



## CANADIAN COAST GUARD



### REFIT SPECIFICATION CCGS ALFRED NEEDLER

**SPECIFICATION NO. 17-A018-018-1**

WINTER, 2018



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CCGS Alfred Needler  
2017 FY Dry-Docking  
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**GENERAL NOTES**

**CCGS Alfred Needler** is an Offshore Fisheries Science vessel operated by the Canadian Coast Guard.

**VESSEL PARTICULARS:**

|                                |   |
|--------------------------------|---|
| Year Built                     | 1982                                      |
| Yard                           | Ferguson Industries Limited, Pictou, N.S. |
| Length, Overall                | 165.00'                                   |
| Length, Between Perpendiculars | 144.67'                                   |
| Breadth, Moulded               | 36'                                       |
| Depth, Moulded                 | 14.75'                                    |
| Rake of Keel                   | 3.90'                                     |
| Mean Draft, Extreme            | 13.20'                                    |
| Displacement, Extreme          | 1123 L. Tons                              |
| Gross Tonnage                  | 925.03                                    |

1. **ON-SITE PROJECT OFFICER:**

All the specified work, as well as all work arising, shall be completed to the satisfaction of the On-site Project Officer who, unless otherwise advised, will be the vessel's **Chief Engineer**, or his/her designated representative. Upon completion of each item of the specification, the Chief Engineer shall be notified so that he/she may inspect the work prior to the complete closing up of any work. Failure to give notification does not absolve Contractor of the responsibility of providing Chief Engineer the opportunity to inspect any item. Inspection of any item by the Chief Engineer does not substitute for any required inspection by Transport Canada Marine Safety Branch (TCMSB), Public Works and Government Services Canada (PWGSC) or Health Canada (HC).

2. **SAFETY:**

Vessel shall be under the Contractor's Safety Management program while under their Care & Custody. Potential Contractors shall include with their bids the name of their Safety Manager or Supervisor who will ensure that these requirements for workplace safety are met. While under CCG Care & Custody the ISM Safety annex shall apply.

3. **SUB-CONTRACTORS:**

All conditions, stipulations etc. listed in the General Notes apply to any Sub-Contractors employed by the Main Contractor to carry out work on any Specification item.

4. **SCHEDULE:**

At the Pre-Refit Meeting, the successful Contractor shall provide a Production Gantt Chart or Schedule showing commencement and completion dates for each item in this specification. This document shall highlight any critical dates and be capable of showing the effects of late completion date of the work package. Contractor shall provide updated Production Schedules to the Chief Engineer, Vessel Maintenance Manager and PWGSC Inspector immediately at any point the schedule is revised.

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**GENERAL NOTES**

5. **SAFE WORK CERTIFICATES:**

Before any cleaning, painting or hot work is commenced in confined spaces or machinery compartments, Contractor and subcontractor personnel issuing these certificates must be fully trained, qualified and certified in accordance with Canada Labour Code requirements and all relevant provincial legislation. Certificates shall clearly state the type of work permitted and are to be renewed as required by the regulations. Contractor and his sub-Contractors are advised that any work carried out in confined spaces as defined by the Canada Labour Code (CLC) and relevant provincial legislation must fully comply with all provisions therein.

6. **WELDING:**

All hotwork and welding procedures shall be done in accordance with Canadian Coast Guard Welding Specification:

- Document # **CT-043-EQ-EG-001-E** (English), or **CT-043-EQ-EG-001-F** (French)

Contractor must ensure that welding is performed by a welder certified by the Canadian Welding Bureau (CWB) in accordance with the requirements of the following Canadian Standards Association (CSA) standards:

- CSA W47.1, Certification for Companies for Fusion Welding of Steel Structures (Minimum division level 2.0); and**
- CSA W47.2-M1987 (R2003), Certification for Companies for Fusion Welding of Aluminum (Minimum division level 2.1).**

7. **HOTWORK & FIRE WATCHES:**

Contractor shall abide by their Safety Management Program when performing Hot-work. Contractor shall provide sufficient suitable fire extinguishers and a fire watch during any such heating and until the work has cooled. Ship's extinguishers shall **not** be used except in an emergency. Should Contractor have to use ship's extinguishers in an emergency, they shall be recharged and re-certified by a local facility, of CCG's choice, at Contractor's cost.

8. **SERVICE CONDITIONS:**

Unless specified otherwise, all components, materials and installations supplied by or carried out by Contractor shall be adequate to meet the following service conditions:

In areas that are exposed to the elements:

- outside air temperature of minus (-) 40 C to plus (+) 40 C;
- wind velocity of 50 knots;
- shock loading of 2.5g horizontal, 1.5g vertical.

All new components, materials and installations within the ship shall be adequate to withstand the specified shock loading accelerations.

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9. **SECURITY WATCHES:**

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

10. **TURNOVER:**

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

As part of the initial turnover, digital photographs will be taken by the Owner's Representative with Contractor Representative in attendance consisting of a minimum of four photographs per space. CD copies of the photographs will be distributed to Contractor, CCG Representative and the PWGSC Inspector and shall be accepted as representative of the condition of the vessel at turnover.

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

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

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

11. **ENCLOSURES AND HEATING:**

Contractor shall provide all enclosures and heating required to carry out all the scheduled work, taking into account the nature of the work, the time of year the refit is, and the weather conditions for that time of year in Contractor's geographic area. Examples of where heating and enclosures could be required include but are not limited to painting, Potable Water coating, and tank cleaning.

12. **RELOCATIONS:**

Any piping, manholes, parts and/or equipment requiring temporary relocation to carry out specified work, or to gain access, shall be refitted upon completion with new jointing, anti-seize compound, clamps and brackets as applicable (Contractor supply). All equipment and systems, so disturbed, shall be tested to prove correct function and fluid integrity upon completion. Defects shall be corrected at Contractor's cost. **NOTE:** It is Contractor's responsibility to identify equipment and systems that shall be tested to verify correct function, prior to being disturbed for required work.

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**GENERAL NOTES**

13. **HOTWORK VENTILATION AND CONTAINMENT:**

During all known work and work arising that involve hotwork Contractor shall ensure that all dust, debris, gas and smoke generated by the work is evacuated from the vessel by the most direct method possible.

Each item that involves hotwork shall have a defined zone which shall be kept sealed off from the rest of the vessel during the complete work period that involves the generation of welding gases, smoke, and grinding dust etc. These zones shall be indicated in the items contained within the known work package. All extra work arising where hotwork is involved shall have a zone determined using the same logic. The zone shall be limited to the space(s) where the hotwork is being done, boundary areas where fire watches are required, and the access routes between the zone and the exterior of the vessel for workers, welding and cutting equipment and ventilation ductwork.

In areas where accommodations and or workplaces cannot be completely isolated from personal access a double sealed door (air lock) arrangement shall be erected to minimize ingress of the contaminants into occupied areas. A ventilation extraction point shall be located as near as practical to the inside door on the worksite side to reduce the egress into the air lock and subsequently the accommodations and/or workspaces.

All doorways within the affected area that are not being worked or require access for fire watch activities shall be sealed off to prevent all containments from getting in. Passageway branches that connect to the zone shall be sealed off. Contractor shall completely clean all surfaces and fabrics within a compartment that are not suitably protected.

14. **LIGHTING:**

Temporary lighting and/or temporary ventilation required by Contractor to carry out any item of this specification shall be supplied, installed and maintained in safe working condition by Contractor and removed on completion of the related work. Naked light bulbs or tubes shall not be used as temporary lighting inside the vessel. All lights used in the vessel shall be supplied with approved guards.

15. **CLEANUP:**

Contractor shall ensure that all spaces, compartments, and areas where work has been carried out, or Shipyard staff has used for transit routes, are left in **“as clean a condition as found”** when the vessel commenced refit. All rags, debris, and associated garbage generated by the shipyard staff while on board shall be removed to the garbage container(s) each day. The costs associated with the removal of dirt, debris, and garbage shall be included in the quote.

16. **INSPECTION:**

Contractor shall be responsible for calling in the services of TCMSB, PWGSC and HC Inspectors when and as required for survey and inspection items. All TCMSB surveyors called in by Contractor are to sign-off the Chief Engineer’s Inspection Log Book for all items surveyed.

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**GENERAL NOTES**

17. **CORRESPONDANCE & REPORTS:**

Unless otherwise agreed upon, all correspondence with CCG vessel maintenance personnel shall be in English. All reports shall be typewritten, and provided in **English**. Duplicate copies may be submitted in French. All reports shall be completed in a timely manner and provided to the Chief Engineer immediately following their completion, and shall continue as required throughout each component's respective specification of work. Upon delivery of the vessel, a compilation of all reports and correspondence shall be provided on a CD or DVD to Vessel Maintenance Manager.

18. **PAINTING:**

Unless specified otherwise, replacement and/or disturbed steelwork shall be given a minimum of two (2) coats of Intershield 300 Aluminum Pure Epoxy, each coat to be of contrasting colour. **Lead-based paints shall not be used under any circumstance.** Prior to painting, all new and disturbed steelwork shall be power tool cleaned to SSPC.SP3 standard as a minimum standard of surface preparation. Contractor shall arrange for the NACE Inspector shall be notified after the first coat of paint is fully cured so that it may be inspected prior to the application of the second coat. Failure to do so shall result in another coat being applied at the Contractor's expense.

19. **MATERIALS & TOOLS:**

All materials, unless otherwise specified, shall be supplied by the Contractor. Contractor is to supply all necessary tools and equipment to perform the specified work. Special, ship-specific tools, as required, will be issued by and returned to Chief Engineer. Contractor shall be responsible for removing the tools from their stored location aboard the vessel, and returning them and securing them in place when finished. Otherwise, ship's tools and equipment will not be available for Contractor's use.

20. **MEASUREMENTS:**

All dimensional measurements shall be taken and recorded in inches. Unless otherwise specified, the dimensions shall be taken and reported in thousandths of an inch (0.000"). All measuring devices shall be described on the submitted reporting sheets. All reported dimensions shall be either typed or printed in a neat legible manner, and shall include the name of the person who took the readings.

21. **CO-OPERATION:**

During the period that the ship is in refit, members of the ship's complement, Coast Guard technical staff, and service specialists may be carrying out repairs to, maintenance of, or modifications of various ships' equipment not covered in this specification. Contractor must not deny access to the vessel to these persons. Every effort will be taken to ensure that this Coast Guard controlled work will not interfere or conflict with that being carried out by Contractor.

22. **SMOKING:**

The Public Service Smoking Policy forbids smoking in Government ships in all areas inside the ship where shipyard personnel will be working. Contractor shall inform workers of this policy and ensure that it is complied with in all cases.

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**GENERAL NOTES**

23. **ACCESS:**

The following areas are out of bounds to Contractor's personnel except to perform work as required by the specifications: all cabins, offices, workshops, Wheelhouse, Control Room, public washrooms, Officers' and Crew's Messes and Lounges. Contractor s shall ensure that no workers bring meals onboard the ship.

24. **INSPECTION & GUIDANCE:**

During this contract, Ship's Crew and Regional Staff will be onboard conducting inspections and providing guidance to Contractor personnel.

25. **ASBESTOS:**

There may be locations having asbestos containing materials (ACM). The latest Asbestos Assessment Report is available upon request.

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**SERVICES**

1. **GENERAL:**

All services as described in this section shall be supplied, fitted and/or connected upon formal handover to Contractor, maintained throughout the period that the ship is under Contractor's control, and removed upon return to CCG Custody.

Contractor shall supply all material to point of onboard connection and all cranes/scaffolding required for connection/disconnection. Contractor shall be responsible for any additional disconnections and re-connections required if and when the ship is moved between dock, slipway and any berth at Contractor's premises.

2. **CARE AND CUSTODY:**

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

3. **PRICES:**

Contractor shall quote a global price and daily or unit cost rates for all services supplied to the vessel during the refit period.

4. **BERTHAGE:**

During refit, while not in dry- dock, the vessel shall be berthed at the Contractor's wharf at a safe and secure berth with adequate water at extreme low tide to ensure that the vessel will not touch bottom. The Contractor shall include in quote all costs for initial tying up, any movement of the vessel during refit and slipping of lines from Contractor's wharf on departure of vessel from yard upon completion of the refit.

5. **GANGWAYS:**

Contractor shall supply and install two (2) gangways complete with safety net, while the ship is on the dock or slipway or at berth. Gangways, complete with safety nets, one of the two gangways shall be installed in such a manner that they provide separate routes for escape in the event of fire. Chief Engineer shall advise of specific locations.

Safety nets shall be in compliance with the Canada Labour Code. Gangways shall be safe, well lit and structurally suitable for the passage of shipyard personnel and the ship's crew. Contractor shall maintain gangways in a safe condition throughout the duration of the refit while the ship is out of the water.

Initial installation and later removal of gangways shall be included in quote, as well as maintenance and upkeep while vessel is in Contractor's yard. Any movement of gangway(s) required by Contractor shall be at Contractor's cost.

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**SERVICES**

6. **ELECTRICAL POWER:**

Contractor shall connect and quote on supplying electrical power on one (1) service at **600V, 400A, 3Φ, 60Hz** rating upon ship's arrival at Contractor's facilities. The ship's shore power shall not be used. The cost of all required connections and disconnections shall be included in the quote.

The cost of all required connections and disconnections shall be included in the quote. Contractor shall bid on the supply of 3000 kWh per day for refit period, plus a unit kWh rate for adjustment purposes. Final costs shall be pro-rated up or down by PWGSC 1379 based on actual consumption as indicated by vessel's kWh meter. The power meter shall be read and recorded by the Chief Engineer and Contractor's Representative together at the start and end of the contract period.

