CORRECTIONAL SERVICE CANADA

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Door Control System Replacement at Donnacona Institution (Structured Intervention Unit)

Statement of Technical Requirements

2022-03-15

Correctional Service Canada

Technical Services Branch – Electronic Security Systems

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STATEMENT
OF
TECHNICAL REQUIREMENTS

DOOR CONTROL SYSTEM
UPGRADE

at

DONNACONA INSTITUTION

STRUCTURED INTERVENTION UNIT (SIU)

AUTHORITY

This Statement of Technical Requirements is approved by the Correctional Service of Canada for the upgrade of the SIU DCS at Donnacona Institution.

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Document Revision History

#	Date	Author	Description
0			Initial draft document
2		Julien Goguen	Modify document to follow C25 builds
3	2022-03-15	Julien Goguen	Insert Removal of Cuff Mode to SOW

Table of Contents

ABBREVIATIONS

The following abbreviations are used in this document:

ACS	Access Control System
ATP	Acceptance Test Plan
CER	Common Equipment Room
CCD	Call Cancellation Device
COD	Call Originating Device
CSC	Correctional Service Canada
CSA	Canadian Standards Association
DA	Design Authority
DCS	Door Control System
ESS	Electronic Security System
FAAS	Facility Alarm and Annunciation System
FDR	Final Design Report
FIU	FAAS Integration Unit
GFE	Government Furnished Equipment
ICCS	Inmate Cell Call System
IP	Internet Protocol
MCCP	Main Communication Control Post
OPT	Operability Performance Test
PACP	Primary Annunciation and Control Panel
PDR	Preliminary Design Report
PIDS	Perimeter Intrusion Detection System
PIU	PIDS Integration Unit
PoE	Power over Ethernet
RFID	Radio Frequency Identification
RTO	Regional Technical & Electronics Officer
RU	Rack Units (1RU = 1.75”)
SAT	Site Acceptance Test
SEG	Segregation
SIO	Security & Intelligence Officer
SIU	Structured Intervention Unit
SOW	Statement of Work
STR	Statement of Technical Requirements
TA	Technical Authority
TER	Terminal Equipment Room
TtT	Train the Trainer
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair

LIST OF SUPPLIED REFERENCE DOCUMENTS

ES/SOW-0101 – (See Section 2.2 for details) – 31 pages
ES/SOW-0102 – (See Section 2.2 for details) – 31 pages
ES/SOW-0110 – (See Section 2.2 for details) – 44 pages
ES/SPEC-0006 – (See Section 2.2 for details) – 32 pages
ES/SPEC-0008 – (See Section 2.2 for details) – 15 pages
ES/SPEC-0950 – (See Section 2.2 for details) – 37 pages
Appendix F – Safety Regulations for Security Electronics Contractors – 2 pages
Appendix G – Sample ATP – 1 Excel Document
Appendix H – Handover Report – 2 pages

The following documents will be available to bidders upon request:

“Annexe A” – Existing DCS As-Builts (French only) – 76 pages
“Annexe B” – Screen Shots of Existing Donnacona SIU GUI (French only) – 8 pages
“Annexe E” – Donnacona Site Plan & Bldg I Floor Plans (French only)– 5 pages

The following documents will be provided to the successful bidder:

“Annexe C” – Donnacona SIU DCS Operation & Maintenance Manual R6 (French only) – 177 pages
“Annexe D” – Donnacona SIU Cell Call Operation & Maintenance Manual (French only) – 43 pages
Appendix I – CSC Technical Criteria for Correctional Institutions – 373 pages
“Annexe J” – Existing Programming Logic (French only) – 2508 pages

DEFINITIONS

The following definitions are used throughout this document:

Design Authority:	Director, Electronic Security Systems, Correctional Service Canada (CSC)
Contract Authority:	Public Works & Government Services Canada
Technical Authority	Chief Electronics Systems Maintenance, CSC – Quebec Region
Contractor:	The Company selected as the successful bidder on the contract.

1. INTRODUCTION

1.1 General

The Correctional Service of Canada (CSC) has a requirement to upgrade the Door Control System (DCS) in the Structured Intervention Unit (SIU) at Donnacona Institution in Donnacona, Quebec. The SIU building was originally equipped with an Electronic Security System (ESS) that integrated several security subsystems including: intercom, public address, inmate cell call, guard tour, light/receptacle control, and door control. Over time, the ESS performance has degraded, and several integrated subsystems have been detached and reconfigured as standalone systems or integrated into other building systems. The existing SIU DCS uses Schneider Modicon PLC hardware to collect and distribute IO. This PLC hardware is shared with the SIU ICCS which operates using dedicated touchscreen panel PC's running Honeywell EBI HMI software in the SIU control post. Figure 1 depicts the existing architecture.

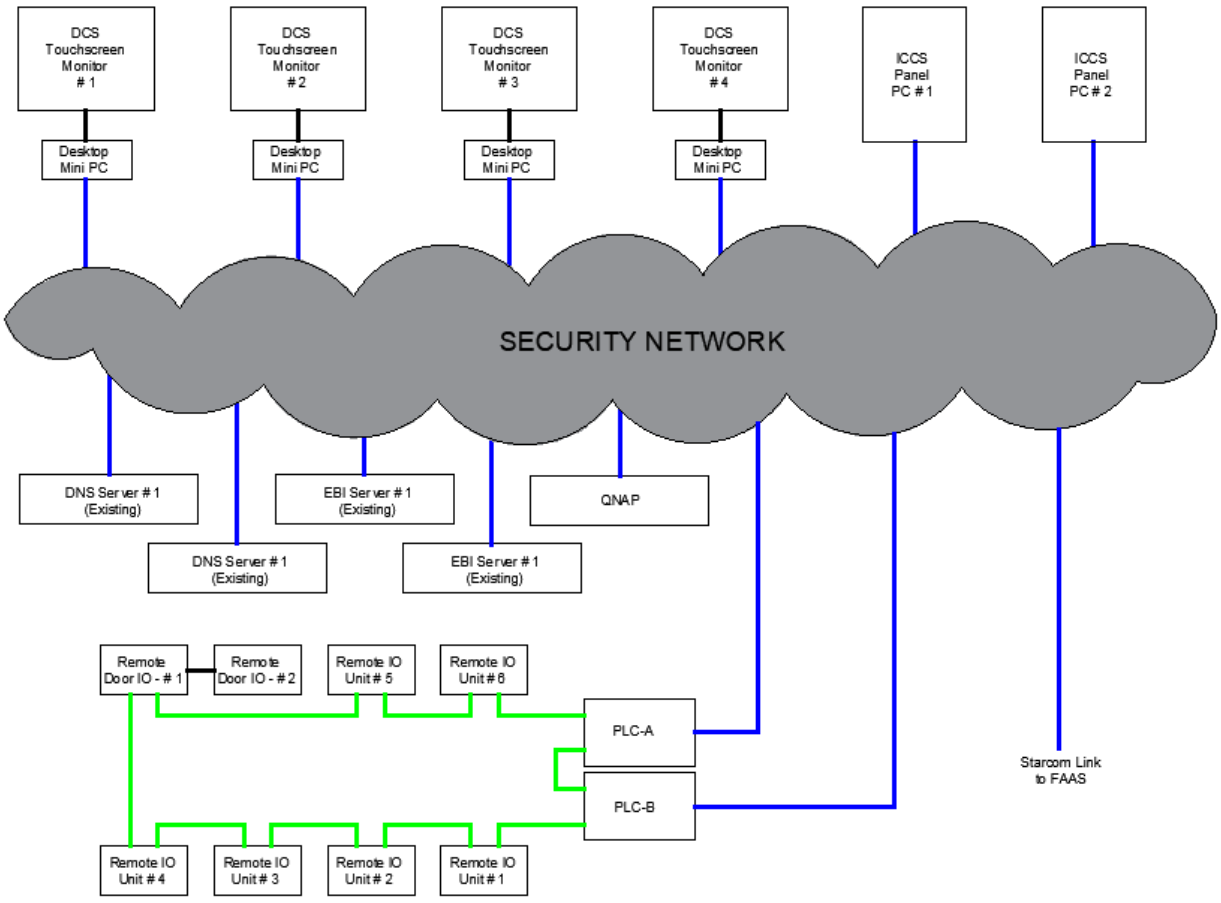


Figure 1: Existing Donnacona SIU DCS/ICCS Architecture

1.2 Scope

The contractor must supply, install, test, and provide operational and maintenance training on an upgraded DCS as described in this STR. The contractor must provide acceptable documentation for the operation and the maintenance of the new system.

The contractor must also completely remove all Cuff Mode functionality for the cell doors as it poses a security risk. Some modifications were done to the existing DCS in the past to eliminate Cuff Mode from the HMI and PLC programming, but hardware that should have been removed/modified was left in place. CSC does not have a set of As-Built drawings for the modifications that were done to eliminate Cuff Mode, the contractor must do a full investigation as part of the design and provide shop drawings as part of the Design submissions.

In addition, the contractor must retain and modify a portion of the existing Modicon PLC hardware for continued integration with a standalone Inmate Cell Call System (ICCS) using the existing Honeywell EBI HMI software.

1.3 Requirements

The purpose of this STR is to define the technical aspects and describe specific work requirements for the upgrade/modification of the DCS/ICCS in the SIU at Donnacona Institution. This STR will indicate the extent to which both general and specific CSC specifications are applicable to the implementation of this requirement.

1.4 Technical Acceptability

The CSC operational environment is unique for its diversity of locations, climate exposures and the physical restrictive construction techniques of correctional institutions. Maintaining national security, the safety of staff and offenders alike is CSC's commitment to the government and public. Electronic security systems operating in this unique environment must maintain very high standards of dependability and reliability.

The CSC Electronic Security Systems Division has established Statements of Work (SOW), technical specifications and standards for electronic security systems, which are based on very specific, and restrictive operational performance criteria. Technical acceptability of these systems means that the systems equipment and components comply with the pertinent CSC SOWs, specifications and standards.

2. APPLICABLE DOCUMENTS

2.1 Applicability

The provisions contained in the documents listed in the following paragraphs must apply to all aspects of this requirement, unless these provisions have been exempted or modified by this STR.

