets, bolts, washers and nuts, which must be supplied by the Contractor.

14.3.1.9 Important: No anode must be installed in the evaporator water intake. The paint used for touch-ups in the seawater intake of evaporators must be certified according to ANSI-NSF 61 for drinking water tanks. No solvents should be added to the paint.

15.0 CATHODIC PROTECTION SYSTEMS

15.1 Identification

- 15.1.1 Inspection of the anodes for the cathodic corrosion protection system and the hull anodes.
- 15.1.2 Renewal of the damaged anodes
- 15.1.3 Calibration of the cathodic protection system according to the manufacturer's specifications.

15.2 References

- 15.2.1 Manual
 - 15.2.1.1 Instruction Manual for « CATHELCO » Electrolytic Protection System
- 15.2.2 Drawings
 - 15.2.2.1 C.C.G.S. Radisson - Anodes – 1
 - 15.2.2.2 C.C.G.S. Radisson - Anodes – 2
 - 15.2.2.3 C.C.G.S. Radisson - Anodes – 3
 - 15.2.2.4 C.C.G.S. Radisson - Anodes – 4

Location of anodes:

54 corrosion-resistant anodes are located as follows:

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Description	Location	Frame	Anode	Qty	Panel
Starboard low seabox	Sprinkler pump	30-31	KE -28	2	E
Seabay (Port and Stbd)	Propulsion motor room (7T)	55-61	KE 28-35	10	D
Port and Stbd Low seabox	Propulsion motor room	60-61	KE 28-35	4	D
Starboard High seabox	Propulsion motor room	58-61	KE 23-28	3	D
Seabay	Aft engine room (14T)	93-95	KE 28-35	10	C
Port and Stbd. low seabox	Aft engine room	92-95	KE 4-28-35	6	C
Port high seabox	Aft engine room	92-95	KE 4-23-28	3	C
Seabay	Forward engine room (14T)	95-97	KE 28-35	10	B
Starboard high seabox	Forward engine room	95-97	KE 4-23-28	2	B
Port and Stbd low seabox	Forward engine room (<i>Note: #20 Neck 6" offset</i>)	95-97	KE 4-28-35	4	B

15.3 Statement of work

15.3.1 Preparation

- 15.3.1.1 Provide the service of a FSR from the manufacturer EMCS for the inspection and the calibration of the system. The contractor must bid for 1 round trip to the dry dock. RDs are required for 7 days or 84 hours.
- 15.3.1.2 Prior to the commencement of any and all work, the Contractor must lock out the power supply for the cathodic protection system as per the Coast Guard ISM Safety Lockout Procedure 7.C.1.M S36-01 safety code.
- 15.3.1.3 The Contractor must install/remove locks and tags accordingly during the scope of work.
- 15.3.1.4 The contractor must consult the IA or TA to determine the equipment that must be locked out.
- 15.3.1.5 It must be the Contractor's responsibility to perform the actual lock out and the Contractor must supply and install its own locking devices and retain all keys during the scope of this work.
- 15.3.1.6 The Contractor must perform all work as per manufacturer's specifications and recommendations in the manufacturer's instruction manual.

15.3.2 Anodes inspection (Cathelco system)

- 15.3.2.1 The Contractor must remove the covers on all anode connection boxes which are to be opened for inspection only. Any defect found must be brought to the attention of the IA or TA for remedial action if necessary. On completion of all work, the Contractor must close the connection boxes using new gaskets.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

15.3.2.2 To gain access to the CATHELCO system anodes, the Contractor must remove all (28) suction pipe extensions from the sea bays. After work has been carried out, the Contractor must reinstall the same extensions using new corrosion-resistant bolts and nuts, as well as new gaskets.

15.3.2.3 The Contractor must disconnect the electrical connections and remove all Cathelco anodes identified in drawings 68-2730-1 and ESK-26 and present them to the IA. The Contractor must dispose of all anodes not being conserved by the CCG.

15.3.2.4 The Contractor must install the new anodes supplied by the TA and verify ground resistance of each anode. The Contractor must verify ground resistance of the electrical wiring linking each anode to the control panel before connecting it to the anodes. The Contractor must supply a report of the readings of the ground resistances to the IA.

15.3.3 Calibration

15.3.3.1 The Contractor must calibrate the cathodic protection system to the manufacturer's recommended levels and test its performance once all work has been completed and the ship has been re-floated.

15.3.3.2 The crew will perform the adjustment of the system in salt water, to a current between 1 and 2 amps.

15.4 Proof of performance

15.4.1 The following inspections are required to be verified by the IA or/and TA:

15.4.1.1 Visual inspection of connection boxes,

15.4.1.2 Visual inspection of reference anodes,

15.4.1.3 Visual inspection of protection anodes,

15.4.1.4 Witnessing installation and connection of new anodes - if required,

15.4.1.5 Witnessing the calibration of the system.

15.5 Deliverables

15.5.1 The contractor must supply the Technical Authority an electronic copy, on a USB stick not protected by a password, in Microsoft Office Word 2003 or more recent format, a report detailing all undertaken works, defects, repairs performed, measurements and readings taken.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 15.5.2 The Contractor must provide a Quality Assurance (QA) report indicating that all parts of the cathodic protection system has been inspected by the Contractor's QA Department for correct installation and fit.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

16.0 PROPELLERS

16.1 SCOPE

- 16.1.1 The Contractor must remove the propellers for overhaul and dismantling of the shaft lines.
- 16.1.2 The Contractor must measure the wear down of the two propeller shafts and record the measurements.
- 16.1.3 If the propellers are not damaged and no work is required by the ABS inspector or CCG, this item can be cancelled in whole or in part. At that point, a credit will be applied via a 1379 form.

16.2 REFERENCES

16.2.1 Drawings and Documents:

- 26801M
- Instruction booklet for Pilgrim type nuts
- Instruction booklet for Morpress pump

16.2.2 Material supplied by the Coast Guard:

All special tools and equipment required to carry out this work will be supplied by the ship and must be returned to the CCG in good condition once the work is completed. Photos of the tools must be taken in the presence of a CCG representative and a shipyard manager. Copies of the photos must be given to both parties.

List of special tools supplied by the ship:

Special tools for propeller removal/Installation	
<u>Tools</u>	<u>Storage Location</u>
Lifting eyes (5) to be screwed to the hull and rudder stock	Steering gear compartment
Lifting eye (1) for propeller	Steering gear compartment
Round wrench for Pilgrim nut	Boat/flight deck near the helicopter hangar
Special studs (8) for propeller removal	Steering gear compartment
Special nuts (8) for propeller removal	Steering gear compartment

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Support plate (1020 mm) propeller removal	Tunnel forward of the helicopter hangar
Hydraulic pumps (2)	Steering gear compartment
High-pressure hoses for hydraulic pumps	Steering gear compartment
Hydraulic pump connections and Dowty Seals hydraulic pump	Central Stores, see Chief Engineer

16.2.2.1 The Contractor must include in its bid, the handling of these tools, including returning them to their respective storage locations. These tools must be returned in the same working condition and cleanliness as before the work.

16.3 TECHNICAL DESCRIPTION

16.3.1 Inspection of Propellers:

16.3.1.1 The rope guards must be removed in order to measure the wear down of the port and starboard propeller shafts. These measurements are to be taken with a feeler gauge in the presence of the IA and recorded for presentation to the ABS inspector. Upon completion of the work, replace the rope guards with new ones. They must be welded continuously along their entire circumference; joints between half-sections must also be welded.

16.3.1.2 The propellers must be inspected by the Coast Guard IA, as well as a qualified service provider recognized by the propeller manufacturer, and by ABS.

16.3.1.3 The contractor shall do a dye penetrant on each blade edge (minimum width of 6 in) and at the root of the blade.