If no kW consumption meter is available, a daily consumption (amps) shall be negotiated and power requirement determined by the following formula:

$$\text{kWh} = I \times E \times P.F. \times 1.73 \times 24/1000$$

7. **STAGING & CRANAGE:**

Contractor shall provide all necessary staging, shoring, and rigging that will be required to carry out all specified work as well as the transportation of all materials that are required. All staging and rigging shall be removed from the vessel on completion of work. Bidders shall allow 5 lifts in the bid for crantage, for loading and unloading ships stores.

In addition, Contractor shall quote an hourly rate for crantage, and a per lift rate. This rate shall include the crane, operator and all other required personnel. Final cost shall be increased or decreased to suit actual usage at refit completion via PWGSC 1379 action.

8. **POTABLE & SANITARY WATER:**

Potable fresh and sanitary water at 415 kPa (60 PSI) constant pressure shall be connected to the ship's system. Connection is to be complete with pressure regulator and shut-off valves, and attached at the ship's fresh water filling connection located on the fwd. starboard side corner of the Trawl deck. Approximately 350 cubic meters shall be supplied for duration of the contract by the contractor. This volume of water shall NOT be used for the flushing and filling of the freshwater tanks by the contractor as per the fresh water tank specifications.

Contractor shall also supply and connect a water meter to the ship's inlet line.

Contractor shall quote a unit rate for PWGSC 1379 adjustments, and include all connection / disconnection costs in bid price.

Contractor shall make arrangements to prevent the potable water supply piping/hoses are protected against freezing.

Contractor shall provide to Chief Engineer at the Pre-Refit Meeting a certificate of potable water quality before water service is connected to the vessel with a current date of testing and its' source.

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**SERVICES**

9. **WASTE MANAGEMENT:**

A garbage dumpster/container shall be provided on the Well Deck for ship's garbage only. Refuse shall be removed daily from the ship; quotation shall indicate a per-diem charge for garbage removal only.

Provisions shall be made for any recycling mandated by local authorities; any receptacles specifically required to meet these requirements shall be provided by the Contractor at no cost; the Contractor shall quote removal costs only. The Contractor shall also quote on removal costs (per unit volume/quantity) for:

- Newsprint/bond paper
- Corrugated cardboard
- Beverage containers

10. **FIRE MAIN:**

During the dry-docking period only, Contractor shall provide shore water connections to ship's 2½" diameter fire main, at a minimum pressure of 415 kPa (60 PSI). Two independent & separate connections shall be supplied at extremities of the vessel, as directed by the Owner's representative.

A pressure-reducing valve with pressure gauge shall be fitted before the connection valve at the Contractor's hydrant. The Contractor shall ensure that there is no interruption of service to the ship's fire main at any time.

11. **PROTECTION:**

Contractor shall supply and fit 1/8" inch (3 mm) thick Masonite to protect the ship's interior decks for the duration of the refit. Placement of Masonite shall be as directed by the Owner's representative. At a minimum, the areas that shall be protected will include all interior passageways and stairs, the Control Lab, the Bridge, and the Chief Engineer's Cabin. It shall also include decking and stair treads in the corresponding sections of the stair tower, and the lower 125cm of all bulkheads.

Contractor shall bid on supplying and installing **100m<sup>2</sup>** and provide unit cost for the supply and installation per m<sup>2</sup>. All seams and edges shall be duct taped in place to prevent movement of the sheets and the ingress of dirt. Upon completion of all work, the Contractor shall remove all Masonite and clean the areas that were covered by the Masonite.

Bulkheads and deckheads in the accommodation areas shall be protected where temporary services are run or where there is a possibility of damage as a result of the performance of contracted work.

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**SERVICES**

12. **TELEPHONE SERVICE:**

Two independent and private telephone lines shall be supplied and connected to the ship's integrated communications system. The cost of connection, unlimited local service and removal shall be included in bid price. All telephones shall be active 24 hours a day for the duration of the contract, and shall have long distance dialing capabilities. The cost of long-distance calls shall be dealt with using PWGSC 1379 action. Contractor shall be responsible for giving notice for connection/disconnection times to the Telephone Company as required for any ship movements during the dry-docking period.

Contractor shall supply a listing of shipyard contacts, fire, police and emergency telephone numbers to Chief Engineer when vessel arrives at Contractor's facilities. Contractor shall ensure the Chief Engineer is notified of any "on call personnel" and their contacts during non-working hours and days.

13. **FLUIDS REMOVAL**

Contractor shall bid on the removal and disposal, in accordance with provincial requirements, of 10,000L oily water mixtures from the ship's waste oil tanks and bilges. Also quote unit cost per each additional removal and disposal of 2,500 litres.

Contractor is responsible for the disposal of all grey and black water according to provincial regulations.

14. **COOLING WATER:**

Contractor shall provide a 30 psi SW or FW cooling for the duration of the refit for the auxiliary machinery cooling. Contractor may use the temporary fire main supply as a feed for the sea water or fresh water. Approximately 75 cubic metres of water per day shall be supplied via the cooling water supply connection.

15. **OVERBOARD DISCHARGE:**

Connections shall be made to the black and grey water overboard discharge hull penetrations, and directed to suitable drains.

Contractor shall include the cost of disposal for 5 cubic meters per day and provide a unit cost per cubic meter for adjustment purposes.

16. **CLEANING:**

Contractor shall ensure that all spaces, compartments and areas of the ship where work has been carried out, or Shipyard staff has used for transit routes, are "as clean as found" when work is completed. The cost of clean-up work shall be included in the quote for each specification item.

17. **PARKING:**

Sufficient parking for DFO/CCG and PWGSC representatives shall be provided conveniently close to the berthed or docked vessel. Contractor shall provide three (3) clearly designated "for DFO/CCG and PWGSC use only" parking spaces for the duration of the docking period.

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**Production Chart**

**1: SCOPE:**

The intent of this specification shall be to provide a means for tracking the overall progress of the refit.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Contractor shall supply three copies of a detailed gantt chart showing the planned work schedule for the ship's refit.
2. This bar chart shall show, for each spec. item, the start date, the manpower loading, the duration and the completion date. The chart shall also highlight any critical paths.
3. The production chart shall be updated weekly and for each production meeting to reflect the actual production on the refit and changes to the anticipated completion dates of each individual item.
4. The production chart shall clearly indicate the arrival/departure dates of any Subcontractors/Field Service Representatives.
5. The production chart shall include the status and production on each 1379 arising.
6. Three copies of the production chart shall be given to the Chief Engineer the day prior to each Production Meeting. A copy shall be emailed to the Vessel Maintenance Manager (VMM), Todd Smith ([todd.smith@dfo-mpo.gc.ca](mailto:todd.smith@dfo-mpo.gc.ca)) the day prior as well.
7. A copy of the original bar chart shall be provided via email to the PWGSC contracting Officer and VMM before the close of business on the day of the ships arrival at the Contractors premises.
8. The update is to be emailed to, PWGSC Contracting Officer and VMM the day prior to the weekly scheduled Progress Meeting.

2.2 Location

N/A

2.3 Interferences

N/A

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**Production Chart**

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

N/A

3.2 Standards and Regulations

N/A

3.4 Owner Furnished Equipment

N/A

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

N/A

4.2 Testing

N/A

4.3 Certification

N/A

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Contractor shall provide production charts as required in Section 2.

5.2 Spares

N/A

5.3 Training

N/A

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**HD-01 Docking & Undocking**

**1: SCOPE:**

The intent of this specification item is to dock the ship in a safe and timely manner while providing access to the work the vessel is to have completed during the refit period.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. The vessel must not dock with any other ship for any part of the contract period in such a way that will interfere with its scheduled re-floating.
2. Vessel docking must commence during the FIRST DAY of the contract period. As such, the Contractor must prepare the dock in advance of the ship's arrival and the official start of the contract. If premium time is required for evening shifts or weekend work in order to meet this objective, the Contractor must identify this and include all costs in his quotation.
3. The Contractor must prepare blocks and necessary shoring to maintain true alignment of the vessel's hull and machinery throughout the dry-docking period. Contractor to dock and undock vessel and allow sufficient time to complete both the work described in this specification as well as a margin of time to cover work arising.
4. A minimum clearance of four feet (4') must be available between the keel and the dock floor.
5. The vessel must be docked to allow unrestricted access to all docking plugs, transducers, bilge keels, anodes and sea inlet grids. If any hull fittings are covered or damaged, the Contractor is responsible for all labour and materials required for making corrective action.
6. The Contractor is responsible for the safe transfer of the ship between its pre and post-docking berth and its docking blocks. During docking of the ship, radio contact must be maintained between the vessel's Commanding Officer and the Contractor's Docking Officer.
7. Contractors must include separately, the price of any tug and/or pilot services required.
8. Contractor must provide two access points to the vessel (Port and Stbd), complete with safety nets and rails as necessary, throughout the docking period.
9. Within two hours of docking completion, the Contractor must commence cleaning the ship's entire hull and appendages by high-pressure fresh water washing to remove all salt deposits and marine growth (Class 1: 5000 psi maximum for growth removal). This work must be completed as soon as possible in preparation for initial hull inspections by the Chief Engineer and DNV-GL as required in *HD-02 – Butts and Seams* and *HD-03 – Underwater Hull Painting*.
10. Upon completion of work the vessel must be undocked and moved to a safe berth. The vessel will require tugs for this movement. The Contractor must include all costs for this safe transfer in their bid.

2.2 Location

Contractor's Docking Facility

## HD-01 Docking & Undocking

### 2.3 Interferences

1. Bar Keel:
  - a. Potential Contractors must note that CCGS ALFRED NEEDLER has a bar keel and that it's docking and undocking must be performed under the supervision of a fully qualified Docking Master.
2. TRANSDUCER FACES:
  - a. All transducer faces must be suitably protected from damage during the entire docking period unless they are being actively worked on. Prior to re-floating, all transducers must be washed off with a mild liquid detergent / water solution to rid them of all contaminants and marine growth. After washing they are to be rinsed with clean fresh water to remove all soap residues.
  - b. Contractor is to note that BIO technical staff may be required to work on the transducers during the refit. The Chief Engineer will coordinate activities to see that the Contractor is not inconvenienced by the activities of DFO/CCG personnel.
3. Contractor is responsible for removal or relocation any items of ship's gear required to be moved or removed to obtain the necessary displacement, draft or trim to suit their facilities during docking or undocking. The safekeeping of all removed and relocated items is the Contractor's responsibility. All items must be refitted in their original locations after the vessel has been undocked.

### 3: REFERENCES:

#### 3.1 Guidance Drawings/Nameplate Data

1. VESSEL PARTICULARS:
  - a. Length, Overall: 165.00'
  - b. Length, Between Perpendiculars: 144.67'
  - c. Breadth, Moulded: 36'
  - d. Depth, Moulded: 14.75'
  - e. Rake of Keel: 3.90'
  - f. Mean Draft, Extreme: 13.20'
  - g. Displacement, Extreme: 1123 L. Tons
  - h. Gross Tonnage: 925.03
2. Vessel Docking Plan J05048-A01
3. Position of Sacrificial Anodes 181/01

#### 3.2 Standards and Regulations

1. Contractor must ensure the growth cleaned from the hull is disposed in accordance with Environment Canada regulations.

#### 3.3 Owner Furnished Equipment

1. N/A

## HD-01 Docking & Undocking

### 4: PROOF OF PERFORMANCE:

#### 4.1 Inspection

##### **TANK SOUNDINGS**

1. Prior to docking, all tanks must be sounded and the contents recorded.
2. Prior to undocking all tanks must be returned to the same levels as the time of the original docking. Tank soundings must be approved by CGTA.
3. Prior to docking and undocking, a Ship Condition Report including a full set of tank soundings must be prepared by the Contractor and signed-off by the Commanding Officer (or his representative), the Chief Engineer and the Contractor's Docking Master. In each case, two copies of the signed-off Ship Condition Report are to be given to the Chief Engineer, and one copy must be provided to the DNV-GL Inspector.
4. During the docking period all fluid movements must be recorded. This record will be kept by the Chief Engineer, and signed by the Chief Engineer and a representative of the Contractor as events occur. At all times, the Contractor is to give the Chief Engineer a minimum of four (4) hours' notice of movement of fluids to/from the ship's tanks.

#### 4.2 Testing

N/A

#### 4.3 Certification

1. CCGS Alfred Needler has a bar keel, requiring it's docking and undocking to be performed under the supervision of a fully qualified Docking Master. As such, prior to contract award, Contractors must identify their Docking Master responsible for the docking and undocking of the ship, and provide documentary evidence of that person's training and certification to perform this work.

### 5: DELIVERABLES:

#### 5.1 Reports, Drawings, and Manuals

1. Docking plan placement of blocks

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Dry-dock  
**HD-02 Butts & Seams**

**1: SCOPE:**

In conjunction with specification items HD-01 - Docking and Undocking and HD-03 - Underwater Hull Painting, the entire hull must be inspected by Coast Guard Technical Authority (CGTA) and attending DNV-GL Inspector.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Contractor is responsible for all inspections and must consult with DNV-GL prior to commencement of work, in order to determine an inspection schedule. Contractor shall advise CGTA when booking each inspection point, to allow his/her attendance.
2. Any required staging shall be covered under section HD-03 - Underwater Hull Painting. Areas requiring detailed examination shall be determined at the time of initial inspection by DNV-GL. In lieu of staging, Contractor may provide the use of a certified man-lift (with operator) for the duration of inspection and repairs, as required.
3. Seams and butts selected for repair shall be marked, cleaned to sound metal by air arc gouging or grinding, and brought up to original level using approved welding techniques and materials. Contractor shall use welding rods suitable for use with GRADE 'A' steel. All work must be completed to approval of DNV-GL and CGTA.
4. Contractor must quote on preparation and welding 200 linear feet for butt and seam repairs on ship's hull. Each linear foot to be repaired shall be quoted as being adequately gouged out, and receive five passes on Grade "A" steel, using 5/32" rod, for a total of 1,000 linear feet of weld. This quote shall include any staging or man lifts required for the repairs.
5. Contractor shall provide a quotation for gouging and welding butts and seams repairs, each linear foot to be repaired shall be quoted as being adequately gouged out, and receive five passes on Grade "A" steel, using 5/32" rod. Costs of personnel and equipment mob/demob, staging or man lifts, and a per liner foot cost of gouges and welds shall be broken out. These unit costs shall be used for PSPC 1379 adjustment upon matching the total amount of repair welds performed for this specification.
  - a. The evaluated bid shall be based on 200 linear feet of defective Butts and Seams, requiring three mob/demobs of associated equipment.
6. Any gas-freeing, certification as Gas Free, personnel Safe for Entry, fuel residue removal and Safe for Hot Work required in a tank that will not be otherwise accessed during this refit shall be by PSPC 1379 action.
7. Contractor shall not apply any underwater hull coatings until DNV-GL inspector has completed the required inspection and repairs are certified completed. Contractor must notify CGTA and DNV-GL Inspector prior to the application of any coatings.