2.2 Applicable ESS Statements of Work, Specifications, and Standards

A. ES/SOW-0101 Statement of Work – Procurement and Installation of Electronic Security Systems

B. ES/SOW-0102 Statement of Work – Quality Control for Procurement and Installation of Electronic Security Systems

C. ES/SOW-0110 Statement of Work – Structured Cable Systems for Electronic Security Systems

D. ES/SPEC-0006 Specification – Conduit, Space and Power Requirements for Security Systems for use in Federal Correctional Institutions

E. ES/SPEC-0008 Specification - Programmable Logic Controllers (PLC)

F. ES/SPEC-0950 Specification – Door Control and Monitoring System for use in Federal Correctional Institutions

G. CAN/CSA-E61131-2-06 – Programmable Logic Controllers Part 2: Equipment Requirements and Tests

H. EIA-310-E – Electronic Industry Association Standard for Racks, Panels and Associated Equipment

I. ANSI/TIA-606-C – Labelling Standard for Telecommunications Infrastructure

2.3 Language

The language at the Donnacona Institution is French. All ICCS/DCS control and display indicators and information must be in French only. The operator manuals, maintenance manuals and as-built documents must be provided per the language provisions noted in Section 5 of this STR. Documentation must be provided as per Section 5 of this statement of technical requirements.

3. OPERATIONAL CRITERIA

3.1 General

The operational parameters of the ICCS and DCS must meet the performance and operational requirements detailed in this STR and the referenced CSC Electronics Engineering SOWs, STDs, and SPECs.

The Contractor must:

1. Carry out a detailed investigation, including a review and analysis of the entire existing door control and monitoring system, including all components that are not being replaced under this contract. CSC does not have a complete up to date set of As-Built drawings of the existing DCS, the contractor must perform a full survey of the existing installation to gather information for their design.
2. Review the CSC Statements of Work, Specifications and Standards listed in Section 2.2 and documents related to requirements for Door Control and Monitoring Systems, and incorporation of them into the system design and implementation.
3. Ensure that the System Development consists of Preliminary Design (33%), Intermediate Design (66%) and Final Design (100%) submissions. Design materials must be submitted to the Design Authority for review at each stage of design.
4. Contractor to follow the Theory of Operation of the existing DCS on site while designing the Theory of Operations for the new DCS, and raise any discrepancies between the documentation and existing logic to CSC ESS for review and approval at the design review stage if sequences are to be modified.
5. Theory of Operations, programming logic & GUI for the new DCS are not to include a “Cuff Mode” functionality for cell doors. Software and some hardware modifications have already been done on the existing DCS to eliminate the “Cuff Mode” from the GUI, however additional physical modifications to the door lock hardware need to be done which will lead to additional field wiring and PLC program logic modifications.
6. Design submissions must contain at minimum the following required drawings but not limited to:
    - Cover Page and Drawing List
    - Electrical Symbol Legend
    - Key Site Plan (aka Location Plan)
    - Floor Plans (existing system) / Demolition Plans
    - Floor Plans (New) [showing equipment, cabinets, racks, conduit runs, junction boxes, wiring, elevations]
    - Schematics/Riser Diagrams/Wiring Diagrams
    - Rack Layouts
    - PLC Cabinet Layouts, PLC cabinets power distribution,

- PLC Input/Output diagrams, Field Devices wiring diagrams
- Shop Drawings

7. Each design submission must contain a full set of screen shots of each graphic map (page) of the DCS GUI, in order for CSC ESS to review with Security Operations and obtain approval prior to implementation.

Familiarization with Site:

1. No allowance shall be made subsequently in this regard on account of error or negligence to properly observe and determine the conditions that will apply.

3.2 System Specifics

This project will see the existing ICCS modified to operate as a standalone system totally independent of the SIU DCS. The existing touchscreen panel PCs, field devices, wiring, and I/O hardware will be retained as part of the modifications.

This project will see the existing DCS replaced with a new headend consisting of a PLC assembly and a new HMI (Rackmount Servers + existing Touchscreens). The existing DCS field enclosures, field devices, and I/O cabling will not be replaced as part of this project. The Donnacona SIU DCS HMI is also used for light control as well as inmate receptacle control.

The project will see the complete removal of all Cuff Mode functionality from the ninety-six (96) cell doors. Physical modifications will be made to the door and lock hardware which will impact field wiring, PLC programming logic, software and will need to be taken into account when designing the new DCS. Detention door hardware modifications must be carried out by qualified and trained trades people regularly engaged in the installation, repair and/or maintenance of electro-pneumatic detention hardware, henceforth references as ``Lock Technician(s)``

4. TECHNICAL REQUIREMENTS

4.1 Existing Systems

4.1.1 Door Control System (DCS)

The existing SIU DCS utilizes Honeywell EBI HMI software and Schneider Modicon PLC hardware for integrating field IO. Four (4) HP mini-PCs along with four (4) Elographics 21.5” capacitive touchscreens are installed in the SIU control post to provide control and display of the DCS. In addition, unit light controls, inmate receptacle controls, and various facility alarms are integrated into the DCS HMI displays. The SIU Guard Tour is not integrated into the DCS HMI, it operates autonomously on Technical Services’ EBI server with no connection to the ESS secure network.

The existing PLC assembly consists of two backplanes each equipped with a CPU (Figure 1 - PLC-A and PLC-B), two local IO backplanes (Figure 1 – Remote Door IO #’s 1 and 2), and six remote IO backplanes (Figure 1 – Remote IO #’s 1 to 6) installed in field enclosures located in the gallery hallway. The two CPU backplanes and the remote backplanes are connected in a Modbus IP ring topology as shown in Figure 1.

4.1.1.1 Room I2-172 (SIU TER)

The headend equipment for the existing SIU electronic security systems is located on the upper level in the SIU Terminal Equipment Room (TER). Figure 2 represents the location of the two main PLC cabinets and the floor model cabinets used to mount the SIU DCS / ICCS servers and switches.

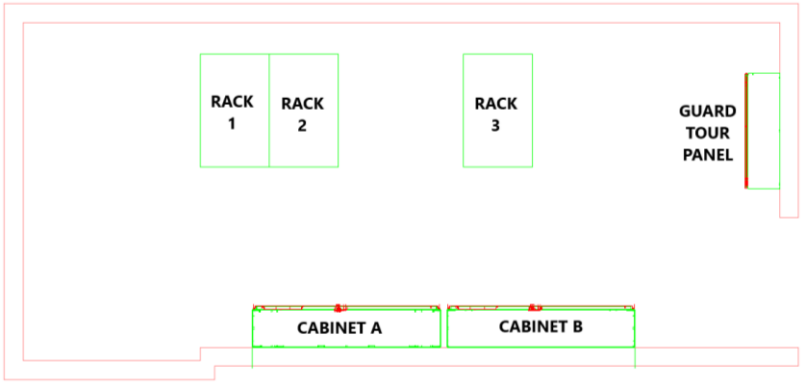


Figure 2: SIU TER Floor Plan

Switches, servers (2 x DNS Server and 2 x Honeywell EBI Server), and patch panels related to the existing DCS/ICCS are installed in rack #'s 2 and 3.

The layouts for wall mounted cabinets A and B enclosures are illustrated in Figure 3.

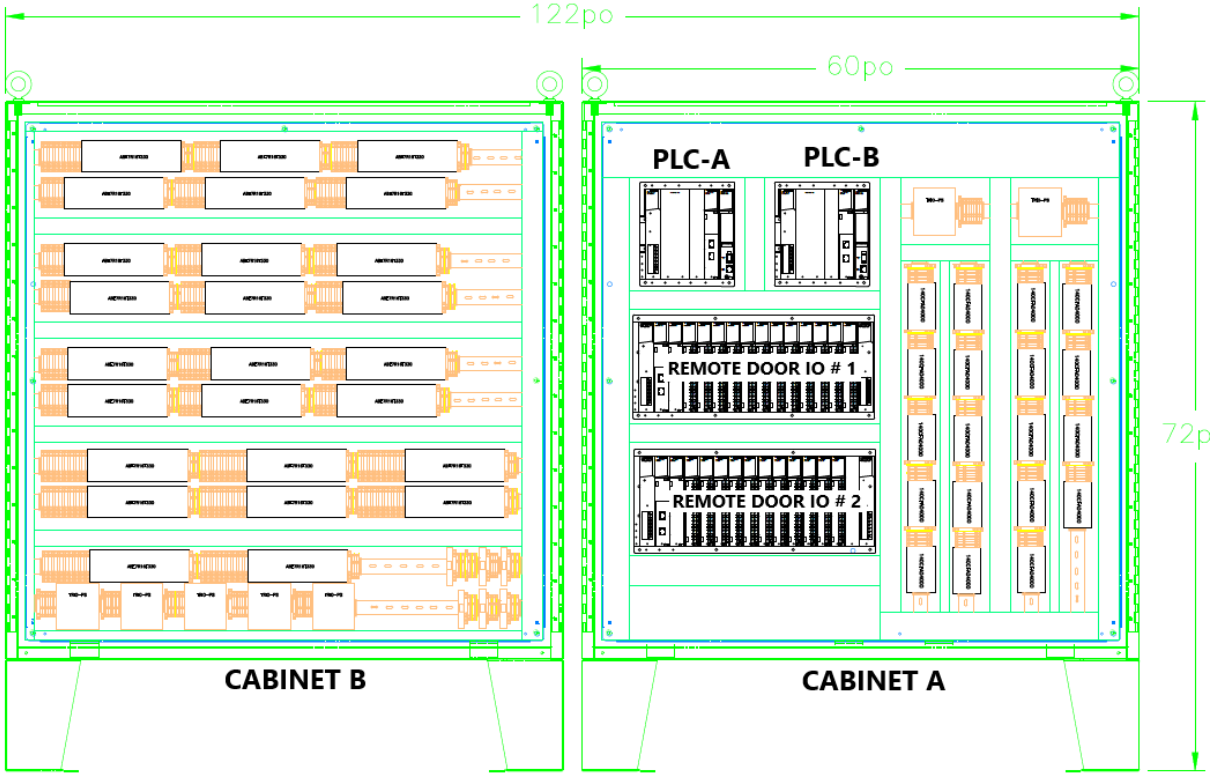


Figure 3: DCS / ICCS PLC Cabinets in I2-172 TER

Cabinet A contains two 6-slot Modicon CPU units (referred to as PLC-A and PLC-B) and two populated 16-slot backplanes connected via an expansion module (referred to as Remote Door IO # 1 and Remote Door IO # 2 in Figure 1). This cabinet also includes external power supplies, power distribution blocks, and field input terminal blocks. All DCS and ICCS inputs are terminated on Modicon 140CFA0400 terminal blocks which are in turn connected to their associated PLC input module using Modicon cable assemblies.

