

PARTICULARIZED MAINTENANCE REPAIR SPECIFICATION (PMRS)

HMCS CHICOUTIMI

**REQUIREMENTS FOR SHIP'S
SERVICES, OFFICE FACILITIES AND
DOCKING/UNDOCKING**

REVISION 02



NOTICE

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NAME PLATE DATA: N/A

SSMRS REFERENCES: C-03-010-000/NQ-001 GENERAL SPECIFICATION [G-1]
C-03-010-000/NQ-001 REQUIREMENTS FOR DOCKING AND UNDOCKING [H-1]
C-28-600-000/NQ-001 SUBMARINE PRESSURE HULL AND CASING [H-4]

NEI NUMBER: E-23-VIC-000

PURPOSE: This specification states the requirements for Ship's Services and Office Facilities for HMCS CHICOUTIMI and for the docking and undocking evolutions at Esquimalt Graving Dock (EGD).

RELATED DOCUMENTS:

- A. D-23-003-001/SF-000 SPECIFICATION FOR CLEANLINESS OF SHIPS AND COMPARTMENTS
- B. D-03-002-008/SG-011 REQUIREMENTS FOR DOCKING AND UNDOCKING OF CF VESSELS
- C. D-LM-008-001/SF-001 CANADIAN FORCES METHODS OF PACKAGING
- D. C-23-VIC-000/AM-001 Quality Assurance For Safety In Submarines – Victoria Class
- E. SSPC-SP WJ-4/NACE WJ-4 WATERJET CLEANING OF METALS – LIGHT CLEANING (WJ-4)
- F. SSPC-SP-1 SOLVENT CLEANING

APPENDIXES:

- APPENDIX A ASSISTANCE OF CONTRACTOR CRANAGE
- APPENDIX B SHIPBOARD TEMPORARY LIGHTING
- APPENDIX C INDIVIDUAL TANK CAPACITY

1. **GENERAL INFORMATION:**

WARNING

- a. Work that requires isolating Fluid, Gas or Electrical Systems shall follow established Lock-out/Tag-out procedures.

NOTES

- b. The following maintenance routines may directly or indirectly affect First Level System Equipment as listed in FLADS. Contractor personnel shall ensure that the requirements of C-23-VIC-000/AM-001 are met.

2. **Services (Vessel Under Department Of National Defence (DND) Control During Turnover)**

The following services must be provided daily during the entire docking period as follows:

- a. The Contractor shall supply; fully inclusive, including connection and disconnection of all power requirements for the Contractor's own work, for ship services, and also for those services required in support of DND shore activities. The following particular supplies will be required for Ship Services:
- b. 440 volts 60Hz, 3 phase 260 amps shore power is required for the vessel.

NOTE 1: Contractor to supply all cabling, connectors and power sources for the above services.

NOTE 2: Contractor shall provide lighting and heating Power Supplies for Shore side accommodations

NOTE 3: Portable AC power unit for the testing of motors in place fed by portable cables through Aft escape hatch.

- c. Power required for the following equipment:

| | |
|--------------------|------------------------------|
| Shore Chiller: | 440 volts, 3 phase 100 amps |
| Bibs Compressor: | 440 volts, 3 phase 60 amps |
| HPA Compressor: | 440 volts, 3 phase 100 amps. |
| DC Power Supply | 440 volts, 3 phase 400 amps |
| Temporary lighting | 440 volts, 3 phase 400 amps |

- d. Material required to manufacture cam lock cable ends for connection to shore power kiosks at services at Esquimalt Graving Dock (EGD):

One (1) of each part number for 440V power, 400 Amps

Part numbers:

LEVITON, 16D24-UR RED TAPER NOSE MALE PLUG
 LEVITON, 16D24-UG GREEN TAPER NOSE MALE PLUG
 LEVITON, 16D24-UE BLACK TAPER NOSE PLUG
 LEVITON, 16D24-UB BLUE TAPER NOSE MALE PLUG

- e. Bidder to quote on 1,000,000 kWh of usage, subject to adjustment by PWGSC 1379.

