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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
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Issuing Office - Bureau de distribution
Electrical & Electronics Products Division
11 Laurier St./11, rue Laurier
7B3, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

Title - Sujet INSTALL CCTV	
Solicitation No. - N° de l'invitation 21120-187284/A	**Amendment No. - N° modif.** 002
Client Reference No. - N° de référence du client 21120-187284	**Date** 2017-07-13
GETS Reference No. - N° de référence de SEAG PW-$$HN-461-72876	
File No. - N° de dossier hn461.21120-187284	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2017-08-08**	**Time Zone** **Fuseau horaire** Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐	
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Canada

Amendment 002 is issued to extend the solicitation close date, provide Questions and Answers, and to amend Part 4 – Evaluation Procedures and Basis of Selection.

1) At Solicitation Close Date

Delete: 2017-07-18

Insert: 2017-08-08

2) Insert at Attachment 2 Questions and Answers

ATTACHMENT 2
QUESTIONS AND ANSWERS

Q1 Is there additional scope that will be clarified ?

A1 No.

Q2 Can you please confirm the requirements for the monitor and switches in the spares list ? if yes, what types and what are the specifications ?

Monitor as per ES/STD-0227. The new switches shall be Layer 3 - 48 port 10/100/1000Mbps switches. Each port will be equipped with PoE (IEEE802.3af) but ports one through eight is also equipped with High-PoE (IEEE802.3at). The high PoE ports are used to provide power to the PTZ cameras. The switch shall be setup as an Internet Group Management Protocol (IGMP) querier and IGMP Snooping for the entire network.

Q3 Can you confirm that we need to test the internal PA system ? And if yes, to what extent ?

A3 Yes. The PA shall be tested from the Dome PACPs, as identified during the site tour, associated to the each range's speakers.

Q4 Can you confirm that we need to test all the devices COD, CCD, GTS and the CCTV internal and external prior to starting the installation? If yes, can you send the list of all the systems documentation?

A4 Acceptance Testing Reports attached – testing to be completed only in corrective action areas as identified on drawings. System and equipment performance in accordance to CSC specifications and standards.

Q5 Can you confirm that there is no requirement for any software upgrade to any of the specifics of the systems (CCTV, ICCS, GTS)?

A5 No requirement for software upgrades.

Q6 Can we get an extension for the submission date?

A6 Already addressed in this amendment.

3) At Part 4 – Evaluation Procedures and Basis of Selection

Insert: For the purpose of the Evaluation Process only, "Bidder" means the person or entity (or, in the case of a joint venture, the persons or entities) submitting a bid to perform a contract for goods, services or both. It may also include the parent and/or subsidiaries of the Bidder.

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/SPEC-0006
Revision 2
14 January, 2002

ELECTRONICS ENGINEERING

SPECIFICATION
CONDUIT, SPACE AND POWER REQUIREMENTS FOR SECURITY SYSTEMS FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

AUTHORITY

This Specification is approved by the Correctional Service of Canada for the procurement and Installation of Conduits for Electronic Security Systems in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service of Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services

TABLE OF CONTENTS

ABBREVIATIONS

The following abbreviations are used in this specification:

CER	Common Equipment Room
COTS	Commercial-Off-The- Shelf
CSA	Canadian Standards Association
CSC	Correctional Service Canada
DES	Director Engineering Services
EIA	Electronic Industries Association
EMT	Electrical Metallic Tubing
GFE	Government Furnished Equipment
MCCP	Main Communications and Control Post
PVC	Polyvinyl Chloride
RFP	Request for Proposal
SOW	Statement of Work
STR	Statement of Technical Requirements
TES	Terminal Equipment Space

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

1.0 INTRODUCTION

1.1 General

This specification defines the requirements for the design and installation of conduits, cable troughs and raceways as well as space and power requirements for telecommunications and electronic security systems in the Correctional Service of Canada (CSC) facilities.

1.2 Scope

This specification has been developed to ensure high standards for the installation of conduits, cable troughs and details equipment space and power requirements for electronic systems. It defines workmanship standards which may not be fully covered in subsidiary specifications. All contractor's documentation and installation procedures shall meet this specification for reliability, maintainability, longevity, appearance and operational use.

1.3 Off-The-Shelf Equipment

The contractor shall provide commercial off-the-shelf (COTS) materials wherever possible. COTS materials shall meet or exceed the manufacturing standards as listed in this specification.

Where COTS material is unavailable or unsuitable for a specific application, the contractor may manufacture or arrange for the manufacturing of a particular item to suit the requirements. Manufactured materials shall meet or exceed the best commercial equipment manufacturing standards.

1.4 Equipment Procurement

Any ordering of material before the approval of the system design report will be undertaken at the contractor's own risk. The Design Authority may authorize the procurement of certain long lead items at, or shortly after a preliminary design review of the proposed system.

2.0 APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of the Request for Proposal (RFP) shall form a part of this specification to the extent specified herein.

ES/SOW-0101	Statement of Work for Procurement and Installation of Electronic Systems
ES/SOW-0102	Statement of Work for Quality Control of Electronic Systems
EIA-310-C	Electronic Industries Association Standard for Racks, Panels and Associated Equipment.
CSA C22.1	Canadian Electrical Code - Part 1 Safety Standard for Electrical Installations
CSA C22.2	Canadian Electrical Code - Part II

3.0 REQUIREMENTS

3.1 General

The contractor shall supply all necessary conduits, cable troughs and raceways and any other items that may be required for the satisfactory completion of the specified project. All installation workmanship shall be performed in accordance with the Statement of Work, Standards specified in Section 2.0 of this specification and all applicable national, provincial, and local electrical codes.

A conduit diagram shall be supplied in the installation documentation to detail where connections terminate and how conduits are routed and terminated.

Conduits, ducts, trays, etc. may be either Government Furnished Equipment (GFE) or supplied and installed by the contractor depending on the particular institution. The determination will be made by the Design Authority and will be identified in the STR.

The contractor shall provide Electronic Industries Association (EIA) standard racks, panels and associated hardware according to the space requirements of this specification.

The contractor shall provide all necessary wiring, circuit panels, circuit breakers and associated hardware according to the power requirements of this specification.