The following Modicon IO modules are used to capture/distribute IO related to the DCS:

Cabinet A - Remote Door IO # 1 Backplane (16 Slots)

- Slots 3 to 13 (11 of Modicon 140ACI0400, 16-Channel Analog Input Modules)

Cabinet A - Remote Door IO # 2 Backplane (16 Slots)

- Slot 7 (1 of Modicon 140DDI35300, 32-Channel Digital Input Module)
- Slots 8 to 10 (3 of Modicon 140DDO36400, 96-Channel Digital Output Modules)
- Slot 12 (1 of Modicon 140DDO36400, 96-Channel Digital Output Module)

Cabinet B contains external power supplies, power distribution terminal strips, and field device termination blocks. DCS / ICCS field output wires are connected into the system via Modicon ABE7R164000 16-Channel relay blocks. The relay blocks are then connected to their associated PLC output module using Modicon cable assemblies.

Remote IO Unit #'s 1 to 6 are installed in field enclosures (C11, C13, C15, C17, C19, and C21) distributed in the gallery hallways. The primary purpose of these panels is to provide light and receptacle control. Figure 4 details the locations of these enclosures. Each of these remote backplanes is equipped with a Modicon Remote IO Modbus module, redundant power supplies, and one or more IO modules).

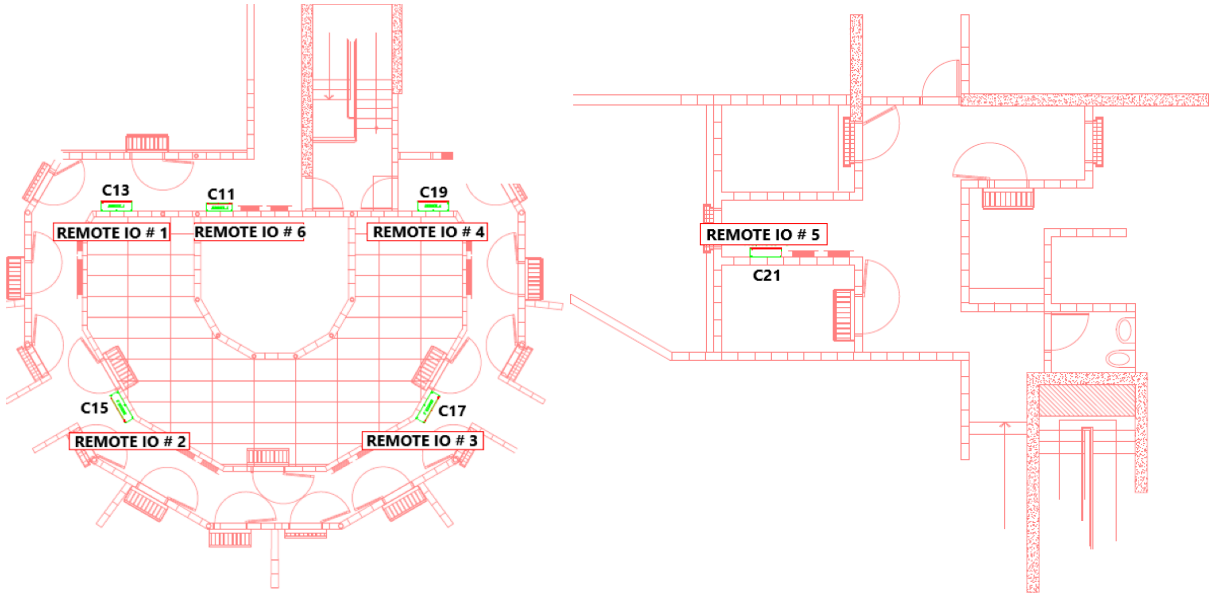


Figure 4: Gallery PLC Remote IO Cabinet Locations

Cabinet C13 - Remote IO Unit # 1 Backplane (10 Slots)

- Slots 3 to 5 (3 of Modicon 140DDI35300, 32-Channel Digital Input Modules)
- Slots 6 and 7 (2 of Modicon 140DDO36400, 96-Channel Digital Output Modules)

Cabinet C15 - Remote IO Unit # 2 Backplane (10 Slots)

- Slots 3 to 5 (3 of Modicon 140DDI35300, 32-Channel Digital Input Modules)
- Slots 6 and 7 (2 of Modicon 140DDO36400, 96-Channel Digital Output Modules)

Cabinet C17 - Remote IO Unit # 3 Backplane (10 Slots)

- Slots 3 to 5 (3 of Modicon 140DDI35300, 32-Channel Digital Input Modules)
- Slots 6 and 7 (2 of Modicon 140DDO36400, 96-Channel Digital Output Modules)

Cabinet C19 - Remote IO Unit # 4 Backplane (10 Slots)

- Slots 3 to 5 (3 of Modicon 140DDI35300, 32-Channel Digital Input Modules)
- Slots 6 and 7 (2 of Modicon 140DDO36400, 96-Channel Digital Output Modules)

Cabinet C21 - Remote IO Unit # 5 Backplane (6 Slots)

- Slot 3 (1 of Modicon 140DDI35300, 32-Channel Digital Input Module)
- Slot 4 (1 of Modicon 140DDO36400, 96-Channel Digital Output Module)

Cabinet C11 - Remote IO Unit # 6 Backplane (6 Slots)

- Slot 3 (1 of Modicon 140DDI35300, 32-Channel Digital Input Module)
- Slot 4 (1 of Modicon 140DDO36400, 96-Channel Digital Output Module)

4.1.2 Inmate Cell Call System (ICCS)

The existing SIU ICCS utilizes Honeywell EBI HMI software and shares the Modicon PLC hardware with the DCS. Two touchscreen panel PC's are installed in the SIU control post to provide control and display of the ICCS. The IO associated with the ICCS Call Originating Devices (CODs) and Call Cancellation Devices (CCDs) are collected/distributed using analog input modules and digital output modules installed in the PLC backplanes labelled "Remote Door IO # 1 and 2" as illustrated in Figure 1.

The following Modicon IO modules are used to capture/distribute IO related to the ICCS:

Remote Door IO # 1 Backplane (16 Slots)

- Slot 14 (1 of Modicon 140ACI0400, 16-Channel Analog Input Module)

Remote Door IO # 2 Backplane (16 Slots)

- Slots 2 to 6 (5 of Modicon 140ACI0400, 16-Channel Analog Input Modules)
- Slot 11 (1 of Modicon 140DDO36400, 96-Channel Digital Output Module)

4.2 Existing System Removal

The contractor must remove all redundant cables and equipment associated with the existing SIU ICCS and DCS. Care must be taken to ensure that any cables and conduits of other systems are not damaged. The contractor must remove all existing Schneider Modicon PLC backplanes and modules installed in the eight (8) existing PLC cabinets. Select components of the existing Modicon PLC hardware will be relocated and reconnected to provide the IO collection/distribution required by the ICCS (refer to Section 4.8 of this STR for details). All electronic equipment not being redeployed must be handed over to CSC in good condition. The contractor must dispose of the removed cables and conduit off site in an environmentally friendly way.

The contractor must provide, to the Project Technical Authority, a list of all equipment to be removed 2 weeks **prior** to any equipment removal. This list must contain the following information as a minimum; location, make, model and serial number. The contractor must return all removed equipment to the local ADGA electronic maintenance workshop, where it will be inventoried and tagged for disposal. This information will be used to ensure the removal of the equipment from the maintenance contract, and its proper disposal.

4.2.1 Removal of Cuff Mode functionality for cell doors

A previous project was done to remove Cuff Mode from multiple Maximum Security Direct Observation Living Units in other regions. The solution that was implemented in that project is the solution described in this STR. The contractor must evaluate the existing Cuff Mode hardware installation and raise any discrepancies between the corrective actions described in the STR and the existing conditions, if any. The contractor must ensure the new DCS is not capable of performing Cuff Mode operations on the cell doors.

The contractor should investigate, through conversations with a qualified professional from the door manufacturers, how to eliminate the cuff mode switches, taking into account: the door performance, maintenance, project schedule, cost and the institution's operational requirements. In addition, the contractor shall take into consideration the possible removal of the pin drop from the door (for the notch), if necessary.

Based on feedback from qualified installers, the Contractor may recommend alternative strategies for CSC review.

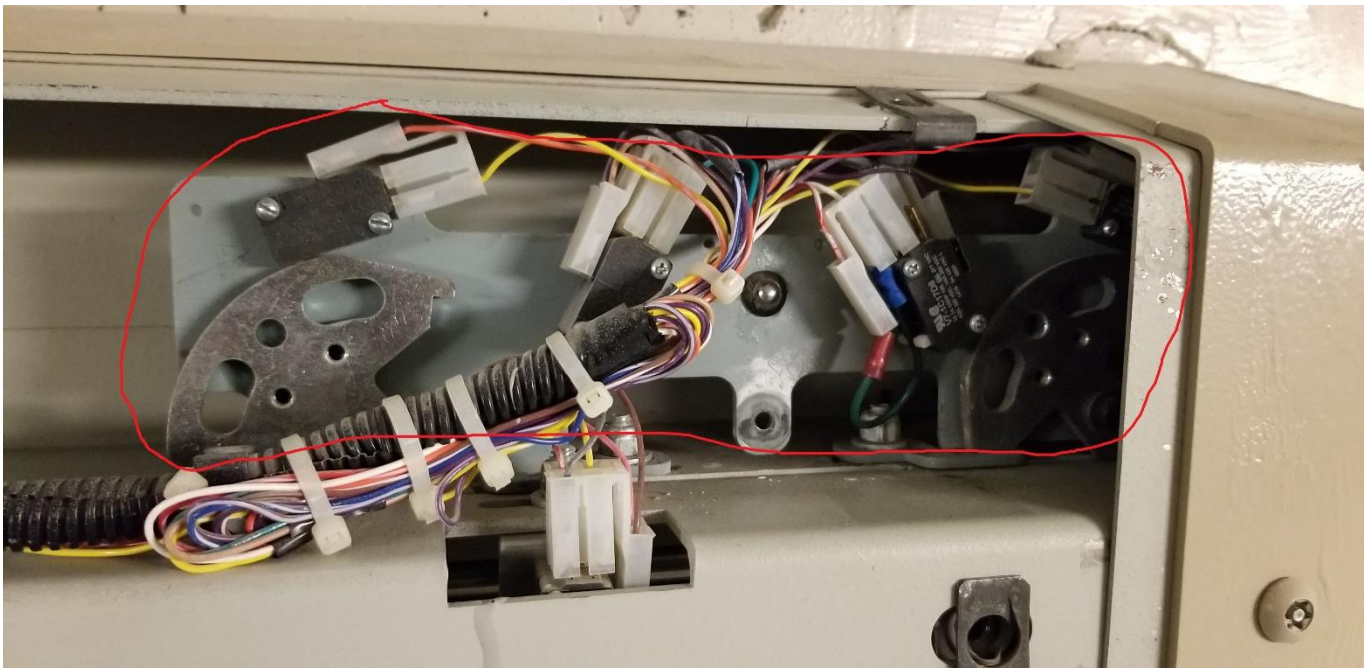
Based on prior experience, CSC's initial recommendations for the mechanical and electrical elements of the work are:

