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TPSGC
11 Laurier St. / 11, rue Laurier
Place du Portage , Phase III
Core 0A1 / Noyau 0A1
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

SOLICITATION AMENDMENT

MODIFICATION DE L'INVITATION

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

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

Comments - Commentaires

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

Issuing Office - Bureau de distribution
Ship Refits and Conversions / Radoubss et
modifications de navires and / et
11 Laurier St. / 11, rue Laurier
6C2, Place du Portage
Gatineau, Québec K1A 0S5

Title - Sujet DRY DOCKING OF CCGS SAMUEL RISLEY		
Solicitation No. - N° de l'invitation F2599-120018/A		Amendment No. - N° modif. 005
Client Reference No. - N° de référence du client F2599-120018		Date 2012-05-17
GETS Reference No. - N° de référence de SEAG PW-\$\$MD-018-22718		
File No. - N° de dossier 018md.F2599-120018	CCC No./N° CCC - FMS No./N° VME	
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2012-05-24		Time Zone Fuseau horaire Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>		
Address Enquiries to: - Adresser toutes questions à: Vandal, Paul		Buyer Id - Id de l'acheteur 018md
Telephone No. - N° de téléphone (819) 956-0645 ()		FAX No. - N° de FAX (819) 956-0897
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:		

Instructions: See Herein

Instructions: Voir aux présentes

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

Solicitation No. - N° de l'invitation

F2599-120018/A

Amd. No. - N° de la modif.

005

Buyer ID - Id de l'acheteur

018md

Client Ref. No. - N° de réf. du client

F2599-120018

File No. - N° du dossier

018mdF2599-120018

CCC No./N° CCC - FMS No/ N° VME

**CCGS SAMUEL RISLEY
PWGSC FILE No. F2599-120018/A
BIDDER'S CONFERENCE
RECORD OF DISCUSSION**

A Bidder's Conference for the repair of CCGS Samuel Risley was held on Wednesday May 9, 2012 at CCG Building, Parry Sound, Ontario. The Conference started at 10:00 AM

In attendance were:

NAME	POSITION	REPRESENTING
Joseph C. D'Achille	Project Manager	Heddle Marine Service Inc.
Michel Labrie	District Principal Surveyor	ABS
Jayson Stansfield	Account Manager	Wartsila
Signe Gotfredsen	Commanding Officer	CCG Samuel Risley
Brent Hornick	Chief Engineer	CCGS Samuel Risley
John Odell	Production Manager Marine Eng.	CCG
Paul Vandal	Contracting Authority	PWGSC

1) OPENING REMARKS

The Chairperson welcomed all attendees to the Conference.

2) DOCUMENTATION TO BIDDERS

Have bidder's received all, yes received both amendments, no issues.

3) REVIEW OF THE INVITATION TO TENDER

PART ONE TERMS AND CONDITIONS

(Chaired by Contracting Authority)

PART 1 – GENERAL INFORMATION

Q: What is the lightest draft the vessel can reach?

A: The vessel is expected to have a draft of 5.2 m (17 feet) forward and 5.0 - 5.1 m. aft.
This is based on there being approximately 100 - 120 m3 of fuel remaining.

Q: What fuel is expected to be remaining on board?

A: Less than 200 cubic meters.

Q: When will vessel be arriving?

A: Expected, 8 am on morning of the 18th and proceed immediately into the dock.

Q: When will sewage plant be shut down and pumped out?

A: the same day.

Q: Will vessel be crewed?

A: Vessel will be crewed for docking and crew depart that day.

PART 2 - BIDDER INSTRUCTION

PART 3 – BID PREPARATION INSTRUCTIONS

PART 4 – EVALUATION PROCEDURES AND BASIS OF SELECTION

PART 5 – CERTIFICATIONS

PART 6 – FINANCIAL AND OTHER REQUIREMENTS

PART 7 - RESULTING CONTRACT CLAUSES

LIST of Annexes:

ANNEX “A”

Requirement

See REVIEW OF THE INVITATION TO TENDER

PART TWO - CCGS Samuel Risley Specification No. 728.11 rev. 1 (Date: 2012-03-28)

(Chaired by Technical Authority)

ANNEX “B”

BASIS OF PAYMENT FIRM PRICE

ANNEX “C”

INSURANCE REQUIREMENTS

ANNEX “D”

WARRANTY

ANNEX “E”

PROCEDURE FOR PROCESSING UNSCHEDULED WORK

ANNEX “F”

QUALITY CONTROL/INSPECTION

Q: Bidder is an ISO 9001-2008 registered company. Will the existing ISO QC Plan be acceptable?

A: Yes

ANNEX “G”

FINANCIAL BID PRESENTATION SHEET/PRICING DATA SHEET

Q: Can Annex G be provided in MS-Excel format?

A: Yes

**ANNEX “H”
VESSEL CUSTODY**

**ANNEX “I”
DELIVERABLES/CERTIFICATIONS**

**REVIEW OF THE INVITATION TO TENDER
PART TWO - CCGS Samuel Risley Specification No. 728.11 Rev. 1 (Date 2012-03-28)
(Chaired by Technical Authority)**

1.0 GENERAL NOTES

- Q: Will vessel be unmanned and which Occupational Safety and Health regulations apply?
A: Vessel will be unmanned, provincial OSH applies but Contractor shall follow CCG OSH documentation procedures in parallel with the Contractor’s own documentation procedures.
- Q: TCMS will not respond to requests from Contractors, how shall requirement to obtain survey credit be fulfilled?
A: Contractor is responsible for advising the attending TCMS surveyor of the progress of the work with sufficient notice such that TCMS is able to attend at the inspection points required by TCMS. Prior to the docking the CCG shall advise the TCMS branch office of the planned work and inspection requirements when the dry dock location is known. Bidders are reminded of the requirement to conduct a pre-refit planning meeting in Section 1.11.2. in order to consult and confirm with TCMS the requirements for inspection points and for communication.
- Q: Bidder has its own inspection control document for TCMS inspection, is this alone sufficient?
A: No, The Contractor shall ensure that the vessel’s TCMS inspection register is completed in parallel with the Contractor’s own control document.

Clarification

Section 1.3.2:

Confined spaces are as defined in the applicable OSH regulations and includes tanks, voids, cofferdams, sea bay, sea chests

2.0 SERVICES

2.11 Crane services for a 20 tonne crane

3.0 VESSEL PARTICULARS

4.0 LIST OF ACRONYMS

5.0 FIELD SERVICE REPRESENTATIVE REQUIREMENTS

Q: Please clarify when the Wärtsilä Field Service Representative FSR is needed?

A: For the work of Sections 16, 17 and 22.

Q: Is a Dex-O-Tex FSR required?

A: See 21.3.5.5, Dex-O-Tex FSR not required if contractor is experienced with material,

6.0 DOCKING AND UNDOCKING

7.0 VESSEL HULL STRUCTURE CONDITION SURVEY

Clarification

7.3.6 the total UT readings of hull plate, shall be 1,000, and in the transverse sections, of decks and framing, 900.

Q: 7.4.1.4 coating thickness measurements is not a function of an RO hull survey, can this be dropped?

A: Yes, 7.4.1.4 to read “Coating condition”.

Q: 7.5.1.1, second bullet point: Recorded on shell plate expansion drawing is not typical requirement. All data is already presented in standard reports, is this sufficient?

A: No. However, the drawing need only be color coded to indicate areas of no diminuation, acceptable diminuation, and diminuation requiring immediate repair.

Q: 7.5.1.1, sixth bullet point: RO’s do not typically provide a costing service. Can this be dropped?

A: No

Q: 7.5.1.2 There is a difference between a condition survey and assessment and “recommendation for entry into class”. Can CCG please clarify what is being asked for?

A: The CCG is asking for a current condition survey and assessment of the hull structure with respect to corrosion and other damage. Section 7.5.1.2 is not intended to be a recommendation for entry into class, but an broad statement of the requirements to be met such that the vessel could be registered with Class and entered into the DSIP program of TCMS.

Q: Can this entire section 7.0 be changed such that the Contractor shall provided the services of an RO to perform a hull conditions survey with an allowance for RO support?

A: No

8.0 UNDERWATER HULL (SURVEY ITEM)

Q: 8.3.16.2, can you give a total area for all items?

A: Yes, 850 square meters

Clarification

Line between underwater and above water hull coatings is approximately 3.8 meters above the baseline.

9.0 SEA AND SEA BAY (SURVEY ITEM)

Q: 9.3.1.2 how many bolts?

A: Number and size of bolts will be covered as work arising.

10.0 SEA VALVES (SURVEY ITEM)

11.0 FUEL TANKS (SURVEY ITEMS)

Q: 11.3.12 Will this involve Hotwork?

A: No

12.0 BALLAST, SEWAGE AND VOID TANKS INSPECTION (SURVEY ITEM)

Q: 12.3.8 What type of brackets, will this involve Hotwork?

A: Bracketing made of flat bar and angle iron, some Hotwork.

13.0 POTABLE WATER TANKS (SURVEY ITEM)

14.0 VOID SPACES (SURVEY ITEM)

15.0 RUDDERS (SURVEY ITEM)

Q: 15.3.4.1 How many fits?

A: Fixed price bid to include two fits per rudder.

16.0 PROPULSION TAIL SHAFTS (SURVEY ITEM)

17.0 CONTROLLABLE PITCH PROPELLER SYSTEM (SURVEY ITEM)

18.0 BOW THRUSTER OUTBOARD BEARING REPLACEMENT

19.0 HYDROSTATIC AND PNEUMATIC PRESSURE TEST PROCEDURES

Q: Can bid price be evaluated on air test only? Hydrostatic test places some Contractor facilities at a disadvantage.

A: No. The objection is noted, however the requirement is not changed.

20.0 STERN THRUSTER GEAR BOX OIL CHANGE

Clarification: 20.3.4 Anodes are CCG supply

21.0 STAIR TOWER DECK REPAIR

22.0 DOCK TRIALS AND SEA TRIALS

23.0 ANNEX A

New Section

24.0 KEYSTONE VALVE REPAIR

Q: Does the valve require disconnection at the flanges?

A: No. The packing and bushings are accessible without removing the valves,

4) CLOSING COMMENTS

Q. Can you extend the Closing Date

A. Yes, New Closing Date is May 24, 2012 at 02:00 PM

The chairperson thanked all attendees for their participation. As there was no further business the Bidders' Conference ended at 12:15 PM

Paul Vandal
Contracting Authority
9 May 2012

CLARIFICATIONS TO INVITATION TO TENDER – DATED MAY 1, 2012
DRY DOCKING OF SAMUEL RISLEY
File No. F2599-120018/A

Section 5.1.1 is amended to read:

The Contractor shall be responsible for obtaining the services of an accredited Wärtsilä Inc. field service representative to supervise the work undertaken in this Specification applicable to the CPP systems and SKF coupling in Sections 16, 17, and 22. The field service representative shall be accredited by Wärtsilä Inc as being a competent person to perform this work.

Section 7.4.1.4 is amended to read:

Coating condition;

Section 16.1.1 is amended to read:

The Contractor shall remove the rope guards, verify the tail shaft bearing, remove the forward and aft stern tube seals, remove the SKF couplings, withdraw the tail shafts, inspect the tail shafts and stern tube bearing, and once inspected by the attending TCMS inspector – re-assemble all equipment and set-to-work. The Contractor shall engage the services of a Thordon Canada Inc FSR to oversee and conduct the work of Section 16 with regard to the work of the Thordon bearings, Thorcoat, and Sternkeeper seals. The Contractor shall engage the services of a Wärtsilä Canada FSR to oversee and conduct the work of Section 16.3.3 with regard to the work of the SKF couplings, and the disconnection and reconnection of the CPP piping.

Section 16.3.2.5 is amended to read:

The Contractor shall disassemble the forward seals on both shaft lines. Seal parts are to be marked as to orientation and from which section they have been removed. The Contractor shall refer to the Thordon FSR and the Sternkeeper manual. On completion of the re-installation of the tail shafts the Contractor shall re-install the Sternkeeper seals.

Section 16.3.4.1 is amended to read:

The Contractor shall remove the Port and Stbd tail shafts once the SKF couplings have been released and the seals have been dismantled. On completion of the work of Section 17.0 the Contractor shall reinstall the Port and Stbd tail shafts. The Wärtsilä Canada FSR shall supervise and conduct the work of disconnecting and reconnecting the interior CPP piping. Care shall be exercised to ensure that the Thor-Coat is not damaged on either shaft during removal and re-installation.

CCGS Samuel Risley Dry Dock 2012

Specification No: Spec # 728.11 rev. 2

Date: 2012-05-10

Prepared by Marine Engineering
Integrated Technical Services
Canadian Coast Guard
520 Exmouth Street
Sarnia, Ontario
N7T 8B1

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1.0 GENERAL NOTES

1.1 Identification

1.1.1 These General Notes describe the CCG requirements applicable to all accompanying Technical Specifications.

1.2 References

1.2.1 Applicable regulations and documentation:

FSSM Procedures	Title	Location
7.B.2.	Fall Protection	CD Folder 1.0
7.B.3	Hazard Prevention Program	CD Folder 1.0
7.D.9	Entry Into Confined Spaces	CD Folder 1.0
7.D.11	Hot work	CD Folder 1.0
7.D.19	Lockout and Tag out	CD Folder 1.0
7.F.6	Handling, Storage & Disposal of Hazardous Material	CD Folder 1.0
7.F.9	Paint and Other Coatings	CD Folder 1.0
7.F.10	Controlling Halocarbon Use Aboard Ships	CD Folder 1.0
7.F.12	Potable Water Quality	CD Folder 1.0
10.A.2	Contractor Liability	CD Folder 1.0
Ship Specific	Vessel Specific - Asbestos Management Plan	CD Folder 1.0
Publications		
TP3177E	Standard for the Control of Gas Hazards in Vessels to be Repaired or Altered	
T127E	Transport Canada Marine Safety Electrical Standard	
IEEE 45	Recommended Practice for Electrical Installation on Ships	
70-000-000-EU-JA-001	Specification for the Installation of Shipboard Electronic Equipment	
CSA W47.1	Certification of Companies for Fusion Welding of Steel Structures Division 2 Certification	
CSA W47.2	Certification of Companies for Fusion Welding of Aluminum	
CSA W59	Welded Steel Construction – Metal Arc Welding	
CSA W59.2	Welded Aluminum Construction	

DO NOT MODIFY

Acts		
CSA	Canada Shipping Act	
CLC	Canada Labour Code	
Regulations		
MOHS	Maritime Occupational Health and Safety	

1.3 Occupational Health and Safety

- 1.3.1 The Contractor shall be responsible for ensuring that the Contractor and all sub-contractors follow Occupational Health and Safety (OHS) procedures in compliance with applicable Federal and Provincial OHS regulations. The Contractor shall be responsible for ensuring that Contractor activities are carried out in a safe manner and do not endanger the safety of any personnel.
- 1.3.2 The Contractor shall be responsible for ensuring all confined spaces are made and maintained safe for entry and safe for hot work for the work of this Specification. This includes opening, ventilation, testing, gas-freeing and maintaining conditions and permits safe for entry and safe for hot work for the duration of this contract.
- 1.3.3 The Contractor and Contractor's employees will not have access to the vessel's washrooms and crew mess facilities. The Contractor shall provide the necessary amenities for the Contractor's and sub-contractors employees as required.

1.4 Access to Worksite

- 1.4.1 The Contractor shall ensure that the CA, the TA and CCG have unrestricted access to the worksite at all times during the contract period.

1.5 Workplace Hazardous Materials Information System (WHIMS)

- 1.5.1 The Contractor must provide the TA with Material Safety Data Sheets (MSDS) for all Contractor supplied WHIMS controlled products.
- 1.5.2 The TA will provide the Contractor with access to MSD sheets for all controlled products on the ship for all specified work items.

1.6 Smoking in the Work Space

- 1.6.1 The Contractor shall be responsible for ensuring compliance with the Non-Smokers Health Act and the Non-Smokers' Health Regulations. No part of the vessel or of the dry dock shall be a designated smoking area. The Contractor shall ensure that there is absolutely no smoking onboard the vessel.

DO NOT MODIFY

1.7 Clean and Hazard Free Worksite

- 1.7.1 Before the Contractor starts any work on the vessel the Contractor's Quality Assurance Representative and the TA shall walk through each space and area where work is to take place, including access and removal routes and areas adjacent to those where the work is to be done as a result of this specification. The Contractor's Quality Assurance Representative shall take digital pictures of each area showing the outfit therein and download the photos in JPG format onto a CD or DVD. Each picture shall be dated and labeled as to the location on the vessel. Copies of this CD or DVD are to be provided to the TA for reference purposes within 48 hours of the start of the contract.
- 1.7.2 The Contractor, during the work period shall maintain those areas of the vessel which Contractor personnel use to access those areas where work is to be undertaken, in a clean condition, free from debris and remove garbage daily.
- 1.7.3 Areas that pose a hazard as a result of the specification work are to be secured and clearly identified by the Contractor with signage to advise and protect all personnel from the hazard in accordance with applicable Canada Labour Code requirements.
- 1.7.4 Upon completion of this contract, the Contractor shall be responsible for the removal of all garbage generated from the work of this specification and for returning the vessel to the state of cleanliness in which the vessel was at the start of the contract period.
- 1.7.5 Once all known work and final clean-up has been completed, the Contractor's QA Representative and TA shall perform a 'walk through' of the vessel to view all areas where work was performed by the Contractor. Any deficiencies or damage noted shall be recorded and compared to the photos and if deemed to have been caused by the Contractor as a result of the work the damage shall be repaired by the Contractor at no cost to the Coast Guard.

1.8 Fire Protection

- 1.8.1 The Contractor must ensure the isolation, removal and installation of fire detection and suppression systems or any components thereof, is performed by a qualified technician. When the fire detection or fire suppression system is deactivated or disabled by the Contractor during the contract, the system(s) must be recertified by a qualified technician as fully functional. A signed and dated original copy of the certificate must be delivered to the TA before the end of the contract.
- 1.8.2 The Contractor must notify the TA and obtain written approval from the TA prior to disturbing, removing, isolating, deactivating / disabling or locking out any part of the fire detection or suppression systems, including heat and smoke sensors.
- 1.8.3 The Contractor must ensure protection against fire at all times including when working on the ship's fire detection and / or suppression system(s). This may be accomplished as suggested below and only with the written permission of the TA:
 - Disabling only one portion of a system at a time;
 - By maintaining system function using spares while work is in progress;
 - Other means acceptable to and approved by the TA.

DO NOT MODIFY

- 1.8.4 The Contractor must note that failure to take the necessary precautions while performing work on the vessel's fire suppression system(s) could result in the accidental discharge of the fire suppression agent(s). The Contractor must recharge and certify at his cost, container(s) or systems that are discharged as a result of such work.

1.9 Touch-up / Disturbed Paint

- 1.9.1 Unless stated otherwise the Contractor shall supply and apply two coats of marine primer compatible with the vessel's existing coating system to all new and/or disturbed metal surfaces.
- 1.9.2 The Contractor must prepare all new and disturbed steelwork to the paint manufacturer's standards prior to painting.

1.10 Not Used

1.11 Regulatory Inspections and/or Class Surveys

- 1.11.1 The Contractor shall contact, coordinate and schedule all regulatory inspections and class surveys with the applicable authority: i.e. TCMS, HC, Environment Canada or others as required by this Specification.
- 1.11.2 The Contractor shall convene a meeting of the Contractor's Project Manager for the work of this Specification, the attending TCMS Surveyor, and the TA, no less than 4 weeks before the scheduled docking of the vessel. The purpose of this meeting is to confer with all parties and determine the inspection and testing requirements of TCMS for the work of this Specification. This meeting shall be held in conjunction with the Opening Meeting required in Specification Section 7.0.
- 1.11.3 Any documentation generated by the above inspections and/or surveys to show that the inspections and/or surveys were conducted (i.e. original signed and dated certificates) must be provided to the TA.
- 1.11.4 Observance by the TA of any inspection point does not constitute an approval by the TA.
- 1.11.5 The Contractor shall not substitute witnessing, observance and inspection by the TA for the required regulatory inspections or class surveys.
- 1.11.6 Throughout this specification the phrase "The Contractor shall obtain TCMS survey credit" or similar phrasing shall have the following meaning:
- 1.11.7 On completion of a successful examination, inspection or test to the requirements of the applicable Legislation, Regulation and other requirements of TCMS, the Contractor shall ensure that the attending TCMS inspector is presented with the vessel's register of TCMS inspections and obtain the signature of the attending TCMS inspector for each inspection item. The vessel's register shall remain in the care and custody of the vessel Chief Engineer at all times.
- 1.11.8 Throughout this specification the phrase "The Contractor shall afford the opportunity" or similar phrasing shall have the following meaning:

DO NOT MODIFY

- 1.11.9 The Contractor shall provide no less than 48 hours' notice to TCMS, and the TA of the starting or completion of a work item, and of the reaching of an inspection point such that TCMS and the TA can witness the conduct of the work or perform an inspection.

