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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**

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Gatineau, Québec K1A 0S5

<b>Title - Sujet</b> CCGS EDWARD CORNWALLIS -DRYDOCK	
<b>Solicitation No. - N° de l'invitation</b> F7049-190047/A	<b>Amendment No. - N° modif.</b> 011
<b>Client Reference No. - N° de référence du client</b> F7049-190047	<b>Date</b> 2020-01-10
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$\$MD-034-27482	
<b>File No. - N° de dossier</b> 034md.F7049-190047	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2020-01-23</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Eastern Standard Time EST
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Green, Dave	<b>Buyer Id - Id de l'acheteur</b> 034md
<b>Telephone No. - N° de téléphone</b> (819) 420-2900 ( )	<b>FAX No. - N° de FAX</b> ( ) -
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

Instructions: See Herein

Instructions: Voir aux présentes

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

**Solicitation Amendment # 11 is issued to:**

- 1) Respond to Vendor Questions
- 2) Upload Additional Drawings and Documents
- 3) Modify Annex A
- 4) Modify ANNEX H – Appendix 1 – PRICING DATA SHEET (CCGS Cornwallis)

**1) Respond to Vendor Questions**

Q38. Can Canada provide more info to quote such as: -provide information as of size, weight, dimensions, weld on or bolt on, what type tabs etc.?

- 22.3.1.14 – (12) x M40 zinc anodes in the rudder trunk
- 23.3.1.2 - (2) tear-drop shaped zinc anodes on each sea strainer cover
- 23.3.2.8 – (78) x M24 zinc anodes in Sea Chests.
- 23.3.3.2 - (32) x M24 zinc anodes in Sea Bays
- 37.3.1.8 - (80) M24 anodes in Water Ballast Tanks

A38. The following information contains the approximate weights and dimensions of the noted anodes:

22.3.1.14 – (12) x M40 zinc anodes in the rudder trunk

Weld on, with 4 steel tabs - 6 inches by 12 inches, and 2" thick – weight 38 lbs.

23.3.1.2 - (2) tear-drop shaped zinc anodes on each sea strainer cover

3 inch x 9 inch , 2 pound tear drop with steel tabs (drilled holes)

23.3.2.8 – (78) x M24 zinc anodes in Sea Chests.

Weld on, with 4 steel tabs - 6 inches by 12 inches, and 1 1/8" thick – weight 20 lbs.

23.3.3.2 - (32) x M24 zinc anodes in Sea Bays

Weld on, with 4 steel tabs - 6 inches by 12 inches, and 1 1/8" thick – weight 20 lbs.

37.3.1.8 - (80) M24 anodes in Water Ballast Tanks

Weld on, with 4 steel tabs - 6 inches by 12 inches, and 1 1/8" thick – weight 20 lbs.

Q39. Can CANADA confirm the Para 23.3.2.8 – (78) x M24 zinc anodes in Sea Chests is correct and are GSM? The Bidder's are only to submit a cost to "fit" supplied anodes?

Para 23.3.2.9 states: e) Total = 78 Anodes (GSM)

A39. Section 23.3.2.8 will be modified to read:

23.3.2.8 The Contractor must inspect the sacrificial zinc anodes mounted in the Sea Chests and renew as directed. The Contractor must bid on the supply and installation of the total number of anodes noted in section 23.3.2.9 and unit prices to install each zinc anodes to be adjusted by 1379 action.

Canada confirms the total number of 78 anodes for the sea chests, the numbers indicated in the specification are for EACH sea chest, therefore in 23.3.2.9 a) and b), there are port and starboard chests.

Section 23.3.2.9 will be modified to read:

23.3.2.9 Anode configurations in the sea chests are as follows.

- a) High Sea Chests: M24 anodes, Ea. 20 (port) and Ea. 20 (starboard) – 40 total
- b) Low Sea Chests: M24 anodes, Ea. 16 (port) and Ea. 16 (starboard) – 32 total
- c) Distiller Sea Chest: M24 anodes, Ea. 2
- d) Aft Sea Chest: M24 anodes, Ea. 4
- e) Total = 78 Anodes (GSM)

Q40. General queries:

- a) Would you please supply the lubrication list for ship.
- b) Are oil and lubricants GSM supply or contractor?
- c) Would require the quantity of oil required for the generator replacement.

A40.

- a) Please note the document called "Lubricants and Applications Table - Cornwallis" in the solicitation amendment.
- b) Contractor supply unless otherwise noted in the specification.
- c) The new C32 Auxiliary Generator will require roughly 140 liters of oil.  
The new Wartsila Propulsion Generators will require 1600 liters of oil per engine.

Q41. At 48.3.1.1 a) The SOW states the requirement is to replace the entire communication wiring (Remove the existing and Install new cabling) but only states to bid on the supply and install of 500m of communication cabling.

- a) Should we include the cost of removal of existing Genius cabling into this price (500m) or the removal of the existing cable to be covered by a 1379?
- b) Would you please clarify who will perform the terminations into Trihedral LSU's? FSR or Contractor?

A41. a) The SOW states in section 48.3.1.1 a) that the Contractor must perform the following work: "Replace the entire alarm system communication wiring with new industrial CAT5E loop, Belden 1300SB or equivalent (no substitutions for the communication wiring) and remove the existing "Genius Bus Cabling". The Contractor must include the cost of removal of the existing Genius cabling. Please note the revisions to section 48.3.1 in the solicitation amendment.

b) All terminations will be performed by the Contractor under the direction of the FSR. Please note the revisions to section 48.3.1 in the solicitation amendment.

Q42. At 48.3.1.1 e) Existing FM200 monitoring system replacement. We understand that the existing monitoring of the FM 200 is realized through a Notifier panel. The new system will now be connected to the Trihedral AMS system.

In the drawing / spec SWA FM200 Modification Rev1 July 2015.pdf at Part 5 5.4 The intend of this specification is to remove the FM200 to Notifier connection.

a) We don't have the existing drawings for the current FM200 showing cabling from existing system to Notifier panels. Can you provide this drawings so we can estimate the amount of time required to perform the cables removal?

b) Would you please clarify who will perform the terminations into Trihedral LSU's and Notifier panel? FSR or Contractor?

A42. a) CCG does not have accurate drawings of the interconnections to the Notifier panels.  
b) All terminations will be performed by the Contractor. Where necessary, guidance will be provided by FSRs. Please note the revisions to section 48.3.1 in the solicitation amendment.

Q43. At Section 11 – Propulsion Generator Replacement.

Would it be possible to get an allowance for the FSR supervision requirement at 11.3.1.4 in this section? At the very least could an allowance be made for the travel and living expenses. It is felt that the cost of the travel and living expenses may put some of the shipyards competing for this tender at a disadvantage.

A43. No, the Contractor must obtain the FSR services including all travel and living expenses included.

Q44. At Section 15.3.4.12, could we get clarification for the purpose of the Bitumastic used to fill between the main deck and false floor within the pedestal of the crane? Could you also give a product number for type of bitumastic to be used?

A44. Please see the answer to Question 15 b).

Q45. At Section 19.3.1.23, could you please specify an average thickness for the application of Belzona within the sterntubes?

A45. The average thickness will be dependent on the Contractor's findings after the mechanical cleaning is done in accordance with section 19.3.1.22 and cannot be predetermined.

Q46. You indicated the contract award would be known early to mid-January and that the winning Contractor would have 2½ months to prepare before April vessel delivery.

A46. Due to the multiple requests for extensions, and the recent amendment to the specifications and Pricing Data sheet, it is Canada's intention to award by the end of January.

Q47. The contract indicates 5,000 hours of unscheduled work. Does Canada believe this is a reasonable amount of hours considering the scope of contract? As this is just an indicator, what does Canada consider a reasonable amount of hours to allow the bidders to schedule the work in our installations?

A47. Due to the nature of the work, Canada is not in a position to dictate what is considered a reasonable amount of hours for unforeseen work. As indicated in Solicitation Amendment 05, the 5,000 hours is only a tool used for evaluation purposes; It is not an estimation of unscheduled work.

Q48. You do not mention in the "minutes" that the hourly overtime rate must be written in the form of the full rate and not only the excedent of the bidder's hourly rate.

A48. Solicitation Amendment 002 revises the Annex H-H1 clarifying what is expected.