2.2 Location

- Underwater Hull

CCGS Alfred Needler  
2017 FY Dry-dock  
**HD-02 Butts & Seams**

2.3 Interferences

- No known interferences. It is Contractor's responsibility to identify any interference items for the known scope of work during the vessel's bidder's meeting.

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

- Drawing # 108-01 - Shell Expansion & Framing

3.2 Standards and Regulations

- Welding Standards as defined in General Notes

3.3 Owner Furnished Equipment

- N/A

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

- All work shall be carried out to the satisfaction of CG TA and attending DNV-GL Inspector.

4.2 Testing

- Contractor shall include the cost of non-destructive tests on all new welds; these tests shall be as directed by attending DNV-GL Inspector.

4.3 Certification

- Contractor shall contact DNV-GL and arrange for all required inspections in order to grant a credit for Division 3 survey item 3LL040.

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

- A computer generated report shall be provided in digital format to CG TA. This report shall include a listing of all welds performed, number of passes and locations, and results of all tests performed.

5.2 Spares

- N/A

5.3 Training

- N/A

CCGS Alfred Needler  
Winter, 2018 Dry-dock  
**HD-03 Underwater Hull Coating**

**1: SCOPE:**

The intent of this specification is to clean the ship's underwater hull, properly prepare the surfaces, and recoat as necessary with specified marine coatings. This work must be carried out in conjunction with all other dry-docking items.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Hull painting extends from the underside of the keel to a level line that is 15'-4" above it at mid-ships. Including the centerline skeg, propeller nozzle, sea bays/chests and rudder, the hull area to this level is calculated to be 8,100 square feet (ft<sup>2</sup>).
2. All hull-mounted equipment such as anodes, echo sounders, speed log, transducers, etc. must be suitably protected against damage during cleaning of the hull and application of the coatings. The Contractor must be responsible for repair/replacement of any such damaged items.
3. The Contractor must take measures to ensure that no damage, unnecessary cleaning or repairs, accrue from the sand or grit blasting and/or the application of coatings. Grit used for blast cleaning must not be permitted to enter into any part of the vessel or its equipment. Contractor must ensure that each and every opening into the vessel where sand or grit may gain ingress and cause damage must be suitably protected. Any cleaning required due to failure to comply will be at Contractors expense.
4. Measures must also be taken to ensure that application of coatings does not take place to surfaces or equipment other than those areas specified, and that any inlets or discharges in the shell must not be blocked by the coating. All deck machinery must be protected against grit, dust and coatings.
5. The Contractor must plug deck scuppers and discharges or take any measures necessary to prevent water or other liquids from contaminating the areas of plating being coated or prepared for coating.
6. After completion of cleaning as required in *HD-01 – Docking & Undocking, sect. 2.1.9*, the CGTA and NACE Inspector must inspect the underwater hull area for areas containing damage, bare metal or corrosion requiring repair. The total area of coating requiring full removal must be approved via PSPC 1379 prior to any further blasting.
7. Approved areas must be abrasive blasted to bare steel (SSPC-SP10). Edges of intact paint must be feathered back to a minimum of 150 mm, and blown clean with compressed air. The surface profile must have a minimum roughness of 3 mils (75 microns).
8. All remaining epoxy on the underwater hull coatings must be grit blasted (swept) to provide a profile for the new coatings. All prepared surfaces must be blown clean with compressed air.
9. Upon completion of all specified surface preparations, prepared areas must be surveyed and approved by the NACE inspector. All underwater hull surfaces must be clean and dry before

## HD-03 Underwater Hull Coating

coatings are applied. If oxidation occurs on freshly blasted steel, a re-blast may be required at contractor expense.

10. A straight line of paint must be cut in at 15' 4", to prevent overspray of these coatings onto the above water hull area.
11. Contractor must apply coatings to the underwater hull as follows:

| <b>Coat</b> | <b>Type</b>                                       | <b>Colour</b> | <b>Required DFT</b> | <b>Application Area</b>                      |
|-------------|---|---------------|---------------------|--|
| 1           | Intershield 300 ENA 301, Abrasion Resistant Epoxy | Aluminum      | 125 micron          | All bared steel, areas prepared to SSPC-SP10 |
| 2           | Intershield 300 ENA 300, Abrasion Resistant Epoxy | Bronze        | 125 micron          | All areas coated above                       |
| 3           | Intergard 263, Epoxy Tie Coat                     | Light Grey    | 100 micron          | All areas coated above                       |
| 4           | Interspeed BRA 640, Tin free Antifouling          | Red           | 125 micron          | All areas coated above                       |
| 5           | Interspeed BRA 640, Tin free Antifouling          | Red           | 125 micron          | Entire Underwater Hull                       |

12. New coatings must be applied in full compliance with manufacturer's requirements to provide a finished coat of no less than 475 microns D.F.T. overall.
13. All draft marks, load line marks, and other underwater hull markings (e.g.: Transverse Bulkhead Frame Numbers) require a coat of white paint, Interlac 665 or equal.
14. Contractor must remove from the vessel all traces of sand and/or grit used for blast cleaning.
15. Contractor is responsible and liable for ensuring that the hull is clear and clean, prior to, during and immediately after the application of coatings.
16. After completion of all specified hull preparation and coating, as well as all other work specified in way of sea intakes, intake grid securing screw holes must be tapped out and grids reinstalled. Securing screws must be tack welded in place as per original arrangement. Contractor shall supply new "UNC X 3 1/2" stainless steel slotted, flat head machine screws for re-securing the grid.
17. Contractor must provide a unit rate for blasting to SSPC-SP10 and subsequent coatings as described above, in 100ft<sup>2</sup> increments.
18. Contractor must provide a unit rate for sweep blasting and coating remaining areas of the underwater hull, in 100ft<sup>2</sup> increments.
19. The evaluated bid will be assessed based on 50% (4,050ft<sup>2</sup>) of the underwater hull requiring repair, as described in paragraph 6, above.

### 2.2 Location

1. Underwater Hull

CCGS Alfred Needler  
Winter, 2018 Dry-dock  
**HD-03 Underwater Hull Coating**

2.3 Interferences

1. No known interferences. It is Contractor's responsibility to identify any interference items for the known scope of work during the vessel's bidder's meeting.

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

1. Drawing # 108-01 - Shell Expansion & Framing

3.2 Standards and Regulations

1. Contractor is responsible and liable for ensuring that the hull is clear and clean prior to, during, and immediately after the coating application.
2. Suitable storage facilities must be provided close to the work site for the material and equipment, to ensure they will be maintained at the recommended temperature of the coating manufacturer for ease of preparation and proper application.
3. New coatings must be applied with atmospheric and steel conditions acceptable to paint manufacturer and CGTA. Application conditions must be recorded by Contractor and/or paint manufacturer's representative for inclusion in Report to be submitted to CGTA.
4. All shelters and heating required to meet the coating manufacturer's specifications must be supplied.

3.3 Owner Furnished Equipment

1. Unless otherwise specified, all labour, materials, and equipment required to complete all tasks required in this specification must be Contractor supplied.

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

1. Contractor must follow the inspection regime outlined in General Notes, and provide documentation to support all inspections and tests performed.

4.2 Testing

1. Contractor and/or paint manufacturer's representative must take sixty (60) wet film thickness measurements; thirty (30) per side, in areas where hull has been cleaned to bare steel. The measurements must be witnessed by the NACE Inspector and recorded with locations referenced to the attached shell expansion drawing. Unwitnessed measurements will be rejected.
2. Using a calibrated DFT gauge, fifteen (15) measurements per 100 square ft. must be taken and recorded, at an agreed upon consistency with the CG TA.

4.3 Certification

CCGS Alfred Needler  
Winter, 2018 Dry-dock  
**HD-03 Underwater Hull Coating**

1. Contractor must provide certification for all hull coatings applied.

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Contractor must maintain a Quality Assurance reporting program, which must at minimum include the following points:
  - a. The areas on the ice belt and above waterline hull that were repaired.
  - b. Which areas were blasted and indicate the blast media type and air pressure
  - c. Which areas were coated, with what product, and the volume of coating used.
  - d. Provide a list of batch numbers with corresponding dates of manufacture.
  - e. Record the quantity and type of any solvent added.
  - f. Measure and record all ambient conditions (Temperature, Humidity, Barometric pressure).
  - g. Hull temperature
  - h. Record all details of spray tips and pressures.
  - i. All WFT and DFT readings taken as prescribed in section 4.2 of this specification.
2. All recorded information must be typewritten in English and three (3) copies must be given to the CG TA.

5.2 Spares

1. N/A

5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Dry-Dock  
**HD-04 Painting Above Waterline**

**1: SCOPE:**

The intent of this specification items is to paint the Above Water Hull portion of the ship & all of its specific markings.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. All topside areas of hull as described below must be cleaned, prepared, primed and painted in accordance with the ship's existing color scheme.
2. After completion of cleaning as required in HD-01 – Docking & Undocking, sect. 2.1.9, the CGTA and NACE Inspector must inspect the above water hull area for areas containing damage, bare metal or corrosion requiring repair. The total area of coating requiring full removal must be approved via PSPC 1379 prior to any further blasting.
3. The total hull area above water level is 6,000 square feet. NOTE: If Bidders have any doubt about the specified topsides area, their concerns are to be promptly brought to the attention of PSPC and the CGTA, along with supporting measurements and or calculations, prior to submission of bids.
4. Contractor must plug all deck scuppers and discharges as well as taking other measures necessary to prevent any liquids from contaminating areas being prepared or coated. Contractor must also take measures to ensure no damage, unnecessary cleaning or any repairs result from either the hull preparation process or coating applications. Measures must also be taken to ensure that surfaces and equipment other than those specified are not coated by over spray, and that any inlets or discharges in the shell shall not be blocked by the coating.
5. Deck machinery and other equipment susceptible to damage by grit or coating material must be protected. All portholes, hull doors, freeing ports, hull opening, anodes, transducers, shafts and propellers must be covered by suitable materials to prevent damage or entry of materials while sandblasting, sand- washing or when painting is in progress.
6. Any bare or corroded areas identified in paragraph 2 above, must be subsequently blasted to near white SSPC-SP-10 standard. Areas blasted to near white must be feathered back a minimum of 150 mm to sound and fast coating material. If feathering is not achievable by blasting, all said areas must be feathered by power tool grinding.
7. All remaining epoxy on the above water hull must be grit blasted (swept) to provide a profile for the new coatings. All prepared surfaces must be blown clean with compressed air.

## HD-04 Painting Above Waterline

8. Contractor must apply coatings to the above water as follows:

| <u>Coat</u> | <u>Type</u>    | <u>Colour</u>   | <u>Required DFT</u> | <u>Application Area</u>                      |
|-------------|----------------|---|---------------------|--|
| 1           | Interprime 198 | Grey  | 75 micron           | All bared steel, areas prepared to SSPC-SP10 |
| 2           | Interprime 198 | White   | 75 micron           | All areas coated above                       |
| 3           | Intersheen 579 | Light Grey  | 50 micron           | All areas coated above                       |
| 4           | Intersheen 579 | To match original scheme:<br>Red (RAL 3000)<br>White (RAL 9003)<br>Beige (RAL 1001)<br>Black (RAL 9004) | 50 micron           | Entire Above Water Hull                      |

9. All draft marks, load lines, white strips, and hull markings must be painted to match existing scheme with "RAL" colours to match requirements of CCG Identity Program.
10. The two forward anchor pockets must be given two coats of INTERLAC 665 CLY999-Black to total D.F.T. of 100 micron.
11. All top side originally black trim including, but not limited to, rubbing strakes, Foc'sle bulwark trim, fairleads, and Coast Guard stripe trim, must be cut in and coated with two coats of INTERLAC 665 CLY999-Black to total D.F.T. of 100 micron.
12. Contractor must strictly follow the manufacturer's requirements in relation to storage, preparation, application, and curing of paint systems described in this specification. Any requirement for variance from manufacturer's instructions must be approved by the CGTA prior to proceeding.
13. Paint must not be applied in rain, snow, fog or when the steel surface is less than 3 degrees Celsius above the dew point. Similarly paint must not be applied to wet, frosted or ice coated surfaces.

### 2.2 Location

1. Ships Above Water Hull.

### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## HD-04 Painting Above Waterline

### 3: REFERENCES:

#### 3.1 Guidance Drawings/Nameplate Data

1. Drawings:
  - VHBA2\_034-06 Freeboard Marking
  - VHBA2\_180-01 Painting Schedule
  - VHBA2\_180-03 Ship's Name Port of Registry
  - VHBA2\_180-04 Details of Fwd. and Aft Draft Marks

#### 3.2 Standards and Regulations

1. Contractor is responsible and liable for ensuring that the hull is clear and clean prior to, during, and immediately after the coating application.
2. Suitable storage facilities must be provided close to the work site for the material and equipment, to ensure they will be maintained at the recommended temperature of the coating manufacturer for ease of preparation and proper application.
3. New coatings must be applied with atmospheric and steel conditions acceptable to paint manufacturer and CGTA. Application conditions must be recorded by Contractor and/or paint manufacturer's representative for inclusion in Report to be submitted to CGTA.
4. All shelters and heating required to meet the coating manufacturer's specifications must be supplied.

