ANNEX B

Appendix 4

Installation Guidance Package

Naval Remote Weapon Station System

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1. BACKGROUND

1.1 This Installation Guidance Package provides general guidance to Bidders to assist in determining the level of effort for hull and cabling work required to install the Naval Remote Weapon Station (NRWS) System on Halifax Class Ships.

1.2 Throughout the installation of the NRWS System, ongoing concurrent work may be performed on the ship and in close proximity to the NRWS System installation.

1.3 The installation of the NRWS System components may cease during brief work stoppages which may include ship radiating periods.

1.4 The installation of the NRWS System will consist of installing multiple remotely operated weapon mounts, sensor suites, safety/veto switches, and operator consoles.

2. INSTALLATION IMPACT

2.1 The NRWS System will impact the ship's power systems and hull penetrations. Equipment installations will also be required for the following areas of the Halifax Class Ships:

a) Fire Control Equipment Room (FCER) No.3
b) Bridge Wings
c) Quarter Deck
d) Operations Room
e) Bridge

2.2 Each mount will have a dedicated operator console.

2.3 The installation of the four NRWS mounts will be at the locations outlined in Table 1.

2.4 The installation of the four NRWS operator consoles will be at the locations outlined in Table 1.

Table 1: NRWS System Component Locations

NRWS System Component	Quantity	Location
Mounts	2	Bridge Wings
	2	Quarter Deck
Operator Consoles	4	FCER No.3

2.5 The installation of each NRWS System shall not cause any physical interference with existing ships weapons and sensors.

2.6 The installation of each NRWS System shall not cause any operational interference with existing ships weapons and sensors.

2.7 The installation of each NRWS System shall not cause any interference with flight operations.

3. DESCRIPTION OF HULL WORK REQUIRED

3.1 **Purpose**

3.1.1 This hull section of the installation guidance package identifies the locations for installation of the mounts and operator consoles that will have an impact on the hull of the Halifax Class Ships.

3.2 **Equipment/Materiel Removals**

3.2.1 All equipment/materiel removals will be performed by Canada.

3.2.2 FCER No.3 will be configured as per figure 1.

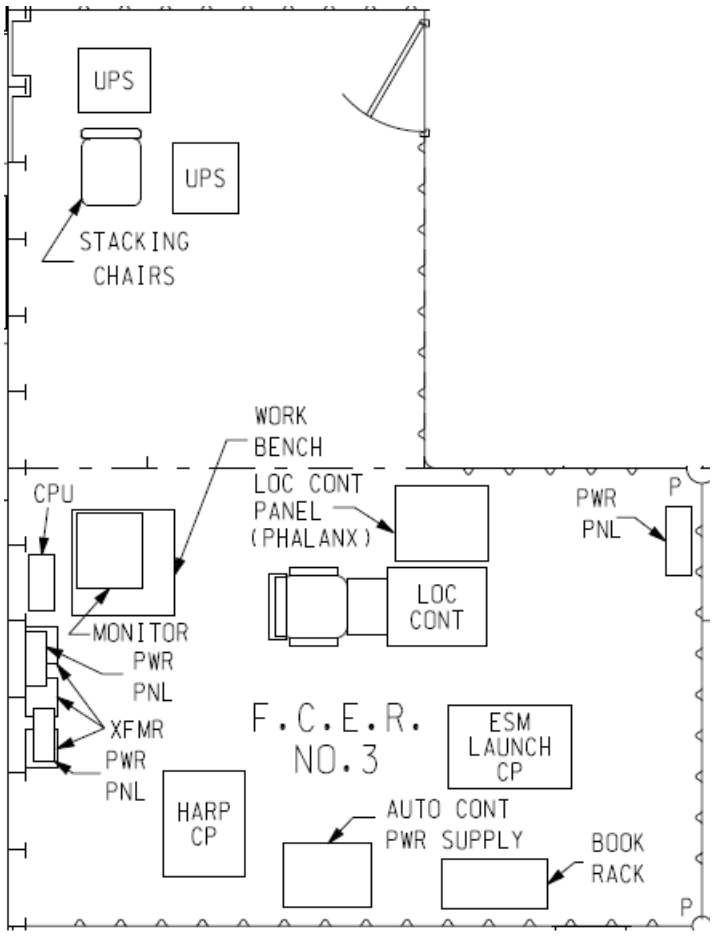

Figure 1: FCER No.3

3.3 Installations

3.3.1 All work in section 3.3 will be performed by the Contractor.

3.3.2 General Installation Procedures

3.3.2.1 All deck penetrations required for the routing of cabling between the mount and the operator consoles will be the responsibility of the Contractor.