Q49. J1 : 9a – 9c You do not mention in the “minutes” that you confirmed that a letter and/or sketch confirming capacity availability.

A49. Solicitation Amendment 007 – Q37 addresses this.

Q50. 50.5.3 : During the conference you indicated that the video and the training was to be included in the allowance, not just the training as provided in Amendment 5 notes.

A50. The allowance includes all aspects of 50.3.5 including its subsections.

Q51. Annex J1: 12 You do not mention in the “minutes” that you confirmed that you wish for bidders to use the dates provided by Canada as the start and stop dates on the preliminary work schedule.

A 51. Solicitation Amendment 005 states “Canada will not dictate the scheduling other than to define the Work Period for the project to be completed in. **It is the responsibility of the Bidder to complete and submit a work schedule that complies with the overall Work Period** based on their individual resources and capabilities.”

Q52. 8.2.1.14: At the bidder’s conference it was confirmed that the crew would prepare and winterize the vessel before they depart the contractor’s installations. In your bidder’s conference Q/A from Amendment 5, you indicate that the crew will “assist in identifying those areas [of concern for winterization] during the change of custody.” Please confirm that crew will proceed with winterization and shipyard will not be held responsible for any incidents in regards to winterization of the vessel. Shipyards cannot be held responsible for winterizing a vessel that they do not own/have enough knowledge of the intricacies of the systems to proceed with such a process – this is the operator’s responsibility.

A52. Due to the change in the work start date from January to April, the vessel will not be winterized prior to arrival and thus the statement that the areas of concern will be identified to the yard for the portion of the work period that falls in the winter months. It is Canada’s opinion that it is indeed the responsibility of the shipyard to supply the labour and materials to do so as directed by the CCG staff and crew and in accordance with Specification 2.4. At minimum, this would include providing the power for heat throughout the ship, or ensuring ALL water systems are drained and blown through with air to prevent freezing of water in pipes.

Q53. 16.3.5.3: What equipment does Canada wish to have installed on wheelhouse?

A53. Solicitation Amendment 007-Q27 addresses this.

Q54. Spec 49: You indicated during the bidder’s conference that the wiring amount would change.  
Section 49

Doppler Speed Log Replacement – some of the wiring in this specification item has already been installed and thus the scope will be reduced somewhat in an upcoming solicitation amendment. This will clarify the wiring remaining to be installed by the Contractor.

A54. Specification 49 has been updated and included in this solicitation amendment.

Q55. For job 37.0 – Ballast Tank Survey – Can you please confirm the square footage of coating repairs that we are to bid on? The spec. calls for 100m2/tank, which would total 800m2. However, the P&D sheet just states to bid on 100m2.

A55. The P&D Sheet should reflect 100m2/tank. The P&D Sheet is amended to reflect this change.

Q56. With regards to job 42.0 – Barge Davit Annual Survey – There is a \$10,000.00 allowance in the spec. for Hydraulic Systems to serve as the FSR. Will they be carrying out all of the hydraulic components of this job under this allowance? Or is the intention for us to get a separate hydraulic contractor in to carry out this work in addition to the \$10,000 allowance?

A56. Please note the modifications to Section 42 – Barge Davit (Survey and Hydraulic System O/H) in the Solicitation Amendment. The scope has been expanded and the roles more clearly defined.

## **2) Upload Additional Drawings and Documents**

File name on Buyandsell.gc.ca: Addl Docs per Q&A 38-56

## **4) Modify Annex A**

At 23.3.2.8

Delete: In its entirety

Insert:

23.3.2.8 The Contractor must inspect the sacrificial zinc anodes mounted in the Sea Chests and renew as directed. The Contractor must bid on the supply and installation of the total number of anodes noted in section 23.3.2.9 and unit prices to install each zinc anodes to be adjusted by 1379 action.

At 23.3.2.9

Delete: In its entirety

Insert:

23.3.2.9 Anode configurations in the sea chests are as follows.

- a) High Sea Chests: M24 anodes, Ea. 20 (port) and Ea. 20 (starboard) – 40 total
- b) Low Sea Chests: M24 anodes, Ea. 16 (port) and Ea. 16 (starboard) – 32 total
- c) Distiller Sea Chest: M24 anodes, Ea. 2
- d) Aft Sea Chest: M24 anodes, Ea. 4
- e) Total = 78 Anodes (GSM)

## At 49.0 DOPPLER SPEED LOG REPLACEMENT

Delete: In its entirety

Insert:

## 49.0 DOPPLER SPEED LOG REPLACEMENT

### 49.1 Scope

49.1.1.1 The intent of this specification is to replace the existing SRD331 Doppler Speed Log system with the new Naviknot 450D Speed Log.

### 49.2 References

#### 49.2.1 Regulations

- a) Canada Shipping Act 2001 - Hull Construction Regulations (C.R.C., c. 1431)
- b) Canada Shipping Act - Tackle Regulations (C.R.C., c. 1494)
- c) Canada Shipping Act – Marine Machinery Regulations (SOR/90-264)
- d) Canada Shipping Act - Hull Inspection Regulations (C.R.C., c. 1432)
- e) Canada Shipping Act – Safe Working Practices Regulations (C.R.C., c. 1467)
- f) Maritime Occupational Health and Safety Regulations (SOR/2010-120)
- g) ABS Rules and Regulations

#### 49.2.2 Standards

- a) CCG Fleet Safety Manual (DFO/5737)
- b) IACS No. 47 - Shipbuilding and Repair Quality Standard
- c) TP 127E, Transport Canada Marine Safety – Ship Electrical Standards
- d) IEEE STD 45– Recommended Practice for Shipboard Electrical Installations
- e) IEEE STD 45.8-2016 Recommended Practice for Electrical Installations on Shipboard--Cable Systems
- f) IEC 60092-504-Electrical Installations in Ships – Part 504: Special Features – Control and Instrumentation
- g) IEC 60533 – Electrical and Electronic Installations in Ships – Electromagnetic compatibility
- h) CSA W59-08 (R2008) - Welded Steel Construction
- i) CSA W47.1-09 - Certification of Companies for Fusion Welding of Steel
- j) Society for Protective Coatings (SSPC) Standards
- k) CCG Welding Specification (CT-043-eq-eg-001-E)
- l) SWA International Paint Specification CM600222

Note: In case of conflict between any of the standards, then the most stringent requirements will prevail.

### 49.2.3 Drawings and Documents

Drawing Number	Title
Existing SRD331 Doppler Speed Log System	
MM683-004-WD	Speed and Distance Log wiring diagram
MM683-011-WD	Wind Speed and Distance Log wiring diagram
MM683-048-WD	Aft Facing Radar wiring diagram
<del>MM683-054-WD</del>	<del>ECPINS wiring diagram</del>
<del>MM683-073-WD-SHT 1/3</del>	<del>BME XandS Band Radar wiring diagram</del>
MM684-054-AL	Transducers on Sir William Alexander – Similar Ship
New Naviknot 450D System	
MM683-105-WD	Naviknot 450D System
056800 Rev. P; Jan 2013	Sperry electronic manual
49	Doppler Speed Log - PHOTOS

### 49.2.4 Government Furnished Equipment

49.2.4.1 GFE will include the Naviknot 450D Doppler Speed Log c/w Electronics Unit, Pre-Amplifier, Gate Valve, Transducer, 24VDC Power Supply, CDU and CDU adaptor plate.

49.2.4.2 The Contractor must supply all materials, labour, equipment, and parts required to perform the specified work unless otherwise stated. All cables are to be properly secured in existing cable trays. In locations where trays do not exist, appropriate hangers are to be installed.