3. Fire Protection

Fire protection must be provided daily during the entire docking period as follows:

- a. Water firefighting connection to ring main requires 21 cubic metres per hour at 3.5 bar.
- b. All fire main supplies shall be tested to the satisfaction of the DND Technical Authority. If a land main is to be proposed by the Contractor, then emergency Sea Water pumping arrangements must be available for use in the event of loss of supply.

4. Habitability

- a. The Contractor must provide metered water supply daily during the entire docking period. Water must be potable for drinking purposes.

5. General – Cleaning

Within 48 hours of docking the Contractor must:

- a. Contact Designated Engineering Authority (DEA) to inspect Propeller to determine cleaning method. Based on condition of propeller DEA will provide cleaning specification **AC***
- b. Clean the entire exterior hull including all appendages by Low Pressure Water Cleaning (LPWC) in accordance with SSPC-SP-WJ4/NACE WJ4, using a **maximum of 3000 PSI**, using water and a biodegradable cleaner/degreaser, to remove all marine growth, loose and flaking paint, salts, oil, grease, dirt and other surface contaminants. Areas include gratings and all areas as specified. **They do not include propeller blades and hubs.** After LPWC, areas of remaining oil/grease shall be cleaned in full in accordance with SSPC SP 1. Wash cleaning shall commence within four hours from the time the dry dock is drained. The QAR NACE Inspector shall inspect on completion to ensure cleaning is as specified. **AC***
- c. Remove, handle, store, transport, and dispose of all hazardous materials and waste in accordance with all applicable Federal, Provincial, and Municipal, regulations and legislation, including the Esquimalt Graving Dock Environmental Best Management Practices. The Contractor shall provide Certificates of Disposal. Precautions shall be taken during removal, cleaning and painting to protect the ship's equipment and the environment from contamination. Precautions shall be taken during coatings removal operations as existing coatings may contain heavy metals such as lead and chromates. If at any time asbestos is encountered in a system, the QAR shall be informed immediately. **C***

6. Personnel Safety

Personnel Safety must be provided daily during the entire docking period as follows:

- a. The Contractor shall provide two (2) brows, two (2) gangways, one (1) forward and one (1) aft, complete with safety nets, and temporary guardrails maintained in a safe disposition to meet the need of emergency evacuation in the event of fire; gangway to be set up maximum 30 minutes after vessel arrival. Requirements must meet Canada Labour Code Part 2 temporary structures.
- b. The Contractor shall provide and maintain the continuity of guardrails at the edges of jetties and wharves adjacent to the submarine's berth and around the dock whilst the submarine is in the dock. Particular attention being paid to avoidance of any gap between the guardrails and the brow.
- c.

QCP

- d. Where the guardrails on board are broken or removed for repair or a section of equipment or structure which would normally form the deck edge guard barrier is removed during the course of the Docking the Contractor shall fit temporary guardrails which meet Health and Safety Regulations.

7. Services (Vessel Under DND Custody)

- a. Provide the following mandatory services while the vessel is in the Esquimalt Graving Dock (EGD)s yard:
 - (i) electrical lighting and power along staging must be provided immediately after dry-dock is drained in accordance with Appendix B–Shipboard temporary lighting;
 - (ii) a minimum 45-gallon bin for weekly garbage collection and disposal;
 - (iii) fresh water mains daily during docking period;
 - (iv) water daily during docking period for Shore Chiller. Shore Chiller is GSM furnished and will be connected by DND Technical Authority;
 - (v) wharfage daily during docking period;
 - (vi) craneage – craneage shall be approved in writing by the Quality Assurance Representative (QAR). All pertinent information shall be recorded on the attached form, Appendix A. Craneage shall meet the requirement of 15 tonnes and 30-metre lift (masts). Craneage is required during staging, docking and undocking period. Estimated usage is 300 hours; Change and /or variation in quantities or scope must be actioned with a PSPC 1379;
 - (vii) all confined spaces must be certified gas-free prior to entry on a daily basis;
 - (viii) line handlers and mooring lines required for four (4) days. Require two (2) days for docking and two (2) days for undocking; and
 - (ix) security arrangements – provide daily security access for FMFCB personnel and contractors/subcontracts during the docking period. This includes a Commissionaire shack for use by the Commissionaire. Contractor is responsible for Site safety orientation to all DND Personnel / sub contractors. Contractor is responsible for Site First Aid to all DND Personnel. Contractor is responsible for site security access/cards and all responsibilities associated with site access for all DND personnel and additional contractors.