4.2.1.1 Door Lock Modifications

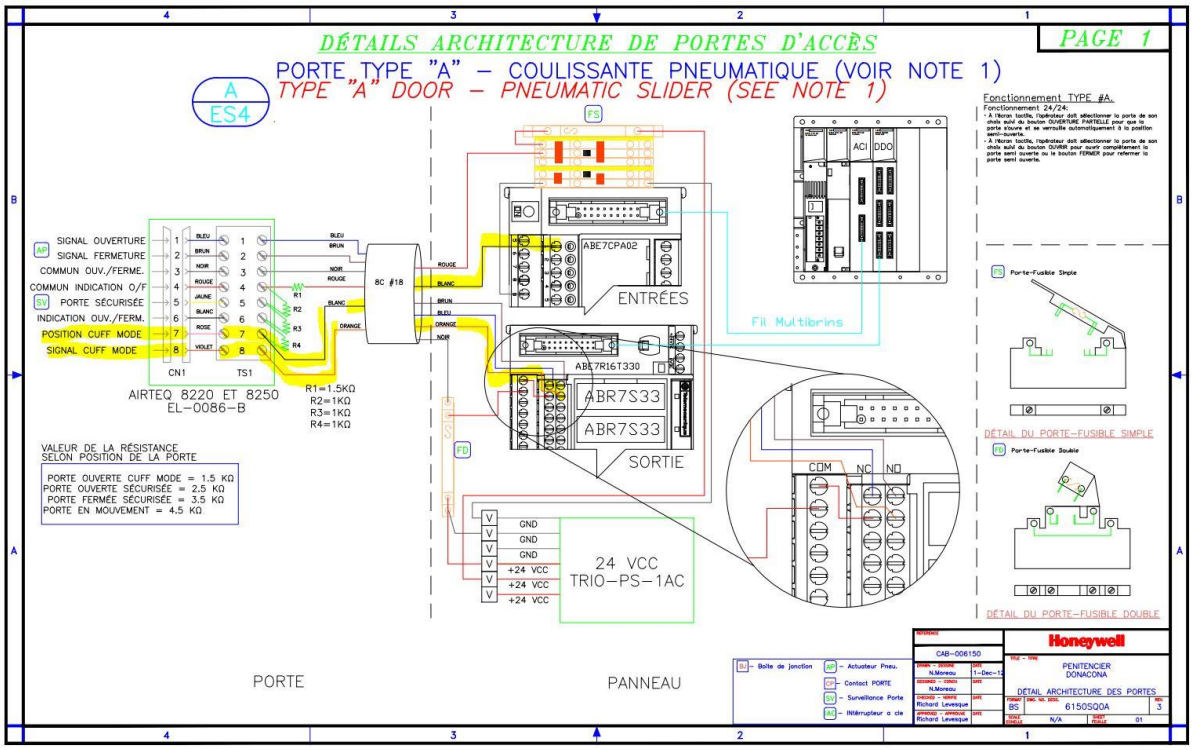
The following changes will be carried out by the Contractor and the Lock Technician(s) at each Cell Door:

- Patch the notch from the cell side. Fabricate, weld and prime metal to fill in cuff-mode notch in bottom of door that lock bar drops into. This is to achieve a continuous rail configuration and strength as though the notch were never there. Smooth and paint to match existing door finish and color.

- Remove cuff mode cams (3) and micro switches (6) assembly from lock. Cut back and insulate any wiring associated with these switches and leave it securely fastened so that it does not interfere with any mechanical or electrical assemblies at or around the door frame.



- Splice lock bar power wire that passed through one of the removed micro switches.
- Remove cuff mode PLC field wires from lock terminal strip (white and orange, terminal strip positions 7 and 8). The following figure shows the anticipated wiring to be changed.



4.2.1.2 Manual Door Stops

Manual door stops replace the cuff mode functionality. The door stop allows the door to be opened at a fixed distance and enable viewing into the cell. The institution already has these door stops fabricated.

4.3 System Installation

4.3.1 General

The contractor must provide, install, and test a complete and fully functional upgraded ICCS/DCS in the Donnacona SIU. The provided system must meet or exceed all the performance and operational requirements contained in the SOW's, specifications and standards listed in Section 2.2. Where there is a conflict between a published specification and this STR; this STR will be the document of reference.

The contractor must avoid, as much as possible, the use of conduit in inmate accessible areas. The contractor must utilize existing pipe chases, existing conduit in the walls, etc., where possible. New lengths of conduit must be of the minimum necessary length. All newly installed conduits for this project must be identified, except in inmate accessible areas, by prominent labels with **BRIGHT GREEN** wording. The contractor must use only rigid threaded conduit in inmate accessible areas. These labels must be located at each end of the conduit run, on both sides of any penetration of a wall, and at 3.5 metre intervals along its length. All junction box covers and conduit joints must be painted bright green except where installed in inmate accessible areas.

The use of flex conduit will only be permitted by written authorisation from the project technical authority on a case-by-case basis; the use of flex conduit is not permitted in inmate accessible areas.

ALL visible CAT6 RJ 45 plugs must be **BRIGHT GREEN**. When fishing cable into a wall the contractor may use flex conduit. Where it is impossible to fish the cable into a hollow wall or the wall is solid (e.g. cinderblock) the contractor may use a decorative wire mold to run the necessary cables to the defined location of the equipment with written permission from the project authority. Wire mold must meet the Canadian Electrical Code when supporting power.

All category 6 Ethernet data cables and data jumper cables (minimum 23 gauge), jacks and connector boots installed as part of this project, must be **BRIGHT GREEN** in colour. All cables must be FT4 rated except where cable in not protected in a conduit or in a plenum ceiling, such cable must meet a FT6 fire rating. All Fibre optic cabling and fibre optic patch cords must be labeled at both ends.

All cabling in equipment cabinets, termination trays, cable trays, junction boxes, and at edge devices must be neatly dressed using Velcro style "hook and loop" re-useable straps. Cable straps must encircle all the cables in a given bundle. Any cable secured with a tie-wrap will require replacement of the entire cable.

All cabling in equipment cabinets must be dressed throughout the cabinet. Cables entering a cabinet from the top must be routed to the base of the cabinet and then return to the designated equipment height, the reverse for cables entering the bottom. Vertical cable runs in the cabinet must be in the side panel areas of the cabinet. Vertical cable runs must be strapped every 12 inches. Cable straps must encircle all the cables in a given bundle. Vertical cable bundles must route from the cable riser across the width of the equipment cabinet and loop back to the termination point on the patch panel. This will provide enough slack to permit any patch panel to be removed, reversed and re-punched.

An installed cable is any cable that is run through a conduit, run from one area in a building to another area, any cable that travels further than the adjacent equipment cabinet in a series of cabinets. Note: Equipment cabinets must be abutting without side panels to open connection to be considered adjacent.

All category 6 structured cabling must be punched onto a high density CAT6 patch field or panel or a CAT6 keystone jack in a single gang box. RJ45 connectors will not be permitted as terminations for CAT6 structured cabling, except where the CAT6 cable is supporting an IP field device or the termination is specifically authorised

by the project authority in writing. Where CAT6 structured cable is terminated with an RJ45 connector, the connector must be rated specifically for a CAT6 connection directly to a CAT6 premise cable (solid conductor) and the RJ45 jack must be shielded.

Figure #'s 5 and 6 detail the new SIU DCS and ICCS architectures respectively.