### 49.2.5 Contractor Supplied Material

49.2.5.1 The Contractor must supply and install 5 meters of Belden 9316 cable.

49.2.5.2 The Contractor must supply and install 80 meters of Belden 9369 cable.

49.2.5.3 The Contractor must supply and install 40 meters of Belden 9322 cable.

49.2.5.4 The Contractor shall supply and install 15 meters of Belden 8302 cable.

49.2.5.5 The Contractor must supply and install 5 meters of 14/3 Marine AC cable.

49.2.5.6 The Contractor must supply and install 80 meters of 10/2 Marine cable.

49.2.5.7 The Contractor must supply and install 5 meters of #12 AWG Green Wire.

49.2.5.8 The Contractor must supply and install 5 meters of #6 AWG Green Wire.



49.2.5.9 For the purpose of adjustments, the Contractor must include a unit cost for the supply and install for 5 meters:

- a) Belden 9316
- b) Belden 9369
- c) Belden 9322
- d) Belden 8302
- e) 14/3 Marine AC
- f) 10/2 Marine
- g) #6 Green Ground Wire
- h) #12 Green Ground Wire

### 49.3 Technical

#### 49.3.1 Gate Valve Replacement

- 49.3.1.1 The gate valve located at frame 162 Starboard must be replaced Ref: MM683-004-WI (SPEED AND DISTANCE LOG WIRING DIAGRAM – See **Photo 1** in the TDP for relevant section); welding services will be required to remove the existing gate valve welded in hull and newly supplied gate valve will have to be welded in place of the old gate valve. The transducer will have to be removed first as noted in 49.3.2.
- 49.3.1.2 The transducer gate valve hull retaining ring must be of the same material as the hull, and the material's mill certificate must be approved by the TA and ABS prior to being installed.
- 49.3.1.3 The transducer gate valve hull retaining ring must be attached with an ABS approved welding plan. Non-destructive testing must be carried out to the weld joints of the insert panels to the vessel structure by an inspector qualified to the Canadian General Standards Board (CGSB) Standard CAN/CGSB-48.9712-2014.
- 49.3.1.4 Hull construction welds must be inspected by X-ray or ultrasonic method in accordance with the Rules and Regulations of TCMS and ABS, and accepted by the ABS inspector prior to any coatings being applied.
- 49.3.1.5 Preparation and painting of the jointing area must be according the Coast Guard's "Paints and Coatings Standard", document No. 18-080-000-SG-003 and in accordance with the paint manufacturer's instructions

#### 49.3.2 Removal of Doppler Speed Log SRD-331 System

- 49.3.2.1 The Contractor must remove all components and cabling from the original Doppler Speed Log SRD331 referred to in Dwg. MM683-011-WD and Dwg. MM683-004-WD except cables **being fed from the PRO-BUF-1 and cable** SPLOG-7 (previously labeled Log-102) and SPLOG-8. Note: Breaker #1 in Panel EL-101 (confirm this is the correct breaker) in wheelhouse must be locked/tagged out prior working on the system.
- 49.3.2.2 Remove the SRD331 Doppler Speed Log Main Display Unit and associated cables from Navigation Console. See cable list at bottom of this section. See Photo 2 and 3 in the TDP for location of Master Control Display Unit.
- 49.3.2.3 Note: Limited access to rear of unit due to Electrical Panels – Unscrew from front and pull unit forward out of console.

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- 49.3.2.4 Remove the Electronics Unit in watertight enclosure mounted on Starboard side of Bow Thruster compartment and all associated cables. Watertight enclosure will be reused, leave in place. See cable list at bottom of this section.
- 49.3.2.5 Remove the Speed Log Transducer and Gate Valve from the hull of the vessel inside the pipe tunnel to be confirmed with Chief Engineer for exact location.
- 49.3.2.6 Remove all remaining cables see DWG# MM683-011-WD and list below as reference, except retain cable SPLOG-7 (previously labeled Log-102) for new installation.
- 49.3.2.7 Remove 1-EL-101 (two conductors) from EL-101 Panel Breaker #1 in forward part of NAV Console to small terminal strip on starboard side of NAV console. Accessible by removing panels from the forward part of the Navigation console immediately starboard of the breaker panels.
- 49.3.2.8 Remove 1-EL-101-1 from small terminal strip in Navigation console back to Master Display
- 49.3.2.9 Remove 1-EL-101-2 from small terminal strip in Navigation console back to junction box located in Dry Provision Stores forward bulkhead inside door.
- 49.3.2.10 Remove the small terminal strip in Navigation console; see Photos 4/5 in the TDP for reference.
- 49.3.2.11 Remove SPLOG-1 from Master Display Unit back to Starboard Radar display.
- 49.3.2.12 Remove SPLOG-2 from Master Display Unit back to Port Radar display.
- 49.3.2.13 Remove SPLOG-3 from Master Display Unit back to Aft Radar display.
- 49.3.2.14 Remove SPLOG-4 (EC-20) from Master Display Unit to ECPINS console SIU Port#3 pins 7/8.
- 49.3.2.15 Remove SPLOG-5 Master Display Unit back to Relay Expander in Starboard side of Navigation console.
- 49.3.2.16 \* Remove SPLOG-6 From PRO-BUF-1 in Starboard side of Navigation console to Gyro IPSU #1.
- 49.3.2.17 \* Remove SPLOG-8 From PRO-BUF-1 in Starboard side of Navigation console to Gyro IPSU #2.
- 49.3.2.18 \*Cables in 49.3.2.16 and 49.3.2.17 may be retained if there is sufficient slack for them to reach the location of the new electronics unit while following proper cable routing.
- 49.3.2.19 Remove the PRO-BUF-1 NMEA Buffer fed by the old Speed Log and its power cable.
- 49.3.2.20 Remove Relay Expander and power cable (disconnect but retain SPLOG-7 cable); see Photo 6 below for reference.
- 49.3.2.21 Note: Expander powered from nearby 24V Junction box via 24V Panel Breaker #13 (confirm this is the correct breaker and lock/tag out prior to disconnecting in junction box).
- 49.3.2.22 Remove YY-1 from Master Display Unit back to back to junction box located in dry provision stores forward bulkhead inside door
- 49.3.2.23 Remove YY-2 from junction box located in Dry Provision Stores forward bulkhead inside door back to Electronics Unit in Bow Thruster Compartment inside watertight enclosure
- 49.3.2.24 Remove Junction Box from Dry Provision Stores; see Photos 7/8 in the TDP for reference.

49.3.2.25 Remove the Transducer complete with cable back to Electronics Unit in Bow Thruster Compartment inside watertight enclosure.

49.3.2.26 All removed equipment (Control Display Unit, Electronics Unit, Transducer c/w cable) are to be stored and returned to CCG upon completion of Vessel Life Extension. All other cables are to be disposed of after removal.

### **49.3.3 Installation of Doppler Speed Log Naviknot 450D**

49.3.3.1 Install the Pre-Amplifier in watertight enclosure mounted on Starboard side of Bow Thruster compartment where the Electronics Units was removed see Photo 9 in the TDP.

49.3.3.2 Install new gate valve where existing gate valve was removed in accordance with 49.3.1.

49.3.3.3 Install the new Transducer inside the newly installed gate valve, run cable along same route as original transducer cable and terminate in Pre-Amplifier as per supplied drawing, MM683-105-WD.

49.3.3.4 Note: Ensure the Transducer is correctly aligned.

49.3.3.5 Install the Electronics Unit in the Starboard end of the Navigation Console in the location currently occupied by electrical outlet. Relocate the outlet. A suitable location is suggested in Photo 10 in the TDP.

49.3.3.6 Install the 24VDC Siemens LOGO! Power Supply Unit below electronics unit as shown in Photo 10 in the TDP.

49.3.3.7 If cable SPLOG-7 (which was removed from relay expander earlier and retained) does not have sufficient length to reach the new Electronics Unit via proper cable routing then install a junction box as per supplied drawing MM683-105-WD where the relay expander was removed. This will be used to extend the cable.

49.3.3.8 Install Control and Display Unit complete with adaptor plate (template drawing will be supplied by TA) in location of removed SRD331 Control Display Unit in the Navigation Console as per Photo 2 in the TDP.

49.3.3.9 Install a #12 green ground wire from the Earthing Point of the system components with the exception of the pre-amplifier to a suitable grounding point on the Ship. The Pre-Amplifier requires a #6 green wire for grounding.