3.2 Environmental Conditions

All materials and equipment which are used in CSC installations shall be chosen with consideration being given to the intended use, safety, retention of appearance, maintainability and durability under rugged operating conditions. These materials shall perform over the following environmental ranges:

a. **Indoor Equipment**

Temperature: 0° C to 50° C; and

Humidity: 20% to 95% non-condensing.

b. **Outdoor Equipment**

Temperature: -40° C to +55° C; and

Humidity: up to 100% condensing.

3.3 Conduits, Cable Troughs and Raceways

3.3.1 Conduits

Conduits installed above ground, and accessible to the inmate population, shall be rigid steel. Metal conduits installed in secure and inmate accessible areas shall be fitted with double the normal quantity of support hangars.

In locations subject to extreme temperature changes, and/or where conduit lengths are of non-standard size, the contractor shall make provisions for the inclusion of conduit expansion joints.

Outdoor conduit shall not be damaged by combinations of direct exposure to the sun, wind, rain, lightning, hail, snow and ice as may be expected to occur at each institution location.

Rigid Polyvinyl Chloride (PVC) conduits shall be used only in buried applications. Rigid PVC conduits shall not be threaded, but may be used with approved adapters and couplings applied in a manner consistent with industry standards. PVC conduits which cross roadways shall be encased in poured concrete. The contractor shall provide a suitable means of protecting the buried conduit against damage caused by digging or excavating. The preferred method is installing a tape marker directly above the conduit path.

Electrical Metallic Tubing (EMT) conduit may be used in administrative areas, and locations which are not normally assessable to the inmate population.

Liquid-tight flexible metal conduits may be used where a flexible connection is required, ie. cameras, microwave dishes, etc. In such applications, the length of "flex" conduit shall not exceed one (1) metre.

In addition to these requirements, the latest issue of applicable industrial standards apply, including:

a. CSA Standard C22.2 - Rigid Metal Conduit

b. CSA Standard C22.2 - Flexible Metal Conduit

3.3.2 Cable Troughs and Raceways

Cable troughs and raceways shall be continuous and shall be constructed of metal. The contractor shall provide adequate mounting devices which will permit the use of fastening devices that will not damage conductor insulation.

Cable troughs, raceways, and fittings shall be free from burrs or other sharp edges which may cause damage to the cable or insulated conductors. All troughs and raceways shall be installed as a complete system before the conductors or cables are installed.

Cable troughs may be either ventilated or solid and unless otherwise specified, shall be equipped with covers and steel guards to protect against damage.

In addition to these provisions, the latest issue of appropriate standards shall apply, including:

a. CSA Standard C22.2 - Cable Troughs and Fittings.

b. CSA Standard C22.2 - Raceways and Fittings.

c. CSA Standard C22.2 - Surface Raceways and Fittings.

4.0 SYSTEM REQUIREMENTS

Summary tables of the electronic security systems minimum conduit, space and power requirements are provided as Appendix A, Appendix B and Appendix C respectively to this specification.

4.1 Perimeter Intrusion Detection Systems

4.1.1 Motion Detection System

The Motion Detection System (MDS) is designed to detect motion between the fences. One system which is type approved for use in CSC uses the Leaky Coax - buried cable technology. The perimeter is divided into sectors and two sectors are controlled by a single local control module. Signal and power fed to the field mounted electronic controllers via the buried coax cables. The main MDS control modules are installed in the common equipment room (CER).

4.1.1.1 Conduit Requirements

Cable entry to the area between the two perimeter fences is made at a single point, usually at the gatehouse. One (1) 38 mm conduit is required from the CER to the area between the two perimeter fences. This conduit is stubbed underground between the fences several meters from the gatehouse.

4.1.1.2 Space Requirements

The MDS control equipment will normally occupy about half of the area of a 2.483 meter rack, usually supplied by the PIDS contractor.

4.1.1.3 Power Requirements

The power requirement for the MDS equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptable power supply.

4.1.2 Fence Disturbance Detection System

The Fence Disturbance Detection System (FDS) is designed to detect particular movement and vibration patterns on the inner perimeter fence. This is accomplished by mounting electro-mechanical fence sensors (geophones, electret or piezoelectric vibration detectors) on the fence. The perimeter is divided into sectors and one array of sensors covers one sector. The cables from all the sectors are run along the top of the fence to the gatehouse and to the control equipment mounted in the CER.

4.1.2.1 **Conduit Requirements**

FDS cable entry to the inner perimeter fence is made at a single point, usually at the gatehouse. Depending on the size of the perimeter and the number of sectors, the requirement is for a minimum of one (1) 38 mm conduit from the gatehouse to the top of the inner fence. The conduit is capped with a weather proof cable outlet.

4.1.2.2 **Space Requirements**

The FDS control equipment will normally occupy approximately half of the area of a 2.483 m rack supplied by the contractor.

4.1.2.3 **Power Requirements**

The power requirement for the FDS equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power supply.

4.1.3 **PIDS Microwave**

Bistatic microwave (beam) systems are normally installed across the pedestrian and vehicle entrance portals (sallyports) to detect movement in the area. The microwave systems are integrated into the PIDS motion detection system. These systems allow small portal sectors to be turned off to allow authorized staff and vehicle access without effecting the entire perimeter security.

4.1.3.1 **Conduit Requirements**

Microwave cable to each of the pedestrian and vehicle sallyport areas are required from the closest motion detection system (MDS) local control module. One buried (1) 19 mm PVC conduit is required from each sallyport to the closest perimeter MDS unit.

4.1.3.2 **Space Requirements**

The control equipment will normally occupy approximately 0.5 metre of rack space supplied by the contractor.

4.1.3.3 **Power Requirements**

The power requirement for the microwave equipment in the CER is a 110.0 VAC, 15.0 ampere, interruptible power supply.

4.1.4 PIDS Closed Circuit Television

Closed Circuit Television (CCTV) monochrome cameras are placed in strategic positions around the perimeter fence. The cameras monitor the institutional side of the inside perimeter fence and the area between the fences. When there is an alarm on the FDS and/or MDS, the CCTV cameras monitoring the appropriate sector inside fence and between the fences are selected for viewing. During an alarm period the video displayed on the monitors from the selected cameras are recorded on a time-lapse video cassette recorder.

The CCTV cameras are usually grouped at the corners of the perimeter and mounted on self supporting towers. 110 VAC power is provided to an VAC distribution panel mounted at each corner of the perimeter. VAC power is distributed to the cameras.