#### 3.3 Owner Furnished Equipment

1. N/A

### 4: PROOF OF PERFORMANCE:

#### 4.1 Inspection

1. NACE Inspector will perform inspections on all specified methods & standards of application throughout all steps of preparation and application.

#### 4.2 Testing

1. WFT & DFT readings as described in Technical Description.

#### 4.3 Certification

1. Certification from attending NACE Inspector is required for acceptance of this coating system.

## HD-04 Painting Above Waterline

### 5: DELIVERABLES:

#### 5.1 Reports, Drawings, and Manuals

1. Contractor must utilize a Quality Assurance (QA) system during all phases of the specified work. As a minimum, this QA system must include the measurement and/or recording of the following data:
  - a. The batch numbers of all coatings with corresponding dates of manufacture.
  - b. The type and quantity of any solvents added.
  - c. The ambient conditions during all phases of coatings application.
  - d. Surface profile measurements taken after completion of surface preparation.
  - e. Surface contamination measurements, particularly chloride (salt) readings.
  - f. Details of application equipment, including spray tips and pressures where applicable.
  - g. Wet Film Thickness (WFT) gauge readings must be taken and recorded on a regular basis during coatings application. The WFT measurements must be recorded with locations referenced to a sketch of the ship.
  - h. Dry Film Thickness (DFT) gauge readings must be taken and recorded on a regular basis after coatings application. The DFT measurements must be recorded with locations referenced to a sketch of the ship.

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Dry-dock  
**HD-05 Hull Anodes**

**1: SCOPE:**

The intent of this specification item is to renew the ship's underwater hull sacrificial anodes.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. All hull sacrificial anodes must be jointly examined by the CGTA and the Contractor's Representative. Those hull anodes identified as sufficiently wasted or missing will be determined by the by the CGTA, recorded by the Contractor and signed-off by all parties with copies of the document for each.
2. Contractor must quote price on replacing (supply and install) sixty-three (63) sacrificial hull anodes with 22 lb. pure zinc anodes (Z-22). Contractor must also quote a unit price to replace one (1) anode for adjustment purposes.
3. Contractor is responsible for supplying any staging or crange required to gain access to the anodes.
4. Replacement anodes must be placed in the same location as the removed anodes using the same securing arrangements.
5. Areas of weld, where old anodes were, must be ground smooth prior to installation of replacement anodes and application of hull coatings.
6. All welds used for new securing straps must be dressed smooth of all slag and spatter prior to surface preparation and touch-up painting.
7. New anode securing straps must be primed and painted with the same coatings as the underwater hull (Refer to specification item HD-03 Underwater Hull Painting).
8. All sacrificial anodes and securing straps must be effectively protected while the underwater hull is being blasted and painted. Protective materials must be removed upon completion of painting.
9. All work is to be completed to the satisfaction of the CGTA.

2.2 Location

1. Underwater Hull

2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

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2017 FY Dry-dock  
**HD-05 Hull Anodes**

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

1. Drawing 181/01 Position of Sacrificial Anodes

3.2 Standards and Regulations

1. Welding Standards as defined in General Notes section of this specification.

3.3 Owner Furnished Equipment

1. N/A

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

1. Visual Inspection by CGTA

4.2 Testing

1. N/A

4.3 Certification

1. N/A

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Updated reference drawing on how many anodes were changed and their location.

5.2 Spares

1. N/A

5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Dry-dock  
HD-06 Cathodic Protection

**1: SCOPE:**

1. The intent of this specification item is to replace all of the Impressed Current system anodes (5 in total).

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. This work must be done in conjunction with Specification item HD-03 Underwater Hull Painting.
2. The ship is fitted with two (2) each 'Cathelco' marine growth (MG) and trap corrosion (TC) impressed current anodes, one each fitted to the port and starboard Sea Chests, Frames 48 - 49: four (4) anodes in total. There is also one (1) combination anode fitted in the Aft Sea Chest located at Frame 12. Contractor is to bid on renewing all five (5) of these anodes.
3. While the ship is still afloat at the Contractor's dock, all five (5) anodes must have galvanic voltage, resistance (system off) and voltage/current readings (system on) measured and recorded by a qualified person, identified by the Contractor in his bid. Three (3) copies of these readings must be passed to the CGTA within one working day of their being recorded.
4. Removal and installation of anodes must be scheduled so that abrasive blasting and painting of the underwater hull is completed with the anodes removed.
5. All anodes must be replaced using CCG supplied replacement anodes. Contractor must transport these anodes from the ships store to the dock floor for installation as required.
6. All removed used anodes must be turned over to the CGTA or disposed of as directed.
7. Contractor must isolate, lock out and tag out power supply to the five anodes. Contractor must disconnect and label each anode at its local connection. Anodes are to be removed from the sea chests, disconnected from their mounting assemblies and marked MG and TC to ensure proper replacement
8. All anodes must be renewed and installed as per manufacturer's instructions, reference drawing No. A1669/A/4973. 'O'-rings, seals and gaskets must be renewed on re-assembly, Contractor supply. The CGTA must witness assembly of each anode before it is re-installed.
9. **NOTE:** A special anode removal and installation tool is required. This tool will be supplied by the indicated Cathelco representative.
10. All connections must be proven water tight on re-assembly and after floating of the vessel.
11. After re-assembly and with the ship afloat, galvanic voltage, resistance (system off), and voltage/amp (system on) must be measured and recorded by a qualified person, identified by the Contractor in his bid. Three (3) copies of these readings are to be passed to the CGTA within one working day of their being taken.
12. The system must be proven to be correctly operating and readings checked to be within expected value range.

## HD-06 Cathodic Protection

13. Contractor must arrange to have a 'CATHELCO' representative (FSR) on site to oversee activities while this work is being performed. Contractor shall include in quote an allowance of \$5,000.00 for the services, travel and living allowances of a Cathelco FSR. The FSR shall be reimbursed for the services, authorized travel and living expenses reasonably and properly incurred in the performance of the work, at cost without any allowance for overhead and profit. The allowance shall form part of the overall bid and shall be adjusted by 1379 action upon proof of final invoice. The 'CATHELCO' representative can be contacted as follows:

Jastram Technologies Limited  
214 Wright Avenue  
Dartmouth, Nova Scotia, B3B 1R6  
Tel.: 902 - 468 - 6450  
Fax: 902 - 468 - 6901  
E-mail: jastramtech@ns.aliantzinc.ca

### 2.2 Location

1. As stated in technical description

### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## 3: REFERENCES:

### 3.1 Guidance Drawings/Nameplate Data

1. Drawing No. A1669/A/4973

### 3.2 Standards and Regulations

1. N/A

### 3.3 Owner Furnished Equipment

1. All 5 anodes

## 4: PROOF OF PERFORMANCE:

### 4.1 Inspection

1. Final assembly of the anodes to ensure they are secure and that wiring is tight.
2. Once the ship is afloat all connection shall be checked to ensure they are water tight.
3. Final readings of voltage & resistance with system off as well as voltage & amperage with system on once ship is afloat

CCGS Alfred Needler  
2017 FY Dry-dock  
**HD-06 Cathodic Protection**

4.2 Testing

1. As described above in 4.1 Inspection

4.3 Certification

1. N/A

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Three copies of the report is to be provided with all the readings taken on the system prior to dry docking and post dry docking with the system on & off.

5.2 Spares

1. N/A

5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Dry-dock  
**HD-07 Propeller & Hub Inspection**

**1: SCOPE:**

1. The intent of this Specification item is to remove all 4 blades from the propeller hub & open it up for DNV-GL inspection and credit.

**2: TECHNICAL DESCRIPTION:**

2.1 General

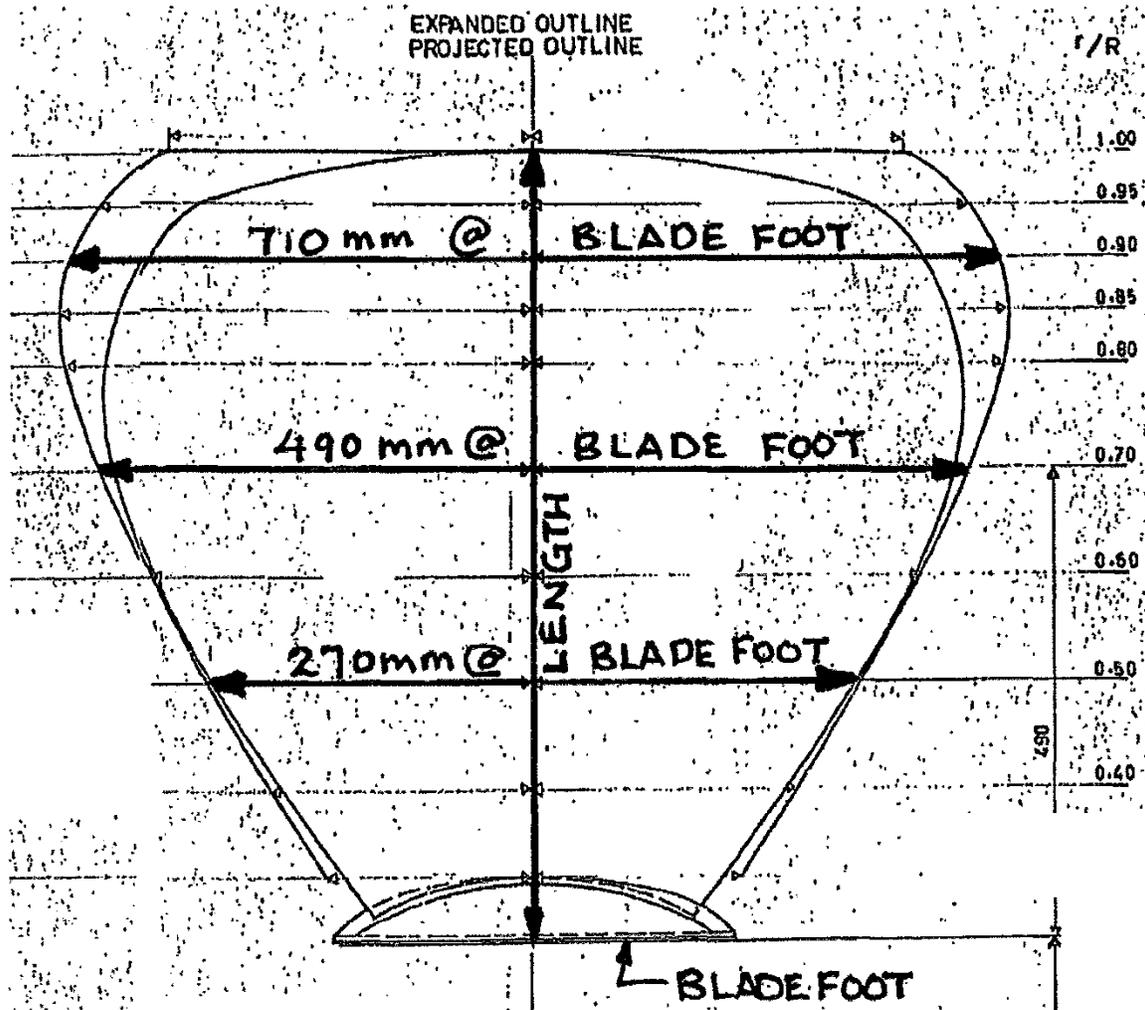
1. This Specification item must be done in conjunction with Specification item HD-06.
2. Contractor must arrange to have a Wartsila Canada Inc. Field Service Representative (FSR) on site to oversee activities while this work is being performed. Wartsila Group is the parent company of LIPS Propellers. The contact information is as follows:

Wartsila Canada Inc.  
Attention: Ron Van der Linden  
164 Akerley Boulevard  
Dartmouth, NS, B3B 1Z5  
Tel. 902 468 1264  
Fax: 902- 468 1265  
Toll free: +1 800 468 1264
3. Contractor shall include in quote an allowance of \$30,000.00 for the services, travel and living allowances of a Wartsila FSR. The FSR shall be reimbursed for the services, authorized travel and living expenses reasonably and properly incurred in the performance of the work, at cost without any allowance for overhead and profit. The allowance shall form part of the overall bid and shall be adjusted by 1379 action upon proof of final invoice.
4. The Wartsila FSR is also required to carry out service and inspections in HD-08 – Tailshaft and Coupling Removal and Inspection. To avoid cost duplication, all Wartsila FSR costs must be captured in this specification.
5. Contractor is responsible for any rigging or lifting lugs required for performing this work.
6. The control lever on the Oil Distribution (OD) Box must be disengaged, and the mechanical stops must be backed off.
7. The propeller pitch is to be cycled back and forth from full ahead to full astern using the command lever on the OD Box.
8. The pitch movement and pressure shall be controlled and monitored by the FSR, both from inside the vessel and outside.
9. **BLADE TRAVEL:** The physical travel of each blade over the full range must be measured using a reference on the blade foot and a datum on the propeller hub as determined by the FSR. Travel of all blades shall be compared to identify any differences that exist.
10. **PITCH REVERSAL:** Propeller pitch shall also be subjected to a sudden reversal from one direction to the other as directed by the FSR, who shall check the blades for free play and/or delay in response.