3.3.3 FCER No.3 Room Installation Information

3.3.3.1 Four (4) NRWS Operator Consoles shall be installed in the 2.9 meters by 1.65 meters location as indicated in Figure 2. Sufficient space must be made for a passage way to the remainder of the compartment.

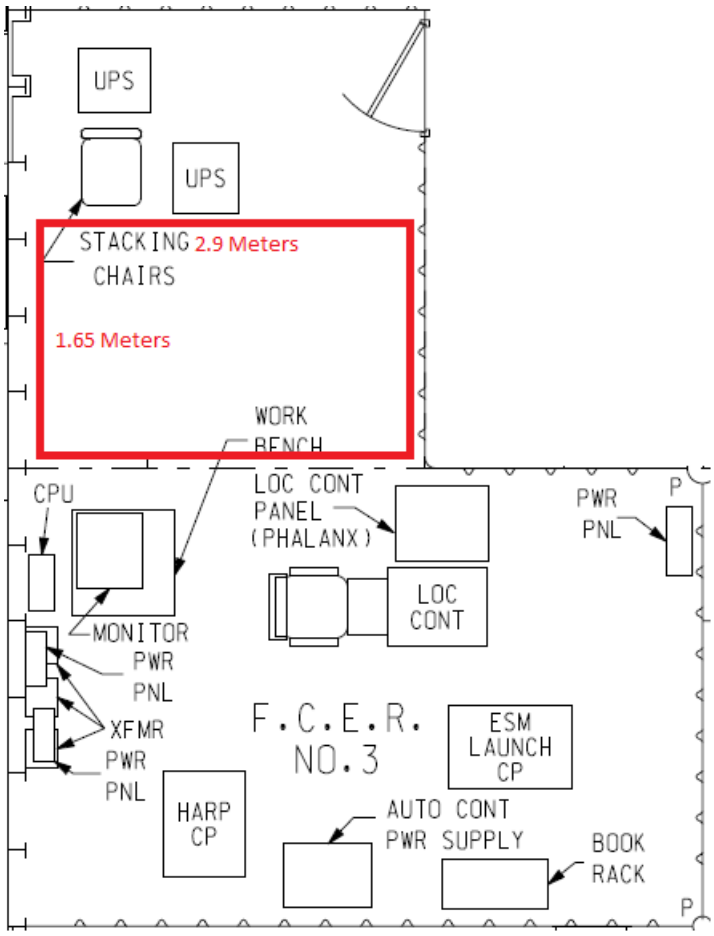

Figure 2: FCER No.3 Installation Location for Operator Consoles

3.3.4 **Operator Chairs**

3.3.4.1 All operator chairs will be provided by Canada.

3.3.4.2 The Contractor shall be responsible for the installation of each operator chair.

3.3.4.3 An operator chair shall be installed for each NRWS Operator Console within the FCER No.3 with the specified limits defined in Figure 2.

3.3.5 **Shipboard Internal Communication System**

3.3.5.1 Canada will install one Shipboard Internal Communication System (SHINCOM) next to each NRWS Operator Console.

3.3.6 **Navigation Distribution System**

3.3.6.1 In order to display true bearing on the NRWS System, it is anticipated a feed from the Navigation Distribution System (NDS) will be required.

3.3.6.2 The cable(s) will be provided by Canada.

3.3.6.3 The contractor shall be responsible for the installation of the cable(s) from the provided NDS feed to the required location for the NRWS System.