NOTE: All requirements and services to be as follows:

- b. HP Air - 280 bar (4000 psi), with a minimum capacity of 102m³ free air per hour. The air must be filtered, free from oil and water. Shore HP Compressor is GSM furnished and will be connected by DND Technical Authority.
- c. Portable enclosures at Fwd and Aft escape hatches as they will remain open during the work period.
- d. A shore based forced air and exhaust system to extract fumes and ventilate the boat (welding, paint, etc.) shall be installed to the Fwd and Aft escape hatches.
- e. Clean dry compressed LP air, supplied at 100 psi minimum dewpoint of -79 Celsius.
- f. Alarm pulls at brow, bottom of dock, control room and shore.
- g. Commissionaire shack with (1) phone line is required adjacent to After Brow.

- h. First aid shack adjacent to the commissionaire shack is required.
- i. Staging – Approved staging from docking bottom to up to the bridge fin on the submarine as per Canada labour code part 2 Temp structures.
- j. Cleanliness of the vessel – The Contractor shall provide sufficient labour and equipment to keep the submarine including staging, dockside and dock bottom clear of rubbish and arisings which are to be removed from the submarine for disposal by the Contractor daily in accordance with D-23-003-001/SF-000.

The Contractor shall provide conditions and establish practices during the Docking to ensure that no contamination of equipment by dirt, shipyard arisings, corrosive products of grit blasting, lagging and kindred operations occur during the Docking period. Decks (outside and inside) shall be kept clean, and deck covering shall be protected from dirt and damage. Particular attention shall be taken to avoid damage to hull tiling and composition by oil, grease and movement of heavy equipment.

- k. Where a process creates dusty or hazardous arisings then arrangements shall be made to confine the spread of those arisings by closing doors and hatches to the compartment or by building an enclosing tent and then prohibiting access for all except those involved in the task.
- l. The Contractor is responsible for taking all action necessary to ensure the effective earthing of the submarine's structure especially when docked down. The arrangements fitted shall be adequate to provide protection for personnel against electrical systems faults and lightning strikes, and shall be fitted at several points along the hull.

8. Tank Cleaning; Black/Grey Water, Fuel and Oily Waste Water Disposal

C

- a. The Contractor must empty the listed tanks in Appendix C once during the docking period. Tanks must be emptied, opened, certified for safe entry, and cleaned to SSPC-SP-1 standard. The tank must be prepared for DND Technical Authority inspection. For bidding purposes, bidders are to bid on emptying all the tanks (Except sewage and Grey water tank) full volume and dispose of contents in accordance with applicable Municipal, Provincial and Federal environmental regulations and legislations, including the Esquimalt Graving Dock Environmental Best Management Practices. The Contractor shall provide individual Certificates of Disposal. Change and /or variation in quantities or scope must be actioned with a PSPC 1379.
- b. Sewage, sullage and grey water disposal once during the docking period. See Appendix C for tank capacity; for bidding purpose, bidder are to bid on emptying the sewage tanks and grey water tanks full volume and quote on 500 liters of sullage, subject to adjustment by PSPC 1379.
- c. All bilge deposits, oily water, oil emulsions, etc., shall be removed, and all bilge's or decks as applicable, power washed down with fresh water and bilge cleaning fluid up to a maximum of 3000 PSI, bidder to quote on 3000 liters oil water disposal and sludge including the wash water Change and /or variation in quantities or scope must be actioned with a PSPC 1379 actions.
- d. The Contractor shall include in his firm price; the cost for any tank cleaning and fuel recovery arrangements, as required to undertake, or in way of, specified work. See Appendix C for specific tank
- e. Clean air circulation and gas free certification shall be arranged prior to commencement of work.
- f. The Contractor must not allow any build-up or collection of noxious or flammable liquids or materials at any time.