External vertical synchronization of the CCTV cameras is by the distribution of an independent vertical pulse to all the cameras and components of the system.

4.1.4.1 Conduit Requirements

CCTV Signal and Control. Two (2) 50 mm conduits run from the CER to the cameras in the corners of the perimeters in both directions. These conduits for the CCTV camera signal and control wiring terminate in a exterior distribution box mounted on the closest camera towers. Two (2) 50 mm conduits run around the perimeter terminating at each of the camera groups at the perimeter corners.

CCTV AC Power. Two (2) 38 mm conduits are required from the power distribution panel in the CER to the power junction box on the closet perimeter camera tower. One conduit is required to run in both directions. VAC power is required for the cameras and the heater and wipers in the camera housings. One (1) 38 mm conduit is required to run form the power junction box around the perimeter providing power to each camera group.

4.1.4.2 Space Requirements

The video distribution and switching equipment in the CER require approximately 1.0 m of rack space.

The four video monitors, wiper control and camera on/off switch panels in the MCCP console require space in one (1) EIA standard console cabinet..

A separate standalone rack in the MCCP is provided to accommodate five (5) time lapse VCRs.

4.1.4.3 Power Requirements

The power required in the CER for video switching and control equipment is one 110.0 VAC, 15.0 ampere uninterruptible power supply.

The power requirement for the perimeter cameras is a 110.0 VAC, 20 ampere supply to each group of usually four (4) cameras from the power distribution panel in the CER.

A camera and housing requires 300 watts each, including heaters, wipers and all other the environmental control units for the camera housing units.

4.1.5 MCCP Console

The control and annunciation equipment for the PIDS and the Facility Alarm Annunciation System are mounted in the console cabinets in the MCCP. The control and annunciation units are normally connected to processing equipment in the CER by cables running under the computer flooring. There is a requirement for rigid conduit between the MCCP and the CER for the 110 VAC uninterruptible power supply (UPS).

4.1.5.1 Conduit Requirements

One (1) 19 mm conduit is required from the UPS location in the CER to the MCCP console.

4.1.5.2 Space Requirements

The console cabinet space requirement will depend on the number of systems provided at the institution and usually consists of six console racks in the MCCP joined together to form the control console. One medium equipment rack for the maintenance video display unit (VDU) and a low profile cabinet with sliding shelves for the time-lapse VCRs and printer.

The MCCP will require a room with a floor area of no less than approx. 23.6 square metres. The CER will require a room with a floor area of no less than 9.0 square metres for the equipment and approx. 6.3 square metres for spare equipment storage and maintenance. Both rooms require computer flooring, all conduits entering will be stubbed or terminated under the computer floor. Both rooms need to be as square as possible to allow for optimum equipment placement.

The UPS will require a room with a floor area of approx. 6.3 square metres if the UPS is located at a different site to the CER. The UPS can be located in the CER within the requirement shown above. The floor may be concrete.

The ventilation system in the CER should keep the temperature below 29.0 degrees C and vent to the outside to eliminate gases that may escape during battery operation or charging.

4.1.5.3 Power Requirements

The power requirement for the MCCP console is two 110.0 VAC, 15.0 ampere, uninterruptible power circuits.

4.2 Facility Alarm Systems

4.2.1 Inmate Cell Call System

The ICCS is provided so that an occupant of a cell may request assistance from the control post. This is achieved by operating a call originating device (COD) mounted in the cell. The call is annunciated in the control post, the guard responds to the call and cancels the call by operating a call cancelling device (CCD) external to the cell and adjacent to the cell door.

4.2.1.1 Conduit Requirements

One (1) 15 mm conduit is required from each cell, the conduits from four cells are combined in a junction box in the pipe chase. Two or three of these junction boxes are linked together by 25 mm conduit. One (1) 38 mm conduit connects the group to the terminal equipment space (TES) where they are terminated.

One (1) 25 mm conduits are provided from the TES to the control post. These are shared by the electronics contractors with each contractor using at least one each.

The cables interconnecting the equipment in the TES to the CER are normally installed in a cable tray which runs throughout the institution.

4.2.1.2 Space Requirements

The equipment should normally occupy half the area of an one (1) 2.483 m rack in each TES.

4.2.1.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere circuit.

4.2.2 Fixed Point Security Alarm System

The FPSA system is provided so that an occupant of designated rooms may request assistance from the control post. This is achieved by operating a call originating device (COD) mounted on the wall or under a desk. The call is annunciated in the control post, the guard responds to the room.

4.2.2.1 **Conduit Requirements**

One (1) 15 mm conduit is required from each designed room, the conduits from these rooms may be combined in a junction box. Two or three of these junction boxes may be linked together. The link will be 25 mm conduit and one (1) conduit (38 mm) is then run to the CER where it is terminated under the computer flooring.

4.2.2.2 **Space Requirements**

The FPSA COD is mounted on a wall or under the desk in the designated room.

4.2.2.3 **Power Requirements**

The power requirement for this system is a 110.0 VAC, 15.0 ampere circuit.

4.2.3 **Personal Portable Alarm System**

The PPA system is used by CSC staff working in all areas of the institution to alert the central security post staff to serious incidents or potentially dangerous personal security or safety situations. The PPA system consists of a central controller, a central receiver and a number of portable wireless transmitting devices (transmitters) in belt worn leather cases. PPA alarms are sent to the security post when these small portable transmitters are activated by the staff member. Alarm identification, alarm time and cancellation may be recorded on a data logger.

4.2.3.1 **Conduit Requirements**

One (1) 15 mm conduit is required from the PPA receiver which is located in a central area of the institution to the MCCP where the PPA controller is located. This conduit will accommodate the twisted and alarm signal wires. One (1) 15 mm conduit is required between the PPA receiver and the antenna which is located on the roof, the side of a building or on an existing radio tower.

4.2.3.2 **Space Requirements**

The PPA receiver will be mounted in a rack or on the wall in a central location of the institution. The PPA controller will be mounted in the MCCP control or on a shelve in the CER.

4.2.3.3 **Power Requirements**

The power requirement for the PPA equipment in the MCCP is a 110 VAC, 15.0 ampere, uninterruptible power circuit.