1.12 Test Results and Data Book

- 1.12.1 The Contractor shall develop an Inspection, Test and Trials Plan which shall include as a minimum all deliverables, inspections, tests, trials, TCMS inspection and survey points for the work of this Specification. The Inspection, Test and Trials plan shall be provided for TA review 4 weeks prior to the originally scheduled start of the inspections. The Inspection, Test and Trials Plan shall be provided in PDF format and in unlocked MS-Excel spreadsheet(s).
- 1.12.2 All tests, measurements, calibrations and readings must be recorded, signed by the person taking the measurements, dated and provided in report format both in hard copy and electronic format, to the TA, and TCMS.
- 1.12.3 Recorded dimensions shall be to a precision of three decimal places (unless otherwise stated) in the measuring system currently in use on the vessel.
- 1.12.4 The Contractor shall provide to the TA current and valid calibration certificates for all instrumentation used in the Inspection, Test and Trials showing that the instruments have been calibrated in accordance with the manufacturer's instructions.
- 1.12.5 Hard copy reports shall be bound in standard 3-ring binders, type written on letter size paper and indexed by specification number. Electronic copies shall be in unprotected Adobe PDF format and provided on CD-ROM media. The Contractor shall provide 3 hard copies and 1 electronic copy of all reports.
- 1.12.6 The Contractor shall update all drawings affected by the work of this specification. The Contractor shall create and supply all drawings required by the work of this specification. The Contractor may provide working drawings in PDF and paper format during the work of the contract period. The Contractor shall supply new and updated paper drawings as well as electronic versions in AutoCAD 2010 DWG format showing the as fitted arrangements in the final version of the Test Results and Data Book.
- 1.12.7 The Contractor shall report the findings, work completed, and final condition for the work of this Specification. All documentation from the contract period shall be inserted in the final version of the Test Results and Data Book and delivered to the TA on completion of the contract.

1.13 Contractor Supplied Materials and Tools

- 1.13.1 The Contractor must ensure all materials are new and unused.
- 1.13.2 The Contractor must ensure replacement material such as jointing, packing, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints, coatings etc. are in accordance with the equipment manufacturer's drawings, manuals and/or instructions.

DO NOT MODIFY

- 1.13.3 Where no particular item is specified or where substitution must be made, the TA must approve the substituted item in writing. The Contractor must provide information about materials used, certificate of grade and quality of various materials to the TA prior to use.
- 1.13.4 The Contractor shall provide all equipment, devices, tools and machinery such as crane, staging, scaffolding and rigging necessary for the completion of the work in this specification.
- 1.13.5 The Contractor shall provide waste disposal services for any oil, oily waste or other hazardous or controlled waste generated by the work of this specification. The Contractor shall provide waste disposal certificates for all of the above generated waste and the disposal certificates shall indicate that the disposal was in accordance with Federal, Provincial and Municipal regulations in effect.

1.14 Government Supplied Materials & Tools

- 1.14.1 All tools are Contractor supplied unless otherwise stated in the technical specifications.
- 1.14.2 Where tools are supplied by the TA they shall be returned by the Contractor in the same condition as when they were borrowed. Borrowed tools must be inventoried and signed for by the Contractor on receipt and return to the TA.
- 1.14.3 Any Government supplied material (GSM) shall be received by the Contractor and stored in a secure warehouse or storeroom having a controlled environment appropriate for the equipment as per manufacturer's instructions.

1.15 Restricted Areas

- 1.15.1 The Contractor must not enter the following areas except to perform work as required by the specifications: all cabins, offices, workshops, Engineers' office, Wheelhouse, Control Room, all washrooms, Galley, Mess Rooms, Lounge areas and any other areas restricted by signage.
- 1.15.2 The Contractor must give the TA 24 hours advance notice prior to working in any accommodation areas or office spaces. This will allow CCG adequate time to move personnel and secure the areas.

1.16 Contractor Inspections and Protection of Equipment and the Worksite

- 1.16.1 The Contractor must coordinate an inspection with the TA on the condition and location of items to be removed prior to carrying out the specified work or to gain access to a location to carry out the work.
- 1.16.2 Any damage incurred as a result of the Contractor's work and that is attributable to the Contractor's work performance shall be repaired by the Contractor at his expense. Materials used in any replacement or repairs must meet the criteria for Contractor supplied material noted above in Section 1.13.

DO NOT MODIFY

1.16.3 The Contractor must protect all equipment and surrounding areas from damage. Work areas are to be protected from the ingress of water, welding and blasting grit etc. Temporary covers to work areas must be installed.

1.16.4 The Contractor must protect the vessel from the possibility of vermin infestation (insect/mammal). If an infestation does occur during the contract period the Contractor shall bear all costs to ensure the vessel is made vermin free before the vessel's departure and contract completion.

1.17 Recording of Work in Progress

1.17.1 The TA may record any work in progress using various means including, but not limited to photography and video, digital or film.

1.18 List of Confined Spaces

1.18.1 The Contractor may request a list of the vessel's identified confined spaces at the Pre-Refit meeting.

1.19 Lead Paint and Paint Coatings

1.19.1 The Contractor shall not use lead based paints.

1.19.2 CG ships have been painted with lead based paints in the past and as a result some of the Contractor's processes such as grinding, welding and burning may release this lead from the coatings. The Contractor shall ensure that coatings in the affected work areas are tested for lead content and that the work is performed in accordance with applicable Federal and Provincial regulations.

1.19.3 The Contractor must provide HC product approval for underwater hull surface paints controlled by HC and the Pest Management Regulatory Agency.

1.20 Asbestos Containing Materials

1.20.1 The Contractor shall not use any asbestos containing materials.

1.20.2 Handling of any asbestos containing materials shall be performed by personnel trained and certified in the removal of asbestos in accordance with Federal, Provincial and Municipal regulations in effect and in accordance with the Fleet Safety and Security Manual. The Contractor shall provide the TA with disposal certificates for all asbestos containing material removed from the vessel indicating that the disposal was in accordance with Federal, Provincial and Municipal regulations in effect.

1.21 Removed Materials and Equipment

1.21.1 All removed equipment as a result of this specification shall remain the property of the Coast Guard unless otherwise specified.

DO NOT MODIFY

1.22 Welding Certification

- 1.22.1 For any work requiring the application of fusion welding for steel structures the Contractor and/or the sub-contractor companies and operators shall be certified by the Canadian Welding Bureau in accordance with CSA Standards W47.1-03, latest revision – Certification of Companies for Fusion Welding of Steel Division 2 Certification as a minimum. Current copies of certification (including those of the welders) shall be provided to the TA.

1.23 Electrical Installations

- 1.23.1 All electrical installations and repairs shall be carried out in accordance with the latest revisions of Transport Canada Marine Safety Electrical Standard TP127E and IEEE Standard 45 Recommended Practice for Electrical Installation on Ships.

1.24 Production Schedule

- 1.24.1 The Contractor shall provide a draft production schedule showing milestones and task durations with the bid documents.
- 1.24.2 The Contractor shall provide a detailed production schedule in PDF format. The production schedule shall be updated bi-weekly during the work period.
- 1.24.3 The Contractor shall conduct a daily briefing at the start of each working with the TA and CCG personnel.

DO NOT MODIFY

2.0 SERVICES

2.1 General

- 2.1.1 The Contractor shall supply the following services to the vessel for the entire work period and disconnect upon completion of the work period. The Contractor shall be responsible for the re-establishment of services if the vessel is moved during the work period.
- 2.1.2 Each of the services noted below shall be separately priced in the Contractor's submitted bid.
- 2.1.3 The Contractor shall be responsible for supplying all material, equipment, and labour required to connect and disconnect the services to the vessel. Unless otherwise stated these services shall be available 24 hours a day 7 days a week for the entire contract period.
- 2.1.4 All staging, crange, screens, lighting and any other support services, equipment and materials necessary to carry out the work identified in these specifications shall be Contractor supplied.

2.2 Berthing

- 2.2.1 The berthing and mooring facilities must be suitable for a vessel of this size in local weather / tide / sea conditions. Fenders shall be supplied by the Contractor to prevent the vessel from contacting the wharf in local weather / tide / sea conditions.
- 2.2.2 The length of the dock must be a minimum of 90% of the length of the vessel (LOA).
- 2.2.3 During the contract period, when the ship is not in the dry dock, the ship must be berthed at the Contractor's wharf at a safe and secure location with a minimum clearance of 1.0 meters under the vessel at extreme low tide to ensure the vessel will not touch bottom.
- 2.2.4 The Contractor shall be responsible for all movements of the vessel, including berthing and mooring of the vessel for the contract period and arrangements and costs for line handlers, tugs and pilots.

2.3 Mooring Lines

- 2.3.1 The Contractor shall be responsible for providing the necessary mooring lines and labour required to secure the vessel alongside the facilities. Ship's mooring lines are not to be used.

2.4 Gangways

- 2.4.1 Contractor shall supply the labour and services required for the installation and removal of two gangways, complete with handrails, safety nets and lighting for the duration of the contract. The Contractor shall be required to supply and maintain the gangways.
- 2.4.2 Any movement of the gangways required by the Contractor will be at the expense of the Contractor.

DO NOT MODIFY

2.4.3 Gangways shall be at separate locations to facilitate fire evacuation.

2.5 Not Used

2.6 Electrical Power

2.6.1 The Contractor shall be responsible for supplying 600 Volt Alternating Current, 60 Hertz, 3 Phase, 200 Ampere service electrical power for the duration of the contract.

2.6.2 The Contractor shall be responsible for supplying and connecting the necessary shore cable to the ship's shore power connection.

2.6.3 The Contractor shall be responsible for ensuring that the correct phase rotation on a 3 – phase system is established prior to energizing the ship's distribution system. Any changes to the ship's power system to accommodate the Contractor supplied shore power connections must be returned to the original setup by the Contractor upon the disconnection of the Contractor supplied power cable and equipment. All work shall be carried out by certified electricians.

2.6.4 The Contractor shall supply all power to the vessel through a Contractor supplied kilowatt-hour meter. The Contractor shall read the kilowatt-hour meter when the connection is made and once again when the power is disconnected. Both readings of the meter shall be witnessed by the TA. The Contractor shall provide a calibration certificate for the kilowatt-hour meter.

2.6.5 The Contractor shall supply a price quote per kilowatt-hour for electrical power while the vessel is fully crewed and vessel staff is accommodated on board. The Contractor and the TA shall together read the kilo-watt hour meter at the start and end of any period when the vessel is fully crewed and vessel staff are accommodated on board

2.6.6 Final price for this item shall be determined at the end of the contract once the meter has been read. The final power consumption total shall be covered PWGSC 1379 action.

2.7 Not Used

2.8 Fire Main Charging Service

2.8.1 The Contractor shall supply a separate and continuous uninterrupted water supply through isolation valves via a calibrated pressure regulator to the ship's fire main system. Supply pressure shall be at 80 to 110 psig. Pressure shall be maintained at all times to the vessel. The isolation valves shall be Contractor supply and install in a double block and drain valve arrangement.

DO NOT MODIFY

2.9 Not Used

2.10 Not Used

2.11 Cranage

2.11.1 The Contractor shall quote on the general services of a crane, including an operator and a rigger, for the support of the vessel's day-to-day activities, i.e. the moving of stores from the vessel to the Contractor's facilities ashore while the vessel is in the dry-dock. The Contractor shall quote on providing this service for 20 hours over the duration of the contract.

2.12 Not Used

2.13 Vessel Security

2.13.1 The Contractor shall provide for the safety and security of the vessel while it is under contract. The Contractor remains liable for all damage and theft while the vessel is not crewed.

2.14 Parking at Contractor's Facility

2.14.1 The Contractor shall provide 3 parking spaces for the exclusive use of the TA and project team for the duration of the contract period.

2.15 Not Used

2.16 Office Services

2.16.1 The Contractor shall provide furnished, private and secure office space for the use of the TA and CCG personnel during the contract period. The office space shall be located adjacent to the dry dock and vessel. The Contractor shall provide commercial quality furnishings for three persons.

2.16.2 The Contractor shall supply and provide internet connections for three computers and one telephone land-line and telephone. Any long distance charges made on this line shall be to the CCG account. The internet connection shall be direct and not through the Contractor's security network.

DO NOT MODIFY

3.0 VESSEL PARTICULARS

Name: CCGS Samuel Risley

Type: Type 1050 Medium Endurance Multitasked Vessel, Ice Class 1A Super/
Arctic Class 2

Propulsion: Twin rudder, direct drive diesel, twin screw, controllable- pitch shrouded
propellers, jet type bow thruster, and tunnel-type CPP stern thruster.

Year Built: 1985

Principal Dimensions:

Length: 69.73 meters

Breadth, molded: 13.7 meters

Loaded Draft: 5.817 meters

Tonnage, displ: 2935 tonnes

DO NOT MODIFY

4.0 LIST OF ACRONYMS

CA	Contract Authority as identified by the Contract
CCG	Canadian Coast Guard
CLC	Canada Labour Code
CSM	Contractor Supplied Material
CSA	Canadian Standards Association
CWB	Canadian Welding Bureau
DFO	Department of Fisheries and Oceans
FSSM	Fleet Safety & Security Manual
FSR	Field Service Representative
GSM	Government Supplied Materials
HC	Health Canada
IEEE	Institute of Electrical and Electronic Engineers
LOA	Length over All
LR	Lloyd's Register of Shipping North America Inc, and its appointed Surveyors
LR Rules	LR Rules and Regulations for the Classification of Steel Ships
LR TM	LR Thickness Measurement and Close-Up Survey Guidance, v6.0
MSDS	Material Safety Data Sheet
OHS	Occupational Health and Safety
PWGSC	Public Works and Government Services Canada
SSMS	Safety & Security Management System
TBS	Treasury Board of Canada Secretariat
TCMS	Transport Canada Marine Safety Directorate, its requirements and inspectors
TA	Technical Authority as identified by the Contract
TM	Thickness Measurement performed in accordance with LR TM
VHSCS	Vessel Hull Structure Condition Survey
WHMIS	Workplace Hazardous Material Information System

DO NOT MODIFY

5.0 FIELD SERVICE REPRESENTATIVE REQUIREMENTS

5.1 Wärtsilä Inc.

5.1.1 The Contractor shall be responsible for obtaining the services of an accredited Wärtsilä Inc. field service representative to supervise the work undertaken in this Specification applicable to the CPP systems in Sections 6, 7, 15, and 16. The field service representative shall be accredited by Wärtsilä Inc as being a competent person to perform this work.

5.1.2 Accredited Wärtsilä Canada Field Service Representatives are available from:

Wärtsilä Canada
Burnside Industrial Park
164 Akerley Boulevard
Dartmouth, Nova Scotia B3B 1Z5
Tel: (902) 468-1264
Fax: (902) 468-1265

5.2 Amercoat

5.2.1 The Contractor shall be responsible for obtaining the services of an accredited Amercoat field service representative to supervise the work undertaken in Sections 8 and 9. The field service representative shall be accredited by Amercoat Canada as being a competent person to perform this work.

5.2.2 Accredited Amercoat International Field Representatives are available from:

Amercoat Canada (Head Office)
1174 Service Road West
Oakville, Ontario L6L 5T7
Tel : (800) 387-7151
Tel: (905) 847-1500
Fax: (905) 847-5899

5.3 Accredited Field Service Representative for DEX-O-TEX in Canada

5.3.1 The Contractor shall be responsible for obtaining the services of an accredited DEX-O-TEX Field service representative required to supervise the work undertaken in Section 21.3.5. The field service representative shall be accredited by Permanox Inc. as being a competent person to perform this work.

5.3.2 Accredited DEX-O-TEX Field Representatives are available from:

Permanox Inc.
Compounders of Dex-O-Tex Systems
11620 4e Avenue, Suite 201
Montreal, Quebec
H1E 3B3
Tel : (514) 648-2828

DO NOT MODIFY

Angelo@perrottec.ca

DO NOT MODIFY

6.0 DOCKING AND UNDOCKING

6.1 Identification

- 6.1.1 The Contractor shall dock the vessel, carry out the work identified in this specification and then undock the vessel.

6.2 References

6.2.1 Not Used

6.2.2 Drawings

Drawing Number	Description	Location
	Samuel Risley Tank Sounding Tables	CD Folder 6.0
	Samuel Risley Intact Stability Book	CD Folder 6.0
	Samuel Risley Damaged Stability Book	CD Folder 6.0
S30102dp1	Docking Plan	CD Folder 6.0

6.2.3 Standards

- 6.2.3.1 Transport Canada Ship Safety Bulletin 6/89.

6.3 Technical

- 6.3.1 The Contractor shall supply all labour, materials, equipment tug services and facilities to dock and undock the vessel.
- 6.3.2 The Contractor shall provide labour and services for the handling of the vessel's mooring lines and tug assistance as required to perform the docking and undocking of the vessel and any other movements required during the contract period. The Contractor shall be responsible for all associated fees including lay days.

6.3.3 Docking

- 6.3.3.1 The Contractor shall prepare adequate blocks and necessary shoring to maintain the true alignment of the vessel's hull and machinery throughout the docking period.
- 6.3.3.2 The Contractor shall refer to the docking plan drawing S30102dp1.
- 6.3.3.3 The Contractor shall record all tank soundings, draft, trim and list of the vessel, and perform the necessary stability calculations for the successful docking of the vessel. Stability calculations shall be forwarded to the TA 48 hours prior to docking the vessel.
- 6.3.3.4 The vessel shall be docked so that all docking plugs, transducers, anodes and sea inlet grids are clear and accessible. A minimum clearance of 1.3 meters (4 feet) shall be available below the keel. If any hull fittings are covered, the Contractor

DO NOT MODIFY

shall provide all labour and materials and make alternative arrangements to drain tanks and/or move blocks to complete the specified work.

6.3.3.5 Immediately after docking the vessel and prior to draining any tanks a second set of tank soundings shall be taken of all tanks and spaces. This set of readings shall be used to prepare the vessel for undocking.

6.3.3.6 The Contractor shall provide a ground cable between the vessel and the dock while the vessel is docked as per TCMS Ship Safety Bulletin 6/89.

6.3.4 Undocking

6.3.4.1 Prior to undocking the vessel the Contractor shall ensure all tanks are filled to the soundings recorded in Section 6.3.3.5. The Contractor shall perform the necessary stability calculations for undocking the vessel taking into account any weight distribution changes as a result of the work of these specifications. The calculations shall be forwarded to the TA 48 hours prior to undocking.

6.3.4.2 The Contractor shall ensure that all shipside openings, including valves, drain and docking plugs are secure before flooding the dry dock.

6.3.4.3 The Contractor shall supply and install and remove upon completion, any necessary fittings and lugs necessary to carry out the work in this specification. Where lugs and/or fittings are installed and removed, the welds shall be ground flush with the hull. Any damaged and/or disturbed paint work shall be treated in accordance with the paint manufacturer's requirements and painted according to the vessel's paint scheme.

6.3.4.4 The Contractor shall supply all labour necessary to handle the ship's lines during the undocking process. The Contractor shall be responsible to supply the services of tugs to ensure that the vessel is undocked in a safe manner and not damaged during the procedure.

