

Spec item #: HD-03	SPECIFICATION	TCMSB Field #: N/A
Hull Impressed Current System Maintenance		

Part 1: SCOPE:

- 1.1 The intent of this specification shall be to remove leaking anodes and re-install with watertight fittings. The services of an authorized Cathelco representative shall supervise the work and provide guidance for repairs.
- 1.2 This work shall be carried out in Conjunction with the following:
 - Ballast Tank and Void Tank Inspections

Part 2: REFERENCES:**2.1 Guidance Drawings/Nameplate Data**

- 2.1.1. Wilson Walton Service Manual And Drawings

2.2 Standards

- 2.2.1. 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.
- 2.2.2. Canadian Coast Guard Fleet Safety Manual (DFO 5737)
- 2.2.3. Coast Guard ISM Confined Space Entry 7.D.9
- 2.2.4. Coast Guard ISM Hotwork procedures
- 2.2.5. Coast Guard ISM Fall Protection procedures
- 2.2.6. Canadian Coast Guard Welding Specifications for Ferrous Materials, Revision 4. (TP6151 E)
- 2.2.7. CWB CSA 47.1 latest revision Division I, II or III
- 2.2.8. SSPC-SPT

2.3 Regulations

- 2.3.1.

2.4 Owner Furnished Equipment

- 2.4.1. The contractor shall supply all materials, equipment, and parts required to perform the specified work unless otherwise stated. Owner will supply new anodes if required.

Part 3: TECHNICAL DESCRIPTION:**3.1 General**

- 3.1.1. The contractor shall allow \$5,000.00 in its bid for the subcontracted FSR services as well as travel and living. This shall be adjusted by 1379.
- 3.1.2. All work dealing with the anodes including installation shall be done under the direction of a Cathelco representative. Cathelco representative shall be arranged for by the Contractor and payment of any costs incurred for this requirement shall be paid by the contractor and included in the known work. The suggested Cathelco representative shall supervise installation of the new anodes is as follows:
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 Technical Support
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Required Work for Anode or Cell Replacement

- 3.1.3.** Contractor is to remove and reset four (4) anodes, the two Starboard aft anodes (located in the Stbd aft shaft void) and the two Port forward anodes (located in the #2 Port Wing Ballast tank).
- 3.1.4.** Contractor is to provide a unit cost for removing and resetting an anode, for adjustment purposes.
- 3.1.5.** Contractor is to take all precautions to not damage the Dielectric shield surrounding the anodes. Damaged areas of the shield are to be cleaned, sanded and the area shall be built up with Devron 140 epoxy compound, 6 mm thick at the anodes to 1mm thick at the edge. Contractor shall supply and install Devron 140 epoxy capastic type filler in way of damaged areas and fair to contour specified by the FSR. Contractor is to bid on repairing one (1) square meter per anode.
- 3.1.6.** The anodes are to be removed, cleaned and prepared for re-installation. The cofferdam is to be cleaned and prepared, with new seals and bedding compound to be used with the installation of the anodes, as per the direction of the FSR.
- 3.1.7.** All ten (10) anodes & four (4) reference electrodes shall be checked for hull external damage such as cracks, missing or damaged securing devices and / or indication of anode separation from hull.
- 3.1.8.** The identified four anodes shall have hull anode cofferdam flange covers removed. Vaseline shall be cleaned from cofferdams. All watertight glands shall be inspected for possible leakage.
- 3.1.9.** Anode/electrode leads shall be disconnected from anodes/electrodes and power source.
- 3.1.10.** Contractor is to replace the electrical cable between the coffer dam and first junction box for each anode. Note that within #2 Wing Ballast tank, the electrical cable runs through a watertight conduit, between the cofferdam and the after tank bulkhead.
- 3.1.11.** New and existing leads to be tested to ground using a multi meter. Leads shall be re-connected to anodes/electrodes and cables and anodes/electrodes checked for continuity. All electrical leads shall be re-connected to power supply.
- 3.1.12.** Upon completion of inspection and above work, all cofferdams shall be filled with Vaseline. Contractor shall quote on supplying and installing 40 KG of Vaseline per cofferdam opened.
- 3.1.13.** Cofferdam flange covers shall be installed using new neoprene gaskets and fasteners (both CFM). All nuts and bolts shall be coated with anti-seize compound.
- 3.1.14.** All staging (including staging in the dock for anode/electrode external

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inspection) equipment, lighting, ventilation equipment, tools shall be Contractor supplied.

3.1.15. Chief Engineer to receive three (3) type written copies of report from service engineer and work carried out on this item.

3.1.16. All work shall be completed to the satisfaction of TCMSB and Chief Engineer.

3.2 Location

3.2.1. Location of anodes and reference electrodes is as follows:

3.2.2. Anodes #'s 1 & 3 Frame 121, starboard - #2 Wing Ballast Tank Stbd

3.2.3. Anodes #'s 2 & 4 Frame 121, port - #2 Wing Ballast Tank Port

3.2.4. Anode # 5 Frame 60, starboard - #3 DB Water Ballast Tank Stbd

3.2.5. Anode # 6 Frame 60, port - #3 DB Water Ballast Tank Port

3.2.6. Anodes #'s 7 & 9 Frame 30, starboard – Aft Shaft Void Stbd

3.2.7. Anodes #'s 8 & 10 Frame 30, port – Aft Shaft Void Port

3.2.8. Reference electrodes a & b Fr 108, P&S - #2 Wing Ballast Tanks P&S

3.2.9. Reference electrodes c & d Fr 45, P&S – Shaft Tunnel Voids P&S

3.3 Interferences

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

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

All work shall be completed to the satisfaction of the Chief Engineer and the FSR for the Impressed Current System.

4.2 Testing

N/A

4.3 Certification

N/A

Part 5: DELIVERABLES:

5.1 Drawings/Reports

5.1.1

5.2 Spares

N/A

5.3 Training

N/A

5.4 Manuals

N/A