9. Provision of Storage Facilities

- a. Dock bottom and dockside laydown area for material is required as follows:
 - i. 2 - 10 x 20 feet Contractor furnished storage containers for tools and equipment (1 for dock bottom and 1 dockside)
 - ii. 10 x 20 feet dockside laydown area for GSM furnished Shore Chiller.
 - iii. 10 x 20 feet dockside laydown area for GSM furnished Shore HP Compressor
 - iv. 10 x 20 feet dockside laydown area for GSM furnished Bids Compressor
 - v. 10 x 10 feet dockside laydown area for GSM DC Power Supply
- b. Dockside laydown area is from one week prior to arrival of ship until one week after undocking. April 25- 22 Sept 2018.
- c. Dock bottom laydown is from 2 May 2018 (after dry dock is pumped dry) until 14 Sept 2018 (2 days prior to undocking).

10. Docking and Undocking Requirements

- a. The Contractor shall dock and undock the submarine in accordance with D-03-002-008/SG-011 - Requirements for Docking and Undocking of CF Vessels and the attached LMRS specification.
- b. In particular reference to the LMRS:
 - i. the Contractor shall prepare and discuss with EGD Operations the proposed docking plan prior to submission to DND for approval. The proposed docking plan to be approved by DND at least 48 hours prior to the docking.

11. Provision of Office Facilities – Removed

12. Provision of Office Equipment

The following office equipment is required daily during the docking period:

- a. Telephone services shall be supplied and maintained on the following scale:

| TABLE 1 – SUPPLIED AND MAINTAINED TELEPHONE SERVICES | | |
|--|-------------------------------------|--------|
| Position | Lines | Phones |
| Phone line for boat | 1 | 1 |
| Phone line for Commissionaire shack | 1 | 1 |
| Total Requirements | 2 – Private Lines 2 – Telephones | |

APPENDIX A

ASSISTANCE OF CONTRACTOR CRANAGE

| | | | |
|---|------------|--|-------------|
| ASSISTANCE OF CONTRACTOR CRANAGE | | | |
| Start Time: _____ | Day: _____ | Month: _____ | Year: _____ |
| Start Time: _____ | Day: _____ | Month: _____ | Year: _____ |
| Total Person Hours Used: _____ | | | |
| _____ Signature of Contractor | | _____ Signature of QAR Representative | |

| | | | |
|---|------------|--|-------------|
| ASSISTANCE OF CONTRACTOR CRANAGE | | | |
| Start Time: _____ | Day: _____ | Month: _____ | Year: _____ |
| Start Time: _____ | Day: _____ | Month: _____ | Year: _____ |
| Total Person Hours Used: _____ | | | |
| _____ Signature of Contractor | | _____ Signature of QAR Representative | |

APPENDIX B

SHIPBOARD TEMPORARY LIGHTING

- a. Temporary lighting when required shall be manufactured and installed in accordance with the following standard:

General

- b. reliable commercial grade cable employing a tough water-tight outer shield of rubber, synthetic rubber, Teflon or equivalent shall be employed throughout;
- c. maximum cable current rating in accordance with the following table, is not to be exceeded;

NOTE

- d. Quick disconnects shall be fitted to all cables in the vicinity of all W/T doors, hatches and manholes to permit closing in an emergency.

| TABLE 4 – CABLE CURRENT RATING | | |
|--------------------------------|--------------------------------|------------------|
| Item No. | Circular Mils | Amps |
| 1. | Below - 10000 Circular Mils | 6 Amps/1000 CM |
| 2. | 10000 – 30000 Circular Mils | 3 Amps/1000 CM |
| 3. | 30000 – 80000 Circular Mils | 2 Amps/1000 CM |
| 4. | 80000 – 160000 Circular Mils | 1.7 Amps/1000 CM |
| 5. | 160000 – 2500000 Circular Mils | 1.2 Amps/1000 CM |
| 6. | Above - 2500000 Circular Mils | 1 Amps/1000 CM |

Protection

- e. each cable of the main distribution system shall be supplied through fuses of a rating as close to the cable rating as can be obtained commercially;