## HD-07 Propeller & Hub Inspection

11. Any further requirements regarding pitch control shall be determined by the Wartsila Canada FSR as a result of the foregoing tests and measurements. Additional work will be negotiated with Contractor by PSPC via 1379. Contractor is responsible to call in DNV-GL Surveyor as required.
12. PROPELLER BLADES: The 4 propeller blades shall now be removed, one at a time by rotating the shaft, from the 6 o'clock position. Each blade weighs approximately 200 kilograms. Each blade shall be identified along with its corresponding location on the propeller hub.
13. After the propeller blades have been removed, the hub must be wrapped and sealed to prevent ingress of dust, precipitation and other contaminants.
14. The removed blades must be thoroughly cleaned. The O-ring grooves must be polished.
15. Propeller blades must be taken to a propeller repair specialist for further examination. Each blade must be precisely weighed and measured. All results must be recorded with respect to the blade and its position on the hub. The measurements must include the following, all recorded in millimeters (Refer to attached Sketch):
  - The total length of each blade from the bottom of the blade foot to the blade tip at the geometric centerline.
  - The expanded blade width at  $0.5R$  Radius = 270 mm above bottom of blade foot.
  - The expanded blade width at  $0.7R$  Radius = 490 mm above bottom of blade foot.
  - The expanded blade width at  $0.9R$  Radius = 710 mm above bottom of blade foot.
16. A report of the blade measurements must be given to the CG TA and PSPC Representative, and must be e-mailed to the CG TA. Any further requirements regarding the blades shall be determined by the CCG Technical Authority as a result of the foregoing measurements. Additional work will be negotiated with the Contractor by PSPC through 1379 action.
17. Under the guidance of the Wartsila Canada FSR, the propeller hub must be opened up for inspection by DNV-GL Surveyor.
18. FSR is responsible to oversee the complete hub teardown & measurements. All measurements must be given in written & digital copies to the CG TA & PSPC.
19. On completion of the foregoing work, the propeller hub must be reassembled. All new hub internal O-rings & seals must be fitted. All fasteners must be torqued to the manufacturer's specifications (available from the CG TA).
20. Propeller blades must be re-installed using new blade foot O-rings. Blade bolts must be torqued down according to manufacturer's specs & secured using stainless stock welded in place.
21. Hubs and actuating gear must be proven in each direction. Pitch travel must be confirmed and proven at indicators on the Bridge & MCR. Adjustments must be made until propeller angle agrees with indicated angle to the satisfaction of the CG TA.
22. All functions of propeller hub must be tested & proved to be leak free.

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 HD-07 Propeller & Hub Inspection



Propeller Blade Elevation View

23. After completion of above work, all temporary lifting eyes shall be removed and welds ground flush
24. All disturbed exterior steel shall be painted in accordance with the existing paint scheme for the underwater hull. NOTE: This paint work is not to be quoted twice as it should be included & done in conjunction with Specification item HD-03.

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**HD-07 Propeller & Hub Inspection**

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**HD-07 Propeller & Hub Inspection**

2.2 Location

1. Underwater Hull

2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

1. Machinery Manuals are available from the vessel upon request

3.2 Standards and Regulations

1. N/A

3.3 Owner Furnished Equipment

1. N/A

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

1. Completed to DNV-GL Surveyor and CG TA satisfaction

4.2 Testing

1. As described in Technical description
2. As per HD-06, Technical description paragraph 20, successful completion of Dock and Sea Trials

4.3 Certification

1. DNV-GL Surveyor must approve hub internals & blades for 5-year survey credit.

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Contractor must supply CG TA with two written and one digital copy of all measurements taken.

5.2 Spares

1. N/A

5.3 Training

1. N/A

## HD-08 Tailshaft and Coupling Removal and Inspection

### 1: SCOPE:

1. The intent of this specification item is to remove the tailshaft for inspection of shaft and stern tube bushings by DNV-GL & CGTA.

### 2: TECHNICAL DESCRIPTION:

#### 2.1 General

1. Contractor is responsible for erecting all necessary staging and rigging and rigging points necessary to withdraw the shaft and propeller.
2. This work must be done in conjunction with Specification item HD-07 Propeller & Hub Inspection.
3. Rope guard must be removed prior to withdrawing shaft. On completion, the rope guard must be replaced and all staging and rigging must be removed by Contractor.
4. Prior to removal the Contractor must take a set of Poker Gauge readings and these are to be recorded and submitted to the CGTA.
5. Contractor must arrange to have a 'JOHN CRANE / LIPS' representative (FSR) on site to oversee activities while this work is being performed, in accordance with requirements of HD-07-2.1.4. FSR costs must not be duplicated, and must be billed exclusively to specification HD-07.
6. Propeller hub and pitch control system must be drained of its lubricating oil by Contractor and disposed of ashore. Oil is to be collected in a suitable container capable of handling approximately 400 liters of oil.
7. Hand rails, shaft guards, intermediate bearings and any other interference items that can be readily seen at the time of viewing must be removed for access and replaced, in good order, on completion.
8. Contractor is responsible to supply the proper tools required to remove and replace the SKF coupling on the tailshaft. SKF Shaft Coupling must be removed as directed by the FSR and be while shaft is pulled.
9. Stern tube packing gland must be backed off and all packing removed.
10. Tailshaft is to be moved back far enough to allow access to internal oil distribution pipes for disconnecting.
11. Tailshaft is to be withdrawn outboard and supported on a suitable wooden cradle supplied by the Contractor to avoid any distortion.
12. Shaft, stern tube, and coupling must be cleaned for inspection by DNV-GL and the CGTA.
13. After completion of all the foregoing work, tailshaft is to be reinstalled in good order. Internal oil distribution piping is to be reconnected and coupling installed. Shaft bearing halves are to be re-installed, torqued-down and housing filled with new Contractor-supplied oil.
14. The tailshaft gland (11.75" Dia.) must be repacked and closed-up in good order using seven (7) turns of 1" square John Crane 867 packing, or equivalent.
15. **NOTE:** Final tightening of the stern tube gland shall be done after the vessel is re-floated, and before the tailshaft is turned.

## HD-08 Tailshaft and Coupling Removal and Inspection

16. After the gland is tightened to the CGTA's satisfaction, the distance between the gland face and packing ring is to be measured at 4 points, 90 degrees apart. All measurements shall be recorded. Handwritten results shall be submitted to the Chief Engineer immediately and, in typed form, within 24 hours.
17. All interference items are to be reinstalled in good order to the satisfaction of the Chief Engineer. Rope guard to be welded back in place and CPP system filled with fresh ESSO - NUTO H-68 oil (400 litres, Contractor-supplied).
18. CPP System to be started up and fully tested, checking propeller angle against the O.D. box indicator. Adjustments are to be made until propeller angle agrees with indicated angle, to the satisfaction of the CGTA.
19. **NOTE:** Prior to re-floating, an additional set of poker gauge readings shall be taken and recorded with copies given to the CGTA.
20. Once vessel is afloat, Contract must allow for two-hour **Dock and Sea Trials** for four hours to ensure work is completed satisfactorily, under direction of Chief Engineer. Shipyard must supply two personnel to assist the Wartsila FSRs. Shaft line bearing and water temperature and main engine pressure and load readings shall be taken every 15 minutes at start up and with Chief Engineer's permission, may be lengthen to no longer than half hour intervals. A copy of all recorded measurements must be given to Chief Engineer at the end of sea trials.

### 2.2 Location

1. Shaft Space and Sterntube

### 1.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## HD-08 Tailshaft and Coupling Removal and Inspection

### **3: REFERENCES:**

#### 3.1 Guidance Drawings/Nameplate Data

1. Machinery Manuals are available from the vessel upon request
2. Ship Drawings: # 98291-1 Tailshaft for sister ship Templemen.

#### 3.2 Standards and Regulations

1. N/A

#### 3.3 Owner Furnished Equipment

1. N/A

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

1. Vessel shaft, coupling and bearings to be re-installed to arrival setup or improvement if a 1379 was raised.

#### 4.2 Testing

1. Two-hour Dock and Sea Trials for four hours to be successfully completed without mechanical, hydraulic, vibration or seal issues to satisfaction of DNV-GL & CGTA.

#### 4.3 Certification

1. DNV-GL 5 Year Survey Credit

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

1. Printed copy of sea trial measurements

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

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**HD-09 Rudder Stock**

**1: SCOPE:**

1. The intent of this specification item is to re-pack the rudder gland with new CFM packing & inspect rudder stock surface.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Prior to any disassembly, the rudder stock must be given zero helm in the steering gear compartment. Rudder position is to then be checked for corresponding alignment with the ship's hull by sighting and measuring outside the ship. The CGTA is to be present on both these occasions and a written statement is to be made up, by the Contractor, of the results, with a copy given to the CGTA.
2. Hydraulic steering cylinders must be released from tiller head and swung clear or removed. All tiller head position feed back linkages are to be carefully released and swung clear. Steering cylinders and feedback links are to be supported and/or stored safely clear of further work on carrier bearing. Any damage or misalignment of these components, or any other equipment in steering gear compartment must be repaired by the Contractor.
3. Rudder stock must be suitably rigged to allow tiller head nut to be released and removed.
4. Tiller head must be rigged and moved clear of carrier bearing.
5. Rudder carrier bearing must be released and lifted clear of seat, all components shall be completely degreased and cleaned for inspection. Bearing plate thickness shall be measured at four equally spaced points around its diameter. Carrier bushing I.D. shall be measured in two directions, top and bottom. Tiller head lower surface and carrier bearing upper surfaces to be inspected.
6. Rudder stock packing gland ring must be removed and all packing material pulled. Gland, rudder stock and ring must be cleaned for inspection.
7. Rudder stock and carrier bearing must be inspected by CGTA & DNV-GL.
8. Specific procedure for clearing away, releasing and removal of the rudder, rudder stock and carrier bearing will be left to the discretion of the Contractor, based on referenced drawings, subject to the approval of the CGTA.
9. Rudder stock jump collar shall be removed and safely stored.
10. Rudder must be adequately rigged to support its weight and allow it to be safely lowered to the dock. It is the Contractor's responsibility to fabricate and install suitable lifting eye pads to the ships hull for rigging purposes. Eye pads must be a minimum of 1" thick material. Upon completion of specified re-assembly of rudder components, lifting eyes to be removed, welds ground flush and affected areas coated in accordance with specification item HD-03 - Underwater Hull Painting.

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**HD-09 Rudder Stock**

11. Six palm bolts must have nut retaining bars removed and nuts released and removed. Palm bolts to be removed. Bolts and nuts are to be clearly identified as to their respective location. Matched bolts and nuts shall be returned to their original locations on re-assembly.
12. The rudder stock must be suitably rigged, its weight taken and lifted clear of the rudder releasing the palm joint connection.
13. Lower pintle fairing plates shall be removed and pintle nut released. Nut to be removed and pintle dropped out.
14. With palm connection released and pintle removed, rudder is to be lifted clear and lowered to the dock floor where it is to be safely and adequately blocked and supported.
15. Rudder stock must be cleaned to allow inspection in way of upper bushing and lower stainless steel sleeve. Stock O.D. to be measured in two directions at each of the upper and lower bushing positions. Lower stock bushing to be cleaned and I.D. measured in two directions at each of two positions over its length.
16. Lower pintle O.D. and bushing I.D. shall be measured, each in two directions.
17. All components, rudder, stock and carrier bearing must be inspected by CGTA and DNV-GL. Contractor is responsible for bringing in the regulatory agencies as required.
18. Upon satisfactory inspection of all components and with CGTA's approval, components of the rudder assembly shall be reinstalled. Stock, carrier bearing and tiller head to be secured. Steering rams and feedback links to be reconnected. All wearing surfaces to be adequately lubricated, with CFM grease, at reassembly.
19. Rudder shall re-fitted, palm bolt nuts and pintle nut being locked as per original arrangements, and pintle fairing plates replaced. Jump collar to be re-installed.
20. Stock gland must be repacked with new CFM Chesterton 329 Stern-Ion packing material. For bidding purposes, eight turns of 5/8" material will be required. Packing gland thread surfaces shall have marine grade anti-seize compound applied prior to reassembly.
21. Carrier bearing and tiller head must be secured. Steering rams and feedback links shall be reconnected. All wearing surfaces shall be adequately lubricated, with CFM supplied grease, at reassembly.

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**HD-09 Rudder Stock**

22. Contractor must quote, separately, the cost of the following repairs, should they be required. For quotation purposes, material and dimensional information is identified on referenced drawings. Final dimensions, if required, will be determined on site at the time of component replacement. All materials to be Contractor supplied:
- a. Resurfacing of rudder stock
  - b. Removal of fiberglass protective wrapping on rudder stock between upper and lower bushing bearing surfaces; sandblasting of area wrapped to SSPC-SP-5 standard; and re-wrapping with fiberglass. Bearing areas, tiller taper and threaded end shall be protected from blasting.
  - c. Re-facing carrier bearing bronze wear plate (Cost per side).
  - d. Renewal of carrier bearing bronze wear plate.
  - e. Re-facing carrier bearing surface.
  - f. Re-facing tiller head bearing surface.
  - g. Renewal of carrier bearing bushing (Upper stock bushing).
  - h. Renewal of lower stock bushing.
  - i. Renewal of pintle bushing.
  - j. Renewal of pintle.

## 2.2 Location

1. Outer hull & Steering Gear Compartment

## 2.3 Interferences

1. Welding to ship's hull will require gas freeing and certification of the associated inboard compartment in way of the weld location.
2. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
3. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## **3: REFERENCES:**

### 3.1 Guidance Drawings/Nameplate Data

1. Drawing No. 501/01 (Rudder)
2. Drawing No. 502/02 (Rudder Carrier Bearing)
3. Drawing No. 502/01 (2 sheets: Steering Gear Seats & Rudder Stock & Details)

### 3.2 Standards and Regulations

1. N/A

### 3.3 Owner Furnished Equipment

1. Rudder Carrier Bearing nut wrench

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**HD-09 Rudder Stock**

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

1. Rudder Gland shall be inspected for leaks once ship is afloat. Any leaks must be repaired by the Contractor.
2. Visual inspection of rudder stock for wear/pitting.
3. Visual inspection of gland ring.
4. Rudder Carrier bearing measurements.