16.3.1.4 A dye penetrant crack test must be conducted on the keyway of the two propellers.

16.3.1.5 If they are damaged, and after they have been assessed by a specialist, they will be loaded into a truck and sent for reconditioning to a qualified service provider. The specialized firm must provide a welding procedure approved by the propeller manufacturer. After welding repair, the propeller must be balanced. The cost of the reconditioning work will

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

be adjusted using a PWGSC 1379 form as per the subcontractor's invoice. The specialist selected must be certified by a Classification Society. The Contractor must provide a report of the repairs made on the propellers and must be submitted to Transport Canada. The Contractor must verify the pitch and the blade thickness of the propellers and produce a report. The contractor must provide an optional price for polishing and balancing each propeller.

16.3.2 Propeller Removal

- 16.3.2.1 The IA must be present for the duration of the propeller removal operation.
- 16.3.2.2 After removing the cement, unbolt and remove the propeller cones and place them at the bottom of the dry dock. These cones are filled with Tallow.
- 16.3.2.3 Unbolt and remove the locking plates (locks) of the two Pilgrim nuts.
- 16.3.2.4 The Pilgrim nuts are to be completely unscrewed from the propeller shafts and reinstalled, taking care to turn them around so that the nuts' internal surface (pressure ring) faces outwards and not toward the propeller hub. The threads of the propeller shaft must be properly cleaned to the satisfaction of the IA. The smallest amount dirt or steel shavings can cause the nut to seize on the shaft.
- 16.3.2.5 After removing the Pilgrim nut and before reversing it on the threaded portion of the shaft, the position of the propellers on the shaft taper must be measured. These measurements must be retained as reference for the reinstallation of the propellers.
- 16.3.2.6 Place the air release valve vertically on top to remove any trace of air. The O-rings and rubber seals of the internal face (stern tube side) of the propeller hub must be removed.
- 16.3.2.7 The eight special studs (supplied by the ship) can then be installed in the threaded holes of the propeller hub.
- 16.3.2.8 A special prefabricated plate, 6 inches thick by 4 foot in diameter (supplied by the ship), must be slipped on to the eight special studs and secured against the Pilgrim nut and propeller shaft by eight special nuts (supplied by the ship).

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

16.3.2.9 The contractor must apply pressure using the Morpress hydraulic pump (supplied by the ship) to force the propeller off of the shaft taper. The inflatable nitrile rubber ring (Nitrile Tyre) must be purged of air using the Morpress pump. During this operation, the propellers must be supported by chain blocks. Special eye bolts that screw into the ship's hull will be supplied by the CCG.

16.3.2.10 The AI **must be** present during the propeller removal process. The pressure of the pump can easily exceed 10,000 psi. For information purposes, removal pressures during the 2013 dry docking were 9,000 psi and 14,500 psi, respectively, for the port and starboard propellers.

16.3.2.11 Once the propeller has been removed, the Pilgrim nut must be reinstalled on the propeller shaft.

16.3.2.12 The two propellers must be placed on suitable supports in the bottom of the dry dock and identified as "port propeller" and "starboard propeller."

16.3.2.13 If applicable, the Contractor must take the necessary measures to organize the transportation of propellers to a qualified subcontractor.

16.3.3 Propeller Fitting

16.3.3.1 Upon completion of repairs and other associated work, each propeller must be fitted to its respective propeller shaft.

16.3.3.2 The Contractor must include in its bid, the cost for 6 fits using Prussian blue on each propeller, for a total of 12 fits, handling of propellers must be included. The Contractor must provide a unit price for per fit using Prussian blue for adjustment purposes. The propeller fits must be performed in the presence of the IA and TCMS inspector.

16.3.3.3 The Contractor must check the key between the shaft and the propeller, the shaft key and the key locking bolts for cracks by means of a liquid penetrant crack test. These tests must be performed in the presence of the IA and the ABS inspector.

16.3.4 Propeller Installation

16.3.4.1 Propellers must be reinstalled with new rubber seals on the inner surface of the hub. The seals must be supplied by the Contractor.

16.3.4.2 The propellers must be securely fixed onto the shaft taper of their respective propeller shaft using the Pilgrim nuts and the Morpress

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

hydraulic pump. The inflatable ring must be purged of air. Pilgrim nuts must be installed to allow the nut's pressure ring to push the propeller against the shaft taper.

16.3.4.3 The Contractor must not exceed the propeller positioning marks made on the propeller shaft during removal. The hydraulic pressure exerted by the Morpress pump can easily exceed 10,000 psi. For information purposes, reinstallation pressures during the 2013 dry docking were 15,000 psi and 14,500 psi, on the port and starboard (respectively) shafts.

16.3.4.4 Once the propellers are in place, the nuts must be tightened and locked into place. New holes for locking devices must be drilled in the propeller hub. The propeller cones must be cleaned, filled with new Tallow, and reinstalled. The cone nut cavities must be filled with aluminous cement, once final tightening of the nuts has been completed.

Note: The CCG should have six (6) spare Dowty Seal connectors and one (1) nitrile rubber chamber (Nitrile Tyre) onboard the ship.

16.3.5 Fabrication and Installation of Rope Guards

16.3.5.1 The Contractor must supply the material and labour required to fabricate and weld in place two new rope guards. They must be made of ¾ in. thick steel and formed to replace the old rope guards. The rope guards must be welded continuously around their entire circumference as well as on the joints between the half-sections.

16.3.5.2 Prior to welding, the rope guards must be sandblasted to Sa 2½ grade, and then painted on both sides with Intershield 163 Inerta 160 or equivalent. The Contractor must provide a unit price for each rope guard that may not be replaced, if their condition is determined to be satisfactory.

16.3.6 Option

16.3.6.1 The Contractor must provide an option for the transportation of a new propeller from the Port of Québec to the site and the return of the used propeller to the Port of Québec

16.4 PROOF OF PERFORMANCE

16.4.1 Inspection

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

16.4.1.1 The IA must inspect the following items:

- The measuring of propeller shaft wear down in the stern tubes;
- The measuring of propeller shaft concentricity;
- The measuring of propeller shaft run-out;
- The mating surfaces between the propellers and the propeller shaft tapers;
- The bluing of surfaces and the quality of the fit of the propellers on the shaft tapers (ABS inspector must attend);
- The final tightening of all retaining nuts and propellers;
- The final installation of the Pilgrim nuts and lock devices;
- The Installation and welding of rope guards.

16.5 DELIVERABLES

16.5.1 Preliminary propeller repair report.

16.5.2 Final propeller repair report.

16.5.3 ABS Acceptance of the propellers and their installation.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

17.0 MECHANICAL SEALS

17.1 GENERAL

17.1.1 The objective of this section is to completely replace the existing Maneseal de Wartsila mechanical seals on both propeller shafts with SeaThigor seal D-15d mechanical seals from Thordon.

17.1.2 The Shipyard shall obtain the services of 2 FSR from Thordon to supervise the installation of the new mechanical seal. The contractor must bid for 1 round trip to the dry dock. RDs are required for 7 days or 84 hours.

17.1.3 The two new mechanical seals SeaThigor will be supplied by the CCG.

17.2 REFERENCES

17.2.1 MA Inboard Seal Technical Manual

17.2.2 H72317-02

17.2.3 SeaThigor Seal - Product Manual - Rev5Final - 20180907

17.2.4 TG-ST-D-15B-00-MOD1

17.2.5 VP-200806-01 SeaThigor Verification Plan

17.2.6 AW201803

17.2.7 AW201805

17.2.8 AW302990

17.3 TECHNICAL DESCRIPTION

17.3.1 Disassembly of the 2 existing mechanical seals

17.3.1.1 The contractor shall carefully disassemble the two Maneseal mechanical seals to allow them to be reassembled and put into operation. The parts of the 2 mechanical seals must then be carefully packed for shipment to the CCG warehouse in Quebec City: 101 Champlain Boulevard, G1K 7Y7. The joints must be reassembled to facilitate their transport and storage.