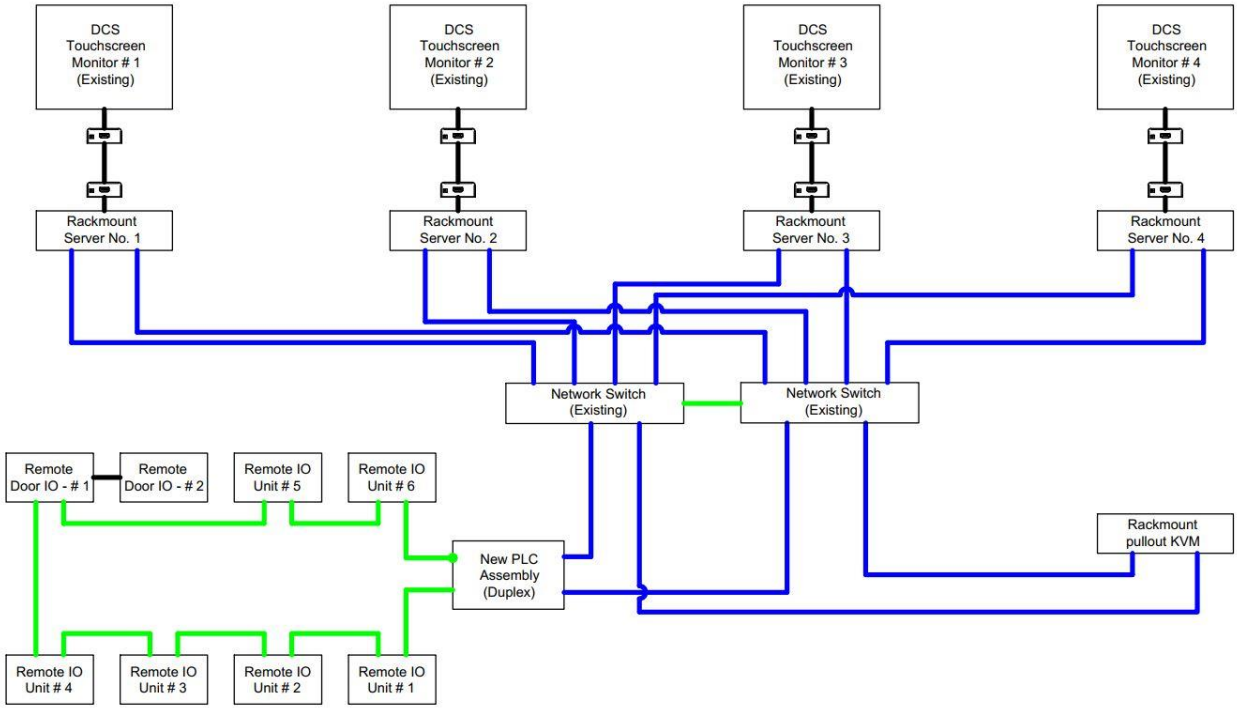


Figure 5: New SIU DCS Architecture

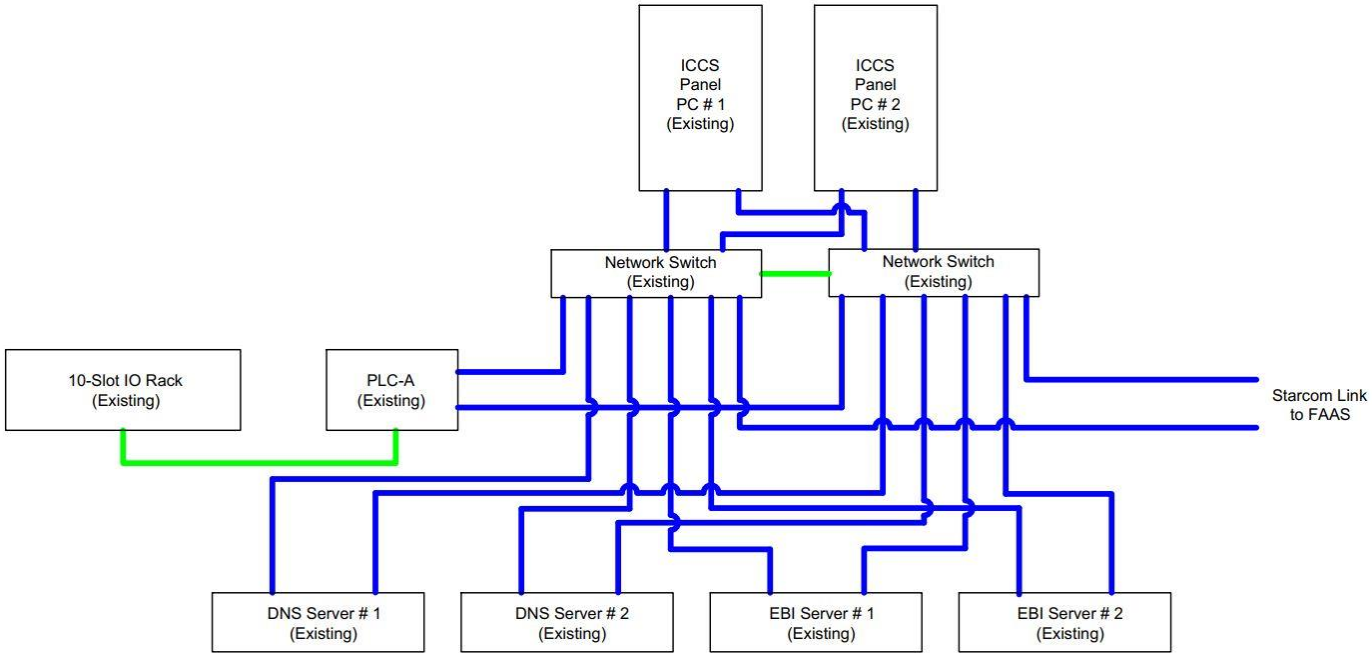


Figure 6: New (Modified) SIU ICCS Architecture

The following sections outline the system physical installation and integration requirements.

4.4 Equipment Cabinets

The contractor must retain and reuse each of the existing eight (8) wall mounted PLC cabinets including the six installed in the gallery hallway and the two installed in the upstairs TER. As detailed in this STR, the contractor must reorganize the existing enclosures to accommodate all new equipment and wiring terminals necessary to provide a fully functional and compliant system. Also accommodate any modifications in the PLC cabinets to isolate the wiring as needed to remove Cuff mode functionality from the doors as described in section 4.2.1 of this STR.

If adequate room is not available to reorganize the existing enclosures in the TER to accommodate all new equipment and wiring terminals necessary to provide a fully functional and compliant system, the contractor may supply and install one (1) new wall mounted PLC cabinet to house the ICCS PLC Assembly in the TER.

The contractor must also provide additional features to the existing eight (8) wall mounted PLC cabinets (and one (1) potential new wall mounted PLC cabinet). Each cabinet must respect the following parameters:

- automatic lighting when opening the cabinet must be cold white LED, 5000k.
- all of the components must be clearly identified.
- a laminated plan of the equipment distribution and connectivity must be provided above the cabinet opening.
- a laminated sequences plan must be inside the cabinet.

4.5 Uninterruptible Power Supply (UPS)

The contractor must retain and reuse the existing UPS unit installed in the SIU TER. Existing equipment and maintenance receptacles located in the existing equipment cabinets must be retained.

4.6 Network

4.6.1 Network Cable

To the maximum extent possible, the contractor must reuse existing cable (Modbus IP and Ethernet) to provide a fully functional and compliant system.

In the event that the reorganization of any existing field enclosures results in a requirement to install new network cable, the contractor must test all new network cable using a CAT6 LAN Analyzer and provide detailed analysis and LANCAT readings for all cables.

- Wire map (Pass/Fail)
- Propagation Delay (Pass/Fail)
- Cable Length (Pass/Fail and Length)
- Insertion Loss (Pass/Fail and dB)
- Return Loss (Pass/Fail)
- NEXT (Pass/Fail)
- ELFEXT (Pass/Fail)

The contractor must supply and install all required patch panels, inserts, and patch cords necessary to provide a fully functional and compliant system.

4.6.2 Network Switches

The contractor must reuse the existing deployed switches to provide a fully functional and compliant system.

During the system design phase, the contractor is responsible for verifying the make and model of each of the existing switches and advising the Design Authority of any technical issues that prohibit the reusage of any existing switch.

4.7 DCS / ICCS Field Devices

The contractor must reuse all existing ICCS Call Originating and Call Cancellation Devices as well as their associated field cabling.

The contractor must reuse all DCS/ICCS termination blocks installed in the existing PLC enclosures.

The contractor must reuse all existing DCS limit switches and door lock hardware as well as their associated field cabling, with the exception of the components that are to be removed to eliminate Cuff Mode as described in section 4.2.1 of this STR.

4.8 ICCS PLC Assembly

The contractor must reuse a removed 10-slot backplane to accommodate the modules required to provide a modified PLC assembly for collecting/distributing ICCS related IO. To free up space in existing PLC Cabinet A, this 10-slot backplane will be installed and mounted in a new PLC cabinet in the TER. The contractor must modify the existing and removed hardware to provide the architecture detailed in Figure 6 of this STR. The contractor must reroute existing cabling located within the Cabinet B duct channels to accommodate the installation of the 10-slot backplane into the new cabinet.

The following existing PLC hardware must be reused to provide 96 I/O to support the existing ICCS field devices:

ICCS IO Backplane (10-Slot) consisting of the following modules:

Slot 1:	120VAC Power Supply Module
Slot 2:	CPU Module with Ethernet TCP/IP Port
Slot 3:	16-Channel Analog Input Module
Slot 4:	16-Channel Analog Input Module
Slot 5:	16-Channel Analog Input Module
Slot 6:	16-Channel Analog Input Module
Slot 7:	16-Channel Analog Input Module
Slot 8:	16-Channel Analog Input Module
Slot 9:	96-Channel Digital Output Module
Slot 10:	120VAC Power Supply Module

The contractor must reuse the existing Modicon IO field terminal blocks, external power supplies, and VDC distribution blocks to implement the required solution. The contractor must fabricate and install custom PLC IO cable assemblies to provide a connection between the existing Modicon terminal blocks and their associated PLC IO module.

The contractor must connect the Ethernet TCP/IP port available on the CPU module to available network switch ports.

The contractor must reconfigure the existing PLC configuration to reflect the new architecture.

The second existing Modicon CPU Module must be kept as a spare, with the ICCS programming pre-loaded, to be used as a replacement in the event that the primary ICCS PLC CPU should fail.

4.9 DCS PLC Assembly

The contractor must supply and install a new PLC assembly to meet the IO requirements associated with the DCS. The new PLC assembly must make use of the existing cable deployed to support a ring topology.

In the SIU TER (Room I2-172), the contractor must supply and install redundant PLC CPUs, redundant Ethernet modules, and redundant power supplies as part of the PLC assembly. The PLC CPU shall be of a make and model that has a USB or SIMCARD port for the loading of program logic should the programming get corrupted. On a failure of the primary PLC CPU the operator must be notified by an alarm that indicates the failure and what action is required. The system shall switch over to the secondary PLC CPU and continue to operate. The system shall remain operational on the backup unit even if the primary comes back on-line. Switching back to the primary shall only occur if the secondary fails or by manual command from the maintenance terminal.

The new PLC assembly must be installed on new backplanes at the locations of the removed backplanes in Cabinet A. If there is enough space available, install the redundant PLC CPUs, redundant Ethernet modules and redundant power supplies on a single duplex backplane.

At each of the six remote IO panels and the two TER PLC enclosures, the contractor must supply and install new PLC remote IO backplane(s) complete with redundant power supplies, all required IO modules, and a module to support ring communications. In each existing PLC IO panel, the contractor must reuse the existing external power supplies, power distribution blocks, and IO field termination blocks. The existing Modicon IO modules are equipped with modular connectors that connect to Schneider IO field terminal blocks using Schneider prefabricated cable assemblies. The contractor must fabricate and install new cable assemblies to connect the existing Schneider IO field termination blocks to the new PLC IO modules. The contractor must review the existing Modbus network cabling and advise the CSC Design Authority of any shortcomings during the system design phase.