4.2 Testing

1. After the assembly of all components, hydraulic steering gear is to be operated and rudder swung hard to Port to hard Stbd several times, full travel to be witnessed and operation to be to the satisfaction of CGTA.

4.3 Certification

1. N/A

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Contractor shall supply CGTA with two copies of all measurements taken as described in Technical Description.

5.2 Spares

1. Contractor shall supply ship with 2 extra rows of packing material

5.3 Training

1. N/A

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**HD-10 Fuel Tank Inspections**

**1: SCOPE:**

1. The following fuel oil tanks must be opened up for cleaning, DNV-GL inspection and testing:
  - i) Item 3L014, Upper Wing Tank Port, Frs 17-28
  - ii) Item 3L015, Upper Wing Tank Stbd, Frs 17-28
  - iii) Item 3L016, Aft Deep Tank Port, Frs 2-11
  - iv) Item 3L017, Aft Deep Tank Stbd, Frs 2-11
  - v) Item 3L018, Aft Peak Tank (Centre), Frs 2-11

These Tanks are classified as confined spaces under the Coast Guard's Safety Management System

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Each of the fuel tanks will be pumped as low as possible by ship's staff. Approximately five (5) cubic meters of residue will remain below the suction of each tank, which must be removed and disposed of in an environmentally responsible manner by the Contractor.  
**NOTE:** No hot work may be conducted on the ship during fuel transfer operations
2. Contractor must open each tank by removing manhole covers. Manhole studs must be examined and defects brought to the attention of CGTA. Inside of manhole covers and mating flanges must be power-tool-cleaned.
  - a. Contractor must include the cost to replace 10 studs and shall quote unit cost for PSPC 1379 adjustment purposes.
3. Tanks must be mechanically ventilated directly to outside atmosphere with equipment approved for explosive atmospheres. Contractor to supply, operate, and maintain fans.
4. Gas-free certificates must be distributed as directed in the GENERAL NOTES before entry in the tanks is permitted. Contractor must maintain the tanks in a gas-free state by maintaining adequate ventilation and re-testing as required by regulations for the duration of the work.
5. All sludge and residue from the tanks, as indicated in paragraph 2.1.1 above, must be removed ashore for disposal in compliance with provincial regulations. All drain holes in the tanks' structure must be cleared of any obstruction so as to allow free flow of liquids. Contractor must ensure that tank outlets, inlets, and sounding tubes are free of any dirt, debris, and obstructions.
6. All tanks and associated piping must be hot water cleaned to ensure biological contaminants are killed (**Minimum Temperature Required is 80°C**).
7. Each tank must be flushed with fresh water and certified gas-free for entry. Copies of the gas-free certificates to be provided to CGTA and conspicuously posted near each tank entrance.
8. The tanks must be thoroughly cleaned to SSPC.SP2 standard (100% tank surface area).

## HD-10 Fuel Tank Inspections

9. **Hold Point:** Contractor and CGTA must inspect each tank and agree on the rusted area requiring additional blasting. This area must be approved via PSPC 1379 action.
  - a. Contractor must provide a cost to prepare 10M<sup>2</sup> for adjustment purposes, and bid on cleaning 25% of each tank to SSPC.SP3 standard based on this rate.
10. Contractor must prepare the area identified in paragraph 2.1.9 to SSPC-SP3 standard. All scale, dirt and debris must be removed ashore and disposed of by Contractor.
11. All tanks must be inspected by CGTA and the attending DNV-GL surveyor.
12. Testing requirement will be specified by the attending DNV-GL Surveyor upon completion of inspection. Contractor must include their bid, air testing of all tanks listed. Additional testing requirements will be considered unscheduled work.
  - a. All overflow lines must be closed by a plug or blank flange prior to testing, and opened following completion.
  - b. All blanks or plugs required for testing shall be supplied, installed and later removed by the Contractor.
  - c. Contractor must notify CGTA a minimum of two (2) hours prior to filling of each tank.
13. Contractor is responsible for disposal of all fluids used for cleaning & testing purposes in an environmentally responsible manner, in accordance with provincial and federal regulations.
14. **Hold Point:** CGTA must be given the opportunity to inspect the tanks prior to final closing-up.
15. All tank manholes must be secured using new Contractor-supplied gaskets/O-rings. All manhole fasteners must be secured with anti-seize compound applied.

### 2.2 Location

1. As described in the Scope.

### 2.3 Interferences

2. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
3. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## HD-10 Fuel Tank Inspections

### 3: REFERENCES:

#### 3.1 Guidance Drawings/Nameplate Data

1. 120/004 Tank Capacity Plan,
2. 532/02 List Of Manholes,
3. 703/04 Manhole Cover

#### 3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Coast Guard ISM Lock Out/Tag Out Procedures
  - c. Coast Guard ISM Confined Space Entry Procedures

#### 3.3 Owner Furnished Equipment

4. N/A

### 4: PROOF OF PERFORMANCE:

#### 4.1 Inspection

1. Contractor is responsible for coordination of all inspections with DNV-GL Surveyor. Contractor must produce an inspection schedule prior to commencement of work.
2. Contractor must provide the Owner's representative a minimum of four hours' notice of each inspection, to allow his/her attendance.
3. Upon completion of all repairs and testing, the Contractor and the CG TA must conduct a final inspection and ensure all tanks, covers, vents and piping connections have been returned to operating conditions and the attending DNV-GL Surveyor has completed all inspections.

#### 4.2 Testing

1. The attending DNV-GL Surveyor shall determine the test method required in paragraph 2.1.12. All tests must be witnessed by the attending DNV-GL Surveyor and the CGTA.
2. For bidding purposes, Contractor must bid on the pneumatic testing of each individual tank, and provide a unit price for hydrostatic testing each tank. The quote must include the installation and removal of blanks for suction, overflow pipes, removal and blanking vent heads, and blanking additional tank openings. Tank drainage (including the disposal of water and the wiping down of the tank internals) must also be included in this quote.

#### 4.3 Certification

1. Contractor is responsible to ensure the DNV-GL Surveyor signs off all surveyed tanks in the vessel's Hull and Machinery Survey Record Book and Division 3 report under the field numbers specified above.

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2017 FY Dry-dock  
**HD-10 Fuel Tank Inspections**

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Contractor must supply the product data sheets and MSDS sheets on all products used in the course of this work (cleaning, coating, sterilizing and neutralizing).
2. Contractor must provide a copy of all test certificates to CGTA.
3. Safety Management System forms and checklists must be provided to the CGTA.

5.2 Spares

1. N/A

5.3 Training

1. N/A

## HD-11 – Port Sea Chest Isolation Valve

### 1: SCOPE:

The intent of this specification item is to remove the Port Sea Bay Isolation Valve, and install a new GSM Butterfly valve in its place.

### 2: TECHNICAL DESCRIPTION:

#### 2.1 General

1. Contractor must remove the existing sea bay isolation valve, for disposal.
2. Contractor must prepare remaining flange surfaces to ensure seal quality.
3. Contractor must fit the new GSM Butterfly Valve, along with a new CFM 8" dia Galvanized Sch. 80 spool piece to fill the gap caused by the shorter valve length.
4. All pipe connections must be fitted with new flanges (eight hole), and installed using new CFM Gaskets, adequate for use in salt water applications, and secured using new CFM Stainless Steel hardware.

#### 2.2 Location

1. Port Sea Chest

#### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

### 3: REFERENCES:

#### 3.1 Guidance Drawings/Nameplate Data

1. <https://www.bray.com/resilient-seated-butterfly-valves/series-3a-3ah>

#### 3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Coast Guard ISM Lock Out/Tag Out Procedures

#### 3.3 Owner Furnished Equipment

1. CCG shall supply the replacement butterfly valve to be installed.
2. Contractor is responsible for supply of all other materials and consumables required to complete all requirements of this specification.

## HD-11 – Port Sea Chest Isolation Valve

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

1. Contractor must coordinate with DNV-GL to ensure all inspection and test criteria required by classification society are met.

#### 4.2 Testing

1. Contractor shall perform a pressure test for 60 minutes at 150% operating pressure, with no leaks (CGTA and DNV-GL Witness).
2. Acceptable test criteria may be substituted at the discretion of the attending DNV-GL Surveyor.

#### 4.3 Certification

1. Class DNV-GL Survey Credit for the seabay valve is required for this specification to be considered complete.

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

1. Contractor must provide one written & one electronic copy of report detailing testing done with results.

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

## HD-12 – Protection & Enclosures

### 1: SCOPE:

The intent of this specification item is to ensure enclosures are installed and heated as appropriate, as required throughout the completion of all work.

### 2: TECHNICAL DESCRIPTION:

#### 2.1 General

1. Contractor must erect a temporary, fully enclosed shelter surrounding all areas requiring coatings throughout refit period.
2. This shelter must be heated as appropriate to maintain temperatures within acceptable limits, per coating manufacturer. Fuel consumed in this process must be accurately tracked, and invoiced via PSPC 1379 action based on invoiced shipyard fuel costs.
3. The Contractor or Sub-Contractors must maintain the painting enclosure in good condition throughout its lifespan. All defects affecting structural and weatherproof integrity must be immediately corrected.
4. The painting enclosure must be constructed so that it will withstand wind loads and protect the enclosed areas from all forms of precipitation. Wherever the painting enclosure meets or rests against any part of the ship's structure or equipment, gaps must be sealed with non-marking tape or other effective means.
5. The painting enclosure must be constructed so that it effectively sheds precipitation and does not experience any accumulations of snow or rain.
6. The painting enclosure shall be constructed so that it allows transmission of natural and ambient light. If the enclosure is built of opaque materials, the Contractor shall supply artificial lighting.
7. The painting enclosure must be positioned with sufficient vertical clearance to clear the Trawl Winch, and allow personnel to move about freely as they perform surface preparation, coatings application and inspection activities.
8. Access to the ship is normally made at locations (P&S) on the after Foc'sle Deck. The painting enclosure and the surface preparation / painting on this deck may interfere with this access. If this occurs, the Contractor must provide alternative access to the ship. The Foc'sle Deck forward of the superstructure is suggested.
9. Shelters may be removed as coatings are completely cured, and verified by NACE QA inspector.
10. Wherever the ship's paint finish is disturbed by attachment points used to secure the painting enclosure, the disturbed areas shall be restored following removal of the enclosure. Disturbed steel or aluminum shall be ground flush if required, prepared and painted according to the paint schedules of associated specification items.

#### 2.2 Location

1. Shelter is required in all areas of the ship requiring coating.

## HD-12 – Protection & Enclosures

### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## **3: REFERENCES:**

### 3.1 Guidance Drawings/Nameplate Data

1. N/A

### 3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Coast Guard ISM Lock Out/Tag Out Procedures

### 3.3 Owner Furnished Equipment

1. N/A

## **4: PROOF OF PERFORMANCE:**

### 4.1 Inspection

1. The shelter is subject to constant inspection to ensure it meets requirements and is in good condition.

### 4.2 Testing

1. N/A

### 4.3 Certification

1. N/A

## **5: DELIVERABLES:**

### 5.1 Reports, Drawings, and Manuals

1. N/A

### 5.2 Spares

1. N/A

### 5.3 Training

1. N/A

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2017 FY Dry-dock  
H-01 Berthing

**1: SCOPE:**

During the Refit contract period at Contractor's facilities, while not in dock, the vessel must be berthed at Contractor's wharf at a safe and secure berth with adequate water at extreme low tide to ensure that the vessel will not touch bottom.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. The vessel will be delivered to Contractor's facility under its own power.
2. Contractor must include in the overall quote, all costs for initial tying up, any movement of the vessel during refit, and letting go of lines from Contractor 's wharf on departure after completion of contract.
3. Maneuvering of the vessel into and out of Contractor's docking facilities must be done under the direction of Contractor. Costs for tugs and pilots required for any movements of the vessel during the contract period must be included in the bid price quoted, but shown separately as well.
4. Contractor must include in their bid the cost of a tug if required for movement of the vessel while tying up at the contractor facilities before and after and the docking.
5. One gangway must be supplied and set up by Contractor while alongside the Contractor's jetty. The gangway must be set up and rigged from the wharf onto the Foc'sle deck. The gangway must be complete with safety net. Gangway must be safe, well lit, and structurally sufficient to support passage of Contractor's workers and ship's crew.
6. Shore power must be available for the vessel while secured alongside, in accordance with Services section of the refit specification.

2.2 Location

N/A

2.3 Interferences

N/A

### **3: REFERENCES:**

#### 3.1 Guidance Drawings/Nameplate Data

##### **Vessel Particulars**

|                 |          |
|-----------------|----------|
| Length Overall  | 165.00'  |
| Length B.P.     | 144.67'  |
| Breadth Moulded | 36.00'   |
| Depth Moulded   | 14.75'   |
| Draft (Mean)    | 13.20'   |
| Displacement    | 925 tons |

#### 3.2 Standards and Regulations

N/A

#### 3.3 Owner Furnished Equipment

N/A

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

N/A

#### 4.2 Testing

N/A

#### 4.3 Certification

N/A

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

N/A

#### 5.2 Spares

N/A

#### 5.3 Training

N/A

## H-02 – Portable Fire Extinguishers (DNV-GL Survey)

### 1: SCOPE:

The intent of this specification item is to complete the annual inspection all 55 portable fire extinguishers onboard the vessel.