17.3.2 Installation of the 2 new mechanical seals

17.3.2.1 The contractor shall install the 2 new mechanical seals under the supervision of the manufacturer's seconded representative.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

17.3.2.2 Installation work shall be performed in accordance with the manufacturer's instructions: SeaThigor Seal - Product Manual - Rev5Final - 20180907.

17.3.2.3 The contractor shall drill holes in the stern tube in order to screw the housing module and safety seal module within the stern tube.

17.4 PROOF OF PERFORMANCE

17.4.1 Inspection

17.4.1.1 All work shall be accepted by the ABS classification society.

17.4.2 Trials

17.4.2.1 The contractor shall test the new mechanical seal in accordance with the manufacturer's instructions: VP-200806-01 SeaThigor Verification Plan.

17.4.2.2 In the presence of the CCG Inspection Authority (IA) and the manufacturer's detached representative, the contractor shall test the inflatable seal once the vessel is afloat along the service dock.

17.4.3 Deliverables

17.4.3.1 The Contractor must submit a report of the work performed by the Thordon service representative and his recommendations to the CCG Technical Authority. This report will include the number of hours worked.

18.0 TAILSHAFT STEADY BEARING

18.1 Objective

18.1.1 To overhaul the two roller bearings in order to pull out the tail shafts and perform the five-year inspection of the bearing with ABS.

18.2 Reference documents

18.2.1 Assembly Manual 9500189ST_Rev 1

18.3 Technical description

18.3.1 Retain the services of a SKF technician to oversee the removal and inspection of the Cooper bearing. The contractor must bid for 1 round trip to the dry dock. RDs are required for 3 days or 36 hours.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

18.3.2 Supply the grease and all necessary material recommended by the Cooper representative.

18.3.3 The temperature sensors will be temporarily removed, then reinstalled on the bearings.

18.3.4 Perform the removal and installation as instructed by the Cooper representative and the "ASSEMBLY, MAINTENANCE AND LUBRICATION INSTRUCTIONS 03 EBCPN 613.20MM EXILOG RJ ALF IH LAB TE SLUB," dated May 2008.

18.4 Deliverables

18.4.1 Provide a measurement log and a visual inspection report from Cooper.

19.0 MUFF COUPLINGS

19.1 Identification

19.1.1 The intent of this specification item is to remove the two Muff couplings from their respective tailshaft in order to perform the removal of the tailshafts from the vessel.

19.2 References

19.2.1 AW-302317 Arrgt for Flange Coupling Removal

19.3 Technical description

19.3.1 The Contractor must supply all the following equipment, not limited to, ventilation, staging, chain falls, slings and shackles or other necessary to perform the work. All lifting equipment must be appropriate for the expected duties, and be accompanied by valid certification indicating, or be permanently marked as to being, of an adequate safe working load for the expected duties. Any brackets or other welded attachments required in the performance of this item are to meet the welding requirement of this specification. On completion of work, all of the Contractor's work related tools and equipment must be removed from the vessel and repair according to the respective requirements of this estimate the surfaces damaged by the welding of fasteners.

19.3.2 In order to gain access to each Muff, the Contractor must move various interference items. These are, but not limited to, walkways, railings above pedestal bearings and the turning gear covers for each tailshaft. Upon completion of all work, the Contractor must return and reinstall these items to "as found" condition.

19.3.3 Contractor must remove the sixteen (16) 3" diameter studs and nuts from each Muff coupling using a special tool supplied by the ship. Contractor must note that it is

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

important that the last nut to be removed is the one facing the eyebolt. Before removing the 16th nut, the Contractor must install the chain block and connect it to the eyebolt.

- 19.3.4 The entrepreneur must remove the 1 1/2 x 1/2 inch flat steel water thrower, built in two (2) sections and forming a 2 feet 8 inches in diameter circle made of grade 14 sheet metal. Both sections are secured with two (2) 1/2 inch in diameter bolts.
- 19.3.5 Once the tail shaft is well supported in and out of the ship, proceed with partial removal.
- 19.3.6 Contractor must partially withdraw each tailshaft aft in order to expose the end of each Muff coupling and its associated PILGRIM nut.
- 19.3.7 CCG supplied special removal tools will be supplied to the Contractor to allow him to remove the PILGRIM nut and the Muff couplings. These will include but not be limited to:
 - 19.3.7.1 one hydraulic pump c/w hydraulic hoses and fittings,
 - 19.3.7.2 one 805 mm (31.69") long x 72 mm or 2.83" diameter stud,
 - 19.3.7.3 special steel plate 640 mm (25") diameter x 120 mm thick,
 - 19.3.7.4 eight (8) special studs,
 - 19.3.7.5 two (2) special sleeves,
 - 19.3.7.6 special steel plate 1,020 mm (41") diameter x 160 mm (6.3") thick,
 - 19.3.7.7 One copy of service manual for the removal and re-installation of the PILGRIM nuts.
- 19.3.8 On completion of all work, these specialized removal tools must be cleaned and returned to the IA in the same condition as received.
- 19.3.9 Using the supplied hydraulic pump, the Contractor must remove each PILGRIM nut and carefully place it aside. The Contractor must protect the PILGRIM Nuts to prevent any damage to their internal mating surfaces.
- 19.3.10 The Controller must perform the following procedure to remove one muff coupling. The same procedure is to be applied to both couplings.
 - 19.3.10.1 The 805 mm long x 72 mm diameter stud is to be screwed into the end of each tailshaft.
 - 19.3.10.2 Once complete, the Contractor is then to install the special 640 mm steel plate and then the eight (8) special studs are to be inserted in the Muff coupling.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 19.3.10.3 Once installed, the eight (8) special studs will serve as a base for the second 1,020 mm diameter steel plate.
- 19.3.10.4 The secondary steel plate is to be rigged and installed in such a way that the PILGRIM nut is between the two plates and mounted on top of the two (2) sleeves fitted on the two (2) lower Muff coupling studs.
- 19.3.10.5 The Muff coupling is then to be jacked off its associated shaft using the PILGRIM nut and the hydraulic pump as defined in the Service Manual.
- 19.3.11 Once each coupling has been removed the Contractor must protect the mating surfaces to prevent any damage from occurring during the tailshaft withdrawal process. Any damage incurred as a result of not adequately protecting these machined surfaces must be to the Contractor's responsibility.
- 19.3.12 On completion of associated work and after the reinstallation of the tailshafts, the Contractor must reinstall on its respective shaft each muff coupling in the reverse order of procedure as laid out in 16.3. The mechanical seals previously removed must be reinstalled in their respective locations following satisfactory blueing on the cone surfaces. Both the TA and the IA must witness final hardening up of each Muff coupling and its associated PILGRIM Nut.
- 19.3.13 The Contractor must perform a dye check (liquid penetrant) on keyways.
- 19.3.14 The Contractor shall include in its price 12 adjustments (fits) with Prussian Blue. MUFF adjustments must be made in place. The contractor must also provide a unit price for a single adjustment. An adjustment of at least 80% is required. The Contractor must consult the TA for any additional adjustments and the cost will be negotiated upward or downward through PWGSC Form 1379.
- 19.4 Proof of performance**
- 19.4.1 The following inspections are required to be verified by the IA the TA:
 - 19.4.1.1 Inspection of the machined mating surfaces between the shafts and the couplings,
 - 19.4.1.2 Hardening up of all retaining nuts.
- 19.5 Deliverables**
- 19.5.1 The Contractor must supply the TA, on an USB stick, not protected by a password and in a compatible format to Microsoft Office Word 2013 or more recent format, a report detailing the work undertaken, defects, repairs made and measurements and readings taken.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 19.5.2 The Contractor must provide a Quality Assurance (QA) report indicating that all parts of the Muff coupling and inboard tailshaft ends have been inspected by the Contractor's QA Department for correct installation and fit.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

20.0 TAILSHAFTS AND STERN TUBE

20.1 Identification

- 20.1.1 The Contractor must unship the Port and Starboard tailshafts and open up the stern tube bearings for inspection and survey by the attending ABS Surveyor for a survey credit.
- 20.1.2 The Contractor must present this survey credit to the IA and the TA prior to the flooding of the dock to re-float the vessel.
- 20.1.3 The Contractor must coordinate the work in this section with these sections: REMOVAL OF MUFF COUPLINGS, Propeller withdrawal inspection and installation TAIL SHAFTS MECHANICAL SEALS.