The program logic in each new PLC shall take into account the modifications to remove Cuff Mode and must not contain any functions associated to Cuff Mode.

The contractor must provide a programming narrative for the new DCS PLC assembly during the design phase for CSC ESS to review and approve. The programming narrative must not contain any functions associated to Cuff mode. The programming narrative shall form part of the Preliminary, Intermediate and Final Design Reports.

4.10 ICCS HMI Touchscreen Panel PC's

The contractor must reuse the two (2) existing touchscreen panel PC's installed in the SIU control post. The contractor must use the existing Honeywell EBI servers, network switches, and ICCS touchscreen panel PC's to obtain the modified ICCS architecture detailed in Figure 6 of this STR.

4.11 DCS Servers & HMI Touchscreens

The contractor must reuse the four (4) existing Elographic touchscreens installed in the SIU control post. The contractor must supply and install four (4) new industrial grade servers in available rack space in the SIU TER, referred to as the DCS servers. The servers must be supplied in rackmount format (maximum of 2RU) and must meet or exceed the minimum specifications provided by the manufacturer of the DCS HMI software.

The contractor must provide HMI (video, touchscreen, and audio) extenders between the existing touchscreens located in the SIU Control Post and the new servers installed in the SIU TER.

Additional requirements related to the HMI extenders are as follows:

- The extender must support the maximum resolution provided by the touchscreen monitor.
- At the touchscreen, the extender device must be mounted via a bracket located on the rear of the touchscreen monitor. The provided bracket must hold the extension device securely.

- The provided bracket must include Velcro cable management straps to neatly dress all excess cable at the bracket.
- All provided extension devices must be immune to RF interference from VHF portable radios emitting up to 6 watts' energy at a distance of no less than 1 meter.

4.12 Door Control Pendant

The contractor must reuse the existing three-button door control pendants installed in the SIU Control Post, and must integrate them as part of the new DCS solution. The purpose of the door control pendants is to supplement the use of the DCS HMI Touchscreens to operate doors. The operators can either execute the command at the touchscreen, or use the button on the pendant to confirm the command. This allows the operator to maintain visual contact with the door instead of focusing their attention on the touchscreens.

4.13 Sequence of Operations for Doors

The contractor must familiarise themselves with each of the existing door types in the Donnacona SIU and understand the Sequence of Operations for each, as well as the door interlock requirements. The Sequence of Operations of Doors for the new SIU DCS shall be based on the existing sequences, with all Cuff Mode functionality eliminated. The contractor must provide Door Sequences of Operations for each door type during the design phase for CSC ESS to review and approve. The different types of doors in the Donnacona SIU are:

a) Range Sliding Doors
b) Range Swing Doors
c) Sliding Doors with SAS
d) Swing Doors with SAS
e) Exit Swing Doors
f) Sliding Doors Exterior Fence
g) Swing Doors Exterior Fence
h) Administrative Doors

Any number of cell doors; individually or in groups, up to a maximum number installed, shall be capable of operating in operator-issued groups without overloading the system.

4.14 DCS Configuration/Maintenance

In the SIU TER, configuring and maintaining the new SIU DCS can be done from any of the DCS Servers. The maintenance technicians must be able to take one of the DCS HMI Touschscreens in the control post offline; log in to the corresponding DCS Server in the TER; isolate that server so that they can make the required modifications without disturbing the other DCS Servers; test the modifications without disrupting the other DCS servers; take the DCS server out of isolation and push (distribute) the update to the other DCS servers; then put the control post DCS HMI Touchscreen back online. These servers must be equipped with a software application that will permit the configuration and management of the new SIU DCS as well as future ESS subsystems in the institution. See section 4.16.2 for more details on DCS HMI Software.

In the SIU TER, the DCS Servers must be connected to a common rackmount, pullout KVM unit shared with other ESS subsystems. Maintenance technicians must be able to log in to one of the DCS servers via pullout KVM unit and provide maintenance to the system without disrupting other servers. The contractor must verify the available port capacity and physical location of any existing KVM units in the SIU TER. If capacity is not available, the contractor must provide a new KVM unit.

4.15 Integration

The existing SIU ICCS is integrated into the Senstar 100 Version 6.22 FIU/PIU using serial Starcom. This integration is accomplished using a fibre link between the SIU and the CER. There is not a requirement to perform a S100 upgrade or to modify the existing S100 site creation data within this project. The contractor

must retain this integration as part of this project. The new DCS software must be capable of integrating into the existing PIDS/FAAS controllers as part of a future project.

4.16 ICCS/DCS HMI Software

4.16.1 ICCS HMI Software

The existing ICCS uses Honeywell EBI HMI software. The contractor must retain this software and all associated/required hardware required to ensure that it is fully functional. At the completion of this project, the ICCS and DCS must be configured as two independent systems.

4.16.2 DCS HMI Software

4.16.2.1 System Configuration/Design Application

The provided DCS HMI Software must include an application that allows electronic systems integrators, maintenance personnel, and trained CSC staff to create, edit, configure, and customize site-specific parameters and generate a Graphical User Interface (GUI). The System Configuration/Design Application must allow trained staff or integrators to configure and customize all parameters using, to the maximum extent possible, a drag-and-drop methodology.

4.16.2.2 Map Layouts

The System Configuration/Design Application must provide the integrator (and possibly eventually maintenance person, or CSC trained staff member, once fully trained on the software) with the capability to create interactive system or site-specific layouts by supporting the customization of the following interactive areas:

- An area for displaying the date/time using various option formats.
- A configurable area for a system legend button, specific to the map currently being viewed or the specific server being used.
- An area where the site name is displayed.
- An area where the current map title is displayed.
- A large area where the map is displayed.
- A navigation button to allow users to navigate between graphical maps.
- An alarm list box detailing current and most recent alarms and their status.
- A user selection area where buttons representing current actions available to the operator are available.
- An operator response text area that advises the operator of any operational response requirements associated with the current alarm.

4.16.2.3 Graphical Floor Plans

The System Configuration/Design Application must provide the integrator, maintenance personnel, or trained CSC staff member with the capability to create, edit, and customize graphical floor plans equipped with icons to represent field devices, control equipment, and systems. The following features must be included:

- The ability to import floor plans or images
- The ability to customize the area occupied by the graphical floor plan or image.
- The ability to customize the background colour of the map.
- The ability to associate a map specific legend.
- The ability to assign a different layout to specific monitors connected to a common server.
- The ability to place assets (with customizable properties) on the map. Customizable asset properties must include the following:
    - Size, location, and orientation of the asset on the map.

- The option to associate each asset with a caption including its font type, font size, font colour, background colour, touch area, location, and orientation.
- The option to assign a camera to the asset for call up or control in an alarm condition.

4.16.2.4 Graphical Design Tools

The System Configuration/Design Application must provide the integrator, maintenance person, or CSC trained staff member with the following graphical design tools:

- The ability to align graphics, functional areas, or assets (Top, Bottom, Center, Left, Right, etc…).
- The ability to order overlaying graphics (Bring Forward, Send Backward, Bring to Front, Send to Back).
- The ability to turn off/on and configure the spacing of a grid to assist in the alignment of graphics, functional areas, and assets.
- The ability to draw basic objects including ellipses, rectangles, polygons, lines, and text labels.

4.16.2.5 Configuration Updates

The System Configuration/Design Application must provide the capability to modify the system configuration from one DCS server and then push (distribute) the update to remote servers with little or no user intervention or interruption. The DCS servers must support the immediate or scheduled sending of configuration updates to one, many, or all servers simultaneously.

For the Donnacona SIU DCS requirement, the System Configuration/Design Application will reside on the DCS servers installed by the contractor in the SIU TER. From this location, authorized individuals will be able to conduct maintenance activities and make configuration pushes to the four (4) SIU DCS servers.

4.16.2.6 Integrated Subsystems

The System Configuration/Design Application must provide the integrator, maintenance person, or CSC trained staff member with the capability to add, edit, and customize integrated subsystems through a standard user configuration interface. The following features must be configurable:

- Communication settings with the integrated subsystem.
- Device states and their icon features (visual and audible).
- Status logging of each asset, device, or system equipment.

The System Configuration/Design Application must (as a minimum) support, or be capable of supporting, the following integrated subsystems/devices which are typically installed in a CSC Living Unit environment:

- Genetec Omnicast Platform
- Genetec Security Centre Platform
- Open Platform Communications (OPC) for PLC integration
- Open Network Video Interface Forum (ONVIF)
- Senstar Starcom Over IP Client/Server
- Senstar Serial Starcom Client/Server
- Simple Network Management Protocol (SNMP) Manager

4.16.2.7 Alarm Management

The HMI Software must have the following alarm management features:

- the capability to annunciate (visually and audibly) alarms;
- the capability to, via the System Configuration/Design Application, define and configure alarm types

and their attributes (including background/text colour by state, sound type, and icon/text flashing by state);
- the capability to present alarms based upon priority on a server-by-server basis;
- the capability to present specific alarms on assigned servers;
- the capability to monitor specific assets on one or more servers while simultaneously annunciating asset alarms on one or more servers;
- the capability to manually mask assets or to mask assets on a predefined schedule; and
- the capability to manually move between simultaneous alarms during alarm processing.

4.16.2.8 User Management

The DCS HMI Software must have the capacity to:

- create users (up to 1024), groups and subgroups of HMI system menus and features, and user access group privileges;
- assign passwords to authorized users;
- support user login using RFID; and,
- control individual user access to available features and groups of features.

4.16.2.9 Simulation Mode

The DCS HMI Software must provide a Simulation Mode that allows for the testing of integrated subsystem devices and for the training of new users.

4.16.2.10 Diagnostic Tools

The DCS HMI Software must be equipped with a diagnostic tool that provides:

- for the display of system error logs and debug messages;
- exportation of message data using text, .csv, or .xls files; and
- a reporting feature that is searchable and customizable.

4.16.2.11 Application Programming Interface (API)

The DCS HMI Software must have an API or SDK for interfacing to or integrating with third party security subsystems on site. The API must be able to transmit/receive commands to/from third party systems and perform operations based upon received commands.