4.2.4 Portable Alarm Location System

The PAL system operates in conjunction with the Personal Portable Alarm (PPA) system to locate an area where the PPA alarm is originating from. The PAL system consists of central monitoring equipment, a number of nodes and a number of wireless sensors distributed within an institution. PPA alarm locations can be determined and sent to the security post. Alarm identification, alarm time and cancellation are data logged.

4.2.4.1 Conduit Requirements

One (1) 15 mm conduit is required from each PAL node which is located throughout the institution to the CER where the PAL controller is located. This conduit will accommodate a co-axial cable for the alarm signal from each node.

4.2.4.2 Space Requirements

The PALS nodes and wireless sensors will be mounted in the ceilings throughout the institution. The PALS controller in the CER will require approximately three (3) feet of rack space.

4.2.4.3 Power Requirement

The power requirement for the PALS equipment in the CER is one 110 VAC, 15.0 ampere, uninterruptible power circuit.

4.3 Access Control & Supplementary Systems

4.3.1 Door Control & Corridor Monitoring System

This system provides room and corridor access by door control from a designated CP. The door control system is usually integrated with a CCTV system to allow staff to view the person(s) requesting access.

4.3.1.1 Conduit Requirements

Two (2) 15 mm conduits are required from under the CER floor or the TES to the room and corridor doors requiring controlled access. One conduit will accommodate the CCTV system for video and camera control purposes. The other conduit is required for the door access control system.

4.3.1.2 Space Requirements

The rack space requirement will usually consists of approximately two (2) feet of one (1) 2.483 m rack in the CER or TES and one rack in the MCCP control console or CP console.

4.3.1.3 **Power Requirements**

The power requirement for the door control and monitoring system is one 110.0 VAC, 15.0 ampere circuit.

4.3.2 **Closed Circuit Television System**

This system allows observations to be made in cells, corridors, exercise yards and other locations where there is a need. The system usually consists of several cameras mounted at these locations with monitors grouped together at a convenient point such as the control post or the MCCP.

4.3.2.1 **Conduit Requirements**

Two (2) 15 mm conduits are required to each camera location, one for signal wiring and the other for VAC power to the camera and housing. If the camera has pan/tilt/zoom facilities, one of the two conduits may have to be increased in size to 19 mm to accommodate possible control wiring.

4.3.2.2 **Space Requirements**

The only space requirement for this system is rack space in a console for the monitors and possibly a pan/tilt/zoom controller.

4.3.2.3 **Power Requirements**

The power requirement for the CCTV equipment is one 110.0 VAC, 15.0 ampere circuit.

4.3.3 **Supplementary Intrusion Detection System**

This system provides supplement outdoor intrusion detection from the MCCP. The SIDS monochrome CCD camera is usually mounted on a high tower or roof top to provide surveillance and assessment of designated area(s).

4.3.3.1 **Conduit Requirements**

Two (2) 15 mm conduits are required from under the CER floor to the outdoor camera location. One conduit will accommodate the CCTV system for video and camera control cables. The other conduit is required for the camera and enclosure VAC power.

4.3.3.2 **Space Requirements**

Rack space in the MCCP control console is required for the SIDS monitor and camera Pan/Tilt/Zoom controller. The size of the rack space will depend on the size of the monitor and controller.

4.3.3.3 **Power Requirements**

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.3.4 **Voice Recording Equipment**

The Voice Recorder Equipment (VRE) records all conversations on the telephones, radios, PA and PIDS PA systems in the MCCP.

VRE wiring can be run under the computer flooring and conduit is not normally required.

4.3.4.1 **Space Requirements**

The VRE is self contained in its own moveable rack and requires a floor area of 650 mm square with an equal area in front and behind for operator and technician access. It can be mounted with its back against a wall if required, however this is not preferable.

4.3.4.2 **Power Requirements**

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.3.5 **Video Recording Equipment**

The Video Cassette Recorders (VCR) record all video from the various CCTV cameras installed throughout the institution. VCR installed in the MCCP will record the PIDS video form the perimeter cameras. VCR install in Security CP throughout the institution will record the video from their particular areas of surveillance interest.

VCR wiring can be run under the computer flooring and conduit is not required.

4.3.5.1 **Space Requirements**

The VCRs are normally installed in moveable racks and requires a floor area of 650 mm square with an equal area in front and behind for operator and technician access. Due to limited space in some CP, the VCRs may be on shelves under the desks.

4.3.5.2 **Power Requirements**

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.4 Communications Systems

4.4.1 Two Way Communications Radio

The two way radio system provides routine operational, maintenance as well as emergency response communications between control posts, guards and vehicles in and around the facility. Base station radios and Digital Interface Units are installed in standard EIA electronic equipment racks in the CER.

The MCCP base station radios are connected to a common antenna mounted on an external tower. In the repeater configuration, the base stations are connected via a series of filters to a common antenna. Rack mounted remote radio controllers are mounted in the MCCP console. Digital Interface Units (DIU) are used to configure the base station radios for digital communications

Base station radios located in security control posts and maintenance control centres are connected to their own local antennas.

4.4.1.1 Conduit Requirements

One (1) 19 mm conduit is required from the CER to the antenna tower. The conduit may terminate at the base of the tower, if the tower is mounted on the roof. In the case of a ground mounted tower the conduit will continue up the tower. The lower portion of the tower is protected by anti climb shields.

4.4.1.2 Space Requirements

Three base station radios with associated DIUs will use approximately half of a EIA standard 2.483 m equipment rack in the CER. If the radios are configured as repeaters and filters are used, another EIA standard 2.483 m rack will be required.

In the MCCP console, the remote controller will require 5¼ inches (3 U) of console cabinet space.

4.4.1.3 Power Requirements

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.4.2 Public Address System

The PA system is designed to allow the entire institution to be addressed or limited areas to be addressed from various points throughout the institution.

4.4.2.1 **Conduit Requirements**

Loudspeakers are distributed throughout the institution in areas where they are required. They are mounted in 254 mm x 254 mm x 102 mm back boxes mounted in the walls or in the ceilings. The boxes are joined in series by 15 mm conduit for the first ten or so boxes and then by 19 mm conduit to the cable tray. Where two strings of speaker boxes combine into one the resultant conduit is usually 19 mm. A 25 mm conduit is used between a TES and its respective control post.

4.4.2.2 **Space Requirements**

The PA equipment requires approximately half of a 2.483 m rack in the CER or half of a 2.483 m rack in a TES.