Grounding

- f. in ships of steel structure, a suitable system is the fitting throughout of a third wire for grounding purposes, ensuring that each fuse or utility box is grounded.
- g. in ships of wooden construction, a third grounding wire is to be run from the main distribution point to each utility box or fuse box. This third wire is to be connected to the ships grounding system;
- h. it is desirable, but not required that earth indicating lamps be fitted at the main distribution point;

Utility Boxes

- i. utility boxes shall be of metal construction and be fitted with a ground terminal. All tools and equipment shall be fitted with approved polarized plugs to ensure that only grounded portable tools and equipment can be connected to the receptacles;
- j. on no account are utility boxes to be ganged together;

Workmanship

- k. cable splices shall be kept to a minimum. When splicing is required it shall be carried out in accordance with a recognized electrical standard as follows:
 - i. connections shall be soldered and suitably wrapped and taped to retain watertight integrity of the cable or
 - ii. use pressure type solderless type connection and suitably wrap and tape as in Paragraph a. above.
- l. care shall be taken to ensure that all terminals and cable ends are suitably covered to prevent electrical shock to personnel or accidental grounding of the system;
- m. cables shall be suspended clear of the deck and protected from damage;
- n. where cables are no longer required, the slack shall be coiled back, tied and attached to the bulkhead;
- o. utility boxes shall be suspended clear of the deck wherever possible;
- p. carry out an insulation test to ground of the complete temporary wiring distribution system using a 500V megger. If the total insulation resistance is less than 500 000 ohms, the source of the low insulation should be located and eliminated as soon as possible. If the total insulation resistance is less than 200 000 ohms, the defective circuit should be located and disconnected immediately and should remain disconnected until the resistance has been raised above 200 000 ohms;
- q. the main power lines for temporary lighting shall be brought aboard near the ships gangway through disconnect switches. This will permit all circuits to be switched off at one (1) point; and

Hazardous Areas

- r. in areas subject to explosive and/or combustible fumes, such as oil tanks and in operations involving the application of paints and plastic finishes, the light fixtures and extension cord outlets shall be approved for Class 1, Division 1, Group C and D locations.
- s. The light fixtures shall be supplied with approved type steel guards. Where temporary lighting is fitted in hazardous areas, such areas shall be gas-freed prior to installing the fittings. The following equipment as been approved for use in hazardous areas:
 - i. Crouse-Hinds, Portable Hand lamp, Type EVH, Catalogue No. EVH 206, or equivalent; and
 - ii. Type A-21, 100 watt explosion-proof incandescent Lamp.

APPENDIX C

TANK CAPACITY

| TANK | Qty | Type of waste |
|-----------------------|--------------|-------------------|
| Fwd Trim (P) | 6.93 tonnes | Ballast sea water |
| Fwd Trim (S) | 6.93 tonnes | Ballast sea water |
| Aft Trim (P) | 6.4 tonnes | Ballast sea water |
| Aft Trim (S) | 6.4 tonnes | Ballast sea water |
| M Comp (P) | 6.58 tonnes | Ballast sea water |
| M Comp (S) | 12.02 tonnes | Ballast sea water |
| R Comp (P) | 15.53 tonnes | Ballast sea water |
| R Comp (S) | 16.7 tonnes | Ballast sea water |
| D Tank | 5.76tonnes | Ballast sea water |
| TOT (P) | 6.99 tonnes | Ballast sea water |
| TOT (S) | 6.99 tonnes | Ballast sea water |
| WRT (P) | 7.64 tonnes | Ballast sea water |
| WRT (S) | 7.64 tonnes | Ballast sea water |
| Galley Slop | 950 litres | Grey Water |
| Sewage Slop | 3127 litres | Black Water |
| No.1 Fuel Group | 55.13 tonnes | Oily Waste Water |
| No.2 Fuel Group | 72.17 tonnes | Oily Waste Water |
| No.3 Fuel Group | 64.25 tonnes | Oily Waste Water |
| Dirty Bilge Tank | 1.54 tonnes | Oily Waste Water |
| Clean Bilge Tank | 1.54 tonnes | Oily Waste Water |
| Port Fresh Water Tank | 12110 litres | Clean Fresh Water |
| Stbd Fresh Water Tank | 5600 litres | Clean Fresh Water |