20.2 References

- 20.2.1 Drawings
 - 20.2.1.1 AW201803
 - 20.2.1.2 AW201804
 - 20.2.1.3 AW201805
 - 20.2.1.4 AW302990
 - 20.2.1.5 AW302998
 - 20.2.1.6 221-620-1
 - 20.2.1.7 221-620-2
 - 20.2.1.8 221-H-52
- 20.2.2 Tailshafts dimensions
 - 20.2.2.1 Weight : 37 tons
 - 20.2.2.2 Length: 46 feet 1 13/16 inches
 - 20.2.2.3 Diameter: 26 inches

20.3 Statement of work

- 20.3.1 General
 - 20.3.1.1 The Contractor must be responsible for preparing the equipment and arranging for all inspections required. The Contractor must consult with ABS prior to commencement of work, to determine an inspection schedule; at each

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

inspection point, the Contractor must advise the IA and the TA, 24 hours in advance, to allow their attendance.

20.3.1.2 The Contractor must supply all equipment, chain falls, slings and shackles necessary to perform the work. All lifting equipment must be appropriate for the expected duties, and be accompanied by current certification indicating, or be permanently marked as to being, of an adequate safe working load for the expected duties. Any brackets or other welded attachments required in the performance of this item must be welded into place by CWB-certified welders only.

20.3.1.3 Whilst the vessel is still afloat, and not yet on the blocks, the Contractor must:

- Uncouple both the port starboard after tailshaft couplings;
- Take an record alignment readings;
- Measure and record the axial clearance, height and parallelism between the coupling flanges when their spigot is freed.
- Supply and install four (4) bolts, not fitted, on the couplings when measuring clearances.
- Take and record a second series of measures taken at 180° from the first readings.

20.3.1.4 These readings must be witnessed by both the IA and the TA.

20.3.1.5 Once the vessel is docked, the Contractor must remove the rope guards, measure and record the clearances between the tailshafts and the sterntube bearings.

20.3.2 **Propeller removal**

20.3.2.1 The Contractor must remove both propellers, and remove the propellers to the dock floor.

20.3.3 **Tailshaft removal and inspection**

20.3.3.1 Using the turning gears, the Contractor must check and record the tailshafts wear down and concentricity at each stern tube end and on the propeller tapers.

20.3.3.2 The contractor must dismantle the tailshaft steady bearing.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 20.3.3.3 The Contractor must hold on each end of the tail shafts then withdraw them enough to perform the following works:
- Remove the pilgrim nut from the Muff couplings;
 - Jack the coupling from the shaft;
 - Install a protective nut at the inner end of the tail shafts.
- 20.3.3.4 The Contractor must completely remove the shafts from the stern tubes. The Contractor must protect, support and manoeuver the shafts, making sure not to damage the bearings, the threads, the tapers and the vulcanised rubber coating between both shaft bearings.
- 20.3.3.5 The Contractor must support the tailshaft at all times, to avoid any warping.
- 20.3.3.6 The Contractor must transport both tail shafts into its shop, where it must always be adequately supported along its whole length.
- 20.3.3.7 The Contractor must thoroughly clean shafts and check them for wear and defects. The Contractor must pay particular attention to the following areas;
- Forward and aft keyways on shaft tapers;
 - Forward and aft shaft tapers;
 - Forward and aft ends of each of the two liners where they meet the tail shaft;
 - Fwd and aft pilgrim nuts and threads on shafting;
 - Liner wear and condition of bushing;
 - Fwd end of fwd liner in way of "MD Seal" seal;
 - Galvanised rubber coating between liners.
- 20.3.3.8 The Contractor must inspect the keyways, the tail shafts threads and tapers, the propeller nuts and the couplings with non-destructive crack detection (dye penetrant) performed by a minimum Level II certified technician NRCan. All materials for testing must be supplied by the Contractor and a report, detailing the results of this testing, must be provided to the TA within three days of completion.
- 20.3.3.9 The Contractor must set each shaft on a lathe and take a short cut on both bronze bearings of each shaft. The finish must be 32 RMS. In order to replace the tailshaft mechanical seal, the contractor must take a cut on both tailshaft

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

liners at the position of the seals in order to bring the liner diameter to 674 mm. The recommended machining tolerance on the liner for seal installation is ISO tolerance class h8 (+0/-0.125) or f8 (-0.080/-0.205). The recommended surface finish for seal installation is: 0.4 to 0.8 micro-metres Ra. Surface finish up to 1.6 micro-metres Ra will perform satisfactorily.

- 20.3.3.10 The machining thickness will be decided following a dimensional analysis of the shafts.
 - 20.3.3.11 While each shaft is set on a lathe, the Contractor must check for shaft run-out. The Contractor must provide run-out readings of the shaft and of a drawing showing the extent of grooving on each shaft. While in the lathe, the lathe steady rest must not interfere with the shaft surface in way of the mechanical seal. Contractor must ensure that lathe's steady rest does not groove the shaft.
 - 20.3.3.12 With the shafts set on a lathe or laid on appropriate rollers, Contractor supplied, and not in the stern tubes, the Contractor must check the concentricity of both tail shafts and the presence of the TA.
 - 20.3.3.13 The Contractor must perform, in presence of the AT, a Spark test on the vulcanised rubber coating of the tail shafts in order to check the adhesion of the rubber product and provide a report.
 - 20.3.3.14 If the Spark test confirms the integrity of the rubber coating or after completion of required repair works, the Contractor must carefully handle the shafts and set them on temporary cradles, Contractor supplied, particularly if they cannot be reinserted immediately because of required works on the stern tubes or stern tubes bearings. If the vulcanised rubber coating is damaged and requires repairs a specialized accredited firm in this type of coating. The entrepreneur must consult the TA before choosing the firm. The cost must be adjusted using PWGSC 1379 form if necessary.
- 20.3.4 **Stern tubes bearings**
- 20.3.4.1 The Contractor shall allow the IA and ABS to inspect the Romor stave for condition.
 - 20.3.4.2 The stave must be adequately protected to allow cleaning of the center area of the stern tube.
 - 20.3.4.3 The contractor must clean and repair both stern tubes in the mid-section, between the two bearings housings using sand blast complying with the SA 2-

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

1/2 grade. Before doing so, the bearings areas will be properly protected against sandblast.

- 20.3.4.4 Once the tubes blasted and cleaned, the cavities and porosities will be filled with an epoxy metal repair compound compatible with Belzona Ceramic R Metal. The contractor will include in their price five (5) kg of this product per tube, which will be increased or decreased using the PWGSC 1379 form. The contractor must provide a unit price per kilo for this purpose. Application of this product will be done following manufacturer's recommendations and under the CCG IA supervision. The date of manufacture of each package is to be given to the CCG IA to ensure the product is not expired.
- 20.3.4.5 Once the product fully cured, a mechanical preparation will be done by the contractor on the repaired spots to roughen the surface. Clean the tubes in order to remove all fine particles and prepare for painting. Apply two (2) coats of epoxy coating compatible with Intergard FPD 052, beige color, 0.005" thick each coat in each stern tube.
- 20.3.4.6 The contractor must inspect all stern tube bearing retaining rings, located at the end of the bearing housings, and check each bolt tightness and locking devices. The contractor must carry out a NDT (dye check) on every retaining ring. The retaining rings at each tube end will be reinstalled after the stern tube bearing replacement, using threadlocker compatible with Loctite 263
- 20.3.4.7 Once the bearings installation completed and their temperature is stabilized, the contractor must measure all bearings' inside diameter at eight (8) points on each bearing section. Note all readings in the measurement book.
- 20.3.5 Reinstallation**
- 20.3.5.1 Upon completion of inspection and repairs, the Contractor must re-assemble all shafting, turning gears, brakes, propellers, rope guards, mechanical seals and couplings. All equipment must be assembled to a fully operable condition and as per manufacturer's recommendations where applicable.
- 20.3.5.2 The Contractor must coat the stern tubes bearing staves end the bronze sleeve with non-polluting water soluble grease.
- 20.3.5.3 The Contractor must verify the fits of the taper connection between each propeller and its associated the tail shaft taper. Verification of fits must be by machinist bluing process with a minimum surface contact area between the flanges and tapers of 75% to 80%. Final fit and hardening up of the propellers must be witnessed by the TCMS Surveyor, the IA and the TA. Copies of all

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

readings shall be provided to the IA and the TA. The Contractor must install the MUFF couplings on the tail shafts and screw the PILGRIM nuts inside.