4.4.2.3 **Power Requirements**

The power requirement is for a 110 VAC, 15.0 ampere supply in the CER or a 110 VAC, 15.0 ampere supply in a TES.

4.43 **Limited Call Intercom System (LCIS)**

The LCIS is designed to provide communications between the control posts and points such as beyond a barrier controlled by the post. The control post has a master station mounted in a console and the remote station is mounted in a back box in the wall.

4.4.3.1 **Conduit Requirements**

The remote station is mounted in a 102 mm x 102 mm x 65 mm back box placed 1500 mm from the floor. One (1) 15 mm conduit connects these points to the TES or the cable tray. One (1) 25 mm conduit is used between a TES and its respective control post.

4.4.3.2 **Space and Power Requirements**

The LCIS usually forms part of the PA. Refer to the PA section for space and power requirements.

4.4.4 **Restricted Visit Intercom System**

The purpose of the RVIS is to provide a means of two-way (full-duplex) voice communication between an inmate and visitor while denying physical exchange. Typically, by providing transparent partitioning between the inmate and visitor, physical access is denied while allowing visual contact between each half of a restricted visiting booth. Within each booth, telephone handset will allow voice communication between the two halves. The control post has a master station mounted in a console.

4.4.4.1 **Conduit Requirements**

One (1) 15 mm conduit is required from each booth to the Restricted Visit Control Post.

4.4.4.2 **Space Requirements**

The RVIS telephone handsets are securely mounted on the wall of the booths. The RVIS controller is mounted in the console in the Restricted Visit CP.

4.4.4.3 **Power Requirements**

The power requirement for this system is a 110.0 VAC, 15.0 ampere supply.

4.4.5 **Entertainment Cable Television**

The Entertainment Cable Television (ECTV) System distributes FM radio and television signals to each cell and various other points throughout the institution.

The signals are received off-air via an antenna array for local and satellite signals or from a cable company. A signal from a VCR can be introduced. All these signals are processed in the head-end equipment and then distributed via splitters and amplifiers distributed throughout the system.

4.4.5.1 **Conduit Requirements**

A conduit outlet is required in each cell and in various inmate and staff lounges. Groups of four cell block outlet boxes are connected to a junction box by 19 mm conduit. The junction boxes are linked in groups of two or three and then to the TES using 38 mm conduit.

All other locations utilize 19 mm conduit to their respective TES locations.

The cable distributing the signals to the TES from the head end location is installed in a cable tray which runs throughout the institution. One (1) 19 mm conduit is required between the head-end equipment rack and the antenna site.

4.4.5.2 **Space Requirements**

The head-end equipment will occupy a half of a 2.483 m rack in the equipment room closest to the antenna site. The remainder of the equipment consists of amplifiers and splitters and is accommodated in a 400 mm x 400 mm x 100 mm cabinet located in each of the pertinent TES. This cabinet can either be mounted on the wall or placed under the computer flooring.

4.4.5.3 **Power Requirements**

The power requirement for this system is a 110 VAC, 15.0 ampere supply.

4.5 Control Posts (CP) and Terminal Equipment Spaces (TES)

There are several control posts and TES's throughout the institution. They are usually paired and connected by banks of conduits to enable connection between the main equipment of the various systems and the control panels that are associated with them. The number of conduits provided is normally very generous and provides for any possible expansion or replacement of the systems.

4.5.1 Conduit Requirements

All the consoles in the control posts with computer flooring do not require conduits. Normally the TES and CP locations are connected by cable trays or at least one 50 mm conduit.

4.5.2 Space Requirements

In each TES accommodation is required for two 2.483 racks, one rack to house the cell call system and the other the PA and LCIS equipment.

4.5.3 Power Requirements

Two (2) 110.0 VAC, 15.0 ampere power circuits are required.

4.6 Installation Requirements

The conduit shall be installed at the site in accordance with the ES/SOW-0101, Statement of Work and the ES/SOW-0102, Statement of Work.

4.7 Documentation Requirements

All as-build drawings and documentation shall be in accordance with the ES/SOW-0101, Statement of Work.

5.0 QUALITY ASSURANCE

5.1 General

All on-site installation work, and installation acceptance shall be conducted in accordance with the ES/SOW-0101, Statement of Work.

6.0 DELIVERY

Delivery requirements for drawings, plans, etc. (where applicable) shall be in accordance with the ES/SOW-0101, Statement of Work.

APPENDIX A

SUMMARY OF SYSTEM CONDUIT REQUIREMENTS

System	Conduit Requirements
MDS	One 38 mm conduit from the CER to the area between the two perimeter fences.
FDS	One 38 mm conduit from the CER to the inner perimeter fence.
MICROWAVE	One 19 mm conduit from the closest local control module to the sallyport area.
PIDS CCTV	**Signal and Control**. Two 50 mm conduits from the CER to the perimeter camera towers in both directions with junction boxes at each of the towers. One 19 mm conduit from the junction box to the cameras on the tower. **VAC Power**. Two 50 mm conduits from the electrical distribution panel in the CER to the junction box on the perimeter. One 38 mm conduit around the perimeter providing power to each camera group.
PIDS PA	Two 25 mm conduits from the CER to the first group of speakers on the perimeter fence, one in each direction. One 25 mm conduit between speaker locations.
MCCP	Control and signal cables (no conduit required) under the computer flooring to the CER. VAC UPS power in 19 mm conduit from the CER.
ICCS	One 15 mm conduit from each cell to a junction box in the pipe chase. Junction boxes linked together by 25 mm conduit. One 38 mm conduit from the group junction box to the CP/TES. One 25 mm conduit from the TES to the CP.
FPSA	One 15 mm conduit from each designed room to a junction box. Junction boxes connected by 25 mm conduit. One 38 mm conduit from a main junction box to the CER.
PPA	One 15 mm conduit from the PPA receiver to the MCCP. One 15 mm conduit from the PPA receiver to the antenna.
PALS	One 15 mm conduit from each PALS node to the CER.
Door Control	Two 15 mm conduits (one for CCTV, one for power) from the CER or from the TES to the room and/or corridor doors requiring controlled access.