6.4 Proof of Performance

6.4.1 Inspections

6.4.1.1 The Contractor, in the presence of the TA, shall verify that all work on the hull is complete, all docking plugs and hull openings are secure and the vessel is in all respects ready to be undocked.

6.5 Deliverables

6.5.1 Documentation (Reports/Drawings/Manuals)

6.5.1.1 The Contractor shall provide the initial tank soundings and stability calculations prior to the docking of the vessel.

6.5.1.2 The Contractor shall provide the second set of soundings taken right after the docking of the vessel.

DO NOT MODIFY

- 6.5.1.3 The Contractor shall provide the stability calculations and soundings prior to undocking the vessel.
- 6.5.1.4 The above requirements shall be provided in accordance with the Inspection, Test and Trials Plan.

DO NOT MODIFY

7.0 VESSEL HULL STRUCTURE CONDITION SURVEY

7.1 Identification

- 7.1.1 The Contractor shall provide the services of a Transport Canada recognized Classification Society to perform a hull and structural survey of CCGS Samuel Risley. The hull and structural survey shall be performed in accordance with the Classification Society's survey requirements for a vessel of this type and age.
- 7.1.2 The Classification Society shall prepare a detailed condition report of the hull and structure of the vessel.
- 7.1.3 The Contractor shall co-ordinate the work of Section 8.0 with the work of this Specification such that duplication of effort is eliminated.

7.2 References

7.2.1 Equipment Data

- 7.2.1.1 Pre-survey questionnaire data is included in Annex A

7.2.2 Drawings

Drawing Number	Description	Location
	Thickness Measurement Report 2009	CD Folder 7.0
S30103mi1	Tank & Capacity Plan & Deadweight Scale	
S30113ga1	General Arrangement	
S30114ar1	Main Deck and Boat Deck Accommodation Arrangement	
S30ar114ar2	Foclse Deck and Bridge Deck Accommodation Arrangement	
S30116mi1.	Main Deck and Boat Deck Joiner Bulkheads	
S30116mi2.	Bridge Deck and Focsle Deck Joiner	
S30117mi1.	Deck covering plan	
S30119ar1.	Insulation arrangement	
S30119ar2.	Insulation arrangement	
S30119ar3.	Insulation arrangement	
S30119ar4.	Insulation arrangement	
S30124de1.	Nozzle Arrangement and Details	
S30164pl1.	Vent and Sounding Piping layout	
S30178de1.	Rudder and Stock Arrangement and Details	
S30193mi1.	Shell Expansion	
S30195me1.	Bulwark and Fenders	
S30204me1.	Stern Tube and Bossing	

DO NOT MODIFY

S30205st1.	Structural Sections	
S30206st1.	Inboard Profile	
S30208st1.	Arrangement of Rudders	
S30104ga1	Profile and Decks	
S30106de1	Longitudinal Bulkhead 0 to FR 32	
S30106de2	Longitudinal Bulkheads Fwd of Fr 32	
S30107se1	Structural Sections	
S30108de1	Transverse Bulkheads	

7.2.2.1 CG will provide any additional structural drawings as required.

7.2.3 Regulations

- 7.2.3.1 Canada Shipping Act 2001, Hull Construction Regulations;
- 7.2.3.2 Canada Shipping Act 2001, Hull Inspection Regulations;
- 7.2.3.3 Arctic Waters Pollution Prevention Act;
- 7.2.3.4 Arctic Shipping Pollution Prevention Regulations;
- 7.2.3.5 TP 12260 Equivalent Standards for the Construction of Arctic Class Ships;
- 7.2.3.6 Other Canada Shipping Act Regulations as they apply to CCGS Samuel Risley.

7.2.4 Standards

- 7.2.4.1 Canadian Coast Guard Fleet Safety Manual DFO5737 and site specific work instructions applicable to CCG Samuel Risley.
- 7.2.4.2 Classification Society Standards (Rules and Regulations) for vessel construction for vessels of the same type as CCGS Samuel Risley.
- 7.2.4.3 Classification Society Standards for the inspection of vessels for vessels of the same type and age as CCGS Samuel.
- 7.2.4.4 Classification Society Thickness Measurement and Close-Up Survey Guidance;
- 7.2.4.5 Ultrasound Technician Certification to Level II of CAN/CGSB 48.9712 – latest edition.

7.3 Technical

- 7.3.1 The Contractor shall engage the services of a Transport Canada approved Classification Society to perform the work. The Contractor and its sub-contractors shall hold all data derived from the work of this Section in strictest confidence and shall not divulge this data and conclusions to any other third party.
- 7.3.2 The work of this Section shall be in compliance with the latest edition of the selected Classification Society Rules and Regulations for a vessel of this type and age.

DO NOT MODIFY

7.3.3 The Contractor shall provide all necessary materials and labor to assist the Classification Society to gain the necessary access to the exterior and interior portions of the hull and vessel's structure required to be surveyed.

7.3.4 If the vessel is manned with CG Crew the Contractor and Classification Society shall adhere to the requirements of the Fleet Safety and Security Manual (DF) 5737) with regards to **Confined Space Entry** and **Working Aloft** procedures.

7.3.5 Survey Planning

7.3.5.1 The Contractor shall arrange for a meeting between the Technical Authority and the Classification Society 4 weeks prior to commencement of the scheduled docking and survey work to establish the detailed survey plan for the hull and structural survey. At this time the Classification Society shall have established the preliminary inspection requirements, identifying the number of hull ultrasounds to be taken and where these will be taken; tanks and voids that will be surveyed as well as any other survey requirements and access requirements for transverse section surveys where identified.

7.3.5.2 The Contractor shall make every effort to co-ordinate the Hull Structural survey requirements of this Section with the Transport Canada Marine Safety regulatory survey requirements for the vessel to avoid duplication of work, specifically for hull ultrasound readings and tank surveys.

7.3.5.3 The Contractor shall provide a detailed survey schedule that integrates the Condition Survey requirements into the general work being performed outside of the Condition Survey. The preliminary schedule shall be presented at the start of the contract and shall be updated at no greater intervals than bi-weekly showing the progress of the survey work.

7.3.5.4 The Classification Society as a minimum shall survey the vessel as per their survey standard and also survey the vessel at three transverse sections. These transverse section surveys shall be carried out as follows:

- Between aft most part of the vessel and amidships;
- At around amidships;
- Between amidships and the forward most part of the vessel.

7.3.5.5 Each transverse section shall include where possible, side scuttles and windows, and at least three locations of the deck plating on each deck inside the accommodation area.

7.3.5.6 The following items shall also be considered for survey such that a representative condition assessment can be rendered:

- Tanks and void spaces where corrosion is considered likely;
- Ballast tanks;
- Indicative fuel oil tanks, fuel oil/ballast combination tanks;
- Fore and aft peak tanks;
- Wind and water strakes of the side shell (ice belt);
- Bottom shell plating;
- Bow area;

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- Forefoot/ice skeg area/ice horn;
- Areas with spec changes in hull modulus or in areas experiencing high sheer due to icebreaking – this shall include the accommodation block/deck connection.

7.3.5.7 The Classification Society shall determine the required extent of the examination of the hull and structure in the Areas of Special Concern as noted in Section 7.3.8.

7.3.6 Hull Thickness Measurements

7.3.6.1 The Contractor shall perform thickness measurements such that the TCMS requirements for hull thickness measurement survey are met in addition to the specific requirements of the Classification Society for the work of this Specification.

7.3.7 Survey Support

7.3.7.1 The Contractor shall remove and reinstall to as found condition the bulkhead, ceiling, and deck panels coverings and insulation. The Contractor shall repair any damage caused during removal and installations.

7.3.7.2 The Contractor shall supply all other materials needed to reinstall and restore the bulkhead, ceiling, and deck panel coverings and insulation to the “As-Found” condition.

7.3.7.3 Support services shall include the removal and repair of all coating systems, deck, bulkhead, and ceiling linings, thermal and fire insulation, and all deck coverings. The Contractor shall supply and apply coating systems in accordance with the vessel’s color scheme.

7.3.7.4 Support services shall include the opening and closing of all tanks and other spaces, including cleaning, preparation for safe entry, and maintaining spaces for safe entry.

7.3.7.5 Support services shall include the provision of all staging, man lifts, ladders, fall-arrest, and all other services required to provide access to carry out the work of this specification.

7.3.7.6 Support Services shall include the provision of a Classification Society approved Thickness Measurement service firm with Classification Society approved Thickness Measurement equipment operators.

7.3.8 Areas of Special Concern

7.3.8.1 Due to faulty drainage of the accommodation air conditioning units the insulation covering the main deck and boat deck in way of the AC units has occasionally been flooded.

7.3.8.2 Hull behind the rubber fenders.

7.3.8.3 The coating system of the aft void space is known to be in poor condition due to the occasional accumulation of water.

7.3.8.4 The void spaces forming the hull appendages around the stern tubes, the Kort nozzles, and the rudders are known accumulate water between dry-dockings. These

DO NOT MODIFY

spaces are accessible for visual inspection via boroscope only, and are protected by soft coatings.

7.3.8.5 The Port Kort nozzle suffered damage in a grounding incident and was repaired.

7.3.8.6 The impressed current protection systems are known to be non-functioning.

7.3.8.7 The underside of the port bridge wing was repaired in 2011; damage was due to atmospheric condensation collecting in the thermal insulation at the outer end of the wing.

7.3.8.8 WBT #1 and WBT#2 port and starboard and the Sewage Holding Tanks are very infrequently used.

7.3.8.9 The non-watertight voids in the ER are not tanks.

7.3.8.10 Main deck area below the timber covering.

7.4 Proof of Performance

7.4.1 Inspections

7.4.1.1 The Contractor shall supply the Classification Society prepared survey plan at the opening meeting.

7.4.1.2 During the survey the Classification Society shall record and assess the condition of the following items:

7.4.1.3 Actual or latent defects, the presence of deficiencies relating to structural damage, fractures, buckling and ice damage and corrosion and weld grooving;

7.4.1.4 Coating condition, both breakdown and representative measurements of remaining thickness;

7.4.1.5 Condition of other anti-corrosion protective systems and devices.

7.4.1.6 During the survey the Contractor shall provide a minimum of 48 hour notice to the TA of the work items pertaining to the Condition Survey such that the TA may make arrangements to have fluids moved from tanks etc. if required.

7.4.1.7 The Classification Society shall notify the TA immediately of any findings which in their opinion requires immediate remediation for the safety of the vessel.

7.4.1.8 The Contractor and the Classification Society surveyor shall meet with the TA at the end of each working day such that a summary of work and inspection results can be presented to the TA.

7.4.2 Testing/Trials

7.4.2.1 The Contractor shall restore all spaces and areas opened or exposed for the Condition Survey to serviceable condition. Materials used for the restorations shall meet the requirements of the Canada Shipping Act and associated regulations.

DO NOT MODIFY

7.4.3 Certification

- 7.4.3.1 The Contractor shall supply Classification Society approvals for the Thickness Measurement Service Company and Thickness Measurement equipment operators to the CA and TA before commencement of the work.
- 7.4.3.2 The Contractor shall supply material and conformity certification for all material supplied and installed as identified in Section 7.4.2.1.

7.5 Deliverables

7.5.1 Documentation (Reports/Drawings/Manuals)

- 7.5.1.1 The Classification Society shall prepare and present a report of their findings and assessment of the condition of the vessel. The report shall include the following:
- A narrative section detailing their findings;
 - Detailed thickness measurements for the hull. These shall be presented in the Society's standard format and shall also be recorded on a shell plate expansion drawing. Additional ship's drawings shall be used to detail the conditions of the structural members not found on the shell expansion plan;
 - Details of the findings for the various areas surveyed specifically the transverse sections. Where necessary these detailed findings shall be supported by drawings and photographs showing the condition and state of the hull and structure;
 - The report shall also incorporate all deficiencies that have been identified. Where critical items have been identified the Classification Society shall provide details for the required remediation work and the time line for when the work will need to be addressed to maintain the vessel's certification and reliability;
 - With respect to the hull coating, the report shall identify any areas of concern and overall condition assessment of the hull coating. Where necessary, the areas of concern shall be identified on a hull expansion plan and the report shall provide details for the necessary remediation and the time frame being considered to address these issues;
 - Where deficiencies or areas of concern have been identified the Classification Society shall develop a plan that identifies the necessary work, a cost estimate for each identified item based on the repairs being conducted in a Canadian shipyard, and a time frame required to affect the repair.
- 7.5.1.2 The plan shall include the requirements, including documentation necessary, for preparing the ship to a state whereby the vessel could be considered for acceptance into class for continuous survey.
- 7.5.1.3 The Contractor shall supply 3 paper copies of the report to the TA prior to the conclusion of the contract. The report shall type written on standard letter size paper and shall be bound.

DO NOT MODIFY

- 7.5.1.4 The Contractor shall supply 1 unprotected electronic copy of the report in MS Word 2003 or later format on a CD-ROM that is not password protected to the TA prior to the conclusion of the contract.
- 7.5.1.5 The Contractor shall supply 3 paper copies of all drawings to the TA prior to the conclusion of the contract. The drawings shall be on standard ANSI D size paper.
- 7.5.1.6 The Contractor shall supply 1 unprotected electronic copy of all drawings in AutoCAD 2007 DWG format or later on a CD-ROM that is not password protected to the TA prior to the conclusion of the contract.
- 7.5.1.7 The Contractor shall provide the initial schedule as indicated in 7.3.5.3 and provide copies of the updated schedule on a bi-weekly basis. Where possible the schedules and updates should be provided in MS Project 2007 or later revisions.

DO NOT MODIFY

8.0 UNDERWATER HULL (SURVEY ITEM)

8.1 Identification

- 8.1.1 The Contractor shall clean the underwater hull area of the vessel and shall do a preliminary survey on the shell plating with the TA and TCMS in attendance. This inspection shall identify areas of the hull that need to be grit blasted and recoated to the paint manufacturer's requirements. The Inspection shall identify and determine seam welds that require repair. This inspection shall be completed within 72 hours of docking the vessel.

8.2 References

8.2.1 Product Data

- 8.2.1.1 Amercoat 238 Product Data and application Sheets
8.2.1.2 Amercoat 339 Product Data and Application Sheets
8.2.1.3 Interprime 198 Product Data and Application Sheets
8.2.1.4 Intersheen 579 Product Data and Application Sheets

8.2.2 Drawings:

Drawing Number	Drawing Title	Location
S30109mil	Shell Expansion	CD Folder 8.0

8.3 Technical

- 8.3.1 The total underwater hull area of the vessel is approximately 1650 m².
- 8.3.2 The total area of hull above the deep load water line excluding the bulwarks is approximately 650 m².
- 8.3.3 The Contractor shall supply all necessary staging and man lifts for the work of this specification, including inspections by TCMS and the TA.
- 8.3.4 The Federal Identity Program Canada Word Mark decals shall be GSM. The Contractor shall supply all other materials and labour for the work of Section 8.0.
- 8.3.5 The Contractor shall ensure that all items not being grit blasted or being painted are protected during the execution of this specification item. All equipment protection shall be removed at completion. Where blasting grit and/or paint overspray damages equipment and/or other paint coatings, these defects shall be rectified by the Contractor at the Contractor's expense prior to the completion of the contract.
- 8.3.6 In particular, care shall be taken to protect the echo sounder transducer covering plates and impressed current corrosion system anodes and cathodes. These shall be identified and clearly marked and covered to protect them from the grit blasting process.

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The Contractor shall ensure no ingress of blasting grit and/or overspray to the accommodation area of the vessel. All openings shall be sealed or closed off to prevent the ingress of blasting grit and/or overspray. The Contractor shall be responsible for the cleanup of all blasting grit, debris and overspray from the vessel's interior and exterior decks.

8.3.7 All overboard discharges shall be plugged and protected from blasting grit and hull coating.

8.3.8 All scuttles, port holes and windows shall be protected from blasting grit and paint/hull coating.

8.3.9 All deck machinery shall be protected from blasting grit and the paint/hull coating.

8.3.10 The Contractor shall dispose of all blasting grit and debris according to applicable Federal, Provincial, and Municipal regulations.

8.3.11 The Contractor shall ensure that all coatings are applied within the allotted dry dock time period in order to allow for the full and proper curing of the coating to the vessel's hull prior to immersion. Any application that results in an unacceptable coating to the FSR and TA shall be redone (blasting included) at the Contractor's expense.

8.3.12 Underwater Hull Cleaning

8.3.12.1 The Contractor shall water blast the entire underwater hull surface of the vessel to the deep water load line within 24 hours of docking the vessel. The water blast pressure shall be a minimum of 3000 psi. The Contractor shall remove all marine growth, including slime, from the underwater hull surface of the vessel.

8.3.13 Underwater Hull Inspection

8.3.13.1 The Contractor, together with the TA and TCMS, shall inspect the cleaned underwater hull areas of the vessel. The Contractor shall mark up a clean copy of the shell expansion plan based on the inspection with the areas of the hull below the deep load waterline that requires grit blasting and re-coating with new Contractor supplied paint.

8.3.13.2 The Contractor and TA shall agree to the area of the hull below the ice belt that is being re-coated and the length of seam welding repairs to be performed. This inspection shall also include the draft marks, thruster symbols, Plimsoll marks, tank and frame markings on the hull. These markings shall be renewed as detailed below.

8.3.13.3 The Contractor, together with the TA and TCMS shall conduct the inspections required in Section 8.3.14 within 36 hours of the vessel coming onto the blocks.

8.3.14 Hull Marking Renewals

8.3.14.1 The Contractor shall use 309L stainless steel flux core electrode wire or better with CO2/Argon gas shield to outline all hull markings identified in this specification to

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a 5 mm profile above the surface. The hull plate in this region is Lloyd's Grade E, and varies between 36 mm and 38.5 mm.

- 8.3.14.2 The Contractor shall complete the marking renewals prior to the hull coating application.
- 8.3.14.3 The Contractor shall supply and apply 2 coats of International Interlac RAL9003 white epoxy paint to outline and paint all draft markings, and Plimsoll markings after they have been re-welded and at the completion of the application and curing of the hull coating system. Tank frame markings shall be recoated with the hull coating system.
- 8.3.14.4 The Contractor shall bid on the following:
- Renewing a total combination of 86 draft marks and tank frame markings with new welding;
 - Two stern thruster symbols to be weld marked;
 - Re-coating a total of 66 draft marks with new white epoxy paint;
 - Re-coating 2 Plimsoll marks with new white epoxy paint;
 - Re-coating a total of 20 tank frame markings with the existing hull coating system.
- 8.3.14.5 The final price shall be adjusted according to the markings which require to be renewed as agreed in accordance with Section 8.3.13.2.

8.3.15 Seams and Butts Welding

- 8.3.15.1 The Contractor shall repair by gouging and re-welding the hull welds identified during the inspection of Section 8.3.13.2. The Contractor shall submit in the bid price a per meter cost for preparation and repair of the hull seams and shall bid on a total of 160 meters.
- 8.3.15.2 The Contractor shall grit blast any weld seam clear of all hull coatings to bare metal to a distance of 80 mm on either side of the weld. The Contractor shall gouge the affected weld area to a depth of 6 mm and shall re-weld the seam areas with multiple passes finishing the weld off with a cap pass. All affected areas shall be prepared and recoated with the hull coating system.
- 8.3.15.3 Welds shall be inspected for conformity by the attending TCMS surveyor for acceptance prior to the application of the hull coatings.
- 8.3.15.4 The Contractor shall supply the welding procedure for the seams and butts welding. The welding procedure shall include flux core wire welding of appropriate grades for the hull plate. The hull plate in this region is Lloyd's Grade E, and varies between 36 mm and 38.5 mm. If SMAW process is used in place of flux core wire processes heated electrode ovens shall be placed close to and convenient for the welding operators.
- 8.3.15.5 The finished weld profile shall be between 2 mm to 3mm above the adjoining plate, but in no place more than 3 mm above.

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8.3.15.6 All welds that fail to meet TCMS approval shall be re-welded at the Contractor's expense and shall be subject to final TCMS approval.

8.3.15.7 This work shall be performed prior to the application of the new hull coating. The Contractor shall renew the hull coating as detailed in Section 8.3.16, where hull coating is removed or damaged due the work of Section 8.3.15.