- 20.3.5.4 The Contractor must use chain blocks to match the coupling of the propeller shaft with the thrust bearing shaft in order to install the sixteen (16) 3 inches diameter bolts with their nuts and locking plates. The Contractor must take care to insert the bolts in their specific hole (#1 bolt in # 1 hole, etc.). The Contractor must fit these bolts in the coupling's face.
- 20.3.5.5 Before tightening the couplings, the Contractor must check their parallelism, before the shaft coupling is on the motor coupling spigot. This verification must be done twice at a 180° angle. The Contractor might use non fitted bolts, Contractor supplied, when the measurements are taken. The Contractor must register the readings.
- 20.3.5.6 The Contractor must complete the coupling tightening on the tail shaft taper using the hydraulic pump and the PILGRIM nut. The Contractor must drill new holes in the locking plates and install them at their specified location.
- 20.3.5.7 The contractor shall reinstall the shaft line steady bearing.
- 20.3.5.8 The Contractor must remove the brackets installed for the purpose of establishing rigging points, grind flush the affected areas, and apply a surface treatment to match the existing paint schedule of the surrounding areas.

20.4 Proof of performance

20.4.1 Essais

- 20.4.1.1 On completion of all work, each shaft must be turned for a period of one (1) hour using the vessel's turning gear in order to test for any leaks of the system. A one (1) hour dock trial must then be conducted using the vessel prime movers to turn the shafts in order to check for overheating and or vibration.

20.4.2 Additional measurements

- 20.4.2.1 Prior to refloating, the Contractor must take an additional set of clearance readings between the tail shaft and stern tube bearing. The Contractor must record these readings and provide copies to the TA.

20.4.3 Sea trials

- 20.4.3.1 After the vessel has been afloat for a minimum twenty-four (24) hours, the Contractor must take shaft alignments readings and compare them to those

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

taken previously. These alignment readings must be witnessed by the Inspection Authority, the TA and ABS Surveyor if so requested.

20.4.3.2 Upon completion of all refit work, but prior to Acceptance; a four (4) hour sea trial must be conducted. A series of evolutions, involving a gradual increase of speed and reversals must be undertaken to test the ship's equipment. The Contractor must submit the trials program to the TA and the IA 48 hours prior to start of the trials for approval.

20.4.3.3 The vessel must be gradually worked up to full speed; the Contractor must have shipyard personnel in attendance to monitor the shafting system on a continual basis for both this trial and the dockside trial noted above. Any overheating or vibration must be remedied at no expense to Canada.

20.4.4 Inspections

20.4.4.1 The following inspections are required to be verified by the IA, the TA and the TCMS Surveyor:

20.4.4.2 Witnessing of readings taken of tailshaft alignment and clearances prior to and after docking of the vessel;

20.4.4.3 Witnessing of readings taken of tailshaft/bearing clearances prior to removal and after re-assembly;

20.4.4.4 Witnessing of NDT testing;

20.4.4.5 Witnessing of shaft run-out verification;

20.4.4.6 Witnessing of stern tube bearing clearances;

20.4.4.7 Blueing of surfaces of tapers;

20.4.4.8 Hardening up of all retaining nuts and propellers

20.5 Deliverables

20.5.1 The Contractor must supply the TA, on an USB stick, not protected by a password, in a Microsoft Office Word 2013 or more recent format, and on a paper copy, a report detailing the work undertaken, defects, repairs made and measurements and readings taken.

20.5.2 The Contractor must also provide a copy of ABS survey credit to the TA.

20.5.3 The Contractor must provide a Quality Assurance (QA) report indicating that all parts of the tailshafts and stern tubes shafts bearings have been inspected by the Contractor's QA Department

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

21.0 BOW THRUSTER SERVICING

21.1 GENERAL

21.1.1 The purpose of this section is to proceed with the inspection of the bow thruster.

21.2 REFERENCES

- Wärtsilä bow thruster manual and information drawings
- Wärtsilä Prop95SN028 Service Bulletin

21.3 TECHNICAL DESCRIPTION

21.3.1 The Contractor must remove the protective grate over the tube. The two grates are attached with bolts, washers and nuts.

21.3.2 An oil sample shall be taken from the base of the propeller and the tank of the hydraulic unit in the presence of the Chief Engineer. The chief mechanic will supply the bottles for the samples.

21.3.3 Conduct a full inspection of the system once it has been filled to detect potential leaks, under the supervision of the vessel's Chief Engineer;

21.3.4 Measure the clearance/gap between each propeller blade and the bow-tube. Indicate the values obtained in the measurement log. The clearance/gap measurements must be offset by 180 degrees and taken under the supervision of the Chief Engineer on two (2) occasions. Also measure the axial space for the gearbox;

21.3.5 Reinstall the protective grates over the tube with new bolts, washers and nuts once the maintenance work and painting have been completed. Grade 7 bolts must be used;

21.4 PROOF OF PERFORMANCE

21.4.1 While the vessel is still in dry dock, the Contractor must test the controllable-pitch steering system.

21.4.2 During sea trials, the Contractor must conduct a full test of the bow thruster in both directions.

21.5 DELIVERABLES

21.5.1 The Contractor must provide a report containing the measurements taken during the inspection of the propeller.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

22.0 RUDDER AND RUDDER STOCK

22.1 GENERAL

22.1.1 The objective for the work described in this section is to evaluate the condition of the rudder, rudder stock and their components and to overhaul them if necessary. It is important to take into consideration that the rudder system has been renewed in 2017.

22.2 REFERENCES

22.2.1 Technical drawings and plans

- 221-H-46, Rudder & Stern frame
- 221-H-47, Rudder Stock & Pintle
- 221-H-48, Rudder casting & Stern frame casting
- C-2145, Split housing rudder carrier bearing
- C-2146, Split radial bearing and packing gland ring
- C-2148, Gland stud ring and lantern ring 'r' class icebreaker
- C_686, Overall Dimensions of Model L2 100-52-37
- D_688, Frame hub's and thrust bearing for 'R' class icebreaker
- D_689, Frame hub bearings for 'R' class icebreaker
- C-690, Tiller hub for r class icebreaker (20.5" rudder stock cap).
- 221-630-4, Steam to rudder-trunk added

22.3 TECHNICAL DESCRIPTION

22.3.1 **Preliminary Measurements**

22.3.1.1 The Contractor must remove the profiled sheets. They must be replaced by new ones during reassembly.

22.3.1.2 The Contractor must measure the clearance/gap for the pintles and gudgeons, under the supervision of the Chief Engineer. These measurements must be recorded.

22.3.1.3 Under the supervision of the Chief Engineer, the Contractor must measure the clearance/gap between the three buffer bearings and the front of the rudder structure at the pintle housings. These measurements must be recorded.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

22.3.1.4 The clearance/gap between the rudder stock's jumping collar and steady bearing must be measured in the rudder trunk.