4.16.2.12 HMI Language

The DCS HMI Software must support two interaction languages; French and English. The choice of language must not require a system reboot or any action that will impact system operations. The user shall have the capability to switch languages using either a button on the user interface or by logging in under an account that identifies their language preference.

Note that for the Donnacona SIU DCS deployment, only one language is required but that the HMI software must have the capability to support both languages.

4.16.2.13 Redundancy and Failover

The DCS HMI Software must support the following capabilities:

- In the event of a server failure, a predefined server must be capable of automatically displaying, monitoring, and controlling system assets that were assigned to the failed server.

- The user must have the capability to manually post and/or monitor maps from a failed server in the event of a secondary device (touchscreen, monitor, keyboard, or mouse) failure.

- The DCS HMI Software must be capable of supporting a client-server model whereby servers report to one or more additional servers that support full application failover.

Note that the initial Donnacona SIU DCS deployment will be based on a peer-to-peer server architecture with all four touchscreens providing redundant operator user interfaces. The SIU DCS must be configured such that the four servers act as tertiary servers which will allows the DCS to continue to run should the network link between servers lose communications.

4.16.2.14 Embedded Video

The DCS HMI Software must support the potential future configuration of embedded video tiles whereby surveillance cameras relating only to specific doors can be viewed directly within the DCS HMI user interface. As a minimum, the DCS HMI Software must support a minimum of two simultaneous video streams from either an integrated subsystem or directly from ONVIF enabled cameras.

4.16.2.15 System Logging and Reporting

The DCS HMI Software must include a Logging and Reporting Application that allows authorized users to view and generate reports on audit trailing and logging data. The logging system will log status changes of all doors and alarms. The system will also log operator actions for doors and alarms. The logging service collects and stores the logs from the DCS servers and transfers the information to a logging server using a guaranteed delivery framework. All logging data will be recorded in real-time. If the logging server is offline, the information will queue on the local DCS Server until the logging server becomes available. These logs can later be pulled from the database to create reports using the reporting application. Reports can be generated automatically on a configured schedule or generated manually as needed.

The Logging and Reporting Application must allow authorized users to perform the following functions:

- Filter and search report events based upon any report information parameter.
- Create “canned” reports using user defined report definitions.
- Format reports using an interactive graphical interface.
- Print reports to a system printer.
- Export reports via removable storage in .csv and .xls formats.

The reports, as a minimum, must include the following information:

- Date/Time of each system event and user action
- Action/State
- Event Type/Description
- Workstation

4.16.2.16 Manufacturer Qualifications

The DCS HMI software manufacturer selected by the contractor must have a minimum of 10 years experience designing, manufacturing, and testing software used as a control and display system for electronic security systems/subsystems including integrating third-party SDK’s and API’s.

4.17 Site Specific Operator Graphical User Interface

The Donnacona SIU Control Post operator(s) must be provided with four (4) DCS HMI each equipped with GUI maps and functions similar to those currently provided by the existing Honeywell EBI HMI (GUI must not contain any Cuff Mode functionality, review existing GUI and eliminate Cuff Mode during design of new GUI if present). All maps associated with the DCS must be available, redundantly, on all touchscreens at all times.

In addition, the DCS GUI must include a text-box feature that provides CSC operators with the capability to add, on a cell by cell basis, a note specific information associated with the inmate occupying the cell. Touching the note icon for a cell will select the note for that cell and then bring up a keyboard popup that will allow the operator to edit both lines of the note. Notes are single select.

4.18 Expandability

It must be possible to expand the system beyond the originally installed capacity through the installation of additional hardware. The system expandability must not be limited in this regard.

4.19 Labelling

The contractor must adhere to the following on site labelling requirements:

1. Bold face laser quality printed labels, black print on white background must be provided.
2. The labels for cables must be printed heat shrunk tubing labels.
3. The Contractor must install labels on each end of the cable that states the source and destination of the cable.
4. The wording on labels must be approved by the DA prior to manufacture.
5. The contractor must install labels not less than 150 mm from termination end of cable.
6. All labels must be clearly visible and readable after final termination of cables without having to move or rotate cables.

4.20 Finishing

Where walls are cut, opened or damaged the contractor must repair the wall to its original appearance, including taping, sanding and colour matching existing paint.

Where the contractor must use wire mold or expose conduit in control post areas or other work areas, the contractor must paint the exposed conduit to colour match the office where it is installed.

5. ADDITIONAL REQUIREMENTS

5.1 Operator Training

The contractor must prepare and present a training course (TtT) for individuals responsible to train staff for the operation of the system in accordance with the specification ES/SOW-0101 Statement of Work. The training course must concentrate on the features and proper operation of the installed system. The course must be presented on the site within two weeks of the successful acceptance testing of the system. The course must consist of two, three-hour sessions. Each session must be presented in French to a group of up to six persons. Training sign-in sheets must be included in the final documentation package and they must clearly identify; name of training, date of training, location of training, printed name of attendee, signature of attendee, and attendees comments on training.

Provide an interactive PowerPoint presentation in French as a training aid for the operator's training that is suitable for use during formal training and for later use by CSC for refresher training.

5.2 Maintenance Training and Certification

The contractor must prepare and present a two-day training course with hands on training, in French, for up to five persons responsible for the maintenance of the equipment. The course must concentrate heavily on the material contained in the technical and site manual and as-built drawings and must ensure that the Authorized Service Contractor technicians are able to provide 1st level monitoring of equipment. The course must be presented on the site within two weeks of the successful acceptance testing of the system. The course syllabus (in PDF or MS Word format) must be presented to the project authority for approval no later than 30 days after approval of the FDR. All manuals and as-built drawing drafts must be available for the training sessions. Training sign-in sheets must be included in the final documentation package and they must clearly identify; name of training, date of training, location of training (institution), printed name of attendee, signature of attendee, and attendee's comments on training.

5.3 Manuals

The contractor must provide the operator and technical manuals in accordance with the specification ES/SOW-0101 Statement of Work. The contractor must provide two printed copies of the operator manual in French to the DA, and two printed copies of the maintenance manual in French to the site. In addition, the contractor must provide one electronic copy of both the operator and maintenance manual in both English and French to each of the following: the Design Authority, the Regional Electronics Officer (RTO), the local CSC Authorized Service Contractor workshop, and the CSC Authorized Service Contractor Headquarters. Maintenance manuals must all include completed Acceptance Test Program (ATP) forms, completed training sign-in sheets, as-built drawings (section 5.4 of this STR), as well as a handover report that includes details of the softwares, dates of warranties, supplier contact information and other project information. A sample copy of the handover report is provided in Appendix H. All manuals are to be delivered in electronic format CD, DVD, USB flash drive or secure sharedrive. All electronic manuals are to have an interactive index that will link the table of contents to documents within the manual. All documents within the manual must be presented in Adobe Acrobat PDF format. In addition, the electronic manuals must include copies of all files in their native modifiable format (e.g .docx, .xlsx, .dwg).

5.4 As-Built Drawings

The contractor must provide as-built drawings of the site installation in AutoCAD 2019 (or compatible) format and in accordance with specification ES/SOW-0101 Statement of Work. The contractor must provide two copies of the as-built drawings to the site, one to the Design Authority, one to the RTO, one to the local CSC Authorized Service Contractor workshop, and one to the CSC Authorized Service Contractor Headquarters.

As-Built drawings must include as a minimum:

- A high-level logical diagram of the replacement SIU ICCS/DCS differentiating between existing equipment and new equipment provided in this project.
- Detailed interconnect drawings showing all aspects of the installed equipment
- A Physical diagram of the installation based on CSC provided Auto-CAD floor plans of buildings. Showing locations of equipment cabinets, devices, conduit, cable trays and junction boxes.
- Drawings equivalent to Heavy Industrial Instrumentation drawings. As an example, "Instrument-Loop-Diagrams" as applicable to the DCS for this project shall be provided for each PLC I/O. Show all connections through junction boxes and equipment cabinets. Drawings to show all of the cable IDs at field devices, wiring harnesses, I/O diagrams for PLC cards, etc.
- Maintenance drawings specifically tailored to facilitate quick and accurate troubleshooting. Provide a typical field wiring loop diagram including all field devices for controls at a door all the way to the inputs/outputs of a PLC. In this example, when the door control for a specific door has a technical issue, the maintenance staff can use a single drawing showing all aspects of the door control.
- Installation Tables Including:
    - Network Switch Port Assignment

Switch, Model, Location, Port, Assignment
- Field Device Details:
  Field Device, Designation, Model, Lens, IP Address, Switch PoE Power Assignment
- Workstation/Server Details:
  Workstation/Server, Location, CPU, Serial #, IP Address, Monitors, Switch, Port
- PLC Interconnect Details:
  Module, Input/Output, Termination Point, Address
- CAT6/Fibre Patch Panel Assignment:
  Location, Port, Assignment

5.5 Software

The contractor must provide CD copies of any system software in accordance with specification ES/SOW-0101 Statement of Work. The contractor must provide two copies of the software to the site, one to the Design Authority, one to the RTO, one to the local CSC Authorized Service Contractor workshop, and one to the CSC Authorized Service Contractor Headquarters.

5.6 System Design Meetings and Testing

5.6.1 System Design Meetings

Within two weeks of receiving a contract, the contractor must schedule an on-site audit and preliminary meeting with the CSC DA to discuss the system design.

The contractor must prepare a Preliminary Design Report (PDR), including a summary of all software design and function criteria to be delivered to CSC, no later than two weeks from the date of the site audit. CSC will review and comment on the submitted PDR and the contractor must incorporate any required changes or modifications into an Intermediate Design Report (IDR). CSC will review and comment on the submitted IDR and the contractor must incorporate any required changes or modifications into a Final Design Report (FDR). The PDR, IDR, FDR must include at minimum but not be limited to the DCS/ICCS Theory of Operation; programming narrative with alarm settings and status changes; Ladder or GCL+ Logic; GUI layout; as well as drawings of wire runs, cabinet locations and detailed equipment installation.

Based upon the approved Final Design baseline, the contractor must develop the required site-specific software configuration and present GUI layout screenshots and detailed functional descriptions (graphics, equipment states, colours, legend [use existing GUI system as reference]) to the CSC DA via an in-person or virtual meeting.