8.3.16 Hull Coating Renewal – Below the Ice Belt

8.3.16.1 The Contractor shall obtain the services of a qualified Amercoat International factory service representative to supervise the surface preparation and coating application for the Amercoat products. The representative shall be present during the entire process to verify conformity to the manufacturer's required procedures for the application of the coating product.

8.3.16.2 The Contractor shall grit blast and coat the following hull areas:

- Hull areas identified during the underwater hull inspection. For the purpose of the bidding process, the Contractor shall bid on the following coating renewals:
- 800 m2 of hull coating;
- Port and Stbd Rudders;
- Port and Stbd propeller nozzles;
- Port and Starboard rope guards.

8.3.16.3 The Contractor shall prepare the surface of the underwater hull in accordance with the coating manufacturer's requirements and as follows:

8.3.16.4 All areas of bare steel shall be grit blasted to near white SSPC SP10 63T. The profile of blasted steel shall be a minimum of 3 mils. The areas where the previous coating shall remain shall be feathered to provide a bond with the new coating.

8.3.16.5 The Contractor shall apply the following coating system to the blasted areas of the hull in accordance with the coating manufacturer's requirements:

- Below the Ice Belt: 1 coat of Amercoat 238 @ 10 mils DFT (Black – first coat);
- Below the Ice Belt: 1 coat of Amercoat 238 @ 10 mils DFT (Red – second coat);
- Below the Ice Belt: 1 coat of Amercoat 339 @ 10 mils DFT (Black) per coat.

8.3.16.6 The Contractor shall adhere to all coating system requirements for the application of the coating system. The FSR shall be on site during all coating applications and shall be consulted for proper application requirements with regards to the ambient conditions.

8.3.17 Hull Coating Renewal – Above the Ice Belt

8.3.17.1 The total area of hull above the ice belt excluding the removable bulwarks is approximately 650 m2.

DO NOT MODIFY

- 8.3.17.2 All fendering shall be protected from grit blasting and hull coating. The Contractor shall ensure that no coating is removed from between the fendering and the steel retention system.
- 8.3.17.3 The Contractor shall punch mark the white stripe mark prior blasting the markings.
- 8.3.17.4 The Contractor shall grit blast and coat the following hull areas:
- Hull areas identified in RED on drawing “ABOVE WATERLINE HULL COATING AREA”. For the purpose of the bidding process, the Contractor shall bid on a total 650 m2 hull coating to be renewed.
- 8.3.17.5 The Contractor shall prepare the surface of the above hull area in accordance with the coating manufacturer’s requirements and to the following requirement:
- All areas shall be grit blasted to bare steel: near white SA 2 1/2 SSPC SP10 63T. The profile of blasted steel shall be a minimum of 3 mils. The areas where the previous below waterline coating remains shall be feathered to bond with the new coating.
- 8.3.17.6 The Contractor shall apply the following coating system to the blasted areas of the hull in accordance with the coating manufacturer’s requirements:
- 2 coat of Interprime 198, @ 3 mils DFT (Grey – first coat, red – second coat CPA099);
 - 2 coats of Intersheen 579 @ 1.5 mils DFT (RED – RAL 3000) each coat;
 - White stripe: 3 coats of Intersheen 579 @ 1.5 mils DFT (WHITE – RAL9003) each coat;
 - Black border stripe: 3 coats of Intersheen 579 @ 1.5 mils DFT (Black – RAL 9004) each coat. 3 inch stripe bordering the white diagonal stripe.
- 8.3.17.7 The Contractor shall adhere to all coating system requirements for the application of the coating system. The Contractor shall record ambient and dew point temperatures in the presence of the TA prior to the application of the coatings. These readings shall be recorded and be provided in the final coating application report.
- 8.3.17.8 The Contractor shall apply the Federal Identity Program Canada Word Mark decals. The word mark decals shall be applied in the same location as they are currently.
- 8.3.18 Renewal of Thruster Symbols and Lettering**
- 8.3.18.1 The Contractor shall supply and apply 2 coats of Intersheen 579 white epoxy paint to outline and paint all thruster symbols and ships side lettering after the completion of the application and curing of the hull coating system. The Contractor shall bid on the following:
- The Contractor shall bid on re-coating a total of 4 thruster symbols with white epoxy paint.
 - The Contractor shall bid on re-coating the “SAMUEL RISLEY” located at the bow, Port and STBD with white epoxy paint.

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- The Contractor shall bid on re-coating the “SAMUEL RISLEY OTTAWA” located at the stern Port and STBD with white epoxy paint.

8.4 Proof of Performance

- 8.4.1 The Contractor shall have the underwater hull surface preparation inspected and approved by the FSR. The FSR, in the presence of the TA, shall verify that the hull has been blasted to the required standard in any bare areas as well that the all hard edges to the existing hull coating have been feathered as required in the paint manufacturer’s recommendations.
- 8.4.2 Prior to coating the Contractor shall have the welding repairs inspected and approved by TCMS. All welding performed shall be inspected and approved by TCMS prior to the application of any hull coating in areas where hull welding needs to be performed.
- 8.4.3 The Contractor shall 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.
- 8.4.4 The Contractor shall perform and record Wet Film Thickness readings during each application of Amercoat 238 and Amercoat 239 as required by the FSR. The readings and their locations shall be contained in the final report.
- 8.4.5 Upon completion of all coating applications the Contractor shall take and record no less than 30 dry film thickness readings as required by the FSR and the TA. The readings and their locations shall be contained in the final report.

8.5 Deliverables

- 8.5.1 The Contractor shall provide a report of the findings, work, final condition of the work from Section 8.0 in accordance with the Inspection, Test and Trials Plan.
- 8.5.2 The Contractor shall provide a coating application report from the FSR to the TA that details all of the particulars of the coating application process as completed by the Contractor. The report shall include details of all environmental conditions at the time any hull coatings were applied and at which areas on the hull the coating was applied. This shall include but not be limited to the dry and wet bulb temperatures, relative humidity, dew point and the times when painting was started and stopped. Also to be included in the report shall be the temperature of the product at application time as well as wet and dry film thickness gauge readings.
- 8.5.3 The Contractor shall include in the final report the details of the seam and butt welding that was required to be carried out. This report shall detail the location and length of each weld, TCMS inspection approval for each final weld and any testing results required in way of each weld.

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9.0 SEA CHESTS AND SEA BAY (SURVEY ITEM)

9.1 Identification

- 9.1.1 The Contractor shall remove the sea chest grids, clean the sea bay and sea chest internals and submit for inspection by TCMS for a survey credit. The sea bay and sea chests shall then be re-coated and the sea bay grids shall be re-installed.

9.2 References

9.2.1 Shell Plate Access Grids for Sea Chests

- 9.2.1.1 The Contractor shall remove the grids and/or covers from the following:

DESCRIPTION	LOCATION	AREA
Port Sea Chest	Frames 25-27	50 m2
Stbd Sea Chest	Frames 25-27	50 m2
Sea Bay	Frames 25-27	130 m2
Port fire monitor sea chest	Frames 16-18	10 m2
Stbd fire monitor sea chest	Frames 16-18	10 m2
Bow thruster sea chest	Frames 39-41	20 m2

- 9.2.1.2 Access to the bow thruster sea chest is through the bow thruster compartment access covers.

9.2.2 Drawings

Drawing Number	Description	Location
S30109mi1	Shell Expansion	CD Folder 8.0
S30112as1	CCGS Samuel Risley Sea Chest Grid Frames 24-26 (P&S)	CD Folder 10.0
S30112as2	CCGS Samuel Risley Sea Chest Grid (Fwd) (FRS 39-41 P&S)	
S30112as3	CCGS Samuel Risley Sea Chest Grid (Aft) Frames 16-18 (P&S)	

9.3 Technical

- 9.3.1 The Contractor shall co-ordinate the work of this Section with that of Section 8 and Section 10. Where ship side valves are removed (Section 10) and hull blasting is being performed (Section 8) the Contractor shall ensure that no blasting debris or overspray from either work enter the machinery space at any time.

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- 9.3.2 The Contractor shall remove all sea chest and sea bay access covers. The Contractor shall note the condition of all defective studs and nuts on the sea chest grids and bring these to the attention of the TA.
- 9.3.3 The Contractor shall thoroughly clean all sea chests and sea bays of all marine growth, dirt and debris. All dirt and debris shall be removed from the vessel and disposed of ashore in accordance with Federal, Provincial and Municipal regulations in effect.
- 9.3.4 The Contractor shall bid on the removal and disposal of 5 cubic meters of solid debris from the sea chests and sea bay areas. Final pricing to be pro-rated adjusted based on the volume of debris removed.
- 9.3.5 The Contractor shall submit the cleaned spaces for inspection by the attending TCMS surveyor to obtain a survey credit.
- 9.3.6 The Contractor, in conjunction with TA and the Amercoat FSR shall inspect and determine the condition of the coatings in the sea bays and the sea chests. Based on this inspection the TA and Contractor will agree on the areas to be re-coated from bare steel and any other necessary work to fully restore the coatings in the sea bays and sea chests.
- 9.3.7 The Contractor shall protect all anodes against grit blasting and painting. The Contractor shall remove all protective material from the anodes prior to the closing of the sea chests and sea bays.
- 9.3.8 The Contractor shall prepare any bare areas in accordance with the coating manufacturer's requirements and shall apply the following coating system to the sea bay and sea chests:
- One coat Amercoat 238 black at 10.0 mils DFT;
 - One coat Amercoat 238 red at 10.0 mils DFT;
 - One coat Amercoat ABC #3 anti-fouling black at 6 mils DFT.
 - Total coating system: 26 mils DFT
- 9.3.9 The Contractor shall bid for 20% (54 m²) of surface area to be re-coated from bare metal with Amercoat 238.
- 9.3.10 The Contractor shall bid on the full area (280 m²) of the sea bay and sea chests to be re-coated with 1 coat of the anti-fouling paint.
- 9.3.11 The Contractor shall take and record coating thickness measurements for each layer of coating system applied. The Contractor shall record where the thickness measurements were recorded. A minimum of 20 readings shall be taken.
- 9.3.12 The Contractor shall re-install all shell plate access grids for the sea chests with new 316 Stainless Steel securing bolts (Bolt size and thread pitch to be determined on site). Bolts shall be Hex-Socket design for flush mounting and shall be tack welded in place after hardening up. Welding shall be performed so as not to foul the hex socket or diminish the integrity of the bolt. Bolt threads and all studs shall be coated with Loctite® Marine Grade or Loctite® 8023 Anti-Seize compound prior to installation.
- 9.3.13 Sea bay and sea chest bilge access covers shall be re-installed after final viewing by the TA. The Contractor shall supply and fit new 1/8" thick neoprene rubber gaskets to the

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sea bay access covers. The Contractor shall replace, any lost, missing or fouled nuts, washers and lock washers as required.

9.4 Proof of Performance

- 9.4.1 The Contractor shall have the surface preparation and coatings inspected by the Amercoat FSR and the TA to ensure that the agreed to areas have been properly coated. The Contractor shall allow sufficient time in dock for the paint system to fully cure prior to undocking the vessel.
- 9.4.2 The Contractor shall conduct a pressure test on the sea bay to the requirements of Section 19.0

9.5 Deliverables

- 9.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 9.0 in accordance with the Inspection, Test and Trials Plan.
- 9.5.2 The Contractor shall provide a coating application report to the TA that details all of the particulars of the coating application process as completed by the Contractor. The report shall include details of all environmental conditions at the time any hull coatings are applied and at which areas on the hull the coating was applied. This shall include but not be limited to the dry and wet bulb temperatures, relative humidity, dew point and the times when painting was started and stopped. Also to be included in the detailed report shall be the temperature of the product at application time as well as wet and dry film thickness gauge readings.
- 9.5.3 The Contractor shall provide the TCMS survey credit documentation for the work of Section 9.

DO NOT MODIFY

10.0 SEA VALVES (SURVEY ITEM)

10.1 Identification

10.1.1 The Contractor shall isolate, open and dismantle the valves identified in the reference table and submit these for inspection by the attending TCMS surveyor for a survey credit. The Contractor shall then reassemble the valves and test all valves once the vessel is undocked. All valves identified as “NEW” have been replaced in 2012.

10.2 References

10.2.1 Equipment Data

{PRIVATE }Overboard Discharge Valves			
Description	Type	Inch Size	Frame Location
Grey Water Drain (NEW 2012)	S.D. Check	3	40-41 Stbd
Grey Water Drain (NEW 2012)	S.D. Check	3	39-40 Stbd
Grey Water Drain (NEW 2012)	S.D. Check	3	39-40 Port
Grey Water Drain (NEW 2012)	S.D. Check	4	35-36 Port
Grey Water Drain (NEW 2012)	S.D. Check	4	22-23 Stbd
Grey Water/Storm Drain (NEW 2012)	S.D. Check	4	22-23 Port
Storm Drain (NEW 2012)	S.D. Check	4	27-28 Port
Storm Drain (NEW 2012)	S.D. Check	4	22-23 Port
Storm Drain (NEW 2012)	S.D. Check	4	27-28 Stbd
Sewage Discharge	S.D.N.R.	6	34-35 Port
Reverse Osmosis Discharge	S.D.N.R.	3	27-28 Port
Port S.S.G. Raw Water Discharge	S.D.N.R.	3	25-26 Port
STBD S.S.G. Raw Water Discharge	S.D.N.R.	3	25-26 Port
Main Engine Raw Water Discharge	S.D.N.R.	6	24-25 Port
Main Engine Raw Water Discharge	S.D.N.R.	6	24-25 Stbd
Bilge Pump Discharge	S.D.N.R.	4	24-25 Port
Oily Water Separator Discharge	S.D.N.R.	2	26-27 Stbd
General Service Pump Discharge	S.D.N.R.	4	24-25 Stbd
Air Conditioning Discharge	S.D.N.R.	3	26-27 Port
Bow Thruster Gearbox Cooler Discharge	Gate	1	39-40 Center
Bow Thruster Gearbox Cooler Inlet	Gate	1	41-42 Center
Sea Connections			
Description	Type	Inch Size	Frame Location
Emergency Fire Pump Inlet	Globe	4	39-40 Center
Aft Port Sea Chest Vent	Globe	4	17-18 Port
Aft Stbd Sea Chest Vent	Globe	4	17-18 Stbd
Port Fire Monitor Inlet	Gate	12	17-18 Port

DO NOT MODIFY

Stbd Fire Monitor Inlet	Gate	12	17-18 Stbd
Air to Aft Sea Chest	Gate	1	17-18 Port
Air to Aft Sea Chest	Gate	1	17-18 Stbd
Main Sea Chest Valve	Globe	16	26-27 Port
Main Sea Chest Valve	Globe	16	26-27 Stbd
Main Sea Bay Isolation Valve	Butterfly	16	26-27 Port
Main Sea Bay Isolation Valve	Butterfly	16	26-27 Stbd
Recirc to Main Sea Chest	Globe	6	25-26 Port
Recirc to Main Sea Chest	Globe	6	25-26 Stbd
Air to Main Sea Chest	Gate	1	26-27 Port
Air to Main Sea Chest	Gate	1	26-27 Stbd
Air to Sea Bay	Gate	1	26-27 Center
Emergency Fire Pump to Main Sea Bay	Butterfly	4	39-40 Center
Emergency Fire Pump to Bow Thruster Sea Bay	Butterfly	4	39-40 Center

10.3 Technical

- 10.3.1 The Contractor shall co-ordinate the work in this Section with that of Sections 8 and 9. Where skin valves are removed and hull blasting (Section 8) is underway the Contractor shall ensure that no blasting media or coating system overspray enter the system from which the skin valves have been removed. The Contractor shall also ensure that no blasting media or overspray enter the machinery space as a result of work from Section 9.
- 10.3.2 The Contractor shall identify all valves and tag all valves and valve parts to ensure that items for a particular valve can be identified once the valve and parts have been removed from the vessel.
- 10.3.3 The Contractor shall disassemble and clean all valves and valve components identified in Section 10.2. The valves shall be laid out for inspection by the attending TCMS surveyor. A survey credit shall be obtained for all valves identified in Section 10.2.
- 10.3.4 The Contractor shall grind all valve disc and valve seats where required. Final lapping shall be done to ensure the valve discs have full contact with the valve seat.
- 10.3.5 The Contractor shall machine valve discs, valve seats, and valve stems where required. The Contractor shall bid on providing 100 hours of machining for the work of Section 10.3.4.
- 10.3.6 The Contractor shall re-assemble all valves with new Contractor supplied gaskets and packing. All valves shall be installed and left in their closed position.

10.4 Proof of Performance

- 10.4.1 The Contractor shall identify all valves that are beyond their serviceability at the earliest possible time to the TA to avoid a potential delay in the undocking of the vessel.

DO NOT MODIFY

- 10.4.2 The Contractor shall afford TA the opportunity to examine all valves in their disassembled state.
- 10.4.3 During the undocking of the vessel, the Contractor shall have sufficient personnel on hand such that all valves listed in Section 10.2 can be inspected for leaks. Once sufficient water depth has been obtained, all closed valves shall be opened and verified that no bonnets or valve packings are leaking. Any leaks shall be rectified by the Contractor prior to the close of the contract.
- 10.4.4 The Contractor shall demonstrate to the TA that all valves are operating as designed.

10.5 Deliverables

- 10.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 10.0 in accordance with the Inspection, Test and Trials Plan.
- 10.5.2 The Contractor shall provide a detailed report of all work carried out to the valves. This shall include details on the machining and repairs (if required) and on what valves it was performed on. The report shall also include details of any valves that have been replaced. Where valves are replaced the Contractor shall supply valve certificates.
- 10.5.3 The Contractor shall provide the TCMS survey credit documentation for the work of Section 10.

DO NOT MODIFY**11.0 FUEL TANKS (SURVEY ITEM)****11.1 Identification**

11.1.1 The Contractor shall open, clean and prepare the identified fuel tanks for TCMS inspection and survey. The tanks shall be visually inspected and shall then be subjected to a pressure test. Upon completion of the work, the tanks shall be returned to a state of operational readiness.

11.1.2 The self-closing drain valves on the Day and Settling tanks shall be overhauled.

11.2 Reference**11.2.1 Equipment Data**

Description	Location	Capacity
No. 1 Fuel Tank	Frame 32-39	190.94 cubic meters
No. 2 Fuel Tank, Port	Frame 17-25	73.00 cubic meters
No. 2 Fuel Tank, Stbd	Frame 17-25	73.00 cubic meters
No. 3 Fuel Tank, Port	Frame 10-17	89.00 cubic meters
No. 3 Fuel Tank, Stbd	Frame 10-17	88.24 cubic meters
No. 3 Fuel Tank, Center	Frame 10-17	74.00 cubic meters
No. 4 Fuel Tank, Port	Frame 5-10	60.94 cubic meters
No. 4 Fuel Tank, Stbd	Frame 5-10	60.94 cubic meters
Settling Tank	Frame 37-39	38.00 cubic meters
Day Tank	Frame 37-39	38.00 cubic meters

11.2.2 Drawings

Description	Location	Capacity
No. 1 Fuel Tank	Frame 32-39	190.94 cubic meters
No. 2 Fuel Tank, Port	Frame 17-25	73.00 cubic meters
No. 2 Fuel Tank, Stbd	Frame 17-25	73.00 cubic meters
No. 3 Fuel Tank, Port	Frame 10-17	89.00 cubic meters
No. 3 Fuel Tank, Stbd	Frame 10-17	88.24 cubic meters
No. 3 Fuel Tank, Center	Frame 10-17	74.00 cubic meters
No. 4 Fuel Tank, Port	Frame 5-10	60.94 cubic meters
No. 4 Fuel Tank, Stbd	Frame 5-10	60.94 cubic meters
Settling Tank	Frame 37-39	38.00 cubic meters
Day Tank	Frame 37-39	38.00 cubic meters

11.3 Technical

11.3.1 The Contractor shall document the fuel tank soundings of all fuel tanks onboard. The Contractor shall remove the vessel's remaining fuel onboard, store the fuel and return it

DO NOT MODIFY

onboard after completion of the fuel tank inspections. The Contractor shall bid on removing, storing, and returning to the vessel 120,000 liters of marine distillate diesel fuel.