22.3.1.5 The clearance/gap between the lower pintle and the thrust washer installed in the bottom of the lower gudgeon housing must be measured under the supervision of the Chief Engineer. This measurement must be taken using a dial indicator and recorded.

22.3.1.6 The removal of the Rudder Stock and Rudder is optional.

22.3.2 Removal of the Rudder Stock and Rudder (optional)

22.3.2.1 Before beginning the work, the Contractor must lock the electrical circuits supplying the main hydraulic pumps and the telemotor pumps.

22.3.2.2 The linkage attached to the tiller and rudder stock as well as the limit switch must be disassembled.

22.3.2.3 The Contractor must ensure that the centrally positioned lockout cylinder is disengaged.

22.3.2.4 The lifting padeye must be screwed into the end of the stock.

22.3.2.5 The Contractor must grab hold of the stock using a crane, through the hatches designed for that purpose (flight deck and upper deck). The Contractor must open and close the hatches.

22.3.2.6 The arch frames and bearings from the steering gear mounting frame must be dismantled and removed.

22.3.2.7 The Contractor must disconnect the hydraulic pipes, support the two (2) hydraulic cylinders and remove the four (4) pivot pins to check for wear on the pins and their bushings as well as the reaction stool of the assembly. The stool must be checked for cracks in the welds. The main oil tanks must be isolated from the system beforehand.

22.3.2.8 The contractor must support the helm tiller, then unbolt and remove the tiller coupling on the stock.

22.3.2.9 The tiller and tiller coupling must be transferred outside of the work area.

22.3.2.10 The Contractor must remove the cement from around the six (6) bolts on the rudder palm.

22.3.2.11 The nuts and bolts must be removed from the rudder palm. The Contractor must ensure to identify the location of each of the bolts. The

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

safety strap held in place by two (2) half- (1/2-) inch bolts must be removed. The transverse key must be completely removed from the keyway. If the key is stuck in the keyway, the Contractor must:

- 1) Remove the jumping collar;
- 2) Raise the stock by three (4) inches (eight [8] cm) to detach the key from the assembly (rudder and stock).
- 3) Remove the key and lower the stock to its original position.

22.3.2.12 The Contractor must rotate the stock 37 degrees, and the rudder as far as possible in the opposite direction.

22.3.2.13 The lifting padeyes must be secured to the hull and the two (2) support rods must be secured to the rudder. The padeyes must be supplied by the CCG. Note: All lifting equipment used by the shipyard must be clearly identified using photos that both parties must have in their possession.

22.3.2.14 The Contractor must lift and manoeuvre the rudder to remove the pintles from the gudgeons and lower the rudder to the bottom of the dry dock. The rudder must be placed upright on wooden blocks at the bottom of the dry dock.

22.3.2.15 The Contractor must lower the stock to gudgeon-level and then release the rope.

22.3.2.16 The carrier bearing must be removed from the stock and its mount. This bearing has not been inspected since 2002. The Contractor must check its general condition and conduct crack tests.

22.3.2.17 The Contractor must unbolt and remove the radial bearing as well as the gland and seal. It is a one- (1-) inch gland that is thirty (30) feet long.

22.3.2.18 The Contractor must unbolt and remove the steady bearing cap. The lubrication lines must be disconnected. The bearing for this assembly must be replaced.

22.3.2.19 The Contractor must grasp the rudder stock using the rope of a crane.

22.3.2.20 Lastly, the Contractor must lower the stock to the bottom of the dry dock and place it on wooden blocks.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

22.3.3 Maintenance of Rudder Grease Lines and Rudder Trunk De-Icing Line

22.3.3.1 The Contractor must check the lubrication lines of the carrier bearing.

22.3.3.2 The integrity of the lubrication lines for the steady bearing must be checked. The Contractor must block the lines and pressurize them by injecting them with grease (supplied by the CCG).

22.3.3.3 The integrity of the lubrication lines for the carrier bearing must be checked. The Contractor must ensure that grease flows freely through the lines and internal piping of the bearing. Grease (supplied by the CCG) must be injected into the lines.

22.3.3.4 The Contractor must check the condition of the rudder trunk de-icing system.

22.3.4 Rudder Condition Check

22.3.4.1 The Contractor must remove the upper drain plug from the rudder, under the supervision of the Chief Engineer and TCMS inspector. This is often sufficient to demonstrate that the rudder is watertight. If there is any doubt, a complete hydrostatic test must be conducted. A hydrostatic test must be conducted on the rudder with an eight- (8-) inch water column.

22.3.4.2 Following the hydrostatic test, the Contractor must empty and dry out the rudder and apply a bituminous coating to the inner walls of the rudder, using the shipyard's preferred method. Once the lower drain plug has been removed, the existing bituminous coating in the rudder will leak through. The Contractor must ensure to collect it. The Contractor must apply Drew Marine MAGNAKOTE PLUS or VapCor Sea Guard A or equivalent on the inner walls of the rudder, according to the product manufacturer's recommendations. The Contractor must close the drain plugs. Drain plug watertightness must be checked using a vacuum box.

22.3.4.3 The Contractor must mark the exact place the pintles are located in their housings on the rudder, and then remove them. The locking plates must be removed. Pintles and gudgeons must be measured precisely, and those values must be recorded. The Contractor must check whether the pintles are ovalized and rectify the problem, if necessary. The surfaces of the pintles must be polished on a metal lathe. (optional)

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

22.3.4.4 The Contractor must check the alignment of the housing holes where the pintles are inserted using a piano wire or laser. The data must be recorded. . (optional)

22.3.4.5 The Contractor must apply an anti-seize paste to the conical surfaces of the pintles and put them back in their original, respective positions. A tightening torque must be applied on the three (3) bolts, and they must be locked in place by welding them to half- (1/2-) inch by two- (2-) inch 316 stainless steel locking plates. . (optional)

22.3.5 Stock and Tiller Measurements and Crack Detection. (optional)

22.3.5.1 The Contractor must conduct a liquid penetrant test on the keys and two (2) keyways (tiller and rudder stock).

22.3.5.2 A liquid penetrant test must also be conducted on the key and keyway between the rudder palm and the reflective side of the rudder stock.

22.3.5.3 The Contractor must measure all these keys and keyways and record that data.

22.3.6 Stern Frame Machining and Sleeve Replacement. (optional)

22.3.6.1 The Contractor must put the carrier bearing and steady bearing back in place by joining their two sections together and applying the appropriate torque to the assembly bolts. The Contractor must check the alignment of the pintles with the carrier bearing and steady bearing using a piano wire or laser. The Contractor must record the data in the final dry dock report.

22.3.6.2 The inner diameter of the gudgeon sleeve for the steady bearing and carrier bearing must be measured. The Contractor must record the data in the final dry dock report.

22.3.6.3 The three gudgeon sleeves must be removed once their retaining screws have been taken out.

22.3.6.4 The Contractor must rectify the bore for the three gudgeon sleeves using a boring bar. The centre of the carrier bearing must be aligned with the bottom gudgeon.

22.3.6.5 The Contractor must construct three new gudgeon sleeves, using the same genuine 905 ASTM B584-73 alloy. The sleeves must be inserted into their respective housings cold, after being cooled with liquid

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

nitrogen. The Contractor must ensure that clearance between the new gudgeons and the pintles that had already been installed on the rudder is consistent with the original plans. Once the sleeves are in place, the Contractor must drill eight (8) sleeve/tapped holes and supply locking screws, as described in plan 221-H-47.

22.3.6.6 The Contractor must pay particular attention to the lower portion of the bottom gudgeon where the carrier disk is lodged in place. This portion must not be bored so that the disk remains in place.

22.3.7 Steady Bearing Machining (optional)

22.3.7.1 The Contractor must replace the bronze alloy bearing (ASTM B584-73 – alloy 905). The Contractor must machine this bearing in one piece and then cut it in half so that it can be installed.