### 2: TECHNICAL DESCRIPTION:

#### 2.1 General

1. Contractor must arrange to have all the ship's portable fire extinguishers inspected, tagged and dated by a service agency certified by Underwriters Laboratory of Canada (ULC).
2. Inspection certificates must be issued to the CGTA and TCMS.
3. NOTE: This work must be carried out during the final three (3) weeks of the contract period. This is to maximise the time before next inspection on all certificates.
4. The following is a summary listing of extinguishers to be inspected and renewed as required:

| Quantity | Weight  | Type                   |
|----------|---------|------------------------|
| 1        | 2.5 lb  | ABC                    |
| 9        | 3 lb    | A                      |
| 15       | 5 lb    | ABC                    |
| 8        | 20 lb   | ABC                    |
| 1        | 10 lb   | ABC                    |
| 10       | 10 lb   | BC                     |
| 3        | 10 lb   | CO2                    |
| 4        | 15 lb   | CO2                    |
| 2        | 20 lb   | CO2                    |
| 1        | 6 litre | Wet Chemical (Galley)  |
| 1        | 6 litre | AFF Foam (Engine Room) |

5. No space may be left without a portable fire extinguisher at any one time. The Contractor must provide temporary equivalent units for use if any extinguishers are required to be removed from the ship for servicing.
6. Any cost of transporting the extinguishers from vessel to the place of inspection, including the return of the extinguishers to the ship, must be included in the bid.
7. Any required repairs identified as a result of the inspections must be addressed by PSPC 1379 action.
8. Extinguishers must be properly secured in their original location after inspection.
9. Copies of inspection and test certificates must be provided to the CG TA and PSPC.
10. All work must be to the satisfaction of the CG TA and TCMS.

**H-02 – Portable Fire Extinguishers (DNV-GL Survey)**

2.2 Location

1. The following eight (8) fire extinguishers must be hydro tested:

| #  | LOCATION          | deck | Make    | Model    | Type (lbs) | Serial # |
|----|-------------------|------|---------|----------|------------|----------|
| 7  | Winch Room Entry  | SD   | Flag    | CO-215F  | 15-CO2     | 221839   |
| 15 | Dry Lab           | MD   | Simplex | A05      | 5-ABC      | 154278   |
| 17 | Steering Flat     | MD   | Kidde   | C0215KS  | 15-CO2     | 30215    |
| 18 | E/R Workshop Stbd | LD   | Flag    | CO2-15-H | 15-CO2     | 75826    |
| 19 | E/R Workshop Aft  | LD   | Flag    | CO2-15-H | 10-CO2     | 13748    |
| 24 | MCR               | LD   | Flag    | C210H    | 10-CO2     | 222043   |
|    | Foredeck Spare    | SD   | Simplex | A05      | 3-A, 10-BC | 154267   |
|    | Foredeck Spare    | SD   | Flag    | C210H    | 15-CO2     | 10721    |

2. The following ten (10) fire extinguishers must have a 6 year inspection completed.

| #  | LOCATION          | deck | Make    | Model   | Type (lbs) | Serial # |
|----|-------------------|------|---------|---------|------------|----------|
| 6  | Outside 1/O cabin | SD   | Simplex | A05     | 3-A,10-B,C | 898020   |
| 7  | Winch Room Entry  | SD   | Flag    | CO-215F | 15-CO2     | 221839   |
| 14 | Main Deck Aft     | MD   | Simplex | A05     | 3-A,10-B,C | 154307   |
| 15 | Dry Lab           | MD   | Simplex | A05     | 5-ABC      | 154278   |
| 21 | E/R Port Fwd      | LD   | Amerex  | A411    | 20-ABC     | 40468    |
| 26 | E/R Escape Ladder | LD   | Amerex  |         | 20-ABC     | 40456    |
|    | Foredeck Spare    | SD   | Simplex | A05     | 3-A, 10-BC | 154267   |
|    | Foredeck Spare    | SD   | Simplex | A05     | 3-A, 10-BC | 154263   |
|    | Foredeck Spare    | SD   | Simplex | A05     | 3-A, 10-BC | 898013   |
|    | Foredeck Spare    | SD   | Simplex | A05     | 3-A, 10-BC | 154279   |

2.3 Interferences

N/A

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

- H-02 - Portable Fire Extinguishers - 2017

3.2 Standards and Regulations

- As defined by Underwriters Laboratory of Canada.

3.3 Owner Furnished Equipment

- N/A

## H-02 – Portable Fire Extinguishers (DNV-GL Survey)

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

- As defined by Underwriters Laboratory of Canada.

#### 4.2 Testing

- As defined by Underwriters Laboratory of Canada.

#### 4.3 Certification

- Inspection certificates must be issued to the CG TA and TCMS.

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

- Contractor shall supply a list of what work has been done to extinguishers including but limited to: inspection dates, recharged, hydro, repairs, etc.

#### 5.2 Spares

- N/A

#### 5.3 Training

- N/A

## H-03 – Fire Detection & Suppression Systems (DNV-GL Survey)

### **1: SCOPE:**

Contractor must arrange for inspection, testing and recertification of vessel's fixed fire detection and extinguishing systems, as described and listed below, by an authorized service provider for Class DNV-GL Survey Credit. Proof of credentials and certification of service provider must be made available to the CG TA.

### **2: TECHNICAL DESCRIPTION:**

#### 2.1 General

1. Contractor must arrange to have all components of the ship's fire detection, alarm, and suppression systems are inspected, tested and certified by a service agency certified by Underwriters Laboratory of Canada (ULC), and approved by the System Manufacturer.
2. Contractor must inform CG TA prior to making any system inoperable due to maintenance/inspection. All bottles must be disconnected before tests are completed.
3. All systems must be left in an operational condition overnight, unless written permission has been provided by the CG TA.
4. No components or parts shall be replaced without the written consent of the CG TA. Any removed parts shall be turned over to CG TA.
5. Final inspection of completed work must be undertaken by Contractor's charge hand in the presence of the CG TA. All work shall be to the satisfaction of the CG TA and DNV-GL Surveyor.
6. All components of the fire detection system must be tested and certified to be in correct working order, including:
  - a. Correct function and indication on Notifier AFP-200 Control Panel, and MCR Slave Panel.
  - b. Confirm operation of all detection and alarm components associated with the fire detection system.
  - c. Confirm operation of fire door activation.
  - d. Perform load test on battery backup to confirm adequate capacity.
7. Vessel's fixed CO<sub>2</sub>, Wet and Dry, Chemical fire, and FM200 suppression systems must be inspected and certified for Class DNV-GL Surveyor.
  - a. The weight, level, and pressure of each cylinder (listed in paragraph 2.2) must be measured and recorded.
  - b. All rotating beacons and flashing lights must be tested and proven in good working order.
  - c. All audible alarms must be tested and proven in good working order.
  - d. All wires and cables must be proven in good working order.
  - e. All piping and nozzles must be proven clear.

## H-03 – Fire Detection & Suppression Systems (DNV-GL Survey)

### 2.2 Location

1. The ship's fire detection, alarm, and suppression system covers all areas of the ship. Refer to Ship's Drawing # 880/02 General Alarm Arrangement for a complete listing of locations.
2. Fixed firefighting system tanks can be found in the following locations:

| Location                             | Type                       |
|--------------------------------------|----------------------------|
| Engine Room + Workshop + Store       | KIDDE FM-200 (390 lbs. x2) |
| Emergency Generator Room             | KIDDE CO2 (50 lbs.)        |
| Paint Locker/Refrig. Mach'y. Comp't. | KIDDE CO2 (75 lbs.)        |
| Winch Control Room                   | KIDDE CO2 (25 lbs.)        |
| Galley                               | Wet Chemical (25 lbs.)     |

### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## **3: REFERENCES:**

### 3.1 Guidance Drawings/Nameplate Data

1. Ship's Drawing # 880/02 General Alarm Arrangement.tif
2. Fire Alarm renovations Dwg # VHBA2\_E-1\_FIRE ALARM RENOVATIONS\_1996.tif
3. Fire Control Plan Dwg # J04001-A07-R7- Alfred Needler FCP.pdf
4. Ship's Drawing # LI-7746201-01 (3 sheets)
5. Fire Detection System consists of the following:
  - a. Notifier AFP-200 System Control Panel
  - b. Notifier CFP-2402B Slave Panel
  - c. 43 Smoke Detectors
  - d. 19 Heat Detectors; a combination of "rate of rise" and/or "fixed temperature"
  - e. 16 Pull Station
  - f. Bells & Visible Beacons
  - g. General Alarm Activation Switch (Bridge forward center console)
  - h. Fire Door Activation (Bridge Aft center by stairs)

## H-03 – Fire Detection & Suppression Systems (DNV-GL Survey)

### 3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Transport Canada TP127
2. Contractor shall refer to General Notes for any other applicable standards and regulations.
3. CAN/ULC-S527-11-AMD1 (2014) Standard for Control Units for Fire Alarm Systems.

### 3.4 Owner Furnished Equipment

1. Unless otherwise stated, all materials, labour, and equipment required to complete all requirements of this specification must be Contractor Supplied.

## **4: PROOF OF PERFORMANCE:**

### 4.1 Inspection

1. Contractor is responsible for arranging Transport Canada Marine Safety for all firefighting and fire detection system inspections.

### 4.2 Testing

1. Refer to Technical Description.

### 4.3 Certification

1. Refer to Technical Description.

## **5: DELIVERABLES:**

### 5.1 Reports, Drawings, and Manuals

1. All certificates and service reports issued by the Contractor for this work must refer to each serviced component's serial number and location on the vessel.
2. Two copies of all certification shall be passed to CG TA upon completion of work, one for vessel and other copy for Class DNV-GL attending Surveyor.
3. Contractor must provide annual inspection certificates for all firefighting systems.
4. Contractor must provide service reports indicating all inspections/work carried out.

### 5.2 Spares

1. All spare or replaced components must be provided to the CG TA.

### 5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Drydocking  
H-04 Sweepline Clutch

**1: SCOPE:**

The intent of this Specification item is to replace the Sweepline (Logan) Clutch. Completion of this specification must be completed in water, in conjunction with Sea Trails.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Contractor must remove the old Logan clutch connecting Main Engine Gearbox and Sweepline pump splitter box.
2. Prior to removal, Contractor must check run-out on gearbox output shaft and steady bearing with a dial indicator. Shaft run out readings must be recorded and reported to CGTA immediately.
3. Contractor must perform a laser alignment check between the main engine gearbox output shaft and the steady bearing input shaft.
4. Once the laser alignment readings and shaft run out readings have been approved by CGTA, Contractor must install a new Logan Clutch. The clutch fasteners must be torqued in accordance with manufacturer's specifications, secured using medium strength Loctite Blue.
5. Clutch operating pressure must be set to 50 psi.

2.2 Location

The Sweepline Clutch is located in the Engine Room, behind main engine gearbox, port side.

2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

Logan Clutch Manual

3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Coast Guard ISM Lock Out/Tag Out Procedures

CCGS Alfred Needler  
2017 FY Drydocking  
H-04 Sweepline Clutch

3.3 Owner Furnished Equipment

1. Logan Clutch

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

1. The reinstalled clutch must be operated with Main Engine shut down. The clutch travel must be measured and recorded. Clutch travel must be measure and remain between 0.100-0.120”.

4.2 Testing

1. Once all measurements have been accepted to be within limits by CGTA, the run in of the clutch must be performed, as per the sequence described below. During testing, infrared temperature readings must be taken every 5 minutes. Each of the following components must be tracked: the clutch input bearing, disc pack, piston assembly and steady bearing.
  - a. 1 Hour: Main Engine must be started up and run at idle.
  - b. 1 Hour: Main Engine RPM may be increased to 600 RPM.
  - c. 1 Hour: Main Engine may be placed in ‘Constant RPM’ mode.
  - d. ½ Hour: Clutch may be engaged.
  - e. ½ Hour: Clutch disengaged.
  - f. 1 Hour: Clutch reengaged.
  - g. Once the CGTA is satisfied with the temperatures recorded throughout testing, the unit may be clutched out and the Main Engine shut down.
2. While Main Engine is running and Logan clutch is ‘clutched in’, clutch input and output speeds must be measured to ensure no slippage occurs.
3. Clutch must not ‘drag’ with Main Engine running and clutched out.
4. Clutch input hub and steady bearing temperatures must not exceed 105°C at any point during run in period.

4.3 Certification

1. N/A

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. Two paper copies and one digital copy of all measurements/readings taken must be given to the CGTA.

5.2 Spares

1. N/A

5.3 Training

1. N/A

CCGS Alfred Needler  
2017 FY Dry Dock  
H-05 Trawl Deck Painting

**1: SCOPE:**

The intent of this specification item is to have the entire trawl deck surface; cleaned, prepped for paint and painted to the requirements described in the Technical Description.

**2: TECHNICAL DESCRIPTION:**

2.1 General

1. Exterior Shelter (Trawl) Deck, from the waterline at the stern ramp and forward to aft bulkhead of deckhouse (Frame # 42), including flush deck hatch covers, stern ramp sides, bobbin rails; plus the bottom (up to 6" above deck where possible) of all bulwarks, bulkheads, coamings and deck equipment seats must be prepared and re-coated. Three hundred and forty square meters (340 m<sup>2</sup> = 3,650 ft<sup>2</sup>) of steel is affected.
2. The identified deck area must be pressure washed clean with fresh water. This work must be carried out immediately on dry-docking using a high pressure, fresh water wash, 3000 - 6000 psi operating pressure.
3. **QUALITY ASSURANCE:** Contractor must utilize a Quality Assurance (QA) system during all phases of the specified work. As a minimum, this QA system must include the measurement and/or recording of the following data:
  - a. The batch numbers of all coatings with corresponding dates of manufacture.
  - b. The type and quantity of any solvents added.
  - c. The ambient conditions during all phases of coatings application.
  - d. Surface profile measurements taken after completion of surface preparation.
  - e. Surface contamination measurements, particularly chloride (salt) readings.
  - f. Details of application equipment, including spray tips and pressures where applicable.
  - g. Wet Film Thickness (WFT) gauge readings are to be taken and recorded on a regular basis during coatings application. The WFT measurements are to be recorded with locations referenced to a sketch of the ship.
  - h. Dry Film Thickness (DFT) gauge readings are to be taken and recorded on a regular basis after coatings application. The DFT measurements are to be recorded with locations referenced to a sketch of the ship.
4. Contractor must effectively protect all deck machinery and equipment (winches, capstans, trawl blocks, stern roller, hatch gaskets, etc.) against damage by surface preparation and the application of coatings. All damages caused by surface preparation and painting must be corrected by Contractor at his expense. All protective coatings must be removed on completion of the specified work.
5. The identified areas must be high pressure fresh water washed. After fresh water washing has completed, all damaged, bare area, and corroded areas must be blasted to an SSPC-SP 10. All remaining area to must be given a hard grit sweep to suitably profile any remaining intact coatings.
6. Contractors must bid on treating 50% of the area (172m<sup>2</sup> = 1,825 ft<sup>2</sup>) to bare steel. Areas of bared metal must be feathered back to sound coating material. If feathering is not achievable by blasting, it must be performed by power tool grinding.