- 11.3.2 Upon completion of this specification item all fuel tanks shall be returned to their sounding levels as they were upon arrival at the Contractor's facility.
- 11.3.3 The Contractor shall open all tanks, ventilate the tanks and shall have a marine chemist or other qualified person certify each tank "safe to enter" prior to the start of the cleaning operation.
- 11.3.4 The Contractor shall post Safe for Entry/Safe for Hot Work certificates at each tank opening in a clearly visible location as close to the entry as practical. These certificates shall be signed by a marine chemist or other qualified person and shall be valid for the duration that the tank is open.
- 11.3.5 The Contractor shall clean all tanks and submit them for inspection by the attending TCMS surveyor for a survey credit.
- 11.3.6 The Contractor shall bid on removing and disposing of 10 cubic meters of sludge and debris from the fuel tanks. All sludge and debris from the tanks shall be disposed of ashore in accordance with Federal, Provincial and Municipal regulations in effect.
- 11.3.7 The Contractor shall pressure test each tank to the requirements of Section 19.
- 11.3.8 Upon completion of the cleaning and TCMS survey, the Contractor shall close up all tanks, installing all drain plugs and use new fuel oil-proof fiber re-enforced gaskets on all man-hole covers.
- 11.3.9 The Contractor shall remove, disassemble and clean all valve and valve components of the spring loaded drain valves for the Day and Settling tank. The valves shall be disassembled and laid out for inspection by the TA.
- 11.3.10 The Contractor shall grind all valve disc and valve seats after inspection. Final lapping shall be done such that the valve discs have full contact with the valve seat.
- 11.3.11 The Contractor shall re-assemble all valves with new Contractor supplied gaskets and packing. All valves shall be installed and left in their closed position.

11.3.12 Fuel Tank Sensor Replacement

- 11.3.12.1 The Contractor shall remove the existing fuel tank sensors out of the following tanks:

Description	Location
No. 3 Fuel Tank, Center	Frame 10-17
No. 4 Fuel Tank, Port	Frame 5-10
No. 4 Fuel Tank, Stbd	Frame 5-10

- 11.3.12.2 The Contractor shall remove the existing sensor and sensor bracket only. The existing sensors are fitted with a specific bracket that is to be removed only. The

DO NOT MODIFY

wire for the existing sensor shall be cut and shall be left in the tank tube. This will be used to fish the new sensor wire out of the tank.

- 11.3.12.3 The TA will provide new tank sensors, brackets, glands and wiring to be installed. Wiring will only have to be fished from the bottom of the tank using the old wiring as a means to bring the new sensor wire out of the tank. The ship's crew will terminate the wire at a later date.
- 11.3.12.4 A new bulkhead gland (TA supplied) shall be installed in the existing tank penetration. The new wire shall pass through this gland and be tightened to a fluid tightness, but shall not pinch the sensor wire.

11.4 Proof of Performance

- 11.4.1 The Contractor shall afford the TA the opportunity to examine all valves in their disassembled state.
- 11.4.2 The Contractor shall afford the TA the opportunity to examine all tank internals prior to closing each tank.
- 11.4.3 The Contractor shall ensure that all tanks remaining open for inspection are certified for entry for the duration they are open for access.
- 11.4.4 The Contractor shall supply, fit and subsequently remove blank connections where required for the pressure test of Section 19. Where blanks are available for use in the piping system the Contractor shall ensure these are returned to the open position and replace all gaskets.

11.5 Deliverables

- 11.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 11 in accordance with the Inspection, Test and Trials Plan.
- 11.5.2 The Contractor shall provide all waste oil and oily water disposal certificates to the TA prior to the completion of the contract.
- 11.5.3 The Contractor shall provide copies of all tank "Safe for Entry" and "Safe for Hot Work" certificates to the TA prior to the close of the contract.
- 11.5.4 The Contractor shall provide the TCMS survey credit documentation for the work of Section 11.

DO NOT MODIFY

12.0 BALLAST, SEWAGE AND VOID TANKS INSPECTION (SURVEY ITEM)

12.1 Identification

12.1.1 The Contractor shall open, remove docking plugs, fire hose wash, and remove debris from the ballast, void, cofferdams, and sewage holding tanks to clean and prepare the identified tanks for TCMS inspection, pressure test and then return them to operational conditions.

12.2 Reference

12.2.1 Equipment Data

Description	Location	Capacity
No. 1 Ballast Tank,	frame 44-46	63.2 cubic meters
No. 2 Ballast Tank, Port	frame 32-37	49.1 cubic meters
No. 2 Ballast Tank, Stbd	frame 32-37	49.1 cubic meters
No. 3 Ballast Tank, Port	frame 27-32	39.2 cubic meters
No. 3 Ballast Tank, Stbd	frame 27-32	39.2 cubic meters
No. 4 Ballast Tank, Port	frame 17-22	34.3 cubic meters
No. 4 Ballast Tank, Stbd	frame 17-22	34.3 cubic meters
No. 5 Ballast Tank, Port	frame 10-17	39.4 cubic meters
No. 5 Ballast Tank, Stbd	frame 10-17	39.4 cubic meters
No. 6 Ballast Tank, Port	frame 5-10	63.7 cubic meters
No. 6 Ballast Tank, Stbd	frame 5-10	63.7 cubic meters
Void Tank Aft		
Non-Watertight Void, Port	frame 27-32	
Non-Watertight Void, Stbd	frame 27-32	
Cofferdam, Center	frame 27-28	
Cofferdam, Port	frame 22-25	
Cofferdam, Stbd	frame 22-25	
Sewage Holding Tank, Port	frame 37-39	
Sewage Holding Tank, Stbd	frame 37-39	

12.2.2 Drawings

Drawing Number	File Name	Location
S30103mi1	Tank & Capacity Plan & Deadweight Scale	CD Folder 7.0

12.3 Technical

12.3.1 The Contractor shall quote on removing 0.5 cubic meters of solid debris from each ballast tank.

DO NOT MODIFY

- 12.3.2 The Contractor shall quote on removing 0.3 cubic meters of solid debris from the Void Tank Aft.
- 12.3.3 The Contractor shall quote on removing 5,000 liters of sewage and sludge from each Sewage Holding Tank.
- 12.3.4 The Contractor shall remove, identify, and keep all docking plugs that have been removed from the vessel. Lost or damaged plugs shall be replaced by the Contractor at the Contractor's expense.
- 12.3.5 The Contractor shall open all tanks, ventilate the tanks and shall have a marine chemist or other qualified person certify each tank safe to enter or safe for hot work as required, prior to the start of the cleaning operation.
- 12.3.6 The Contractor shall post Safe for Entry/Safe for Hot work certificates at each tank opening in a clearly visible location as close to the entry as practical. These certificates shall be signed by a Marine Chemist or other qualified person and shall be valid for the duration that the tank is open.
- 12.3.7 The Contractor shall clean all tanks and shall inspect all sounding pipes and remove any foreign materials from the sounding pipes. All sludge and debris from the tanks shall be disposed of ashore in accordance with Federal, Provincial and Municipal regulations in effect.
- 12.3.8 The Contractor shall provide material and labour to repair the 2 inch fire main pipe hangers in the #6 Port and Stbd ballast tanks. The Contractor shall bid on replacing 8 pipe hanger, brackets and associated hardware in each tank. If new Victaulic fittings are required to reassemble the fire main pipe these will be supplied by the TA.
- 12.3.9 The Contractor shall submit the tanks and void spaces for inspection by the attending TCMS surveyor for a survey credit. Upon completion of the inspection the Contractor shall close up all tanks using new 1/8 inch fiber reinforced neoprene gaskets suitable for sea water service on all man-hole covers.
- 12.3.10 The Contractor shall install all docking plugs using Contractor supplied rubber gaskets and shall harden these up in the presence of the TA.
- 12.3.11 The Contractor shall pressure test each tank and void space to the requirements of Section 19 except the Non-Watertight Voids in the engine room.
- 12.3.12 The Contractor shall refill all tanks to the arrival condition prior to undocking the vessel. The Contractor shall supply only fresh water from a Municipal water supply for refilling the ballast tanks.

12.4 Proof of Performance

- 12.4.1 The Contractor shall afford the TA the opportunity to examine all tank internals prior to closing each tank.
- 12.4.2 The Contractor shall ensure that all tanks remaining open for inspection are certified for entry for the duration they are open for access.

DO NOT MODIFY

- 12.4.3 The Contractor shall blank all connections and shall be responsible for supplying, fitting and subsequent removal of blanks for the pressure test of Section 19.
- 12.4.4 The Contractor shall drain the tanks following the pressure test if water is used for the test. The Contractor shall dispose of any water used for hydrostatic testing in accordance with all Federal, Provincial and Municipal regulations in effect.

12.5 Deliverables

- 12.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 12 in accordance with the Inspection, Test and Trials Plan.
- 12.5.2 The Contractor shall provide all sewage and waste disposal certificates to the TA prior to the close of the contract.
- 12.5.3 The Contractor shall provide all tank entry certificates to the TA prior to the close of the contract.
- 12.5.4 The Contractor shall provide the TCMS survey credit documentation for the work of Section 12.

DO NOT MODIFY**13.0 POTABLE WATER TANKS (SURVEY ITEM)****13.1 Identification**

- 13.1.1 The Contractor shall open, clean and prepare the identified potable water tanks for TCMS inspection and survey. The tanks shall be cleaned, visually inspected, repaired and shall then be subjected to a pressure test. Upon completion of the work, the tanks shall be returned to a state of operational readiness.

13.2 References**13.2.1 Equipment Data**

Tank	Location	Volume	Area
Port Pot. Water Tank	Frames 27 – 32	33.6 cubic meters	180m2
Stbd Pot. Water Tank	Frames 27 – 32	33.6 cubic meters	180m2

13.2.2 Drawings

Drawing Number	File Name	Location
S30103mil	Tank & Capacity Plan & Deadweight Scale	CD Folder 7.0

13.2.3 Standards

7.F.12	Potable Water Quality	CD Folder 1.0
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13.3 Technical

- 13.3.1 The tank surfaces shall be cleaned of all debris and sludge and wiped dry. All debris and sludge shall be disposed of ashore by the Contractor. The Contractor shall bid on removing 1 cubic meter of water/debris from the tanks.
- 13.3.2 The tanks shall be inspected by the Contractor and the TA and the total surface area for touch up and re-coating shall be agreed upon.
- 13.3.3 The Contractor shall wire wheel prepare the identified surfaces in accordance with the application Data for the Potable Water Tank paint Interline 925.
- 13.3.4 The Contractor shall bid on touch up and repair for 10 m2 of coating for each potable water tank. The potable water tank coating is Interline 925.
- 13.3.5 The tank coating shall be applied after all welding has been completed to the tank brackets or other repairs required in the tank.
- 13.3.6 The potable water tanks shall not be sealed and filled with any liquid until the coating cure time has elapsed.

DO NOT MODIFY

- 13.3.7 The Contractor shall repair all pipe brackets in way of the suction piping and sounding piping. All new bolts and new brackets used to replace or repair the pipe brackets shall be 316 stainless steel materials.
- 13.3.8 The piping in the potable water tanks is 1-1/2" schedule 40 in size. The Contractor shall bid on replacing 4 complete bracket assemblies Port and Starboard (8 in total) and replacing 30 bolts, nuts and lock washers.
- 13.3.9 The Contractor shall remove the existing tank sensors out of the potable water tanks and the associated sensor brackets only. The wire for the existing sensor shall be cut at the sensor and left in place to fish in the tank sensor wire. New tank sensors will be provided by the TA.
- 13.3.10 The Contractor shall use the existing old sensor wire to fish in the new sensor wire into the sensor wire tube. Wiring shall be left free at the outside of the tank for termination by the ship's crew at a later date.
- 13.3.11 After cleaning the tanks shall be inspected by the attending TCMS surveyor. The Contractor shall obtain survey credit for these survey items.
- 13.3.12 The Contractor shall close all tank access covers after final inspection by the attending TCMS surveyor and TA. The Contractor shall replace all tank access cover gaskets with new 1/8 inch thick fiber reinforced neoprene gaskets suitable for potable water service
- 13.3.13 The Contractor shall conduct a pressure test of the potable water tanks according to the requirements of Section 19.0

13.3.14 Tank Disinfection

- 13.3.14.1 The Contractor shall supply the disinfection media and shall disinfect the tanks according to the FSSM procedure 7F12 after the successful completion of the hydrostatic pressure tests using the following procedure:
- 13.3.14.2 All potable water tanks shall be filled with hyper-chlorinated potable water for a period of 24 hours. The hyper-chlorinated water shall have a free chlorine content of 50 ppm (part per million). The Contractor shall certify to the TA that the water used for the disinfection meets these requirements. If the Contractor uses calcium hypochlorite to produce the hyper-chlorinated potable water, the water shall be filtered to remove all calcium before it is introduced into the potable water tanks.
- 13.3.14.3 Following the 24 hour disinfection period, the Contractor shall drain and flush the potable water tanks to attain the following readings for the potable water:

Free Chlorine	0.2 and 0.4 ppm;		
E. Coli	0 per 100ml	Nitrate/Nitrite	45 mg/L
Total coliform	0 per 100ml	Mercury	0.001 mg/L
Turbidity	1 NTU	Selenium	0.01 mg/L
Antimony	0.006 mg/L	Uranium	0.02 mg/L
Barium	1.0 mg/L	Benzene	0.005 mg/L
Boron	5.0 mg/L	Xylenes	0.3 mg/L

DO NOT MODIFY

Cadmium	0.005 mg/L	Flouride	1.5 mg/L
Chromium	0.05 mg/L	Lead	0.01mg/L
Copper	1.0 mg/L	Sodium	200 mg/L
Iron	0.3 mg/L	Zinc	5 mg/L
Manganese	0.05 mg/L	Ethylbenzene	0.00024 mg/L
pH	6.5-8.5 pH units	Toluene	0.024 mg/L
Colour	15 TCU	Sulpahtes	500 mg/L
TDS	500 mg/L	Chloride	250 mg/L

- 13.3.14.4 These readings shall be verified by an independent laboratory that is provincially licensed to perform these tests on potable water. Copies of all final test results shall be presented to the TA.
- 13.3.14.5 The Contractor shall flush the water tanks until the free chlorine content of the water in the tanks drops to an acceptable level of no more than a maximum of 5 PPM.
- 13.3.14.6 The Contractor shall dispose of all hyper-chlorinated water in accordance with Federal, Provincial, and Municipal Regulations in effect.
- 13.3.14.7 The Contractor shall re-fill all potable water tanks to their initial tank soundings prior to undocking the vessel using a certified potable water source.

13.4 Proof of Performance

- 13.4.1 The Contractor shall afford the TA the opportunity to examine all tank internals prior to closing each tank.
- 13.4.2 The Contractor shall ensure that all tanks remaining open for inspection are certified for entry for the duration they are open for access.
- 13.4.3 The Contractor shall blank all connections The Contractor shall be responsible for supplying, fitting and subsequent removal of blanks.
- 13.4.4 The Contractor shall drain the tanks afterwards if water is used for the hydrostatic test. The Contractor shall dispose of any water used for hydrostatic testing in accordance with Federal, Provincial and Municipal regulations in effect.

13.5 Deliverables

- 13.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of this Section in accordance with the Inspection, Test and Trials Plan.
- 13.5.2 The Contractor shall provide waste and hyper-chlorinated water disposal certificates to the TA prior to the completion of the contract
- 13.5.3 The Contractor shall provide copies of all tank entry certificates to the TA prior to the completion of the contract.

DO NOT MODIFY

13.5.4 The Contractor shall provide the TCMS survey documentation to the TA prior to the close of the contract.

13.5.5 The Contractor shall provide the potable water laboratory reports to the TA prior to the close of the contract.

DO NOT MODIFY

14.0 VOID SPACES (SURVEY ITEM)

14.1 Identification

- 14.1.1 The Contractor shall remove all drain and vent plugs from the void spaces identified in Section 14.2. The spaces shall be float coated with Sea Guard A and the spaces shall be resealed with new drain and new vent plugs.

14.2 Reference

- 14.2.1 Port and Starboard Kort Nozzles, and fairing spaces
14.2.2 Port and Starboard Stern Tube Struts
14.2.3 Port and Starboard Skeg Voids

14.2.4 Drawings

Drawing Number	Drawing Title	Location
S30103mi1	Tank & Capacity Plan & Deadweight Scale	CD Folder 7.0
S30113ga1	General Arrangement	
S30124de1	CCGS Samuel Risley Nozzle Arrangement & Details	CD Folder 15.0

14.3 Technical

- 14.3.1 The Contractor shall remove the drain and vent plugs from each of the void spaces taking note of approximate quantities of liquid being drained.
- 14.3.2 The Contractor shall float coat the interiors of these spaces with Contractor supplied VapCor Sea Guard A in accordance with the manufacturer's recommendations. (See VapCor Sea Guard A – E-Mail)
- 14.3.3 The Contractor shall supply all new 316 Stainless Steel Drain and Vent Plugs. Plugs are to be flush mounting with Hex-Socket style construction. The Contractor shall supply Loctite®PTFE for sealing all new drain and vent plugs.
- 14.3.4 The Contractor shall install all new drain and new vent plugs once the spaces have been float coated. The Contractor shall apply Loctite® PTFE for sealing the threads of the drain and vent plugs prior to installation.
- 14.3.5 Surplus or emulsified Sea Guard A that can no longer be used due to water emulsification shall be disposed of by the Contractor in accordance with Federal, Provincial and Municipal regulations in effect.

DO NOT MODIFY

- 14.3.6 The Contractor shall quote on supplying five (5) 45 gallon drums of VapCor Sea Guard. This quantity includes the amount necessary for the float coating of the Rudders.

14.4 Proof of Performance

- 14.4.1 The Contractor shall afford the TA the opportunity to witness the draining and coating of the void spaces.
- 14.4.2 The Contractor shall harden up all drain and vent plugs in the presence of the PWGSC TA.

14.5 Deliverables

- 14.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 14.0 in accordance with the Inspection, Test and Trials Plan.
- 14.5.2 The Contractor shall provide waste and oily-waste disposal certificates to the TA prior to the close of the contract.

DO NOT MODIFY

15.0 RUDDERS (SURVEY ITEM)

15.1 Identification

15.1.1 The Contractor shall unship the rudders, prepare them for TCMS survey and then re-install the rudders and set them to work.

15.2 References

15.2.1 Equipment Data

15.2.1.1 The Contractor shall reference the Wagner Steering Gear Manual for details concerning the carrier bearings and the radial bearings.

15.2.2 Drawings

Drawing Number	Description	Location
S30179de1	Rudder & Stock Arrangement & Details	CD Folder 15.0

15.3 Technical

15.3.1 General

15.3.1.1 The Contractor shall unship the Port and Starboard rudders and rudder stocks for inspection by the attending TCMS surveyor for survey credit.

15.3.1.2 The Contractor shall take and record the Port and Starboard gudgeon to pintle clearances and the Port and Starboard rudder stock lower end carrier bearing clearances. Copies of readings shall be provided to the TA within 24 hours of the rudders being removed from the vessel.

15.3.1.3 Readings taken by the Contractor shall be used to determine if new pintle and gudgeon bearing sleeves need to be machined and installed and if the work of section 15.3.2 will be completed.

15.3.1.4 The Contractor shall include in the following in the bid price as a specific line item:

- Cost for the removal of the existing gudgeons and pintle sleeves;
- Machining of GSM supplied gudgeon and pintle sleeve material;
- Machining of GSM supplied gudgeon and pintle bearing material Thordon XL;
- Cost of installing gudgeon and pintle sleeves and bearings.