### **49.3.4 Cable Installation**

49.3.4.1 Install and label the following cables as per drawings (primarily DWG MM683-105-WD), use existing cable ways and transits. Cables will be terminated by the onsite CCG technical representative:

<b>CABLE LABEL</b>	<b>CABLE TYPE</b>	<b>FROM</b>	<b>TO</b>
DL-1	Factory Supplied	CDU in NAV Console	Electronics Unit inside STBD side of NAV Console.
DL-2	Belden 9369	Electronics Unit inside STBD side NAV Console.	Pre-Amplifier in Bow Thruster Compartment

*SPLOG-6	Belden 9322	Electronics Unit inside STBD side NAV Console.	IPSU #1 in Gyro Room
*SPLOG-8	Belden 9322	Electronics Unit inside STBD side NAV Console.	IPSU #2 in Gyro Room
*DL-5	Belden 9322	SPLOG-7 Junction Box in STBD side of NAV console	Electronics Unit inside STBD side NAV Console.
DL-6	Belden 9316	24VDC Power Supply Unit inside STBD side NAV Console.	Electronics Unit STBD side of NAV Console.
DL-7	Marine 10/2 cable	24VDC Power Supply Unit inside STBD side NAV Console.	Pre-Amplifier in Bow Thruster Compartment
DL-8	Belden 9322	Electronics Unit inside STBD side NAV Console.	Autopilot Steering Control Unit in Steering Console
DL-9	Belden 9322	Electronics Unit inside STBD side NAV Console.	Radar Display STBD side of NAV Console Wheelhouse
*DL-RDR-A	Belden 9322	Electronics Unit inside STBD side NAV Console.	Furuno Sensor Adapter
*DL-RDR-B	Belden 9322	Electronics Unit inside STBD side NAV Console	Furuno Sensor Adapter
*DL-VDR	Belden 8302	Electronics Unit inside STBD side NAV Console.	S-VDR in Port Fire Panel Console
1-EL-101	14/3 Marine AC cable	Breaker Panel EL-101, Breaker #1	24VDC Power Supply Unit inside STBD side NAV Console.

49.3.4.2 \*Not necessary to run these cables if existing cables reach new Electronics Unit connection points.

49.3.4.3 \*\* Not necessary to run DL-5 if there was found to be sufficient slack in cable SPLOG-7 during installation process in section 49.3.3.7.

49.3.4.4 \*\* If Navipilot 4000 is not installed still run DL-8, but leave coil of extra cable secured in central part of forward steering console for future use.

#### 49.4 Proof of Performance

##### 49.4.1 Set to Work/Commissioning

49.4.1.1 The Contractor must arrange for OEM authorized Field Service Representatives (FSR) to conduct the set to work and commissioning of the Sperry Doppler Speed Log Naviknot 450D System, including:

- Perform Doppler Transducer Calibration 2 Way Trial Runs as per Chapter 7, section 7.2 of the supplied Operation, Installation and Service Manual (056352/C, 06 Dec 2011).
- Record the setup in the configuration table in Appendix A of the supplied Operation, Installation and Service Manual (056352/C, 06 Dec 2011), a copy of the completed table must be provided to CCG.

## **49.5 Deliverables**

### **49.5.1 Reports**

49.5.1.1 The Contractor provide a report on the work performed for this specification itme, including all tests and commissioning reports. The report must include any deficiency found and its corrective action.

### **49.5.2 Certification**

49.5.2.1 The Contractor must provide the following welding documentation:

- a) Material Certificates for Plates and Sections;
- b) CWD Certificates for Welders;
- c) CWB Certificates for Welding Supervisors;
- d) CWB Weld Procedures;
- e) CWB Weld Data Sheets;
- f) UTM/NDT Testing Documentation.

49.5.2.2 The Contractor must provide all material certificates including Class approval documents of the transits, cables and other electrical components.

### **49.5.3 Spares**

**49.5.3** The Contractor must ensure that the Sperry Marine Supplied CD (Manuals on CD-ROM) Stock No. 056800 Rev. P; Jan 2013 supplied with the new equipment unit is returned to CCG prior to the acceptance of this item.

At 48.3.1

Delete: In its entirety

Insert (highlights to provide clarity on changes):

#### **48.3.1 General**

The Contractor must have an allowance of \$30,000 for the services, including travel and living expenses of a Don Breton's FSR to oversee the installation of the FM200 & Nitrogen pressure switches, plus oversee all interconnections between the pressure switches and the Trihedral Alarm System . The actual amount must be adjusted up or down via 1379 action

The FSR Allowance for Trihedral is covered under 12.3.6

Contact information for Don Breton's:

Ken Crooks  
Project Manager Fire Protection Service  
Don Brenton's Fire Protection/ DBCAN  
Phone: 1(902)-876-7879 Ext 215  
Cell: 1(902)-471-9792  
Fax: 1(902)-876-1976  
E-Mail: [kencrooks@brentons.com](mailto:kencrooks@brentons.com)

48.3.1.1 Under the direction of the FSRs , the Contractor must perform the following work:

- a) Replace the entire alarm system communication wiring with new industrial CAT5E loop, Belden 1300SB or equivalent (no substitutions for the communication wiring) and remove the existing "Genius Bus Cabling". The new communication loop must be connected to the 2 new LSUs mentioned in item (d) and to the existing 13 LSU units plus the 2 PLC units in the MCR. Contractor must supply the industrial CAT5E cable. For bidding purposes, Contractor must supply and install 500 meters of communication cabling. Note, the loop cables must be separated as much practically possible.  
The existing communication double GE "Genius Bus" must be removed by Contractor.
- b) The Contractor must install scaffolding in the cargo hold, tween deck and in the main engine room spaces to allow access to the various deck heads, cable transits etc. in order to allow the installation and securing of the communication loop cables and removal of the existing communication loop.
- c) The Contractor must supply and install 24VDC power supply wiring to the 2 new LSU units mention in item (c). Power sources for the 2 LSU units will be from the emergency generator room for the upper fan room LSU and from the MCR for the foscle LSC unit.

- d) Install 2 new GFE supplied LSUs, one to be fitted in the upper fan room and the other in the foscle compartment (crane/Bow Thruster). Note, the installation of the foscle LSU communication wiring and power supply must be performed in conjunction with the new crane installation. Communication and power supply wiring must be fitted through the #3 fuel tanks, using the new cable transits/conduit fitted for the crane installation.
- e) Remove existing FM200 cylinder pressure monitoring system and install a new system as per instructions and drawing shown in document "SWA FM200 Modifications Rev1 July 2015.pdf". The Contractor is to note that there is a significant amount of work and materials required for this item. It is suggested that bidders review the provided instructions and drawings in document "SWA FM200 Modifications Rev1 July 2015.pdf" completely.  
Under the direction of Don Bretons FSR, all unused existing wiring that connected the FM200 system pressure switches to the Notify System must be removed from the devices throughout the ship that link the FM200 system to the Notifier fire alarm panel. This included the removal of the isolation modules fitted within the emergency/information console on the bridge (portside aft console).
- f) Install various Roxtec cable transits at various locations so that communication cabling and FM200 cylinder monitoring pressure wiring can be installed. For estimation purposes, the Contractor must bid on supplying and installing 12, Roxtec S6x1 (weld in mild steel frame style) complete with sealing and wedge kits. Actual size (to be determined during installation) and number of Roxtec transits will be adjusted by PSPC 1379.
- g) Modify the existing MCR PLCs, the existing 13 LSUs and also connecting the 2 new LSUs by performing the following work, all under the direction of the FSR:
- Terminate 74 CAT5E cables
  - Install and wire 20 fuses clips with 2A fuses
  - Terminate 58 connections for FM200 signals
  - Replace 16 Genius Bus Interface modules with Profinet Scanner modules and mount power supplies Contractor is to note that there may a requirement to relocate the fuses/blocks currently fitted on a DIN rail
  - Remove extra modules (thermocouples and others as per TA's direction) and carriers. Contractor is to assume 15 modules will be removed.
  - Remove PLC modules no longer used and replace, 6 per rack
  - Wire in new PLC modules
  - Install and wire relays with diodes
  - Install and wire Modbus converter
  - Install and wire 13 network switches – may require additional DIN rail and/or mounting on door (new backplane)
- For bidding purposes, Contractor is to allow for 150 hours (Electro-Technician) to performed the work listed in section "g" and for \$5,000 in materials.



48.3.1.2 In addition to the work listed in 48.3.1.1, the Contractor is also responsible for providing assistance to Trihedral in the following trades:

- a) Welding/metal and fabrication;
- b) Pipe fitting and fabrication;
- c) Electrical installations.