22.3.7.2 See drawings 221-H-47 and C-2146 for machining details.

22.3.7.3 The rudder stock must be polished or machined (depending on its surface condition) at the steady bearing.

22.3.7.4 The Contractor must ensure that the lubrication lines for the bearing are disconnected.

22.3.7.5 Clearance/gap measurements must be taken and recorded in the log.

22.3.8 Carrier Bearing Machining . (optional)

22.3.8.1 The Contractor must replace the bronze alloy bearings (ASTM B584-73 – alloy 905). The Contractor must supply the material and labour required to machine new bearings. These bearings must be cut in half in order to be installed.

22.3.8.2 See drawings 221-H-47 and C-686 for machining details.

22.3.8.3 The rudder stock must be polished (depending on its surface condition) at the carrier bearing.

22.3.8.4 The Contractor must ensure that the lubrication lines for the two (2) bearings are disconnected.

22.3.8.5 Clearance/gap measurements must be taken and recorded in the log.

22.3.9 Rudder Stock Reinstallation . (optional)

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

22.3.9.1 The Contractor must reinstall the rudder stock by following the disassembly procedure in reverse.

22.3.9.2 The Contractor must replenish the stock gland and supply the seals. The gland must have a one- (1-) square-inch section and be about thirty (30) feet in length.

22.3.10 Rudder Reinstallation . (optional)

22.3.10.1 The rudder must be reinstalled once work on the stock is complete by reversing the disassembly procedure.

22.3.10.2 Palm key reinstallation. The Contractor must put the bolts back on the palm. The Contractor must have previously polished and cleaned the threads of the nuts and bolts for the palm. The palm key and keyways must be tested.

22.3.10.3 The Contractor must weld palm bolts in place, as well as screw and tighten nuts. The bolts (on the top of the palm) must be covered in cement.

22.3.10.4 The Contractor must install new, three-quarter- (3/4-) inch thick profiled sheets to cover and protect the pintle screws.

22.4 DELIVERABLES

22.4.1 Logbook with all the measurements taken during the inspection.

22.4.2 Proof that ABS has approved the condition of the rudder and rudder stock.

23.0 Sprinkler system piping inspection (optional)

23.1 Scope

23.1.1 The purpose of the work is to conduct a complete inspection of the sprinkler system piping to verify the condition of the components. **These works are optional.**

23.2 Reference documents

23.2.1.1 221-661-1

23.2.1.2 221-661-2_01

23.2.1.3 221-661-2_02

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

23.2.1.4 221-661-2_03

23.3 Technical description

23.3.1.1 The Contractor shall make to a company specialized in the installation and maintenance of the sprinkler system in order to carry out a complete evaluation of the piping system of the ship's sprinkler system in accordance with the requirements of NFPA 25 Standard for inspection, testing and maintenance of water-based fire protection systems.

23.3.1.2 For bid submission, the Contractor must schedule 200 hours of work for the investigation. The contractor will provide the hourly rate for a technician.

23.3.1.3 The specialized company must visually inspect the piping to report any anomalies that could affect the efficiency of the system.

23.3.1.4 The Company shall flush the system in accordance with the requirements of NFPA 25: Standard for Inspection, Testing and Maintenance of Water Based Fire Protection Systems.

23.3.1.5 The specialized company shall perform a hydrostatic test. All lines must be blown with compressed air. To do this, all nozzles must be dismantled and reinstalled.

23.3.1.6 The Contractor shall provide a price for sampling the deposits contained inside the pipes and for their laboratory analysis to determine if bacterial corrosion is present.

23.3.1.7 Contractor shall use a non-destructive testing company to inspect the piping of the sprinkler system by X-ray NDT. For bidding purposes, the Contractor must bid for 20 radiographic films on sprinkler piping. The film should be 17 inches long. 4 films will be performed on a 4 "pipe, 2 films on a 3" pipe, 4 films on a 2 "pipe, 4 on a 1½ pipe, 4 on a 1" pipe, 2 on a ½ pipe in. For bid submission, the contractor will have to provide 8 hours of work for the X-ray inspection.

23.4 Proof of performance

23.4.1 Test

23.4.1.1 The Contractor shall conduct a hydrostatic test on the piping at 110% of system rated pressure

23.4.2 Report

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

23.4.2.1 The Contractor will produce a report containing the following information:

- The date and time of the start and end of the work and the number of hours for each working day.
- A description of the work performed and the anomalies detected.
- The list of replaced parts
- Pictures of anomalies
- Full radiographic inspection report signed by the technician.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

24.0 OVERHAUL OF CIRCUIT BREAKERS (OPTIONAL)

24.1 Scope of work

- 24.1.1 This work is optional. The work involves performing a complete upgrade and reconditioning of four (4) circuit breakers currently in operation on the CCGS *Pierre Radisson*.
- 24.1.2 The work shall be carried out in shops belonging to the Contractor's sub-contractor.
- 24.1.3 The Contractor is responsible for transporting the circuit breakers from the vessel to its repair shop and vice-versa. The Contractor is responsible for protecting the circuit breakers against damage during transportation. The vessel will be located at the shipyard having been awarded this contract.
- 24.1.4 The Contractor shall provide the materials, tools and labour to carry out the work required to certify the circuit breakers according to the requirements of the ABS Class Surveyor. The following technical requirements are mandatory, but the overhaul must not be limited to them, in order to obtain the approval of the work by the classification society ABS.

Suggested service providers

Mathieu Pelletier, Service Technician
Siemens Canada Limited
Customer Service Division / Centre of Expertise
2800 St-Jean-Baptiste Street, Suite 190
Québec, QC G2E 6J5
Tel.: 418-956-8068
Fax: 418-623-9162
mathieu.pelletier@siemens.com

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

24.2 Technical description

PRÉFÉRENTIEL 3E-047

MANUFACTURER:	WESTINGHOUSE
TYPE:	DSL-416
TRIP UNIT:	LS
LOCATION:	CONTROL ROOM
IDENTIFICATION:	PRÉFÉRENTIEL
SERIAL NUMBER:	CPJ2B46854-1A
SENSOR:	1600/5 A
CAPACITY:	1600 A
FUSES:	2500 A

MAIN TIE 3E-043

MANUFACTURER:	WESTINGHOUSE
TYPE:	DSL-208
TRIP UNIT:	LS
LOCATION:	CONTROL ROOM
IDENTIFICATION:	MAIN TIE BREAKER
SERIAL NO.:	CPJ2B46858-1A
SENSOR:	800/5 A
CAPACITY:	800 A
FUSES:	2000 A

EMERGENCY TIE 3E-043

MANUFACTURER:	WESTINGHOUSE
TYPE:	DSL-208
TRIP UNIT:	LS
LOCATION:	EMERGENCY DISTRIBUTION
IDENTIFICATION:	EMERGENCY TIE
SERIAL NO.:	J2B 47268-1A
SENSOR:	800/5 A
CAPACITY:	800 A
FUSES:	2000 A

FEEDBACK 3E-044

MANUFACTURER:	WESTINGHOUSE
TYPE:	DSL-208
TRIP UNIT:	LS
LOCATION:	EMERGENCY DISTRIBUTION
IDENTIFICATION:	FEEDBACK
SERIAL NO.:	J2B 47269-1A
SENSOR:	400/5 A
CAPACITY:	800 A
FUSES:	1200 A

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

24.2.1 All inspection and overhaul work shall be performed as quickly as possible to minimize power shutdowns.

24.2.2 CCG personnel will disconnect and connect the electrical supply.

24.2.3 Replacement of parts

24.2.3.1 If any parts are defective or damaged and must be replaced, the Contractor shall provide a list of such parts with an assessment of replacement cost and associated delivery times. No parts may be replaced by the Contractor until written authorization has been received from the Contracting Authority (CA) involved in the project.

24.2.3.2 The Coast Guard already has several spare parts for this type of circuit breaker and can use them if needed for repairs.