System	Conduit Requirements
Supp. CCTV	Two 15 mm conduits to each camera location, one for signal wiring and the other for AC power to the camera and housing. If the camera has pan/tilt/zoom facilities, one of the two conduits may have to be increased in size to 19 mm to accommodate additional control wiring.
SIDS	Two 15 mm conduits from the CER to the camera location. One conduit for video and camera control cables. The other conduit for the camera and enclosure VAC power.
MCCP/VRE	Cables under the computer flooring.
MCCP/VCR	Cables under the computer flooring.
Two-way Radio	One 19 mm conduit from the Base Station to the antenna location.
Interior PA	One 15 mm conduit between speaker locations. Combine speaker locations require one 19 mm conduit. One 25 mm conduit from the TES to the CP.
LCIS	One 15 mm conduit from remote stations to the TES or the cable tray.
RVIS	One 15 mm conduit from each booth to the RVIS CP.
ECTV	One 15 mm conduit to in each cell and various inmate lounges. Groups of cell outlet boxes are connected to a junction box by 19 mm conduit. One 38 mm conduit from junction boxes to the TES. One 19 mm conduit from the head-end equipment rack and the antenna site.
CER/TES	CER and various TES are linked by one 50 mm conduit.

APPENDIX B

SUMMARY OF SYSTEM SPACE REQUIREMENTS

System	Space Requirements
MDS	The MDS control equipment requires approximately 1.5 m of EIA standard equipment rack space in the CER.
FDS	The FDS control equipment requires approximately 1.5 m of EIA standard equipment rack space in the CER.
MICROWAVE	The microwave control equipment requires approximately 0.5 m of EIA standard equipment rack space in the CER.
PIDS CCTV	The video distribution and switching equipment require approximately 1.0 m of EIA standard equipment rack space in the CER. The PIDS CCTV equipment in the MCCP requires approximately 1.0 m of EIA standard console cabinet space. A separate standalone rack is required to housed five (5) time lapse VCRs in the MCCP.
PIDS PA	The PIDS PA equipment requires approximately 0.5 m of EIA standard equipment rack space in the CER.
MCCP	The MCCP console usually consists of six EIA standard console cabinets joined together to form the control console. The maintenance video display unit (VDU) and ancillary equipment require approximately 1.0 m of EIA standard equipment rack space in the MCCP. The time-lapse VCRs and printer require a low profile cabinet with sliding shelves in the MCCP.
ICCS	The ICCS control equipment requires approximately 1.5 m of EIA standard equipment rack space in the TES.
FPSA	The FPSA control equipment requires approximately 0.5 m of EIA standard equipment rack space in the CER.
PPA	The PPA receiver requires to be mounted on a shelve in a rack or on the wall in a central location of the institution. The PPA controller mounted on a shelve requires approximately 0.25 m of the rack space in the ancillary equipment rack space in the MCCP.

System	Space Requirements
PALS	The PALS nodes and wireless sensors will be mounted in the ceilings throughout the institution. The PALS controller requires approximately 1.0 m of EIA standard equipment rack space in the CER.
Door Control	The hall and door control equipment require approximately 1.0 m of EIA standard equipment rack space in the CER or TES. The operator control equipment requires approximately 0.25 m of rack space in the control console.
Suppl. CCTV	Video switchers, multiplexers, etc. require rack space in EIA standard equipment racks in the CER or TES. The space requirement will depend on the type and amount of video equipment being used. The space requirement in the control console for the monitors and the pan/tilt/zoom controller if applicable will depend on the type and amount of video equipment being used.
SIDS	The space requirement for the SIDS control equipment in the CER will depend on the type of equipment being used. Rack space in the control console is required for the monitors and a pan/tilt/zoom controller if applicable.
MCCP/VRE	The Voice Recording Equipment is usually self contained in its own moveable rack in the MCCP and requires a floor area of 650 mm square with an equal area in front and behind for operator and technician access.
MCCP/VCR	The Time Lapse Video Cassette Recorders are normally installed in moveable racks in the MCCP and require a floor area of 650 mm square with an equal area in front and behind for operator and technician access.
Two-way Radio	Three base station radios with associated DIUs require approximately 1.5 m of EIA standard equipment rack space in the CER. If the radios are configured as repeaters, another EIA standard equipment is required for the filters. In the MCCP console, the remote controller requires 5¼ inches (3 U) of console cabinet space.
Interior PA	The Public Address equipment requires approximately 1.5 m of EIA standard equipment rack space in the TES.

System	Space Requirements
LCIS	The Limited Call Intercom System usually forms part of the interior PA system.
RVIS	The Restricted Visit Intercom System controller is mounted in the console in the Restricted Visit CP.
ECTV	The Entertainment Cable TV system head-end equipment requires approximately 1.5 m of EIA standard equipment rack space close to the antenna site. Amplifiers and splitters will be accommodated in the EIA standard equipment racks in the TES or amplifiers and splitters can be a small cabinet mounted on the wall or placed under the computer flooring.
TES	Each TES requires two EIA standard equipment racks, one rack to house the inmate cell call system and ancillary equipment. The other rack will house the interior PA and LCIS equipment.

APPENDIX C

SUMMARY OF SYSTEM POWER REQUIREMENTS

System	Power Requirements
MDS	The power requirement for the MDS equipment in the CER is one 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
FDS	The power requirement for the FDS equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
MICROWAVE	The power requirement for the microwave equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
PIDS CCTV	The power required in the CER for video switching and control equipment is one 110.0 VAC, 15.0 ampere uninterruptible power circuit. The power requirement for the perimeter cameras is a 110.0 VAC, 20 ampere circuit to each group of usually four (4) cameras from the power distribution panel in the CER.
PIDS PA	The power requirement for the PIDS PA equipment in the CER is a 110.0 VAC, 15.0 ampere, uninterruptible power circuit.
MCCP	The power requirement for the MCCP console is two 110.0 VAC, 15.0 ampere, uninterruptible power circuits.
ICCS	The power requirement for the Inmate Cell Call System equipment in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
FPSA	The power requirement for the Fixed Point Security Alarm system equipment in the CER is a 110.0 VAC, 15.0 ampere circuit.
PPA	The power requirement for the Personal Portable Alarm system equipment in the MCCP is a 110.0 VAC, 15.0 ampere circuit.
PALS	The power requirement for the Portable Alarm Location System equipment in the CER is a 110.0 VAC, 15.0 ampere circuit.
Door Control	The power requirement for the Hall, Corridor and Door Monitor and Control system in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
Suppl. CCTV	The power requirement for the Supplementary CCTV system equipment in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
SIDS	The power requirement for the Supplementary Intrusion Detection System equipment in the CER is a 110.0 VAC, 15.0 ampere circuit.