48.3.1.3 The Contractor must bid on 200 hours labour at the Contractor's charge rate for the above trades for adjustment purposes. In addition, the Contractor must include an additional 30 hour labour for clean-up work. These bids and charge rates must be included in the overall bid quote. Please note, the work listed in section 48.3.1.1 is not part of the "200 hours", the work listed in 48.3.1.1 must be bid separately and included in the overall bid.

48.3.1.4 The Contractor must supply the TA with a weekly report indicating the number of hours that have been charged out per trade. This report will be compared to a similar report that will be recorded by Trihedral. Discrepancies will be investigated.

48.3.1.5 Hot work must not commence until the associated work areas have been certified gas free and safe for hot work. The Contractor is responsible for any cleaning in this area to prepare for hot work. The Contractor is responsible for arranging a certified Marine Chemist to visit the vessel and to carry out the necessary testing to obtain safe entry and safe for hot work certificates. A copy of a gas free/safe for hot work certificate must be given to the TA prior to personnel entering the space and a copy of each certificate must be posted in a conspicuous location in close proximity to the manhole cover for each space. Spaces must be tested each day that personnel are required entry in the space. All precautions must be taken to protect all areas from hot work damage. Contractor is responsible for maintaining an adequate fire watch during the course of all hot work. This must include providing various applicable extinguishers and extinguishing mediums as necessary. This must also include any necessary preparations and cleaning in the vicinity of the work area to obtain a gas-free permit. Contractor must take note of the requirements under the DFO/5737 Fleet Safety Manual, 7.B.3 – Entry Into Confined Spaces and DFO/5737 Fleet Safety Manual, 7.B.4 – Hotwork for these spaces.

48.3.1.6 The Contractor must use new Lloyd's Grade A steel or equivalent. Any proposal for material substitution must be made in writing and must be approved by TA prior to fabrication. All materials installed must be in accordance with ABS rules and regulations.

48.3.1.7 It is necessary for the Contractor to remove deck heads, panels, expanded metal sheathing, and insulation in the vicinity of the new wire transits locations to allow installation of the transits. All items must be reinstalled with new insulation in a clean condition upon completion of all related work, including testing.

48.3.1.8 Once the cable transits have been fitted, packed and sealed, and all steel work completed, the Contractor must demonstrate packed transits are gas tight using ultrasonic testing to satisfaction of ABS Surveyor, and the TA. Any deficiencies identified with the transit welds must be corrected by the Contractor and a retest performed at the Contractor's expense.



The Contractor must install suitable metal cable trays where required. All wiring and cable  
48.3.1.9 trays must be marine class approved. All cables must be secured using metal clamps and metal cable ties as per section 56 of TP-127, complete with metal embossed ID tag.

48.3.1.10 All areas that have been affected by the Contractor's work must be mechanically cleaned by the Contractor to SSPC-SP-11 Standards. The Contractor must apply primer and paint as per the SWA Paint specification; "International Interspec CM600222", dated 11-May-2015. The Contractor must apply coatings as listed in appropriate sections.

48.3.1.11 In cases where the areas are not listed in the "SWA Paint Specification", at a minimum Contractor must apply 2 coats of primer paint, Interprime 198 Grey color No. CPA098 International Paint. Coatings will be applied to yield 2-3 mils (ASTM D1640) DFT per coat and 2 top coats of Interlac 665 fire Retardant International Paint, with the colour to match the existing colour scheme to all areas that are disturbed/damaged from this work. This must include new steel work and newly fitted equipment.

48.3.1.12 The Contractor must be responsible for the identification of interference items, their temporary removal, storage and refitting to the vessel.

#### At 48.2.3 Drawings and Documents

Delete:

SWA FM200 Modifications Rev1 July 2015.pdf

Insert:

SWA FM200 Modifications Rev2 drawings only.pdf

## At 42.0 BARGE DAVIT ANNUAL SURVEY

Delete: In its entirety

Insert:

## **42.0 BARGE DAVIT (SURVEY & HYDRAULIC SYSTEM O/H)**

### **42.1 Scope**

- 42.1.1 The intent of this specification is for the Contractor to remove and disassemble the barge davit system for overhaul, blasting, coating, survey, reinstallation and load testing.

### **42.2 References**

#### **42.2.1 Regulations**

- a) Canada Shipping Act 2001 – Marine Machinery Regulations (SOR/90-264)
- b) Maritime Occupational Health and Safety Regulations (SOR/87-183)
- c) ABS Rules and Regulations

#### **42.2.2 Standards**

- a) Fleet Safety and Security Manual (DFO/5737)
- b) Canadian Coast Guard Welding Specification
- c) CCG Paints and Coatings Standard

#### **42.2.3 Nameplate Data**

Davit:

Manufacturer: Caley Ocean Systems Ltd.

Ph: +44 (0) 1355 246626 Fx: +44 (0) 1355 229359

Email: [caley\\_ocean\\_systems@compuserve.com](mailto:caley_ocean_systems@compuserve.com)

Job #: J4373

Model: 18 Ton Barge Launch and Recovery Davit

Winch:

Manufacturer: Zollern

Reference: 04.29 10569

Capacity: 620Kg

Eng Flange Bearing Unit:

Manufacturer: Zollern

Reference: 04.26

Capacity: 25Kg

Hydraulic Winch Motor:

Manufacturer: SAI  
Reference: GM2 300 7 H D40  
Capacity: 47Kg

Brake Unit:  
Manufacturer: Zollern

#### 42.2.4 Government Furnished Equipment

42.2.4.1 The Contractor must supply all materials, labour, equipment, and parts required to perform the specified work unless otherwise stated.

#### 42.3 Technical

##### 42.3.1 General

42.3.1.1 Contractor must disassemble the Caley davit system A-frame and associated components for inspection, non destructive testing (NDT), repairs, fully blasted to bare metal, cleaning, re-coated as per the FSR's requirements (refer to the approved Caley survey report, dated August 21, 2019) . All components are included, those fitted to the A-frame structure, deck mounting brackets and associated pins, luffing cylinders, flagging sheaves, and fixed sheaves. All A-frame components must be re-assembled and installed in good order upon completion of all work and the system load tested as per Heavy Lift Davit/Crane inspector and FSR's requirements.

42.3.1.2 The Contractor must obtain the services of a qualified Caley Davit Field Service Representative. Contractor is responsible for verifying FSR's qualification certificate(s) and authorization given by the manufacturer.

<https://pennecon.com/hydraulic-systems/>  
[http://hydraulic-systems.com/pages/contact\\_main.htm](http://hydraulic-systems.com/pages/contact_main.htm)  
<http://www.pennecon.com/Energy/ContactInfo>

42.3.1.3 Contractor is responsible for scheduling the services of the Caley Davit FSR. Contractor must include an allowance of \$15,000 to cover the services of the attending FSR. The allowance must form part of the overall bid and will be adjusted by 1379 action upon proof of final invoice.

42.3.1.4 Contractor must follow the manufacturer's procedures and recommendations during this scope of work, with all CCG technical specifications being treated as a minimum standard by the Contractor, superseded by manufacturer's procedures in the event of conflicting information.

42.3.1.5 In addition to the work identified in this specification item, Contractor must also complete any additional work referenced in the latest approved Caley survey report, dated August 21, 2019, a cost must be included in the bid price to complete any additional work identified and listed in the FSR maintenance requirements as identified in the reports summary of recommended repairs.

42.3.1.6 Contractor must arrange for an on-site independent certified Heavy lift Davit / Crane inspector to conduct and record the inspections / tests during the course of all work.