24.2.4 Replacement of the protection unit

24.2.4.1 Replace the current protection unit (LS) with a WESTRIP RMS-2012AF model.

24.2.4.2 Program and adjust the new protection module to be equivalent to the previous LS module.

24.2.5 Maintenance of the mechanism and frame

24.2.5.1 Completely disassemble the mechanism;

24.2.5.2 Inspect and clean each part;

24.2.5.3 Replate all the mechanism's parts with zinc;

24.2.5.4 Clean the frame using glass beads;

24.2.5.5 Repaint the front of the circuit breaker;

24.2.5.6 Replace damaged bolts;

24.2.5.7 Lubricate the mechanism in accordance with the manufacturer's recommendations;

24.2.5.8 Reassemble and test the mechanism assembly.

24.2.6 Maintenance of electrical components

24.2.6.1 Clean the main and disconnecter contacts;

24.2.6.2 Replate all conductive parts (main contacts) with silver;

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 24.2.6.3 Check the pressure, straightness, and alignment of the main contacts and make adjustments if required;
- 24.2.6.4 Clean and reinsulate the moulded plastic parts around the main contacts;
- 24.2.6.5 Clean and reinsulate the arcing chambers;
- 24.2.6.6 Clean and reinsulate all insulators;
- 24.2.6.7 Test and clean all auxiliary contacts, replacing them if required;
- 24.2.6.8 Clean and lubricate the electrical connection points at the rear of the circuit breaker;
- 24.2.6.9 Check and replace the spring loading motor brushes if necessary;
- 24.2.6.10 Check the general condition of internal wiring and replace attachments if necessary;

24.2.7 Electrical tests

- 24.2.7.1 Check the operation of the new protection unit;
- 24.2.7.2 Check the operation and adjustment of the SHUNT trip;
- 24.2.7.3 Measure the resistance of the main contacts;
- 24.2.7.4 Measure the insulation level of the electrical circuits;
- 24.2.7.5 Check the operation of the spring loading motor;
- 24.2.7.6 Check the operation of the low voltage trip relay (if applicable);
- 24.2.7.7 Check the operation of the anti-hunting relay (if applicable).

24.3 Proof of performance

24.3.1 Tests and inspection

- 24.3.1.1 Tests and inspections shall be carried out in accordance with ABS requirements and the following standards:
 - a) TP127E "Ships Electrical Standards (2008)" Transport Canada www.tc.gc.ca
 - b) IEEE-45 "IEEE Recommended Practice for Electrical Installations on Shipboard (2002)" ieeexplore.ieee.org ISBN: 0-7381-3381-7
 - c) CSA C22.1-12 "Canadian electrical code, part I (22nd edition), safety standard for electrical installations" shop.csa.ca

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- d) CSA C22.2 NO. 0-10 "General requirements - Canadian electrical code, part II"
Shop.csa.ca
- e) SOR-90-264 "Marine Machinery Regulation (2014)" lois-laws.justice.gc.ca

24.3.2 Deliverable documents:

24.3.2.1 The Contractor shall produce a report containing the following information:

- a) The original ABS certificates
- b) The name of the person who performed the certification
- c) The date and time the complete inspection/rebuilding of the circuit breakers have been certified by Transport Canada
- d) The serial number or identification number of the circuit breaker
- e) The date and time of the start and end of work, as well as the number of hours for each work day
- f) A description of the work done and of anomalies detected
- g) A list of parts replaced
- h) Photos of the anomalies

25.0 HULL VALVES

25.1 Scope

25.1.1 The objective of this task is to replace some valves in the "Soupape Vanne Dalot" list in order to replace worn valves and maintain the Load Line certificate. Valves to be replaced will be provided by CCG.

25.2 Reference Documents

- 25.2.1 Décharge par dessus bord
- 25.2.2 Soupapes Vannes Dalots
- 25.2.3 221-H-80

25.3 Technical Description

25.3.1 Close the discharge valves before starting work, clean the inside of penetration pipes and clean all debris to allow inspection.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 25.3.2 Dismantle the valve "51 Auxiliary Diesel No.1 - Diesel Service Ship No. 1" and the "52 Auxiliary Diesel Degreasing" valve. no.1 - De-icing for S / S diesel no.1 "En 98-99 starboard.
- 25.3.3 Overhaul the ½ "valve," 52 Degreaser for Diesel Aux. no.1 - De-icing for S / S diesel no.1 "En 98-99 starboardside.
- 25.3.4 Thorough inspection of the flange and "thru-hull" transit in the presence of the IA. Replace the penetration pipe section diameter 5 inches by 3 feet (approximately) with flange between the valve and the plating sheet. Provide for the adaptation of the pipe to the shape of the shell.
- 25.3.5 Supply and apply one (1) coat of marine epoxy coating inside the penetration pipes.
- 25.3.6 The steam line and its steam valve for de-icing shall be adapted to the new overboard valve.
- 25.3.7 The cups, rods and rod nets shall be cleaned and reassembled by coating the moving parts with a site-supplied anti-seize product.
- 25.3.8 The seals and gaskets will be replaced with new ones compatible with seawater supplied by the shipyard. Provide material specifications and get approved by AI before use.
- 25.3.9 The new valve provided by the CCG will be brushed internally to the metal and coated with two coats of marine epoxy coating.
- 25.3.10 Dismantle Valve "27 Condenser, Front Evaporator 4" Spherical - Forward Evaporator Condenser Globe "and" 28 Condenser Deflating Front Evaporator ½ "Spherical De-icing for forward evap. Condense Globe »Fr 96-97 port.
- 25.3.11 Revise the "28 Evap condenser De-icing. before ½ "Spherical De-icing for forward evap. Condenser Globe"
- 25.3.12 Modify the valve for the addition of a ½ "flanged fitting for de-icing.
- 25.3.13 Thorough inspection of the flange and "thru-hull" transit in the presence of the IA. Replace the penetration pipe section diameter 4 inches by 3
- 25.3.14 Provide and apply one (1) coat of marine grade epoxy paint to the inside of the penetration pipes
- 25.3.15 The steam line and its steam valve for de-icing shall be adapted to the overboard valve.
- 25.3.16 Caps, rods and rod threads shall be cleaned and reassembled by coating the moving parts with anti-seize mixture provided by the site.

Refit (Dry-Dock)	CCGS Pierre Radisson	ANNEX "A"
Statement of Work (SOW)	Canadian Coast Guard (CCG)	Version 2018-08-03

- 25.3.17 Seals and gaskets shall be replaced by new ones supplied by the site. Provide specifications and have AI approve before use.
- 25.3.18 The new CCG supplied valve and the valve (#27 and #51) shall be internally metal brushed and coated with two coats of marine grade epoxy paint. Particular care should be taken not to apply paint to the seat or moving parts of the valves.
- 25.3.19 The new valve provided by CCG and the valve (#27 and #51) will be opened and dismantled for inspection by the ABS marine surveyor.
- 25.3.20 After inspection, the valves shall be reassembled and checked for function and tightness.
- 25.3.21 Plates, grids, studs and floor supports that have been removed to access the valves shall be properly and securely reassembled. The pipe sections removed for the same reasons will be reassembled with new gaskets provided by the site.
- 25.3.22 The insulation removed to access the valves shall be replaced by new insulation, new mesh and secured in the same manner in accordance with Insulation Plan 221-H-80.

25.4 Proof of performance

25.4.1 Inspection

- 25.4.1.1 Demonstration to the inspection authority of the proper functioning and tightness of valves, valves and gutters

25.4.2 Deliverables

- 25.4.2.1 The contractor shall provide a report for each valve. The report should include the following information:
 - 25.4.2.1.1 Clear identification of the valve;
 - 25.4.2.1.2 Work performed and parts replaced;
 - 25.4.2.1.3 The results of the measurements taken on the components;
 - 25.4.2.1.4 A photo of all disassembled components and a photo of the inside of the valve.