System	Power Requirements
MCCP/VRE	The power requirement for the Voice Recording Equipment in the MCCP is a 110.0 VAC, 15.0 ampere circuit.
MCCP/VCR	The power requirement for the Video Cassette Recorder equipment in the MCCP is a 110.0 VAC, 15.0 ampere circuit.
Two-way Radio	The power requirement for the Radio Communications system equipment is a 110.0 VAC, 15.0 ampere circuit.
Interior PA	The power requirement for the Interior Public Address system equipment in the security Control Post is a 110.0 VAC, 15.0 ampere circuit.
LCIS	The Limited Call Intercom System is usually part of the Interior PA system. If a standalone LCIS installed, the power requirement for this system is a 110.0 VAC, 15.0 ampere circuit.
RVIS	The power requirement for the Restricted Visits Intercom System equipment in the RV Control Post a 110.0 VAC, 15.0 ampere circuit.
ECTV	The power requirement for the Entertainment Cable TV system equipment is a 110.0 VAC, 15.0 ampere circuit.
TES	The power requirement for the Terminal Equipment Space room is two 110.0 VAC, 15.0 ampere circuits.

Correctional Service Canada
Technical Services Branch
Electronic Security Systems

ES/SPEC – 0500
Revision 5
12 March 2012

ELECTRONICS ENGINEERING SPECIFICATION

INMATE CELL CALL SYSTEM FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

AUTHORITY

This Specification is approved by the Correctional Service Canada for the procurement and installation of an Inmate Cell Call System in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

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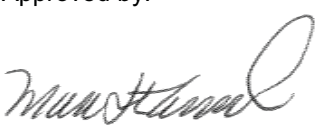
Approved by:



Director,
Electronic Security Systems

RECORD OF REVISIONS

Revision	Paragraph	Comment
5	<Most>	Original Record of Revisions. Major update with RFID tracking and report samples.

CONTENTS

ABBREVIATIONS

The following abbreviations are used in this specification:

API	Application Programming Interface
CCD	Call Cancellation Device
CD	Commissioner's Directive
CER	Common Equipment Room
COD	Call Origination Device
CSC	Correctional Service Canada
FAAS	Facility Alarm Annunciation System
GFE	Government Furnished Equipment
ICCS	Inmate Cell Call System
MCCP	Main Communications and Control Post
NTP	Network Time Protocol
OSOR	Officer's Statement/Observation Report
RFID	Radio Frequency Identification
RFP	Request for Proposal
STR	Statement of Technical Requirements
TCP/IP	Transport Control Protocol/Internet Protocol
UPS	Uninterruptible Power Supply

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services, Correctional Service Canada (CSC)
Contractor	The Company selected as the successful bidder.

1 INTRODUCTION

1.1 General

This specification defines the essential technical and functional requirements of the Correctional Service of Canada for the procurement and installation of an Inmate Cell Call System (ICCS) for Federal Correctional Institutions. This system shall share displays with the Security Patrol System in the Control Posts, if they are from the same supplier.

1.2 Purpose

The primary purpose of the ICCS is as life safety system. It is an alarm button which is permanently installed in a cell that, when activated, triggers an alarm at the unit control post. The ICCS are derived from the Commissioner’s Directive (CD) 567-2 Use of and Responding to Alarms. Data logging and report generation will provide a record for evidentiary use, assessment, and follow-up. It is also used for tracking Officer's Statement/Observation Reports (OSORs) relating to exceeded cell call service timeouts.

2 APPLICABLE DOCUMENTS

2.1 Specifications, Standards and Statements of Work

The following documents of the issue in effect on the date of the Request for Proposal shall form a part of this specification to the extent specified herein.

ES/SOW-0101 Statement of Work for Installation of Electronic Systems

ES/SOW-0102 Statement of Work for Quality Control of Electronic Systems Installations

ES/SOW-0110 Statement of Work for Structured Cable Systems for Electronic Systems Installations

ES/SPEC-0005 Specification for Main Communications and Control Post Integration Consoles

ES/SPEC-0102 Electronics Engineering Specification, Data Logger for use in Federal Correctional Institutions

EIA-310 Electronic Industry Association Standard for Racks, Panels and Associated Equipment

3 REQUIREMENTS

3.1 General

The ICCS consists of one Call Origination Device (COD), and one Call Cancellation Device (CCD) per cell, two or more Status Displays per Control Post for redundancy, one or more Monitoring Displays, common equipment, wires, cables, conduits, ducts, etc.; and interfaces to the Data Logger, and to the Main Communications and Control Post (MCCP).

The Status Displays display the Cell Call application. The existing Facility Alarm Annunciation System (FAAS) will collect, record, and display alarm signals in the MCCP. The Monitoring Displays display the Monitoring, Reporting, Configuration, Maintenance, and Admin Applications.

The contractor shall design, supply, install, test and provide documentation and training for an ICCS in accordance with the Specifications, Standards and Statements of Work specified in Section 2 of this specification.

3.1.1 System Capacity

The system shall support:

a) at least two hundred and fifty (250) cells (COD + CCD) per Status Display in a Control Post;
b) at least sixteen (16) Status Display pairs per facility; and
c) at least four (4) Configuration Displays per facility.

3.1.2 Period of Operation

The ICCS and all associated equipment shall be rated and capable of operation 24 hours per day, seven days a week with an expected operational life of no less than 10 years.

A system failure shall be deemed to have occurred when any required alarm or warning (visual or audible) is not produced or when any required control function cannot be performed. This applies to both the Status Display and the Monitoring Display.

Loss or restoration of primary power to the system shall not produce spurious reads or outputs to the data logger. When power is returned after a power failure, the system shall resume normal operation without operator action and shall automatically start from an all calls cleared condition.

3.2 System Requirements

3.2.1 Commercial-Off-The-Shelf Equipment

The ICCS shall use commercial off-the-shelf equipment and proven designs to the maximum extent possible. All new equipment shall meet the specified lifespan requirements. The goal is to allow integration of co-located systems on to shared displays and provide a consistent, common look and feel. The equipment design shall provide open Ethernet TCP/IP APIs to the consoles and the edge devices to allow integration with future systems. The goal is for the APIs to be usable in an extensible, open architecture, security electronics framework.