- 42.3.1.7 The Contractor must arrange for scheduling the ABS Surveyor for onsite inspections as required throughout the course of all work.
- 42.3.1.8 Contractor must supply all resources required (i.e. staging and craneage as required to work on, remove, transport, and install the various components during this overhaul) to carry out the overall work under the direction and guidance of the FSR.
- 42.3.1.9 All personnel working on the A-frame must be suitably trained in fall restraint and all fall restraint equipment must be certified and current.
- 42.3.1.10 The davit wires must be removed by Contractor's personnel prior to locking out the davit system. Wire removal process is detailed in section 42.3.3.1.
- 42.3.1.11 After the barge and davit wires have been removed, the Contractor must electrically and mechanically isolate power pack motors, associated 110 volt condensation heaters, and the oil reservoir immersion heater to allow the removal of components. All electrical and mechanical lockouts and tag outs must be carried out to the satisfaction of the TA, as per the DFO/5737 Fleet Safety Manual, 7.B.5 - LOCKOUT AND TAGOUT. Contractor must install /remove locks and tags accordingly during the scope of work. Electrical Officer will assist Contractor in identifying the locations to perform the lock outs, but will not perform the actual lock out. Contractor must supply and install their own locking devices and retain all keys during the scope of this work. Upon completion of all work the Electrical Officer must be in attendance when all locks/tags are removed.
- 42.3.1.12 NOTE: The nitrogen charged accumulator must be isolated and locked out electrically as per above and the accumulator must be relieved of all hydraulic pressure prior to working on the davit system.
- 42.3.2 Hydraulic Components**
- 42.3.2.1 The maximum working pressure of the hydraulic system is 250 bar.
- 42.3.2.2 Contractor must take all necessary precautions to protect the cylinders, piston rods and remaining hydraulic components from exposure to dirt, dust, welding fumes, and damage in general. During removal, exposed piston rods must be coated with a protective oil film and wrapped with a suitable barrier material.
- 42.3.2.3 All Denso tape removed to carry out the specified work must be discarded and new Contractor supplied Denso tape installed upon completion of all work.
- 42.3.2.4 An oil reservoir sample must be taken and sent ashore for analysis by Contractor. Contractor must provide a copy of the resulting analysis report to the TA upon receipt. Contractor must drain all oil from both sections of the reservoir, approximately 800 litres. The oil must be disposed of ashore by Contractor in an environmentally safe manner as per local, provincial, and federal requirements. Proof of this disposal must be given to the TA by way of invoice or other pertinent documentation.

- 42.3.2.5 Contractor must remove both hand hole covers from the oil reservoir. Contractor must clean the reservoir immersion heater elements. Contractor must wipe clean the internals of each tank and allow for visual inspection by the TA prior to final close up. All cleaning rags used for the internal surfaces must be lint free. New Contractor supplied oil resistant gaskets must be installed on each hand hole cover upon completion of work.
- 42.3.2.6 Both pump suction strainers must be opened out and cleaned/renewed as required. All cleaning rags used must be lint free. Contractor must supply and install new common pressure filter and return filters.
- Suction Variable displacement pump LHA Type LSE 134
  - Gear pump UCC Type UC 1457
  - Pressure System Pall 12 um (Beta) HH 9680F20KSTBP
  - Return System Pall 6 um (Beta) HH 6424F32KNUBG
- 42.3.2.7 Oil reservoir level gauge must be removed, dismantled, cleaned, inspected and old gaskets removed. Upon completion of identified work, Contractor must reconstruct and reinstall the level gauge using new Contractor supplied gaskets/seals as per the original fit and function.
- 42.3.2.8 Desiccant filter cartridge (Stauff, 600 ml) must be removed and a new Contractor supplied desiccant filter cartridge installed.
- 42.3.2.9 While the oil reservoir is open, the low oil level pump motor cut-out switch must be tested for correct operation with the Electrical Officer in attendance. The motors must be disconnected for this test.
- 42.3.2.10 Winch gearbox: Prior to disposal of the oil from the winch gearbox a sample must be taken and analysed to determine the status of flushing/filtering requirement; a copy of the analysis report must be provided to TA. Winch gearbox must be drained (19 litres) and oil disposed of ashore as per local, provincial, and federal requirements. Proof of this disposal must be given to the TA by way of invoice or other pertinent documentation. Upon completion of all work, the gearbox must be refilled with new Contractor supplied oil; for bidding purposes Contractor to quote on using Petro Canada Enduratex™ EP 68, and confirm with the Chief Engineer prior to ordering to ensure correct oil has been identified.
- 42.3.2.11 All hydraulic hoses must be drained, removed, and renewed with hoses of the same rating, complete with new stainless steel fittings suitable for the system requirements. Copies of manufacturer's compliance certificates for each hose must be given to the TA. All hose openings and hose connection points on equipment must be plugged / capped with proper hydraulic plugs/caps to prevent the ingress of dirt and debris until the new hoses are installed on the davit system. No rags are permitted in the prevention of foreign material ingress into equipment, tanks, and hoses. Prior to flushing, each hose must undergo a pressure test in compliance with ABS requirements for the size and pressure rating of the intended service. All new hoses must have jackets fitted to prevent UV deterioration. Contractor must include an allowance of \$25,000 to cover the cost of hydraulic hoses and fittings and associated hardware. This allowance must form part of the overall bid, but shown separately. The allowance will be adjusted up or down upon proof of invoice through 1379 action.

- 42.3.2.12 Contractor must supply all equipment, fittings, hardware, filters, manpower, etc. to carry out a full system filter/flush. This must include the services of a certified hydraulics technician to carry out the work. Flushing oil must be supplied by Contractor and disposed of in an environmentally safe manner upon completion of all work. The davit system must be flushed and filtered down to ISO code 17/15/12 or better (NAS1638 6 or better). Contractor must take periodic oil samples and analyse to determine the status of flushing/filtering. Copies of final oil cleanliness certificates must be given to the TA.
- 42.3.2.13 Upon completion of all work, the unit must be filled with 800 litres of new Contractor supplied Petro Canada Hydrex MV32 oil. The reservoir must be filled by means of a filter cart utilizing a 3 micron filter.
- 42.3.2.14 Upon completion of all operational testing, Contractor must take an additional oil sample and send for analysis complete with report. A copy of the final analysis report must be provided to the TA.
- 42.3.2.15 Contractor must disassemble the Caley davit system A-frame and associated components for cleaning, inspection, repairs, blasting, coating and NDT testing as per Heavy Lift Davit/Crane inspector and FSR's requirements. The components must include those fitted to the A-frame structure, wire ropes, deck mounting brackets and associated pins, luffing cylinders, flagging sheaves, and fixed sheaves. All A-frame components must be re-assembled and installed in good order upon completion of all work and the system load tested as per Heavy Lift Davit/Crane inspector and FSR's requirements.
- 42.3.2.16 Component weights:
- |                     |                  |
|---------------------|------------------|
| A-frame structure   | 10.0 tonnes (Te) |
| A-frame aft leg     | 1.8 tonnes       |
| A-frame forward leg | 1.8 tonnes       |
| A-frame cross beam  | 2.6 tonnes       |
| Luffing cylinder    | 450 kg each      |
- 42.3.2.17 All fasteners within the structural assembly must be renewed using Contractor supplied materials. Unless otherwise specified the material must be grade 8.8 zinc plated steel. Torques must be applied to all fasteners as per the fastener manufacturer's table, if not specified.

### **42.3.3 Wires**

- 42.3.3.1 The davit wires must be removed by Contractor's personnel, prior to locking out the Caley davit system. Wires must be run out and disconnected at the winch barrel ends. All wires must be removed with care, coiled, tagged and identified by Contractor. All reeving must be noted (sketch made) and reported to the TA. Removed wires must be returned to the TA pending the installation of new wires. Contractor must not cut off or damage any fitted swivel assemblies during the removals.

#### 42.3.3.2 Contractor must supply and install 2 new davit wires.

Possible supplier: Hercules SLR

Construction	35 x 7
Lay	RHLL
Finish	Galvanized
Diameter	26mm
Length	119 feet
Design Factor	5:1
Breaking Strength	148593 lbs
WLL	14859 lbs

42.3.3.3 Contractor must provide separate test certificates for each new davit wire. The swivel assemblies from the existing wires must be inspected. If they are suitable for reuse, the swivel assemblies must be fitted to the new wires and the complete wire swivel assembly must be tested as a unit.

#### 42.3.4 Grease

42.3.4.1 Contractor supplied grease; Mobil SHC™ PM Series 220 must be added/used at all grease points.

#### 42.3.5 Flagging Sheaves

42.3.5.1 Both Ansell Jones flagging sheave assemblies (including clamping straps) must be removed from the A-frame and transported ashore to Contractor's facilities. Each unit must be identified for subsequent installation into its original respective position and orientation. All sheave components must be similarly identified. There must be no interchanging of components.