The contractor must incorporate any requested modifications identified in the preliminary meeting into the GUI design and conduct a second meeting using an interactive demonstration of the GUI controls. At the discretion of CSC, this meeting may be conducted in-person or virtually.

Any changes or modifications to the system resulting from the second meeting must be incorporated into the system and demonstrated at a third meeting to finalize the system.

Any modifications to the system resulting from the third meeting will be incorporated and demonstrated during factory acceptance testing using the equipment being deployed as part of the installation phase.

5.6.2 Factory Acceptance Testing

The contractor must arrange for CSC and/or their designate(s) to witness factory testing of the touchscreen control and monitoring system assembled in a factory environment. The contractor must submit a factory acceptance test plan to CSC at least two weeks prior to the scheduled date of factory testing.

As part of the FAT process, the complete system must be demonstrated, complete with interfaces to other systems including, but not limited to the following:

5.6.2.1 All required software must be installed, fully configured and demonstrated.

5.6.2.2 All operational provisions must be demonstrated.

5.6.2.3 All central equipment including servers, and network switches must be active and demonstrated.

5.6.2.4 The complete PLC assembly must be connected and fully operational.

5.6.2.5 Touchscreen monitors must be fully operational and must meet the requirements of the contract. The touchscreen must be used to demonstrate all operational features of the systems. The following must be provided:

- At least one mock-up of the I/O associated with each door type must be demonstrated.
- All applicable system interfaces (access control, I/O, etc…) must be fully implemented and demonstrated.
- Where two or more input/output devices are required to fully demonstrate operations (such as interlocks) said feature must be demonstrated.

Space and power requirements for the demonstration and testing must be provided by the contractor.

After factory testing is completed, the contractor must correct any deficiencies found, retest the system, and conduct a demonstration of the completed system. A CSC representative must be present at each demonstration and will direct the contractor to make any additional tests at that time.

The contractor must not ship equipment to site until such time as CSC has approved the FAT results and granted permission.

5.6.3 Progress Meetings

The contractor must hold at minimum bi-weekly meetings at the site to provide updates on the status of the project. The contractor shall be responsible for the preparation and distribution of the meeting minutes in MS Word format.

5.6.4 Site Acceptance Testing

The contractor must provide a detailed site ATP in either an unprotected PDF or MS Word format to the DA, or his designated representative, by email, for approval at least two weeks prior to the start of installation of the upgraded SIU DCS.

The contractor must complete one hundred percent of the tests outlined in the ATP prior to the ATP testing being carried out by the DA. This will be referred to as the Pre-ATP Contractor Testing

The contractor must provide a fully completed and signed copy of the Pre-ATP to the DA, or his designated representative, by email, at least two working days prior to the start of the final ATP testing. This copy of the Pre-ATP must include all of the results of the tests carried out in Section 5.6.2.

In the case where subcontractors have been used, the contractor must provide written confirmation that the work of their subcontractor has been inspected and verified. The contractor must provide a written report of the work that was done by the subcontractor, stating that it was inspected and verified by the contractor, as well as provide any testing results. This verification must be sent to the DA or his designated representative, by email, at least two days prior to the start of the ATP. The contractor is responsible for the work of their subcontractor(s) and to ensure that it meets the requirements of the ESS specifications.

Testing may be carried out by the DA, a designated representative or a third-party contractor.

The DA may repeat all of the ATP tests done by the contractor or a percentage of them. If the DA during the

ATP testing finds a minor deficiency that does not affect the operational effectiveness of the replacement system, the ATP testing may continue. If a major deficiency is found during the ATP testing that does affect the operational effectiveness of the replacement system; the testing must cease for a minimum of two (2) weeks until the deficiency has been corrected. The Project Authority and the contractor must re-convene in a minimum of two (2) weeks to continue testing. The two (2) week minimum window may be decreased solely at the projects authority's discretion and with the agreement of the contractor.

ATP testing must be done during normal working hours, 08:00 to 16:00, Monday to Friday. ATP testing at other times will only be done in an emergency situation.

The DA or designated representative will sign-off on the ATP, upon the successful conclusion of the testing. Any minor deficiencies noted during the testing must be indicated on the ATP form. This signature indicates the Conditional Acceptance of the system.

The system must be subjected to an Operability Performance Test (OPT) for a period of two (2) weeks following the Conditional Acceptance of the system. CSC will formally accept the system from the Contractor at the end of this two (2) week period, but only if ALL deficiencies have been corrected. Throughout the OPT period, the system will be tested under full operation to ensure that the performance requirements are met and to measure the system reliability and availability.

Any deficiencies noted by CSC during this two (2) week OPT period will be communicated to the Contractor, who will then be required to correct the deficiencies within two (2) weeks. The two (2) week OPT period must begin again after all deficiencies have been cleared.

The equipment warranty period (2 years) must start on the date the system is formally accepted.

5.7 Operational Down-Time

Equipment and systems operational down time must be kept to a minimum. All scheduled down time must be approved in writing by the project design authority or designate with three (3) days notice. All approved down time must be coordinated with the Correctional Manager Operations (CMO) on site. The contractor's staff must be available to work during evenings, nights and/or weekends to reduce the amount of down time and to meet operational requirements. The contractor shall allow for all associated fees to perform work outside of normal working hours in their submission. If any system is required to be shutdown during the course of the work, it must be tested and verified to fully operational once it gets re-energized, prior to the contractor leaving the site.

Ensure that at no time the entire Living Unit is without an operating Door Control System. Ensure that the existing Door Control System, including HMIs at the control posts, remain operational until the migration from the old system to the new system is completed.

5.8 Institutional Operations

The contractor must take every precaution to minimize any disturbance to institutional operations. The contractor and his staff on site must cooperate fully with operational staff and conform to all security requirements.

5.9 Institution Address

Donnacona Institution
1537 Highway 138
Donnacona, QC
G3M 1C9

5.10 Safety

The contractor must comply with the document titled “Safety Regulations for Security Electronics Contractors Working at CSC Institutions” attached as Appendix F.

5.11 Spares

The bidder's proposal must include provision of the following (minimum) spares:

- One spare PLC CPU with program logic pre-loaded.
- One spare analog input PLC module.
- One spare digital input PLC module.
- One spare digital output PLC module.
- One spare DCS Server
- One spare HMI extender

Additional spares may be required. Successful bidder is to provide a recommended spare parts list based on the equipment to be installed. When percentage is less then 1 spare quantity must be rounded up to 1. When spare quantity is greater than 1 the quantity must rounded down to the nearest whole number.

A complete list of all spares, make, model, quantity and serial numbers will be confirmed and signed off by the project authority upon delivery. An electronic version of the list must also be provided which must also include project number; cost and warranty information. The contractor must only remove delivered spare equipment to replace a defective component during installation with the expressed written consent of the project authority. Spares must be delivered on or before the day of final acceptance testing. The Crown will not be responsible for any spare equipment delivery prior to the final acceptance testing.

5.12 Communication Responsibility

The contractor must brief institution staff prior to leaving the work site every day. The briefing must be given to the works supervisor, or designate and must include, as a minimum:

- Work performed that day
- Operation status of the system, including any limitations in functionality or peculiarities
- Contact name and number in the event of a system failure
- Emergency contact numbers of installation technicians

As a minimum the parties must meet at the beginning and end of the working day.

5.13 Design Change Procedure

The contractor must address all requests for change or deviation from this STR with the Technical Authority before any on site discussions or request submissions to PSPC, to ensure all changes are consistent with National Policy and Technical Standards, and to ensure the Crown maintains a complete awareness of the project.

5.14 Support

1. Provide written confirmation in the form of an official letter from the Original Equipment Manufacturer (OEM) supplier that the “commercial off the shelf” elements of the DCS, including software and hardware, will be supported by the OEM suppliers for at least ten years from the deployment of the system.
2. Provide minimum **two-year** of full warranty support of the DCS/ICCS, once it has been formally

accepted by CSC. This support must include the correction of any deficiencies and the resolution of operational or technical problems, troubleshooting, all system upgrades as they become available via access to self-service downloads of service packs / maintenance loads for software updates.

3. In the event of any failure of equipment under this STR, the contractor must provide resolution for resumption of full system operation. The contractor, if necessary with an appropriate arrangement with the equipment vendor, must provide next business day shipment of an advanced replacement unit for failed hardware and full software support, for the duration of the warranty period.
4. The Contractor must meet the following support requirements:
    1. National Distribution: Contractor to have access to national distribution and local parts and service outlets.
    2. Escalation Plan:
        1. Upon contract award, if there are any changes to the staff/credentials that were submitted as part of the bid, the Contractor must provide the name and credentials of qualified service technician(s) or manager(s) who will be responsible for ensuring that all inquiries or service issues related to the system are addressed satisfactorily and in a timely fashion.
        2. This/these individual(s) must have the authority, resources, and responsibility to address technical issues, dispatch a service representative to the site if required, escalate any issue that cannot be resolved within the expected time frame, and keep CSC informed at regular intervals until issues are resolved.
        3. Provide the company's definitions for problem types with expected response resolution times, and company's procedures for escalating service issues that are not resolved within expected periods.
    3. Local Technicians:
        1. The Contractor must be able to provide maintenance service 24 hours a day, 7 days a week. In the event of any failure of equipment under this STR, the contractor must provide immediate resolution for resumption of full system operation. This must include a response time to a service call of within four (4) hours.
        2. The Contractor is to identify one or more local technicians, who are within a 75 km radius, to handle on-site maintenance and repair of the equipment at the institution.
        3. The local technician(s) must be trained, certified, and available for dispatch to the Institution any time a system problem cannot be diagnosed and rectified by maintenance personnel.
        4. Should it become necessary, the Contractor must be willing and able to dispatch additional technicians to the Institution.
        5. If on-site service is to be provided by a subcontractor, identify the proposed subcontractor and describe the subcontractor's qualifications to provide this service. This information must be provided to the DA via email, in the form of a letter from the contractor stating that the subcontractor is certified and has been trained to provide service on the particular system.
        6. The Contractor must be fully responsible for all work performed by a subcontractor.
    4. Software & System Support:
        1. The Contractor must provide full support of the DCS HMI Software as well as the System through completion and acceptance by CSC and for **two (2) full years** after acceptance (warranty period).
        2. This support must include system upgrades (as they become available), troubleshooting, the correction of any system bugs or deficiencies, and the resolution of any operating problems.