## H-05 Trawl Deck Painting

7. The area as described in the image attached at the end of the Technical Description must have the following non-skid painting schedule supplied and applied by Contractor:
  - a. **First Coat:** Intershield 300, Abrasion Resistant Aluminum Pure Epoxy, Colour = Aluminum, 5 mils D.F.T. in way of bared steel.
  - b. **Second Coat:** Intershield 300, Abrasion Resistant Aluminum Pure Epoxy, Colour = Bronze, 5 mils D.F.T. in way of all areas.
  - c. **Third Coat:** Intershield 9G, High Solids Epoxy Non-Skid Deck Coating, Colour = Dark Grey, 30 mils D.F.T. at thinnest point, Roller-Applied in a ridged pattern.
8. The remaining trawl deck working area must have the following painting schedule supplied and applied by Contractor:
  - a. **First Coat:** Intershield 300, Abrasion Resistant Aluminum Pure Epoxy, Colour = Aluminum, 5 mils D.F.T. in way of bared steel.
  - b. **Second Coat:** Intershield 300, Abrasion Resistant Aluminum Pure Epoxy, Colour = Bronze, 5 mils D.F.T. in way of all areas.
  - c. **Third Coat:** Intergard 5377, Abrasion Resistant Epoxy, Colour = Red Oxide, 5 mils D.F.T. in way of all areas.
  - d. **Fourth Coat:** (Trawl Working Area): Intergard 5377, Abrasion Resistant Epoxy, Colour = Red Oxide, 5 mils D.F.T., complete with the paint manufacturer's recommended aggregate which shall be applied to the wet paint as required to produce a uniform non-skid finished deck coating.
9. **RAMP SIDES, BULWARKS, COAMINGS, ETC.:** Remaining areas of prepared steel, as identified in Section 1 of this specification item (Area  $52\text{m}^2 = 560\text{ft}^2$ ), must have the following painting schedule supplied and applied by Contractor:
  - a. **First Coat:** Intershield 300, Abrasion Resistant Aluminum Pure Epoxy, Colour = Aluminum, 5 mils D.F.T. in way of bared steel.
  - b. **Second Coat:** Intershield 300, Abrasion Resistant Aluminum Pure Epoxy, Colour = Bronze, 5 mils D.F.T. in way of all areas.
  - c. **Third Coat:** Intergard 5377, Abrasion Resistant Epoxy, Colour = Red Oxide, 5 mils D.F.T. in way of all areas.
10. Contractor must strictly follow the manufacturer's requirements for storage, preparation, application, etc. of the paint system described in this specification. Any requirement for variance from manufacturer's instructions is to be approved by CGTA prior to proceeding.
11. All work must be completed to the satisfaction of CGTA.



## H-05 Trawl Deck Painting

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

1. Attending NACE surveyor will inspect, test, and certify all stages of painting application.

#### 4.2 Testing

1. N/A

#### 4.3 Certification

1. N/A

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

- a. All recorded information must be typed in report form by the Contractor or his Representative / Sub-Contractor. **Two (2) copies of the Painting QA Report must be given to the CGTA, and one (1) copy is to be given to PWGSC Representative.**

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

## H-06 Science Cabin Deck Coverings

### **1: SCOPE:**

The intent of this specification item is to remove all the carpets in 4 science cabins on the Shelter Deck, and install new vinyl flooring.

### **2: TECHNICAL DESCRIPTION:**

#### 2.1 General

1. Contractor must remove & dispose of the carpet, baseboard moulding, and any underlay exposing the open deck currently fitted in the four science cabins on the shelter deck.
2. Once carpet and baseboard mouldings are removed, Contractor must advise CGTA to inspect the condition on the deck.
3. Contractor must supply and install new non-flammable marine –rated seamless sheet vinyl flooring covering, including all required underlay over entire decks. Approximate total area to cover is 45 m<sup>2</sup>. Colour (light grey / blue non-pattern) to be similar to Chief Engineers decking. CGTA must approve vinyl flooring selection prior to install.
4. Contractor must install new 4” high, medium-grey rubber baseboard moulding around perimeter of each cabin. Approximate total length is 37 meters.

#### 2.2 Location

1. Science cabins # 1, 2, 3 & 4 are located on the Shelter (Trawl) Deck, Forward Port & Starboard.

#### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal, storage, and refitting to the vessel.

### **3: REFERENCES:**

#### 3.1 Guidance Drawings/Nameplate Data

1. Dwg # VHBA2\_007-03\_SHELTER DECK ACCOMMODATION.pdf

#### 3.2 Standards and Regulations

1. N/A

#### 3.3 Owner Furnished Equipment

1. N/A

## H-06 Science Cabin Deck Coverings

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

1. CGTA shall inspect new flooring and Baseboard mouldings for cleanliness and install quality once installation is completed.

#### 4.2 Testing

1. N/A

#### 4.3 Certification

1. N/A

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

1. Contractor must supply technical information on flooring installed to CGTA, prior to installation

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

## E-01 Gearbox Oil Cooler Inspection (DNV-GL Survey)

### 1: SCOPE:

The intent of this specification item is to remove, clean, pressure test & inspect gearbox oil cooler for Class DNV-GL Survey Credit.

### 2: TECHNICAL DESCRIPTION:

#### 2.1 General

1. Contractor must disconnect and remove the gearbox oil cooler from its location in the engine room and transport to Contractor's Facility for cleaning, testing, pressure testing & inspection.
2. Contractor must ensure all systems associated with the gearbox oil cooler are fully blanked and locked out & tagged out prior to removal.
3. Contractor must ensure that all exposed lube oil lines are capped to prevent ingress of foreign material in the system.
4. Contractor must drain old oil from cooler and associated lines, for disposal in accordance with local provincial and federal regulations.
5. Once cooler is in Contractor's Facility, it must be disassembled. The tube bundle must be removed for chemical cleaning.
6. **Hold Point:** Following cleaning, Contractor must arrange for DNV-GL Surveyor & CGTA to view cooler parts. Any defects identified must be repaired via PSPC 1379 action.
7. Following inspection and associated repairs, the cooler must be re-assembled using new gaskets and O-rings.
8. Contractor must hydrostatically test assembled clean cooler to 100psi for 30 minutes. DNV-GL Surveyor & CGTA must witness pressure test for acceptance.
9. Contractor must transport the reassembled oil cooler back to the vessel, to be re-installed in its original position using new gaskets, S/S fasteners & O-rings.
10. A full function test must be completed after installation aboard vessel. Any leaks must be repaired at Contractor's expense.

#### 2.2 Location

1. Engine room, above gearbox, centerline.

#### 2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## E-01 Gearbox Oil Cooler Inspection (DNV-GL Survey)

### **3: REFERENCES:**

#### 3.1 Guidance Drawings/Nameplate Data

1. Machinery Manuals are available from the vessel upon request.

#### 3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Coast Guard ISM Lock Out/Tag Out Procedures

#### 3.3 Owner Furnished Equipment

1. N/A

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

1. As described in technical description

#### 4.2 Testing

1. Pressure test for 30 minutes at 100 psi with no leaks in Contractors facility (CGTA and DNV-GL Witness).
2. Once re-installed, Cooler to be function tested for leaks using ships gearbox pre-lube pump (CGTA Witness).

#### 4.3 Certification

1. Class DNV-GL Survey Credit for the Gearbox Oil Cooler is required for this specification to be considered complete.

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

1. Contractor must provide one written & one electronic copy of report detailing testing done with results.

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

## L-01 Electrical Insulation Test (DNV-GL Survey)

### **1: SCOPE:**

The intent of this specification item is to complete the annual meggar survey of the ship as per Class DNV-GL survey credit requirements.

### **2: TECHNICAL DESCRIPTION:**

#### 2.1 General

1. Contractor must carry out annual insulation resistance megger testing of all electrical panels and breakers as identified in the Meggar Template included in the reference package.
2. Circuits feeding either navigation equipment or electronic components are exempt from meggar requirements, to prevent damage to equipment.
3. Switchboard breakers must to have their electronic components isolated prior to testing. Generator related equipment must have the Automatic Voltage Regulators isolated prior to testing.
4. Megger Testing must be carried out within the first 2 weeks of the ship arriving at Contractors facility to allow sufficient time for repairs to any electrical systems.
5. In regards to megger testing, motor circuits must be tested in a two-step manner. Firstly, circuit is to be tested between load side of circuit breaker and line side of motor starter; and secondly, between load side of starter and motor.
6. Any defects found, including all readings below  $1M\Omega$  must be reported to the CGTA as soon as possible, and repaired. Contractor shall allow for 100 labor hours for repairs in this manner. Actual hours will be adjusted via PSPC 1379 action based on timesheets.
7. Two computer generated-copies of Final results shall be given to CGTA upon completion.
8. Note: It is important that CGTA receive this report immediately at completion on Contract work period for Credit submission to Class DNV-GL Surveyors.

#### 2.2 Location

1. Refer to "Electrical Panel Locations" spreadsheet included in reference package.

#### 2.3 Interferences

1. For 120V circuits affecting accommodation spaces, contractor must provide ship's crew reasonable notice of areas being tested, to ensure crew members have adequate time to unplug their belongings. Contractor is responsible to ensure all 120V equipment outside of accommodation spaces is unplugged in public areas prior to testing, and reconnected upon completion.
2. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
3. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.

## L-01 Electrical Insulation Test (DNV-GL Survey)

### **3: REFERENCES:**

#### 3.1 Guidance Drawings/Nameplate Data

1. Meggar Template included with reference package
2. Electrical Panel Directory included with reference package

#### 3.2 Standards and Regulations

1. Transport Canada TP 127

#### 3.3 Owner Furnished Equipment

1. N/A

### **4: PROOF OF PERFORMANCE:**

#### 4.1 Inspection

1. See Technical Description

#### 4.2 Testing

1. As described in Technical Description

#### 4.3 Certification

1. Contractor shall supply Class DNV-GL a typewritten copy of the final results of the Megger Survey Final Report after all corrections have been made and verified.
2. Once approved, Contractor shall ensure DNV-GL Surveyor signs off Megger Survey in Ship's Survey Record Book.

### **5: DELIVERABLES:**

#### 5.1 Reports, Drawings, and Manuals

1. One electronic & two typed copies of the Final Megger Survey Report.
2. One electronic & two typed copies of deficiencies found and what was done to rectify them.

#### 5.2 Spares

1. N/A

#### 5.3 Training

1. N/A

## L-02 – Galley Equipment Cleaning

### **1: SCOPE:**

The intent of this specification is to internally and externally degrease and thoroughly clean the ship's Deep Fryer and outboard Range.

In order to minimise interruption to galley services, this specification shall be completed alongside E-07 – Galley Range Installation.

### **2: TECHNICAL DESCRIPTION:**

#### 2.1 General

1. Contractor shall disassemble each unit for pre-inspection. All internal wiring shall be inspected, amperage readings shall be recorded for each element, and insulation shall be tested (meggered) for each wire.
2. Operation of switches and thermostats shall be proven. Any defects shall be reported to CGTA, and repaired via PWGSC 1379 action. Note: CCG has spare switches and thermostats available if required.
3. All internal and external surfaces shall be scrubbed clean of all grease, cooking residues, dirt and debris.
4. Contractor is responsible for the removal of associated debris and used cleaning supplies. All cleaning supplies shall be approved by CGTA before the cleaning is started.
5. On completion of the work, a function test shall be witnessed by the CGTA and shall be carried out on the stove and deep fryer. Final megger and amperage readings shall be recorded.
6. Acceptance shall be based on full functionality of the range, and proof of increased insulation resistance, no less than 5MΩ.

#### 2.2 Location

All work shall take place in the Galley.

#### 2.3 Interferences

1. Contractor shall include in their cost the removal and re-installation in good order, any interference items that may interfere with the scope of the work.
2. Contractor shall ensure interference items are relocated a minimum amount of times to complete all specifications in order to prevent unnecessary work and cost.

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**3: REFERENCES:**

3.1 Guidance Drawings/Nameplate Data

Refer to product manuals for cleaning guidelines.

3.2 Standards and Regulations

1. The following Coast Guard Standards and or Technical Bulletins must be adhered to in the course of executing this specification. Copies of these standards and bulletins can be obtained from the CCG Technical Authority.
  - a. Canadian Coast Fleet Safety Manual (DFO 5737)
  - b. Coast Guard ISM Lock Out/Tag Out Procedures

3.3 Owner Furnished Equipment

1. Unless otherwise stated, all materials, labour, and equipment shall be Contractor supply.

**4: PROOF OF PERFORMANCE:**

4.1 Inspection

1. See technical description.

4.2 Testing

1. See technical description.

4.3 Certification

N/A

**5: DELIVERABLES:**

5.1 Reports, Drawings, and Manuals

1. A report including all test results both before and after cleaning, shall be provided.
2. Any adjustments to temperature controllers shall be recorded and provided in a final report to CGTA.

5.2 Spares

1. Any unused spare parts shall be returned to CCG.

5.3 Training

N/A