42.3.5.2 Each flagging sheave assembly must be totally disassembled, including associated sub-components. Each component must be cleaned and laid out for inspection by the attending FSR, TA and ABS Surveyor. All grease passages must be proven clear. All new Contractor supplied stainless steel grease nipples must be installed in place of existing units. All defective components must be repaired / renewed as determined by FSR, TA and ABS Surveyor.

42.3.5.3 All sheave pin and pivot pin diameters must be measured in way of each bearing surface and recorded. The measurements must be taken at each pin end and in the middle. A second set at each location at 90 degrees to, for a total of 6 measurements per pin are required. Each pin bushing bore must be measured in the same manner and recorded.

42.3.5.4 All thrust washer thicknesses must be taken as well as the clearances between the washers and motion components and recorded. A total of four (4) measurements will be taken per thrust washer/clearance unit.

42.3.5.5 Sheave bearings must be removed, cleaned, and inspected for wear and defects. Sheave bores must be inspected for wear and defects. Bore measurements must be taken and recorded. Two (2) measurements must be taken per bore.

42.3.5.6 All the foregoing measurements must be included in a final detailed report. Contractor must provide 2 type written copies and 1 electronic copy in PDF format to TA.



- 42.3.5.7 Upon completion of all work, each flagging sheave must be assembled in good order with new Contractor supplied fasteners. All M12 fasteners must be renewed by Contractor and torqued to 74 Nm. All flagging sheave M20 mounting fasteners must be renewed by Contractor and torqued to 370 Nm.

#### **42.3.6 Fixed Sheaves**

- 42.3.6.1 The fixed sheave assembly must be removed from the A-frame for disassembly, cleaning, inspection, and measurements as per the flagging sheave assemblies. All fasteners must be renewed with Contractor supplied M24 fasteners and torqued to 636 Nm. Loctite 270 must be applied to the side lock screws. The grub screws fitted to the dimple shaft must be torqued to 124 Nm.

#### **42.3.7 "A" Frame Brackets and Deck attachment points**

- 42.3.7.1 The A-frame's current alignment must be checked and measurements recorded. Contractor must consult with the FSR and Heavy Lift Davit/Crane inspector to determine, based on the readings taken, if there is a need for realignment. Contractor to provide a cost in their bid for installation of "Chockfast" chocking material fitted at each heel pin and luffing pin deck brackets; The cost is to form part of the overall price, but shown separately for adjustment purposes. Contractor must consult with the onsite FSR with regards to ensuring the alignment of the davit is returned to OEM required values upon completion of work. Contractor will be required to monitor the curing of the new Chockfast if required. It is estimated that 48 hours cure time will be required. Readings must be taken on the hour bases at each deck bracket. Contractor is responsible for arranging/scheduling a Chockfast installation specialist for the above noted work, if realignment is deemed necessary.
- 42.3.7.2 The A-frame and each of two (2) luffing cylinders must be fully supported (A-frame assembly weighs 10.0 tonnes), (Luffing cylinders weigh 450- kg each) during the disassembly process.
- 42.3.7.3 The luffing cylinders rod end pins and their respective deck bracket pins must be removed. The luffing cylinders must be lifted ashore.
- 42.3.7.4 The A-frame heel pins must be removed and the "A" Frame assembly must be lifted ashore and blocked/supported as per the manufacturer's drawings.
- 42.3.7.5 The 2 heel pin brackets plus the 2 luffing pin brackets must be disassembled, cleaned, and inspected for wear and defects. All grease passages must be proven free and clear. New Contractor supplied stainless steel grease nipples must be installed in place of existing units. The bushing/bearing surfaces must be cleaned, inspected for wear and defects. Each bushing/bearing Id is to be measured in two (2) planes. Readings must be recorded in a detailed final report.
- 42.3.7.6 The seats for the heel assemblies and the luffing cylinders are to be cleaned and examined for defects. The seat to deck welded interface areas are to be subjected to the NDT Inspection process as detailed in section 42.3.11.



42.3.7.7 Contractor must fabricate new pins for the system davit heel assemblies and the luffing cylinders.

42.3.7.7.1 Contractor must fabricate 2 new heel pins, approximately 170mm diameter x 610mm long. Contractor to ensure each pin is fabricated (fitted) with rifle grease ways, similar to original and with prior written approval by the FSR. Contractor must fabricate 4 new heel pin bearings, sizing measured at the time of renewal (or provided by FSR). The cost must be included in the overall bid and shown separately. For bidding purposes, contractor to assume bearing stock outside diameter of 190 mm and ID approximately 171mm.

42.3.7.7.2 Contractor must fabricate 2 new luffing cylinder deck pins and 2 new luffing cylinder rod end pins. Dimensions, clearances, and greaseways will be based on the removed pins and be approved by the FSR prior to fabrication.

42.3.7.7.3 The 6 new pins must be measured in 2 planes within each bushing/bearing interface location. These measurements will be recorded in the final report.

42.3.7.7.4 New Contractor supplied stainless steel grease nipples must be installed as per the original location for each of the new pins. All new pins will have their greaseways proven clear.

42.3.7.7.5 Materials for all the new pins will be as follows:

- Pin shaft material is; "BS EN 10025 S355J2G3", with upgrade to Charpy V-notch
- Impact Tested Longitudinal 34 Joules @ -40 degree C"
- Pin bearing material is; BS EN 1992 CC481K-GC

42.3.7.8 The deck bracket fasteners must be renewed with Contractor supplied fasteners.

Heel pin bracket hold down bolts: 16 x M24 @ 650 Nm  
Luffing cylinder bracket hold down bolts: 12 x M30 @ 1300 Nm

#### **42.3.8 Luffing Cylinders**

42.3.8.1 Contractor must ensure that there is no system pressure remaining, prior to hydraulic cylinder removal. Each luffing cylinder must be removed ashore to Contractor's facilities. Each spherical self-aligning bearing at the cylinder rod end and cylinder clevis must be cleaned, inspected, and measured for wear/defects. Each pin must have its associated lock removed and each pin must be withdrawn to permit removal of both cylinders. Both cylinders must be supported at all times and the piston rods must not be used for support or movement of the unit.

42.3.8.2 Contractor must disassemble both hydraulic cylinders.

42.3.8.3 All components must be cleaned and laid out for inspection. Precautions to be taken to prevent interchanging components. The cylinder bore, rod, piston, gland, etc. must be inspected for wear and defects. All pin must be renewed and cylinder connection bores must be measured at 6 locations (2 at each end and 2 in the middle at 90 degrees apart). All readings must be recorded and entered into a detailed final report. All defective parts must be renewed with Contractor supplied parts. New Contractor supplied OEM piston and gland seal kits must be installed.

- 
- 42.3.8.4 Contractor must include an allowance of \$20,000 to cover the cost of labour, transportation and for services to re-chrome both cylinder rods and must be included in the overall bid price and cost shown separately. Final cost will be adjusted through 1379 action upon proof of final invoice.
- 42.3.8.5 Contractor must notify the FSR and the TA in advance, 24 hours if possible, to ensure their present for all inspection of components.
- 42.3.8.6 Both cylinders must be assembled, coated as per the vessels paint specification and returned to the vessel upon completion of all work. The cylinders must be attached with new contractor supplied pins. All applicable fasteners and pins must be locked. All fasteners must be torqued accordingly and all threaded fasteners must be coated with anti-seize compound. Note; new pins can be tapped and threaded on their end face for ease of installation and removal, welding a nut on the pin end is not an acceptable alternative and will be rejected and a new pin(s) fabricated at the Contractor's expense.
- 42.3.8.7 All fittings must be wrapped in Contractor supplied Denso tape upon completion of work. New Contractor supplied seals and O-rings must be installed on all connections.
- 42.3.9 Winch**
- 42.3.9.1 The complete winch assembly must be overhauled at a certified hydraulic repair facility. The complete winch assembly must be disassembled for inspection and renewal of all seal assemblies, including those of the hydraulic motor. All seals/seal assemblies are Contractor supplied. The winch drums and various components must be blasted to bare metal. Contractor must prime and coat all bare areas as per the FSR and TA recommendations. All corroded and rusty fasteners must be renewed with new Contractor supplied fasteners of equal grade and sizing.
- 42.3.9.2 The hydraulic motor must be load tested once the Contractor has completed the re-assembly, to check for leaks and output torque.
- 42.3.9.3 Upon completion of all work the winch assembly must be returned and fitted to the davit in good order.
- 42.3.10 Crossbeam**
- 42.3.10.1 Contractor must supply and renew the 28 x M24 @ 721 Nm fasteners on both of the crossbeam flanges. The removal and installation of the new fasteners must be done one bolt at a time, so as to not disturb the alignment of the structural members.
- 42.3.10.2 Contractor must supply and renew the 16 x M24 @ 721 Nm winch barrel mounting bracket fasteners used to secure the winch to the aft A-frame leg.
- 42.3.11 Load Testing / NDT Inspection**
- 42.3.11.1 Upon completion of all work Contractor must carry out operational testing and system load testing. Contractor must supply and utilize the certified weights as well as all appliances,

hardware, and manpower necessary to load test the Caley Davit (derrick) system. All test equipment used, as well as weights, must have verification and applicable test certificates and Contractor must show these to the Independent Heavy lift Davit/Crane inspector, FSR and TA. Equipment, materials, etc. not having applicable certification must not be used, and the testing must not proceed until authentication can be provided.