15.3.1.5 The approximate size of the stainless sleeves is 200mm OD by 180mm ID by 255mm long.

15.3.1.6 The approximate size of the Thordon bearing is 250mm OD by 200mm ID by 255mm long.

DO NOT MODIFY

15.3.2 Sleeve and Bearing Replacement

- 15.3.2.1 The Contractor shall break out the component of Section 15.3.2 as a separate line item in the bid submission.
- 15.3.2.2 The Contractor shall provide the services of a Thordon FSR or other certified Thordon service representative to oversee the work of this Section.
- 15.3.2.3 Pintle to gudgeon clearance specifications shall be determined by the Thordon FSR. Documentation with the final measured clearance for both Port and STBD rudder bearings with reference to the Thordon specified clearance shall be provided to the TA and to TCMS for approval.
- 15.3.2.4 The machining and fitting of the Thordon material shall comply with the specific material application guidelines. The Contractor shall supply a Thordon FSR to witness and approve the machining and installation process.
- 15.3.2.5 The Contractor shall supply all materials necessary to machine and fit the stainless steel sleeves and the Thordon bearing material.
- 15.3.2.6 Final measurements of the pintle outside diameter and gudgeon inside diameter shall be taken and recorded in three places along the length of the bearing (Top, Center and Bottom) in both the Port/Starboard and Fore/Aft directions.

15.3.3 Rudders

- 15.3.3.1 Unshipping of the rudder stocks shall include the removal of the rudder follow-up assemblies, disconnecting of the actuating rams from the rudder tiller arms, the rudder stock nuts and locking bars, and tiller heads. Any damage to the threads of the rudder stocks during the removal of the nuts, removal, storage or refitting of the rudders and rudder nuts shall be corrected by the Contractor to TCMS approval.
- 15.3.3.2 The Contractor shall remove and dispose of all packing from the rudder stock glands. The Contractor shall supply and install new Teflon impregnated flax type packing (3/4").
- 15.3.3.3 The Contractor shall remove the drain and vent plugs from each rudder and subject the forward and after sections of both rudders to an air pressure test not in excess of 0.1 bar (1.5 psig). This test shall be witnessed and approved by a TCMS surveyor and the TA.
- 15.3.3.4 After testing, the Contractor shall float coat the interior sections of both rudders with Contractor supplied "VapCor SeaGuard A". Upon completion of float coating the rudders shall be drained and all plugs shall be reinstalled.
- 15.3.3.5 The Contractor shall supply and install new 316 Stainless Steel Hex- Socket plugs on both rudders. This work shall be done prior to the installation of the rudders. All Plugs shall have Loctite®PTFE applied to the threads prior to installation.
- 15.3.3.6 The Contractor shall perform MPI examinations of the rudder stock keyways and rudder stock threads.

DO NOT MODIFY**15.3.4 Installation and Set to Work**

- 15.3.4.1 The Contractor shall verify the initial fit of the taper connection between each rudder stock and the associated tiller head. Verification of initial fit shall be by machinist bluing process. The acceptable minimum contact area between the rudder stock taper and tiller head shall be 80%. Final fit of the flanges and tapers shall be witnessed by the attending TCMS surveyor and the TA.
- 15.3.4.2 The Contractor shall re-install the rudders, rudder tiller arms, rudder stock nuts, locking bars, hydraulic rams and rudder follow-up assemblies and set the rudders and steering gear to work.
- 15.3.4.3 The Contractor shall take and record the fitted clearance between the fitted keys and keyways of the rudder stocks and tiller heads for both the Port and STBD rudders.

15.4 Proof of Performance

- 15.4.1 The Contractor shall have each rudder inspected by the attending TCMS surveyor and provide the TA with proof of inspection.
- 15.4.2 The Contractor shall provide a Quality Assurance report indicating that all parts of the rudder assembly have been inspected by the Contractor's Q.A. department for correct installation and fit.
- 15.4.3 The Contractor shall ensure that the rudders are installed in good order and that the rudder coupling bolts, lower gudgeon bolts, nuts and the jumping collars screws are locked and to the satisfaction of the attending TCMS surveyor.
- 15.4.4 The Contractor shall touch up any damaged paint in this area.
- 15.4.5 Upon completion of the inspection and final installation of the rudders and rudder stock, the Contractor shall perform operational tests on the rudders to ensure that the steering system performs as required. All operational tests shall be witnessed by the TA. The Contractor shall test and verify the following items with regards to the steering system:
- The Contractor shall verify the proper operation and indication of each rudder's angle indicator system. The Contractor shall verify that all local and remote rudder angle indicators indicate the true deflection of the rudder as witnessed in the steering gear compartment. Where necessary, the Contractor shall adjust the system to provide correct indication.
 - The Contractor shall verify the hydraulic operation of each steering gear pump and that each rudder's hydraulic system operates in a smooth manner. Where air is entrapped in the system, the Contractor shall bleed the hydraulic system until all entrapped air has been removed.
 - The Contractor shall verify that each rudder has full travel from hard over to hard over when being steered by the hydraulic systems. The Contractor shall adjust the hydraulic systems to prevent the rudders from contacting the mechanical stops on either side and to ensure that travel in both directions is equal.

DO NOT MODIFY

- The Contractor shall verify that both rudders operate and respond to all local and remote steering station inputs.

15.5 Deliverables

- 15.5.1 The Contractor shall provide a report of the findings, work and final condition for the work of Section 15.0 in accordance with the Inspection, Test and Trials Plan.
- 15.5.2 The Contractor shall provide waste and oily-waste disposal certificates to the TA prior to the close of the contract.
- 15.5.3 The Contractor shall provide the TCMS survey documentation to the TA prior to the close of the contract.

DO NOT MODIFY

16.0 PROPULSION TAIL SHAFTS (SURVEY ITEM)

16.1 Identification

16.1.1 The Contractor shall remove the rope guards, verify the tail shaft bearing, remove the forward and aft stern tube seals, remove the SKF couplings, withdraw the tail shafts, inspect the tail shafts and stern tube bearing, and once inspected by the attending TCMS inspector – re-assemble all equipment and set-to-work. The Contractor shall engage the services of a Thordon Canada Inc FSR to oversee and conduct the work of Section 16.

16.2 References

16.2.1 Equipment Data

- 16.2.1.1 LIPPS CPP and Shafting System.PDF
- 16.2.1.2 SKF Manual.PDF
- 16.2.1.3 Sternkeeper Installation Manual.PDF
- 16.2.1.4 Sternkeeper Parts List.PDF
- 16.2.1.5 Sternkeeper Catalog.PDF
- 16.2.1.6 Thor-Coat.PDF
- 16.2.1.7 Thordon Bearing Measurements (original installation).PDF

16.2.2 Drawings

Drawing Number	Description	Location
S30123ar1	CCGS Samuel Risley Arrangement of Shafting	CD Folder 16 .0
S30123ar2	CCGS Samuel Risley Shafting	CD Folder 16.0

16.3 Technical

16.3.1 The Contractor shall co-ordinate the work in this specification item with that of Section 8 and 17. Should blasting be performed in the vicinity of the stern tubes these shall be covered to prevent ingress of any blasting media or coating system.

16.3.2 Stern Tube Seal Service

- 16.3.2.1 Prior to disassembly, the Contractor shall take and record the aft tail shaft bearing wear-down measurements for each of the Port and Stbd shaft seals.
- 16.3.2.2 The Chief Engineer shall supply the Contractor with the wear down gauges for the Port and STBD shafts. The Contractor shall promptly return these gauges directly to the Chief Engineer following the taking of the readings.

DO NOT MODIFY

- 16.3.2.3 For all shaft work covered in this specification the Contractor shall ensure the shafting remains supported during all phases of shafting and propeller work. The free shaft ends shall not be allowed drop, raise or bend so as to interfere with bearing removal or cause damage to the shafting or bearing surfaces. The Contractor shall be responsible for all damage to stern tube bearings, tail shafts, liners, tail shaft and stern tube coatings caused during disassembly and re-assembly.
- 16.3.2.4 The Contractor shall cut free the rope guards from the Port and Stbd tail shaft struts taking care to protect the shafting arrangement and propeller hub assemblies from any hot work damage. The rope guards shall be marked for orientation prior to removal and the cutting shall be performed in such a manner that the rope guards are reusable.
- 16.3.2.5 The Contractor shall disassemble the forward seals on both shaft lines. Seal parts are to be marked as to orientation and from which section they have been removed. The Contractor shall refer to the Thordon FSR and the Sternkeeper manual.
- 16.3.2.6 The Contractor shall protect the surfaces of the shaft sleeves and the Thor-Coat shaft protection from mechanical damage during the entire removal of the shafting, transportation of shafting and re-installation of the shafting. Damage to the shafting shall be repaired at the Contractor's expense.

16.3.3 SKF Coupling

- 16.3.3.1 The Contractor shall note the location of all SKF coupling parts on the intermediate and tail shafts.
- 16.3.3.2 The Contractor shall release the SKF couplings on both shaft lines.
- 16.3.3.3 After completion of the tail shaft removals, inspections and re-installation, the Contractor shall re-assemble the two SKF couplings, ensuring that all parts are returned to their marked location on the tail shafts and the intermediate shafts.
- 16.3.3.4 Final tightening of the SKF coupling shall be witnessed by the TA.
- 16.3.3.5 Following assembly and approval of the SKF coupling assembly by TCMS the Contractor shall apply a continuous bead of silicon to both the couplings at the intersection between the coupling and the shaft. This silicon seal shall be established both forward and aft on the Coupling to prevent the ingress of water.

16.3.4 Tail Shaft Removal

- 16.3.4.1 The Contractor shall remove the Port and Stbd tail shafts once the SKF couplings have been released and the seals have been dismantled. Care shall be exercised to ensure that the Thor-Coat is not damaged on either shaft during removal.
- 16.3.4.2 The Contractor shall power wash the Port and Stbd stern tube spaces to allow for a complete inspection of the interior coating and the forward and after Thordon shaft bearings. The bearings shall be protected from mechanical damage during the cleaning.

DO NOT MODIFY

- 16.3.4.3 The Contractor shall take 3 sets of bearing measurements of each tail shaft bearing surface. The measurements shall be equally spaced along the length of the bearing and shall be in both the horizontal and vertical position. Readings shall be recorded for the forward and aft bearing surface of each tail shaft. Readings shall be provided to the TA.
- 16.3.4.4 The Contractor shall have the Thordon FSR inspect the forward and after bearing retaining compound and report as to its condition. The FSR shall notify the TA of any issues that require correction.
- 16.3.4.5 The Contractor shall take 3 sets of bearing measurements of each stern tube bearing surface. The measurements shall be equally spaces along the length of the bearing and shall be in both the horizontal and vertical position. Readings shall be recorded for the forward and aft bearing surface in each stern tube. Readings shall be provided to the TA.
- 16.3.4.6 The Contractor shall have the attending TCMS surveyor inspect the shafts and shall obtain a TCMS survey credit for the inspections.
- 16.3.4.7 The Contractor shall perform NDT testing of each tail shaft flange radius to the requirements of TCMS. Results from this testing shall be passed to the TA.
- 16.3.4.8 The Thordon FSR shall determine the condition of the forward Sternkeeper seals and provide recommendations for re-use or replacement.
- 16.3.4.9 The Contractor shall clean the interior of the stern tubes to allow for a proper bond with an application of Anti Fouling.
- 16.3.4.10 The Contractor shall apply a coating of Amercoat ABC# antifouling paint to the inner surfaces of the Port and STBD stern tubes. This coating shall be continuous from the forward bearing to the after bearings.
- 16.3.4.11 The Contractor shall clean the Port and Stbd tail shaft Thor-Coat coating and prepare the surfaces for the application of a coat of Contractor supplied Amercoat ABC# antifouling paint to a DFT of 6 mils and shall allow sufficient time for the coating to cure prior to re-installation of the tail shafts.
- 16.3.4.12 The Contractor shall take another set of wear-down measurements after the tail shafts have been re-installed and the SKF couplings secured.

16.3.5 Intermediate Shaft Bearing Inspections

- 16.3.5.1 The Contractor shall drain and dispose of the Environ AW 68 oil from the sump of both intermediate shaft bearings. Sump capacity for each bearing is approximately 2 liters.
- 16.3.5.2 The Contractor shall disassemble the Port and Stbd intermediate shaft bearings and remove the bearings from the pedestals for survey by TCMS. When removing the bearing shells particular attentions shall be given to the proper removal of all remote and local temperature sensors from the bearing shells.

DO NOT MODIFY

- 16.3.5.3 The Contractor shall have the attending TCMS surveyor survey the bearings and provide the TA with a survey credit for the inspection.
- 16.3.5.4 The Contractor shall perform a hydrostatic pressure test on the cooling circuit of the intermediate shaft bearings. The test pressure shall be 1.5 bar.
- 16.3.5.5 The Contractor shall re-connect the cooling water piping flanges and shall supply and install new Contractor supplied fiber re-enforced neoprene gaskets.
- 16.3.5.6 The oil sump, bearing shell support surfaces and housing components shall all be clean and free of debris prior to re-installation.
- 16.3.5.7 The Contractor shall reassemble and set-to-work the two shaft bearings. Care shall be exercised in the assembly of the bearings to ensure that all parts removed during disassembly of the bearings are returned to their original location. The Contractor shall verify the run-out on the oil slinger rings to ensure that they are set at 90 degrees and do not rub on any part of the bearing housing. The Contractor shall ensure the proper location of the rubber shaft lip seals.
- 16.3.5.8 The Contractor shall fill the oil sumps of both intermediates shaft bearings to their working level with Coast Guard supplied oil.

16.4 Proof of Performance

- 16.4.1 The Contractor shall afford the TA the opportunity to witness the taking of the bearing measurements for the tail shafts and the stern tube bearings.
- 16.4.2 Upon completion of the shaft seal installations the Contractor shall fill the Port and Stbd stern tubes with water and ensure all air is purged from the systems. The Contractor shall follow the Stern Keeper manuals on filling and setting the forward shaft seal to work. This shall include bleeding the air off the seals to ensure that these seals will be properly lubricated. Seal plugs shall be lock wired with stainless steel locking wire.
- 16.4.3 The Contractor shall test the shaft seals to ensure that there are no leaks in the shaft seals prior to undocking the vessel. The Contractor shall repair any leak prior to the completion of the contract.
- 16.4.4 The Contractor shall refit the rope guards and ensure that there is clearance to avoid contact between the rope guards and the propeller hubs. The Contractor shall verify the propeller hub clearance through 1 full rotation of each of the shaft lines.
- 16.4.5 The Contractor shall ensure that the rope guards are also positioned to allow wear down readings to be taken.
- 16.4.6 The Contractor shall record the seal face and the intermediate shaft bearing oil temperatures as well as the water quality package pressure for both shaft lines during the dock trials and sea trials for the vessel.
- 16.4.7 The Contractor shall ensure that the intermediate shaft bearing oil supply rings and scrapers are working to supply oil to the top of the shaft bearings and that the shaft bearings are receiving proper lubrication.

DO NOT MODIFY

16.5 Deliverables

16.5.1 The Contractor shall provide a report of the findings, work and final condition of the work Section 16.0 in accordance with Inspection, Test and Trials Plan.

16.5.2 The Contractor shall supply the following documentation to the TA prior to the completion of the contract:

- Oil disposal certificates;
- SKF Coupling measurements and pressure used to set the SKF coupling;
- Tail shaft bearing readings for the forward and aft bearings on each shaft;
- Stern tube bearing readings for the forward and aft bearings on each stern tube;
- Temperature readings of the forward seal during dock and sea trials;
- Intermediate shaft bearing oil temperatures;
- Results of all NDT testing performed on the Tail Shafts and securing fasteners;
- TCMS survey credits for both shaft lines.

DO NOT MODIFY

17.0 CONTROLLABLE PITCH PROPELLER SYSTEM (SURVEY ITEM)

17.1 Identification

17.1.1 The Contractor shall remove and disassemble the controllable pitch propellers and submit these for survey by the attending TCMS surveyor and then re-assemble the propellers using the CCG spare blade set for assembly. The Contractor shall engage the services of a Wärtsilä FSR to oversee the work of Section 17.

17.2 References

17.2.1 Equipment Data

- HUB PARTICULARS:
- Type LIPS 4C11SW
- Diameter 1100 mm
- Mass 3900 kg

17.2.2 Drawings

Drawing Number	Description	Location
S30123ar1	CCGS Samuel Risley Arrangement of Shafting	CD Folder 16 .0
S30123ar2	CCGS Samuel Risley Shafting	CD Folder 16.0

17.3 Technical

17.3.1 The Contractor shall coordinate the work of this Section with that of Sections 8 and 16. The work in this Section shall be done under the supervision of a Wärtsilä FSR

17.3.2 CPP Oil System

- 17.3.2.1 The Contractor shall drain the CPP Oil from both the Port and Stbd systems and shall dispose of the oil in accordance with Federal, Provincial and Municipal regulations in effect. The Contractor shall provide disposal manifests to the TA.
- 17.3.2.2 The Contractor shall dispose of approximately 1025 liters of oil from each of the Port and STBD CPP systems for a total of 2050 liters of Hydrex MV 36 oil.
- 17.3.2.3 The Contractor shall re-fill both the Port and Stbd CPP oil systems with Coast Guard supplied oil at the completion of all work in Section 17. The Contractor shall relocate the Coast Guard supplied oil drums as required.

17.3.3 CPP Propeller Blades

- 17.3.3.1 The Contractor shall remove four Starboard propeller blades and four Port propeller blades. The Contractor shall install eight Coast Guard supplied propeller blades and associated blade seals.

DO NOT MODIFY

- 17.3.3.2 The removed propeller blades shall be stored on the same wooden pallets as the spare propeller blades. The used propeller blades shall be secured down for shipment on the wooden pallets with steel tie straps. The Contractor shall remove the spare propeller blades from the deck of the CCGS Samuel Risley and transport these to the work site. The removed propeller blades shall be stored onboard the vessel in the same location.
- 17.3.3.3 The Contractor shall fit the spare propeller blades after the work on the propeller hubs has been completed. All propeller blade O-rings will be Coast Guard supplied.
- 17.3.3.4 The hardening-up of the propeller blade hold-down bolts shall be witnessed by TCMS and the TA.
- 17.3.3.5 The Contractor shall observe correct torque procedure for the hardening-up of all propeller blade hold-down bolts.
- 17.3.3.6 The Contractor shall use a Certified and calibrated hydraulic torque wrench for the purpose of securing the blade bolts.
- 17.3.3.7 Prior to welding on the stainless steel locking strips the Contractor shall ensure that all blade bolt plugs are installed and secure.
- 17.3.3.8 The Contractor shall weld Coast Guard supplied stainless steel locking strip across the propeller blade hold-down bolts in the following manner:
- Each stainless strip shall span two bolt heads;
 - On the three bolt side, a locking strip shall be fitted from each outside bolt to the center bolt ensuring that the vent plugs within the heads of the bolts are not damaged.
 - On the four bolt side, a locking strip shall be fitted from the outermost bolts to the next bolt closest to the center. The strips shall only span two bolts, with the two center bolts not being connected by a locking strip.

17.3.4 CPP Propeller Hubs

- 17.3.4.1 The Contractor shall disassemble the Port and Stbd CPP propeller hubs under the supervision of a Wärtsilä Canada FSR. The propeller hubs shall be disassembled to such a degree that the attending TCMS surveyor can ascertain the condition of the hub components and the Contractor shall obtain a TCMS survey credit
- 17.3.4.2 All hub components shall be inspected for wear and measurements shall be taken and recorded as directed by the FSR and in accordance with the service manual.
- 17.3.4.3 Once all items have been inspected and passed TCMS inspection the Contractor shall re-assemble the hubs under the supervision of the FSR.
- 17.3.4.4 The hubs shall be re-installed on their respective propeller shafts and all hold down bolts shall be torqued in the presence of the TA. All propeller bolts shall be secured as originally fitted.

DO NOT MODIFY

- 17.3.4.5 The Contractor shall set all pitch references with regards to the OD boxes, CPP systems and the CPP propellers.

17.4 Proof of Performance

- 17.4.1 The Contractor shall develop and perform a set-to-work trials procedure to bring the CPP propeller system back to full operational status taking into account as a minimum the requirements outlined below:

17.4.2 CPP Propeller Blades

- 17.4.2.1 The Contractor shall ensure that new propeller blades do not foul in the nozzles and shall record blade tip to nozzle clearances in all three positions (full ahead, neutral and full astern pitch) for each of the blades within the nozzles.
- 17.4.2.2 The Contractor shall designate one propeller blade as the master blade and shall verify and record the blade tip clearance of all propeller blades through one full revolution of the shaft in all three conditions of the blades mentioned above. Readings shall be taken in 4 key positions around the circumference of the nozzle. All recorded propeller tip clearances shall be provided to the TA.