3.3.7 **Bridge Wing Mount Installation**

3.3.7.1 Canada will modify the existing Bridge Wing deck and bulwark and relocate existing equipment as per Technical Data Package (TDP) drawing number “HFX583 Sketch No.1”, sheets 6 and 7.

3.3.7.2 Canada will modify the Bridge Wing deck in order to include a base plate at deck height which will allow the contractor to install the NRWS mount.

3.3.7.3 The mounts shall be installed at the locations identified in TDP drawing number “HFX583 Sketch No.1”, sheet 3.

3.3.7.4 Installations of the NRWS mounts shall occur at both port and starboard locations of the Bridge Wings of the ship.

3.3.8 **Quarterdeck Mount Installation**

3.3.8.1 Canada will modify the existing Quarterdeck as per TDP drawing number “HFX583 Sketch No.1”, sheet 4.

3.3.8.2 Canada will modify the Quarterdeck in order to include a base plate at deck height which will allow the contractor to install the NRWS mount.

3.3.8.3 The mounts on the Quarterdeck shall be installed at the locations identified in TDP drawing number “HFX583 Sketch No.1”, sheet 2.

3.3.8.4 Installations of the NRWS mounts shall occur at both port and starboard locations of the Quarterdeck of the ship.

3.3.9 **NRWS Veto Functionality and NRWS Firing Circuit Interrupt**

3.3.9.1 Two veto switches are required for the NRWS System in the OPS room and two veto switches are required for the NRWS System in the Bridge. One switch for port NRWS mounts and one switch for starboard NRWS mounts.

3.3.9.2 Remote Switching Boxes which are operated by the veto switches will be installed in FCER No.3.

3.3.9.3 Canada will provide and install the veto switches, Remote Switching Boxes and associated cabling.

3.3.9.4 The Contractor shall provide and install the firing circuit interrupt cable(s) from each NRWS Operator Console up to the Remote Switching Boxes.

4. DESCRIPTION OF CABLE INSTALLATION WORK REQUIRED

4.1 **Relevant Documents**

4.1.1 MIL-STD-1310 Rev H (Navy): Shipboard Bonding, Grounding, and Other Techniques For Electromagnetic Compatibility, Electromagnetic Pulse (EMP) Mitigation, and Safety;

4.1.2 C-03-007-181/ME-001: Cable and Cable Termination Data for Shipboard Installation

4.2 **Purpose**

4.2.1 These instructions provide guidance on cabling routing from the NRWS mounts to the NRWS operator consoles.

4.3 **Installations**

4.3.1 **Cabling Installation**

4.3.1.1 The estimated cable lengths for the NRWS System components may be used to estimate the level of effort required for the installation of the cables for the NRWS System. The table below outlines components and component locations of anticipated cabling connections required.

Estimated Cable Length (meters)	From		To	
	Component	**Component Location**	**Component**	**Component Location**
125	NRWS Mount	Port Side Bridge Wing	NRWS Operator Console/ RSB	FCER No.3
125	NRWS Mount	Starboard Side Bridge Wing	NRWS Operator Console/ RSB	FCER No.3
75	NRWS Mount	Port Side Quarterdeck	NRWS Operator Console/ RSB	FCER No.3
75	NRWS Mount	Starboard Side Quarterdeck	NRWS Operator Console/ RSB	FCER No.3

4.3.2 **Power Cable Installations**

4.3.2.1 Power cabling shall be supplied and installed at each Mount from the nearest available power panel.

4.3.2.2 Power cabling shall be supplied and installed at each Operator Console from the nearest available power panel.

4.3.3 **Cable Routing**

4.3.3.1 Where possible, all cabling shall be installed on existing wireways, in accordance with the specifications listed in 4.1.1.

4.3.3.2 All indicated cable lengths are estimated. Actual lengths should be measured at ship prior to cutting.

4.3.4 **Cabling Requirements**

4.3.4.1 Cable terminations shall be in accordance with the specification listed in 4.1.2.

4.3.4.2 Bonding and grounding of electrical equipment and cabling shall be in accordance with the specification listed in 4.1.1.