- 42.3.11.2 Prior to load testing, the davit system must be proven operational. Each wire end must have a nominal weight affixed to the connection swivel to preload the lifting wires. The weight must be determined by the FSR. The davit will be run through a minimum of 2 complete cycles to ensure correct operation to the satisfaction of the TA, FSR, and ABS Surveyor.
- 42.3.11.3 The safe working load of the system is 18.0 tonnes. The system must have a function load test carried out. Contractor must supply and attach a 9.9 tonne weight to each fall wire for a total of 19.8 tonnes. The system must then be operated to demonstrate a function load test. All testing must be carried out to the satisfaction and specifications of the attending FSR, TA, ABS Surveyor and Heavy lift Davit/Crane inspector. Contractor must confirm with the Surveyor that the weights and test method are satisfactory prior to the actual test.
- 42.3.11.4 Upon completion of load testing, Contractor must carry out non-destructive testing on various assembly welds and components as per the directions of the attending Independent Heavy lift Davit/Crane inspector and/or FSR. Contractor must use a certified NDT technician or sub-contract to a certified NDT company to carry out this work.
- 42.3.11.5 Contractor must include in the bid, 100 linear feet of NDT as well as a quote per additional foot for adjustment purposes. This price must include preparations for the weld areas, Magnetic Particle inspection using the technician's services.
- 42.3.11.6 Upon completion of all NDT; Contractor must provide a detailed report that includes at a minimum, the overall results of the tests performed, locations identified on a sketch or TA supplied drawing, all resulting test point readings, baseline readings, dates, times, conditions and recommendations.
- 42.3.11.7 All locations chosen for NDT must be at the direction of the Independent Heavy Lift Davit / Crane Inspector and FSR.
- 42.3.11.8 After the NDT testing is complete, the ship's barge must be fitted to the davit system and brought aboard. Another full cycle of operation must be carried out. These operations with the barge, must be conducted under the supervision of the FSR. Any adjustments required to bring the system to full operational function and alignment must be carried out by the Contractor.

#### **42.3.12 Completion Of Specified Work**

- 42.3.12.1 Upon completion of all work, all structures blasted to SAE2 and NDT carried out on all load path primary welds. Fully coat the davit structures to OEM paint scheme. Also, as per the most recent copy of the Caley survey report, dated August 21, 2019, contractor must ensure that all requirements as identified in the summary of recommended repairs have been completed to the satisfaction of the attending FSR.

42.3.12.2 This must include the deck seat mounts for the hinges and rams. Primed area must be feathered back to provide a smooth surface for the Contractor supplied top coats.

42.3.12.3 All work must be completed to the satisfaction of the TA, FSR and the attending Independent Heavy lift Davit/Crane inspector.

#### **42.3.13 Location**

42.3.13.1 Caley Barge Davit located on Starboard Side of vessel, Boat Deck, frames 37 -65.

#### **42.3.14 Interferences**

42.3.14.1 It is the Contractor's responsibility to identify any interference items not identified in this specification, and with the TA's approval, ensure they are safely removed, stored, and reinstalled in working order as required.

42.3.14.2 Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

### **42.4 Proof of Performance**

#### **42.4.1 Inspection**

42.4.1.1 Contractor must arrange for on-site presence of an Independent Heavy lift Davit/Crane inspector and a Caley Davit FSR for inspections / testing during for the course of all Caley Davit work. Contractor must refer to the above Technical Description for determining required inspection points.

42.4.1.2 The Contractor must arrange for the on-site presence (scheduled) of an ABS Inspector as required for inspections/testing throughout this scope of work. Prior to commencement of the work, the Contractor must verify with ABS any inspection hold points in this specification, along with any not identified, and adjust their production schedule accordingly.

42.4.1.3 Inspection points, at a minimum the following have been identified;

- Allow for visual inspection of tank Internals by the TA prior to final close up.
- Inspection of disassemble davit system A-frame and associated components.
- Inspection of new Davit wires.
- Inspection of flagging sheave assemblies after disassembly, including associated sub-components.
- Inspection of A-frame fixed sheave assembly after removal and disassembly.
- Both Luffing cylinders must be transported to Contractor's facilities and inspected.
- All components of both hydraulic Luffing cylinders must be cleaned and laid out for inspection.
- Contractor must include in the bid, 100 linear feet of NDT inspection as well as a quote per additional foot for adjustment purposes.

#### 42.4.2 **Testing**

42.4.2.1 Contractor must refer to the above Technical Description for determining required testing points and criteria, FSR requirements, ABS requirements and Heavy lift Davit/Crane inspector. A short list is identified below;

- Upon completion of all operational testing, Contractor must take an additional oil sample and send away for analysis complete with report provided to the TA.
- Upon completion of all work Contractor must carry out operational testing and system load testing.
- System must be operated to demonstrate a function load test. All testing must be carried out to the satisfaction and specifications of the attending Independent Heavy lift Davit/Crane inspector and FSR. Contractor must confirm with the FSR that the weights and test method are satisfactory prior to the actual test.
- Upon completion of load testing, Contractor must carry out non-destructive testing on various assembly welds and components as per the directions of the attending Independent Heavy lift Davit / Crane inspector and FSR.

#### 42.5 **DELIVERABLES:**

##### 42.5.1 **Reports**

42.5.1.1 All documentation must be provided to demonstrate OEM compliance. No material substitutions must be undertaken without the expressed written consent of the TA and FSR.

42.5.1.2 Contractor must provide the TA with 2 type-written copies and 1 electronic copy, in PDF format, of the final detailed report. None of the drawings or measurements taken must be given to the TA in hand written form. The final detailed report must, at a minimum, list all work undertaken, repairs, parts used, parts substituted, measurements, readings, recommendations, etc.

##### 42.5.2 **Spares**

42.5.2.1 Any remaining spare parts that were purchased, but not used, for this specification must be supplied to the TA for on board spares.

##### 42.5.3 **Certification**

42.5.3.1 Contractor must refer to the above Technical Description, FSR requirements, ABS requirements and Heavy lift Davit/Crane inspector for determining the necessary certifications to have on hand and what certificates must be provided to the TA.

42.5.3.2 ABS Surveyor certification for load testing must be provided upon completion of this specification.

42.5.3.3 Manufacturer's certification of safe operation must be obtained from the FSR and a report must be received from the FSR. The Contractor is responsible for scheduling the FSR as per production plan.

Solicitation No. - N° de l'invitation  
F7049-190047/A  
Client Ref. No. - N° de réf. du client  
F7049-190047

Amd. No 11. - N°11 de la  
File No. - N° du dossier  
034mdF7049-190047

Buyer ID - Id de l'acheteur  
034md  
CCC No./N° CCC - FMS No./N° VME

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#### **4) Modify ANNEX H – Appendix 1 – PRICING DATA SHEET (CCGS Cornwallis)**

At ANNEX H – Appendix 1 – PRICING DATA SHEET (CCGS Cornwallis)

Delete: ANNEX H – Appendix 1 – (E) FINAL Pricing Sheet - Cornwallis - Dec 28

Insert: See attachment document entitled (E) FINAL Pricing Sheet - Cornwallis – Jan 9

**End of Solicitation Amendment #11**