17.4.3 CPP Oil Distribution Boxes

- 17.4.3.1 The Contractor shall test the port and starboard controllable pitch propeller systems as follows:
- All system pressures and temperatures shall be recorded;
 - All propeller blades shall be observed to be free from hydraulic oil leaks. Any leaks shall be corrected by the Contractor.
 - The blades shall be rotated from full astern to full ahead and the pitch readings observed on the remote indicators shall match the actual pitch reading of the propeller blades. Where pitch readings do not reflect the actual readings the Contractor shall make adjustments to ensure that all pitch readings are identical. This shall be done for both the PORT and STBD systems.
 - The Contractor shall ensure that the manual pitch control for each OD box is functional and that the pitch feedback system reads correctly.

17.5 Deliverables

- 17.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 17.0 in accordance with the Inspection, Test and Trials Plan.
- 17.5.2 The Contractor shall provide waste and oily-waste disposal certificates to the TA prior to the close of the contract.
- 17.5.3 The Contractor shall provide the following documentation:
- Measurements for the Port and Stbd Propeller Hub internal components;
 - Blade Tip clearances for each propeller blade in the ahead, astern and neutral position through 1 shaft revolution;

DO NOT MODIFY

- Temperatures and pressures of the CPP Systems;
- Pitch feedback settings for actual pitch recorded on the blades, the OD box and the pitch readings in the control room and on the bridge readouts;
- TCMS Survey credits for both controllable propeller systems.

DO NOT MODIFY

18.0 BOW THRUSTER OUTBOARD BEARING REPLACEMENT

18.1 Identification

18.1.1 The Contractor shall repack the bow thruster stuffing gland and shall inspect the bow thruster outboard bearing to determine if the outboard bearing requires replacement. The Contractor shall bid on the replacement of the outer bearing and subsequent work required as outlined in Section 18.3.

18.2 References

18.2.1 Equipment Data

18.2.1.1 Peacock Operating and Maintenance Instructions. PDF;

18.2.2 Drawings

Drawing Number	Drawing Title	Location
161-551-2	Bow Thruster Room Arrangement	CD Folder 18.0
A0-104872	Sectional Arrangement Bow Thruster	CD Folder 18.0

REF	RUNNING CLEARANCES
A	3mm DIAMETRAL
B	6mm AXIAL
C	6mm AXIAL
D	0.16-0.26mm DIAMETRAL

18.3 Technical

18.3.1 The Contractor shall complete the initial inspection and measurement requirements within 36 hours of the vessel docking.

18.3.2 The Contractor shall take and record clearance measurements between the impeller blade tips and the wear ring of the pump casing at the top and bottom and port and starboard of the pump casing. The measurements shall be provided to the TA.

18.3.3 Access to the thruster impeller and outer bearing for the purpose of inspection and measurement can be gained through the discharge nozzle, Port or STBD.

18.3.4 The Contractor shall provide all labour tools and non-GSM materials to replace the outboard thruster bearing. The Contractor shall also inspect and measure the impeller shaft, housings, and stuffing box and wear rings to assess their current conditions.

18.3.5 GSM materials are:

DO NOT MODIFY

- Thordon SXL bearing material;
- Stuffing box packing material;
- Timkin roller bearings.

18.3.6 Disassembly

- 18.3.6.1 The Contractor shall remove the diffuser Section (A0-104872 item 12) at the flanges, removing all flange-coupling bolts necessary to separate the diffuser Section from the suction bend item 48 and tee piece, item 57 and clean all sealing surfaces of gasket material. Prior to the removal of the diffuser Section, the Contractor shall support and secure the suction bend and tee piece.
- 18.3.6.2 The Contractor shall perform a thorough inspection of the interior coatings of the bow thruster casing. The TA shall be in attendance during this inspection. The Contractor shall provide a cost and time estimate to repair any damaged coating areas. The coating material is a Belzona coating.
- 18.3.6.3 The Contractor shall measure and record the running clearances A, B and C as indicated on Drawing A0-104782;
- 18.3.6.4 The Contractor shall measure and record the top and side running clearances D after the removal of the locking nut, locking device and impeller.
- 18.3.6.5 The Contractor shall disconnect the remaining running gear to allow removal of the impeller shaft from the bow thruster. Care shall be exercised to prevent damage to any part of the impeller shaft during the removal process. The Contractor will be required to rectify any damages caused to the impeller shaft at his own expense.
- 18.3.6.6 NOTE: The Thrust Bearings are of a two piece design. The races are an interference fit to the shaft and housing and therefore the inner races required heating in order to fit to the shaft and the outer races require cooling. Care shall be exercised during disassembly.

18.3.7 Inspection and Measuring

- 18.3.7.1 The Contractor shall clean and then inspect the shaft, impeller blade roots, stuffing box sleeve and bearing sleeve using dye-penetrant NDT methods. Where defects are noted these shall be recorded and provided to the TA.

18.3.8 Reassembly

- 18.3.8.1 The Contractor shall reassemble the bow thruster shaft, bearings, and diffuser.
- 18.3.8.2 The Contractor shall install the new forward outboard bearing ensuring that the bearing is secured in the housing bore and in alignment with the shaft line.
- 18.3.8.3 The Contractor shall install the impeller and impeller shafts along with the other components ensuring that all clearances are measured and recorded. Re-installation of the thrust bearings shall be in accordance with the manufacturer's instructions.
- 18.3.8.4 The Contractor shall install the diffuser Section with new Contractor supplied fiber re-enforced gasket material.

DO NOT MODIFY

- 18.3.8.5 The Contractor shall pack the stuffing box with the supplied packing in accordance with the installation instructions provided.

18.4 Inspections, Tests, and Trials

- 18.4.1 The Contractor shall afford the TA the opportunity to examine all bow thruster sea chest and nozzle internals prior to sealing up.
- 18.4.2 The Contractor shall ensure that the bow thruster diffuser joints are completely watertight. This shall be verified during the flooding of the dock and shall be witnessed by the TA.
- 18.4.3 The Contractor shall ensure that the bow thruster impeller shaft stuffing box is watertight. This shall also be verified during the flooding of the dock and shall be witnessed by the TA.
- 18.4.4 Where there are deficiencies in the above two noted items, the Contractor shall make a decision as to how the deficiencies will be corrected with least impact to the undocking schedule.
- 18.4.5 The Contractor shall have personnel in attendance when the bow thruster is started for the first time to observe and record the stuffing box and impeller shaft temperatures. These temperatures shall be monitored and recorded in 15 minute intervals for a total time of 1 hour.

18.5 Deliverables

- 18.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 18.0 in accordance with the Inspection, Test and Trials Plan.

DO NOT MODIFY

19.0 HYDROSTATIC AND PNEUMATIC PRESSURE TEST PROCEDURES

19.1 Identification

- 19.1.1 The Contractor shall pressure test tanks and spaces according to this Section. The Contractor shall provide in the bid price a cost for hydrostatically testing each tank and space named. The Contractor shall provide an alternative cost for pneumatically testing each tank and space named.
- 19.1.2 At the pre-refit planning meeting required in Specification Section 1.0 the Contractor, the TA and TCMS shall agree on which specific tanks shall be pressure tested and which method is to be used. The final price shall then be adjusted as required. The ITT shall be evaluated on the basis of 100% tanks to be tested hydrostatically.
- 19.1.3 The Contractor shall provide all materials, labour and services required for the work of Section 19.0.

19.2 References

19.2.1 Equipment Data

- 19.2.1.1 As referenced in the applicable Specification Sections

19.2.2 Drawings

- 19.2.2.1 As referenced in the applicable Specification Sections

19.2.3 Regulations

- 19.2.3.1 As referenced in the applicable Specification Sections

19.2.4 Standards

- 19.2.4.1 As referenced in the applicable Specification Sections

19.2.5 Quality Assurance Standards

- 19.2.5.1 As referenced in the applicable Specification Sections

19.3 Technical

- 19.3.1 The Contractor shall pressure test each tank after obtaining TCMS survey credit for the inspection of each tank and space required in this Specification.

19.3.2 Hydrostatic Testing

- 19.3.2.1 The Contractor shall hydrostatically test each tank with fresh water. The Contractor shall perform all work involved and supply all necessary materials, fittings, hardware and labour required to:
- Prepare each tank for testing after completion of the inspection;
 - Perform the test;

DO NOT MODIFY

- Restore each tank to service conditions.
- 19.3.2.2 Each tank and space shall be hydrostatically tested to a head of water not less than 2.44 m of water above the crown of the tank and space. This pressure shall be verified with a water filled manometer.
- 19.3.2.3 The Contractor shall provide a detailed price quote for each tank for the following work:
- Hydrostatic tank/space test;
 - Cost for hydrostatic test preparation;
 - Cost of storage of clean fuel oil and lubricating oils if they need to be removed from the vessel;
 - Disposal costs for the test water;
 - Restoration of the tank/space to service condition after the test. This shall include the removal of all water from fuel and lube oil tanks.
- 19.3.2.4 The Contractor shall dispose of all fresh water used for the tests in accordance with applicable Federal, Provincial, Municipal regulations. All water used for the testing of tanks for oil and oily water and spaces protected by soft coatings shall be deemed to be water contaminated by oil.
- 19.3.2.5 Preparation shall include:
- Inspection of the tank prior to closing;
 - Closing the tank;
 - Blanking all tank connections;
 - Supply and fitting of a U tube water column;
 - Supply and fitting of filling and draining connections, and any necessary pumps and pumping arrangements.
- 19.3.2.6 Testing shall include:
- Filling of the tank and water column to the required head;
 - Holding the test for a period of 30 minutes;
 - Recording observations;
 - Determining the location of any leakage.
- 19.3.2.7 Returning to serviceable condition shall include:
- Removal and disposal of all test water and drying of all fuel and lube oil tank surfaces;
 - Removing all blanks and restoring all connections to service condition;
 - Supply and install new pipe flange gaskets;
 - Supply and install new reinforced neoprene gaskets on access plates;
 - Removal and installation of docking plugs.
- 19.3.2.8 Each tank has at a minimum the following connections:
- Vent pipe or vent and over flow pipe;
 - Sounding pipe;
 - Fill and empty pipes and valves;

DO NOT MODIFY

- Tank electronic sounding connection.

19.3.2.9 The Day Tank and Settling Tank have these additional connections:

- Low and high suction pipes and valves,
- Drain/water test cocks;
- Purifier suction and discharge pipes and valves;
- Overflow pipe and sight glass.

19.3.3 Pneumatic Test

19.3.3.1 The Contractor shall also provide a detailed price quote for each tank for the following work:

- Pneumatic pressure test of each tank/space;
- Cost for pneumatic test preparation;
- Cost of storage of clean fuel oil and lubricating oils if they need to be removed from the vessel;
- Restoration of the tank/space to service condition after the test including the removal of blanking flanges.

19.3.3.2 The Contractor shall prepare and submit the test procedure for the approval of TCMS and the TA at the planning meeting required in Section 1.0.

19.3.3.3 The Contractors shall supply a water column manometer for all pneumatic tank/space tests. The water column shall be sized in comparison with the air supply flow rate to prevent a tank pressure greater than 1.5 psi. The air supply arrangement shall include a regulated air supply with shut-off valve, two pressure gauges on the downstream side of the regulator and a manual vent valve. The manual vent valve shall have a flow capacity greater than the air supply.

19.4 Proof of Performance

19.4.1 Inspections

19.4.1.1 The Contractor shall conduct the pressure tests in the presence of TCMS and the TA.

19.4.1.2 The Contractor shall submit a written test procedure to the TA prior to testing.

19.4.2 Testing/Trials

19.4.2.1 Prior to final closing of the tank and space the Contractor shall demonstrate to the TA that the tank is ready to be returned to service condition. This shall include the verification that all blanking devices have been removed, gaskets renewed and all connections restored, and that all spaces are clean, dry, and free of debris and any foreign object. The Contractor shall perform the final closing of the tanks and spaces in the presence of the TA.

DO NOT MODIFY

19.5 Deliverables

- 19.5.1 The Contractor shall provide a report of the findings, work and final condition of the work Section 19.0 in the required formats and according to the Inspection, Tests and Trials Plan.
- 19.5.2 The Contractor shall provide all waste and oily waste disposal certificates to the TA prior to contract completion.
- 19.5.3 The Contractor shall ensure that where tank pressure tests are due of TCMS survey a record and signature are received from the attending TCMS survey for the survey credit of the inspected and tested tanks.

DO NOT MODIFY

20.0 STERN THRUSTER GEAR BOX OIL CHANGE

20.1 Identification

- 20.1.1 The Contractors shall drain and refill the stern thruster hub with oil, inspect the shaft seal exterior, and replace the tunnel sacrificial magnesium anodes.

20.2 Reference:

20.2.1 Equipment Data

Document Name	Location
Ulstein Maritime Instruction Manual	CD Folder 20.0

20.3 Technical

- 20.3.1 The Contractor shall remove and salvage the port side grid from the stern thruster tunnel.
- 20.3.2 The Contractor shall remove the rope guards to inspect the shaft seals for oil leakage.
- 20.3.3 The oil in the lower unit shall be drained and disposed of ashore (draining of the oil is through a drain plug in the hub). The Technical Authority shall be present for the draining of the stern thruster hub in order to obtain an oil sample for testing purposes. The Contractor shall dispose of approximately 150 liters of waste oil from the thruster. The Contractor shall remove and dispose of one (1) oil filter from the stern thruster piping in the stern thruster compartment. The Contractor shall refill the unit with new Coast Guard supplied hydraulic oil. The Contractor shall install one new Coast Guard supplied oil filter for the stern thruster. The installation of the drain plug and gasket shall be witnessed by the TA. The drain plug areas and the shaft seals shall be surveyed for oil leaks after the unit has been refilled with new oil. The Contractor shall install the rope guards.
- 20.3.4 The Contractor shall remove three sacrificial anodes, supply and install same size replacement magnesium anodes in the stern thruster tunnel, and reinstall the grid and shall touch up any damaged paint in this area with the hull coatings system paints.

20.4 Proof of Performance

- 20.4.1 The Contractor shall afford the TA the opportunity to witness the work in progress.

20.5 Deliverables

- 20.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 20.0 in accordance with the Inspection, Test and Trials Plan.
- 20.5.2 The Contractor shall provide all waste and oily waste disposal certificates to the TA prior to the close of the contract.

DO NOT MODIFY

21.0 STAIR TOWER DECK REPAIR

21.1 Identification

21.1.1 The main deck level of the stair tower of the CGCS Samuel Risley has been identified as having a moisture problem within the mineral fiber insulation layer of the floor structure. The Contractor shall remove the current flooring material to the steel deck and install a new light weight, sound attenuating concrete floor and top coat with a nonskid coating

21.2 Reference

21.2.1 Equipment Data

21.2.1.1 **NOTE:** This repair specification refers to the Main Deck Level of the Aft Stair Tower ONLY. This is an A60 fire rated deck. The area referred to includes the area beneath the stair tower structure around the emergency escape hatch and behind the inspection panel for the wire deck penetrations. All dimensions are approximate and it is the Contractors responsibility to verify the correct amount and size of materials required.

21.2.2 Drawings

Number	Description	Location
S30113gal	General Arrangement	CD Folder 7.0
S30117mil.	Deck covering plan	CD Folder 7.0
S30119ar3.	Insulation arrangement	CD Folder 7.0
S30119ar4.	Insulation arrangement	CD Folder 7.0
CFN-161-320-5	Main Deck and Boat Deck Joiner BHDS	CD Folder 7.0
S30116mil.	Main Deck and Boat Deck Joiner Bulkheads	CD Folder 7.0
S30104gal	Profile and Decks	CD Folder 7.0
161-202-34-1	Structural Sections Frames 34 and 34-1/3	CD Folder 20.0
161-202-35-2	Structural Sections Frames 35-1/2 and 35-2/3	CD Folder 20.0
	ISOLAMIN PANEL BULKHEAD SUPPORT DETAILS	CD Folder 20.0
	DEX-O-TEX A-60 INSTALLATION	CD Folder 20.0
	Decklite Installation Guide	CD Folder 20.0
	Dexotex	CD Folder 20.0
	Installation Manual Isolamin	CD Folder 20.0
	Isolamin Marine Brochure	CD Folder 20.0
	Screw for Wall Panels	CD Folder 20.0

DO NOT MODIFY**21.2.3 Electrical Isolation**

Non Essential Distribution Centre # 2 – 240 Volt AC	
	Space Heater and thermostat- Panel M5-3 – Breaker # 5 120 Volt AC Distribution
	Wall receptacle – M4-6 breaker #10 (main deck corridor – port side)
	3x Deck head lighting – E1-5 breaker #5 (main deck corridor – port side)
	Smoke detector – E1-3 breaker #3 (bridge) and disconnect batteries in fire system panel on bridge.
	3x magnetic fire door hold backs – E1-3 breaker #13 (bridge)
	FM200 incinerator room light - E1-3 breaker #3 (bridge)
	Disconnect batteries in fire system panel on bridge or BA-1 breaker#7 (deck work shop)

21.2.4 Stair Tower (Main Deck) Approximate Dimensions

	Perimeter = 14.8 m including under the stair tower
	Area of floor = 10 m ² not discounting any penetrations
	Thickness of Floor Isolamin panel = 73 mm (approximate)
	Thickness of Floor Leveling = 3.5 mm

21.3 Technical

21.3.1 The Contractor shall ensure that all surrounding areas not disturbed in this specification are protected from any damage. Any damage from the “as delivered” condition of the vessel shall be repaired at Contractor’s expense.

21.3.2 Equipment and Material Removals

- 21.3.2.1 All equipment removed shall remain the property of the Canadian Coast Guard unless otherwise specified.
- 21.3.2.2 The Contractor shall disconnect, remove and safely store for reinstallation all firefighting equipment located in the fire cabinet on the forward bulkhead of the stair tower, as well as the fire axe and its mounting brackets located on the starboard bulkhead of the stair tower.
- 21.3.2.3 The Contractor shall remove and store for reinstallation the 240V space heater secured to the aft bulkhead.
- 21.3.2.4 The Contractor shall supply all materials and ventilation equipment necessary to isolate the main deck level of the stair tower from the rest of the ship for the duration of the work in this specification.
- 21.3.2.5 The Contractor shall monitor the air quality of the space and ventilate it to the exterior of the vessel.

DO NOT MODIFY

- 21.3.2.6 The Contractor shall protect the Isolamin Wall Panels in the space from mechanical and other forms of damage for the duration of the time work is being carried on in the stairwell space.
- 21.3.2.7 The Contractor shall support the wall panels during the extraction phase of the Isolamin panel decking and take care not to damage the wall panels during the removal process.
- 21.3.2.8 Upon removal of all necessary equipment the Contractor shall break out, remove and dispose of all vinyl floor tiles and baseboards, the leveling cement sub coat and the Isolamin floating floor panels.
- 21.3.2.9 The Contractor is advised that the bulkhead support channel was to be secured during initial installation at 600 mm intervals. It will be necessary to remove the Isolamin deck panel entirely to establish a new A-60 flooring system.

21.3.3 Repairs

- 21.3.3.1 The Contractor shall clean the deck of all remaining fire insulation and flooring material, remove rust and paint to bare metal. The Contractor shall further prepare the deck to bare metal by blasting to Sa2-1/2 (ISO 8501-1:2007) or power tooling to a minimum of St2 (ISO 8501-1:2007).
- 21.3.3.2 The Contractor shall provide the TA the opportunity to inspect the condition of the steel deck after it has been cleaned. The TA shall determine the locations for ultrasonic readings to be taken. Particular attention shall be paid to areas of the deck plate with visible damage and corrosion.
- 21.3.3.3 The Contractor shall take ultrasonic readings on the deck plate. The Contractor shall provide personnel certified to Level II of CAN/CGSB 48.9712-2000 for the taking of the ultrasound readings.
- 21.3.3.4 The Contractor shall record no less than 20 measurements and supply the TA with the measurements and their locations marked on a clean copy of a diagram of the deck within 24 hours of the ultrasound testing.
- 21.3.3.5 The Contractor shall perform an extensive survey of all the exposed steel bulkhead boundaries to ensure there are no perforations that compromise the fire integrity of the stair tower space. The Contractor shall produce a report detailing any defects found and proposed repair procedures to the TA within 48 hours of the survey.
- 21.3.3.6 Should there be issues with the underlying steel deck, the Contractor shall produce a repair plan for the deck plate and submit this to the TA and the TCMS surveyor prior to commencing further repair work. This work will be dealt with under 1379 action.

21.3.4 Bulkhead Support

- 21.3.4.1 During the floor removal phase the Contractor shall support the Isolamin Panel bulkheads with temporary means in order to preserve the original spacing and

DO NOT MODIFY

prevent collapse of the panel system. The Contractor shall be responsible for any damage to the bulkhead system resulting from lack of support.

21.3.4.2 The Contractor shall refer to Drawing: “Isolamin Panel Bulkhead Support Details” for information regarding fastening the bulkhead structure to the deck.

21.3.4.3 The Contractor shall refer to the PDF : “Screw for Wall Panels” for details regarding a proposed fastener.

21.3.4.4 The Contractor shall fit the new bulkhead supports and tack weld to the steel decking ensuring that the Isolamin bulkhead remains true and at original spacing from the inner steel bulkhead.

21.3.4.5 Bulkhead supports shall be fitted at each joint channel (596.9 mm) as per drawing “ISOLAMIN PANEL BULKHEAD SUPPORT DETAILS” so that the required 600 mm fastening specification is maintained. The Contractor shall include and fit supports at any free end of a bulkhead panel and at any point where additional support is required.

21.3.5 Deck-Plate Fire Insulation and Flooring Material Installation

21.3.5.1 The Contractor shall adhere to all manufacturer’s specifications and recommendations for deck preparation and installation thicknesses of all flooring products to achieve the required fire ratings of the deck. DEX-O-TEX has been suggested and product information has been provided. The provided Dex-O-Tex Marine flooring applications are already TCMS approved.

21.3.5.2 The Contractor shall install a new A-60 rated floor covering using suitable A-60 rated light weight pourable or trowelled cement flooring materials. The Contractor shall refer to the drawing DEX-O-TEX A-60 INSTALLATION for additional details.

21.3.5.3 The Contractor shall supply all materials required for establishing the new floor as required by the manufacturer. This may include:

- Primer;
- Bonder;
- A-60 material;
- Top coat;
- Finish coat preparation and final coat materials.

21.3.5.4 The Contractor shall adhere to the manufacturer’s recommended application guidelines and establish the work schedule with attention to the cure times required between coatings or applications.

21.3.5.5 The Contractor should consider a certified FSR for the product application to ensure that the product cures correctly and that the application will meet an A-60 fire rating. Where this is not achieved the Contractor will be required to re-work the coating application to achieve this.

DO NOT MODIFY

- 21.3.5.6 The top coatings shall be applied to a thickness such that the finish level is just above the bottom of the side bulkhead panels. This is necessary to provide additional support and seal the bulkhead panels.
- 21.3.5.7 The Contractor shall carefully remove residual contact cement from the baseboard area of the bulkheads.
- 21.3.5.8 The Contractor shall supply and apply new base board material of the same profile as the existing.

21.3.6 Installations

- 21.3.6.1 The Contractor shall reinstall all fire-fighting equipment located in the fire cabinet on the forward bulkhead of the stair tower, as well as the fire axe and its mounting brackets located on the starboard bulkhead of the stair tower.
- 21.3.6.2 The Contractor shall reinstall and reconnect the electric baseboard heater in its original location.

21.4 Proof of Performance

- 21.4.1 The Contractor shall provide personnel certified to Level II of CAN/CGSB 48.9712-2000 for the taking of the ultrasound readings.
- 21.4.2 The Contractor shall test the space heater in the presence of the TA prior to the completion of the contract.

21.5 Deliverables

- 21.5.1 The Contractor shall provide Type Approval certificates to the TA for all floor, bulkhead and ceiling panels used.
- 21.5.2 Proof of current certification of the ultrasound personnel shall be provided to the TA
- 21.5.3 A detailed report shall be prepared showing the exact location of each test point marked on an ANSI size E paper copy of drawing CFN-161-300-1 General Arrangement. The report shall also include an MS-Excel spreadsheet table identifying the test points by position on the drawing, steel thickness found, the corresponding original thickness and percent wastage. A copy of this report shall be submitted to the TA.
- 21.5.4 The Contractor shall provide the original written acceptance report from TCMS regarding the A-60 certification of the Stairwell space to the TA.
- 21.5.5 The Contractor shall provide 3 copies of updated “as fitted” drawings detailing the repairs of the space to the TA.

DO NOT MODIFY

22.0 DOCK TRIALS AND SEA TRIALS

22.1 Identification

22.1.1 The Contractor shall perform dock and sea trials for all machinery that is affected by the work of this specification. The Contractor shall bid on conducting dock and sea trials over 4 days at 12 working hours each day.

22.2 Not Used

22.3 Technical

22.3.1 Dock Trials

- 22.3.1.1 The Contractor shall have on hand sufficient personnel for the undocking of the vessel to attend to the requirements of this specification with regards to ensuring that all valves are verified as being properly seated and that the valve bonnets are not leaking; all manholes and access covers to sea bay and sea chests are not leaking. Where leaks are discovered the Contractor shall have a plan in place to address the deficiencies prior to the flooding of the dock.
- 22.3.1.2 Prior to flooding the dock the Contractor shall perform a dock trial on the rudder system to ensure that the rudder carrier bearings are tight and that the rudders operate as designed and that neither rudder comes up hard on its mechanical stops.
- 22.3.1.3 Prior to flooding the dock the Contractor shall perform a dock trial on the Controllable Pitch Propellers to ensure that once the vessel is undocked the propeller blades are free to move and can be rotated from full ahead to full astern with no detection of ingress of water into the system or leakage of oil out of the system.
- 22.3.1.4 The Contractor shall devise a plan of dock and sea trials with the Thordon Bearings technical service representative. These trial plans shall be provided to the TA four weeks before the scheduled undocking.
- 22.3.1.5 The Contractor shall perform a dock trial on the Propulsion Tail Shafts to 25% load. The Contractor with the assistance of the ship's crew shall perform a 4 hour dock trial on the shaft line and the intermediate bearings. The Contractor shall monitor the water supply and temperature to the intermediate shaft bearings. Temperatures shall be recorded every half hour. Readings shall be provided to the TA. Any abnormal readings shall be investigated prior to the vessel proceeding to sea trials.
- 22.3.1.6 The Contractor shall perform a dock trial on the Stern Thruster to 100% load with the assistance of the ship's crew. The stern thruster shall be run up and tested for proper operation prior to the vessel proceeding on sea trials. The trial shall ensure that the stern thruster and controls function normally.

DO NOT MODIFY

22.3.2 Sea Trials

- 22.3.2.1 The Contractor shall conduct sea trials that shall consist of the following:
- 22.3.2.2 The vessel shall be operated on four engine mode until all shaft line bearing and oil temperatures have reached steady state. A sea trial of a minimum of 4 hours shall be conducted during which the load on the controllable pitch propellers is steadily increased from minimum pitch to maximum in ½ hour increments until all temperatures stabilize. In the event that bearing temperatures do not stabilize, the trials shall be discontinued until the Contractor can determine and rectify the problems. Once all bearing and oil temperatures have been verified as being normal, the vessel shall be maneuvered from full ahead to full astern to ascertain that the controllable pitch propeller and shaft lines function as intended. The Contractor shall record bearing and oil temperatures. The ship's crew will assist in gathering full sets of engine room readings for all operating machinery. Readings shall be taken at half hour increments until the oil and bearing temperatures have stabilized. Readings shall be provided to the TA upon completion of the sea trial period.

22.4 Proof of Performance

- 22.4.1 The Contractor shall provide the Dock and Sea Trials Plan no less than 4 weeks before the scheduled undocking.

22.5 Deliverables

- 22.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 22.0 in accordance with the Inspection, Test and Trials Plan.

DO NOT MODIFY

23.0 ANNEX A

Name of ship:	CCGS Samuel Risley
IMO number/ LR Number:	8322442
Type of ship:	Ice-breaking navigation aids tender
Flag State:	Canada
Port of registry:	Ottawa, Ontario
Gross tonnage:	1967 GRT
Deadweight (metric tonnes):	2935
Length between perpendiculars (m):	69.73 LOA
Shipbuilder:	Vito Steel Boat and Barge, Vancouver, B.C.
Hull number:	161
Recognized organization (RO):	Not in Class. Previously in Class to LR ∇ 100AI Ice Class 1A Super ∇ LMC – Navigation Aids Vessel
Date of delivery of the ship:	1983
Owner:	Government of Canada
Intermediate / Special Survey:	Special Survey
Due date of Intermediate / Special Survey:	Deferred by TCMS Board Decision to “summer 2012”
Due date of Docking Survey:	Deferred by TCMS Board Decision to “summer 2012”
Type of cargoes carried (see Note 2):	Various deck cargoes consisting of aids to navigation, anchors, construction materials, and similar. The cargo hold is primarily used for general storage of ship’s equipment.

Space Name/ Description	Type	Frames	Capacity m3	Corrosion Protection	Coating Condition/Comment
Ballast Tanks					
No.1	WBT	44-46	63.2	Epoxy	Good/very rarely used
No.2 Port	WBT	32-37	49.1	Epoxy	Good
No.2 Stbd	WBT	32-37	49.1	Epoxy	Good
No.3 Port	WBT	27-32	39.2	Epoxy	Good
No.3 Stbd	WBT	27-32	39.2	Epoxy	Good
No.4 Port	WBT	17-22	34.3	Epoxy	Good
No.4 Stbd	WBT	17-22	34.3	Epoxy	Good
No.5 Port	WBT	10-17	39.4	Epoxy	Good
No.5 Stbd	WBT	10-17	39.4	Epoxy	Good
No.6 Port	WBT	5-10	63.7	Epoxy	Good
No.6 Stbd	WBT	5-10	63.7	Epoxy	Good
Peak Tanks					
Fwd Void	Void Space	46 to stem		Epoxy	Good
Aft Void	Void Space	A to 1		Epoxy	Poor

DO NOT MODIFY

Cofferdams					
Center	Cofferdam	27-28		Epoxy	Good
Port	Cofferdam	22-25		Epoxy	Good
Stbd	Cofferdam	22-25		Epoxy	Good
Non-Watertight Voids in ER					
Port Void	Void Space	27-32		Epoxy	Good
Stbd Void	Void Space	27-32		Epoxy	Good
Potable Water Tanks					
Port	Potable Water	27 – 32	33.6	Epoxy	Good
Starboard	Potable Water	27-32	33.6	Epoxy	Good
Sewage Holding Tanks					
Port	Sewage	37-39		Epoxy	Good/very rarely used
Stbd	Sewage	37-39		Epoxy	Good/very rarely used
Sea Bay and Sea Chests					
Sea Bay	Sea Bay	25-27		Epoxy	Good
Port Sea Chest	Sea Chest	25-27		Epoxy	Good
Stbd Sea Chest	Sea Chest	25-27		Epoxy	Good
Port Fire Monitor	Sea Chest	16-18		Epoxy	Good
Stbd Fire Monitor	Sea Chest	16-18		Epoxy	Good
Bow Thruster	Sea Chest	39-41		Epoxy	Good

Space Name/ Description	Type	Frames	Capacity m3	Corrosion Protection	Coating Condition
Hull Appendages					
Skeg Void	Void	6-8		Soft Coating	Unknown
Port Stern Tube Void	Void	6-9		Soft Coating	Unknown
Starboard Stern Tube Void	Void	6-9		Soft Coating	Unknown
Port Rudder	Void			Soft Coating	Unknown
Starboard Rudder	Void			Soft Coating	Unknown
Port Kort Nozzle	Void			Soft Coating	Unknown
Starboard Kort Nozzle	Void			Soft Coating	Unknown
Diesel Fuel Tanks					
No. 1	DO	32-39	190.94	Shop Primer	Good
No. 2	DO	17-25	73	Shop Primer	Good
No. 2	DO	17-25	73	Shop Primer	Good
No. 3	DO	10-17	89	Shop Primer	Good
No. 3	DO	10-17	88.24	Shop Primer	Good
No. 3	DO	10-17	74	Shop Primer	Good
No. 4	DO	5-10	60.94	Shop Primer	Good
No. 4	DO	5-10	60.94	Shop Primer	Good

DO NOT MODIFY

Day Tank	DO	37-39	38	Shop Primer	Good
Settling Tank	DO	37-39	38	Shop Primer	Good

Sea Connections			
Description	Type	Location	Size (inch)
Grey Water Drain	S.D. Check (new in 2012)	40-41 Stbd	3
Grey Water Drain	S.D. Check (new in 2012)	39-40 Stbd	3
Grey Water Drain	S.D. Check (new in 2012)	39-40 Port	3
Grey Water Drain	S.D. Check (new in 2012)	35-36 Port	4
Grey Water Drain	S.D. Check (new in 2012)	22-23 Stbd	4
Grey Water/Storm Drain	S.D. Check (new in 2012)	22-23 Port	4
Storm Drain	S.D. Check (new in 2012)	27-28 Port	4
Storm Drain	S.D. Check (new in 2012)	22-23 Port	4
Storm Drain	S.D. Check (new in 2012)	27-28 Stbd	4
Sewage Discharge	S.D.N.R.	34-35 Port	6
Reverse Osmosis Discharge	S.D.N.R.	27-28 Port	3
Port S.S.G. Raw Water Discharge	S.D.N.R.	25-26 Port	3
STBD S.S.G. Raw Water Discharge	S.D.N.R.	25-26 Port	3
Main Engine Raw Water Discharge	S.D.N.R.	24-25 Port	6
Main Engine Raw Water Discharge	S.D.N.R.	24-25 Stbd	6
Bilge Pump Discharge	S.D.N.R.	24-25 Port	4
Oily Water Separator Discharge	S.D.N.R.	26-27 Stbd	2
General Service Pump Discharge	S.D.N.R.	24-25 Stbd	4
Air Conditioning Discharge	S.D.N.R.	26-27 Port	3
Bow Thruster Gearbox Cooler Discharge	Gate	39-40 Center	1
Bow Thruster Gearbox Cooler Inlet	Gate	41-42 Center	1
Emergency Fire Pump Inlet	Globe	39-40 Center	4
Aft Port Sea Chest Vent	Globe	17-18 Port	4
Aft Stbd Sea Chest Vent	Globe	17-18 Stbd	4
Port Fire Monitor Inlet	Gate	17-18 Port	12
Stbd Fire Monitor Inlet	Gate	17-18 Stbd	12
Air to Aft Sea Chest	Gate	17-18 Port	1

DO NOT MODIFY

Air to Aft Sea Chest	Gate	17-18 Stbd	1
Main Sea Chest	Globe (new in 2012)	26-27 Port	16
Main Sea Chest	Globe (new in 2012)	26-27 Stbd	16
Main Sea Bay Isolation	Butterfly	26-27 Port	16
Main Sea Bay Isolation	Butterfly	26-27 Stbd	16
Recirculation to Main Sea Chest	Globe	25-26 Port	6
Recirculation to Main Sea Chest	Globe	25-26 Stbd	6
Air to Main Sea Chest	Gate	26-27 Port	1
Air to Main Sea Chest	Gate	26-27 Stbd	1
Air to Sea Bay	Gate	26-27 Center	1
Emergency Fire Pump to Main Sea Bay	Butterfly	39-40 Center	4
Emergency Fire Pump to Bow Thruster Sea Bay	Butterfly	39-40 Center	4

Areas of Special Concern	
Area/Space/Item	Cause of Concern /Comment
Hull Impressed Current System	Non-functioning
Sea Chest Impressed Current System	Non-functioning
Aft Void	Coating system is known to be in poor condition and known to accumulate water
Skeg Void	Un-vented space with soft coating system known to accumulate water
Port Stern Tube Void	Un-vented space with soft coating system known to accumulate water
Starboard Stern Tube Void	Un-vented space with soft coating system known to accumulate water
Port Rudder	Un-vented space with soft coating system known to accumulate water
Starboard Rudder	Un-vented space with soft coating system known to accumulate water
Port Kort Nozzle	Un-vented space with soft coating system known to accumulate water; previous bottom contact damage repaired in 2010
Starboard Kort Nozzle	Un-vented space with soft coating system known to accumulate water
Hull Fenders	Known corrosion behind hull fenders due to poor drainage
Main Deck below timber covering	
Main Deck and Focsle Deck below winches	Suspected corrosion due to poor coatings maintenance
Chain Lockers	
All decks in accommodation spaces	Known accumulation of condensation in the thermal and fire insulation covering all decks in the accommodations
Fire Monitor Deck and Void, Fire Monitor Support Structure	Known corrosion
Mast	Known corrosion on similar vessel
Crawl space deck below wheelhouse and wheelhouse wings.	Known accumulation of condensation; steel replaced on port side wheelhouse wings in 2011
Forefoot and stem	

DO NOT MODIFY

24.0 BOW THRUSTER KEYSTONE VALVE REPAIR

24.1 Identification

The bow thruster fitted to the Samuel Risley uses two large 1067mm (42 inch) Keystone Butterfly valves to control flow direction. These valves require the replacement of seals and bushings in both port and starboard valves.

24.2 References

24.2.1 Equipment Data

24.2.2 Drawings

Number	Description	Location
	F105 Brochure 83-F105-E	Keystone Valves.PDF
	F105 INSTALLATION AND MAINTENANCE INSTRUCTIONS	

24.3 Technical

24.3.1 The Contractor shall perform this work in conjunction with the requirements of Section 18.0 Bow Thruster Outboard Bearing Replacement.

24.3.2 The Contractor shall mark and record all mechanical and electrical settings for the valve connections and limit switches.

24.3.3 The Contractor shall remove and replace on both port and starboard Keystone F105 valves the parts as indicated on Drawing 105 S 104:

- No. 4 Upper Packing;
- No. 5 Upper Bushing;
- No. 9 Lower Bushing;
- No. 10 Lower Packing.

The replacement parts will be Coast Guard supplied.

24.3.4 The Contractor shall reference the documentation listed in Section 24.2 and Section 18.2 for the correct procedures involved in changing the parts required.

24.3.5 The Contractor shall inspect and measure part No. 12 Thrust Plate for wear. The Coast Guard will supply a new No. 12 Thrust Plate for comparison. After inspection and measurement of the part the Contractor shall inform the TA. Should it be required, the Contractor shall install a new No. 12 Thrust plate as provided by the Canadian Coast Guard.

24.3.6 The Contractor shall re-connect the valve connections and limit switches in their original marked positions.

DO NOT MODIFY

24.4 Proof of Performance

- 24.4.1 The Contractor shall have in place a witness to observe the repairs to the bow thruster Keystone valves during the flooding of the dry dock following the completion of the requirements of Section 24.00.
- 24.4.2 The Contractor shall prepare an Inspections Tests and Trials Plan and perform the inspections, tests and trials during the work of this section and during the Dock and Sea Trials required in Section 22.0
- 24.4.3 The Contractor shall afford TCMS and the TA the opportunity to inspect and observe the work of Section 24.0 in progress and to witness the tests and to observe the operation of the Keystone valves during the trials and testing as outlined in Section 22.0
- 24.4.4 The Contractor shall take corrective action where valve seals are found to be leaking during the warranty period of the contract.

24.5 Deliverables

- 24.5.1 The Contractor shall provide a report of the findings, work and final condition of the work of Section 24.0 in accordance with the Inspection, Test and Trials Plan.
- 24.5.2 The Report shall include The Contractor shall provide a list of all parts used during the valve repair and the comparison measurements with respect to the thrust plate.
- 24.5.3 The Contractor shall obtain TCMS survey credit for the work of Section 24.0