3.2.2 Technical Acceptability

The CSC operational environment is unique for its diversity of locations, climate exposures and the physically restrictive construction techniques of penal 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 shall maintain very high standards of dependability and reliability.

The CSC Technical Services Branch, Engineering Services Division has established technical specifications and equipment standards for specific electronic security systems which are based on very specific and restrictive operational performance criteria as detailed in its Electronic Engineering Standard. Technical acceptability of these systems means that the equipment complies with the pertinent CSC specifications and standards.

3.2.3 Prototype Approval

When the contractor is to supply the COD and CCD as part of the system, a working COD and CCD prototype shall be provided to the Design Authority for approval prior to manufacturing or purchasing of system quantities

3.2.4 General

The system shall:

a) be managed with a non-proprietary interface;
b) include an open SDK for the display interface generation;
c) provide a managed, object model for all TCP/IP end devices that abstracts their core functionality;
d) provide a published or standard protocol for all TCP/IP end devices preferably based on existing network standards such as SNMP;
e) synchronize its internal clocks with a NTP network time source, where available;
f) ensure a minimum of twelve (12) months of data is retained; and
g) ensure data over twelve (12) months is deleted automatically.

3.2.5 System Configuration

The ICCS shall consist of the following elements in the quantities given in the Statement of Technical Requirements (STR):

a) COD
    i. vandal resistant mount and construction (provide no lip for prying between box and cover or button and cover, single gang box configuration preferred, surface mount is not acceptable, and no suspension points),
    ii. IP65 environmental rating or better,
    iii. IK10 impact resistance rating or better,
    iv. sever the wiring in case of unit destruction,
    v. if mechanical, isolate the switch from loads greater than the operation force (to prevent switch damage),
    vi. leave 9/16” of unobstructed depth in the installation box for cabling,
    vii. pushbutton with a minimum diameter of 2.5cm,
    viii. require between 5.6 and 11.0N (20 and 40 oz.) force to operate,
    ix. provide audible feedback in the form of a click or a beep upon activation,
    x. provide visual feedback in the form of an red LED upon activation, preferably integrated into the pushbutton,
    xi. connect to TCP/IP over Ethernet (either directly or from a I/O end device such as the CCD),
    xii. if connected to an I/O end device, have supervised wiring to detect short circuits and open circuits,
    xiii. be powered directly by Power over Ethernet (PoE) or from the I/O end device;
b) CCD
    i. vandal resistant mount and construction (provide no lip for prying between box and cover, single gang box configuration preferred, surface mount is acceptable),
    ii. IP65 environmental rating or better,
    iii. IK10 impact resistance rating or better,
    iv. leave 9/16” of unobstructed depth in the installation box for cabling,
    v. a red LED visual alarm indication,

vi. a green LED visual card read indication, 20 seconds duration,
vii. audible card read indication with enable/disable in the protocol,
viii. green colour insert or finish (to differentiate from Security Patrol Device),
ix. connect using TCP/IP over Ethernet (either directly or from a remote controller),
x. support in-situ re-programming of the reader using TCP/IP over Ethernet,
xi. be powered by Power over Ethernet (PoE) IEEE 802.3af (802.3at Type1), and
xii. read HID “Corporate 1000” Format compatible RFID cards (GFE);

c) Status Display
   i. deployed in each control post console and security patrol “home” locations,
   ii. graphical colour touch screen display,
   iii. minimum 19” screen size,
   iv. minimum resolution height x width of 1.2 million pixels,
   v. no mouse or keyboard,
   vi. an RFID reader (CCD equivalent) for alarm acknowledge, and
   vii. audible alarm output;
d) Configuration Display
   i. deployed according to the STR, may be combined onto other displays or systems,
   ii. a graphical touch screen display,
   iii. minimum 19” screen size,
   iv. minimum resolution height x width of 1.2 million pixels,
   v. an RFID reader (CCD equivalent) for application access control, and;
   vi. two (2) USB 2.0 (or better) ports (to be used for a keyboard and mouse for the Configuration Application only, a USB keyboard and a USB mouse are part of this system);
e) Common equipment (network hardware, CCD controllers, etc.);
f) Interconnecting wiring, cables, etc.; and
g) Conduit, ducts, outlet boxes, etc.

3.2.6 Displays

The displays shall:

a) use iconography and guidelines provided (pending creation) or approved by CSC.

The preferred display layout will be based on a simplified floor plan of the whole or part of a unit based on screen space. Icons shall be used instead of text where possible.

3.2.7 Wires, Cables, Conduits, Ducts

The contractor shall supply all necessary terminations, cross connection cabinets, conduits, wire and cabling and any other items that may be required for the satisfactory completion of the specified system. All installation workmanship shall be performed in accordance with ES/SOW-0102 and ES/SOW-0110 Statements of Work and all applicable national, provincial, and local electrical codes.

A wiring diagram shall be supplied in the Installation section of the Maintenance Manual to detail where module connections terminate and how wires are routed and terminated.

Conduits, cables, ducts, trays, etc. may be either GFE or supplied and installed by the contractor depending on the particular institution. The determination will be made by the Design Authority and will be identified in the RFP.

Connectors provided on the ends of any cable must mate with the corresponding connector on the equipment. Adapters from one type of connector to another are not acceptable.

3.2.8 Common Equipment

Where feasible and practical all common equipment (e.g., power supplies, logic boards, amplifiers, etc.) shall be located in the Terminal Equipment Room supplied for that purpose. This area will be identified in the STR. Consistent with the foregoing, only items of equipment such as visual and audible annunciators, switches, actuators, etc. which the operator must access directly shall be located in the control panels.

All equipment deployed in Terminal Equipment Room shall be rack mounted in racks compliant with EIA-310.

To the maximum practical extent, off-the-shelf equipment shall be selected for use in the SPS. New designs shall be restricted to common interface areas, control panels and consoles, or unique devices for which an off-the-shelf item does not exist.

3.2.9 Interface to Data Logger

The contractor shall supply and install all necessary wiring and control equipment required to interface the ICCS to the MCCP Data Logger described in ES/SPEC-0005. All actions in the ICCS shall be logged including alarms, acknowledgements, cancellations, escalations, fault alarms, reboots, mask changes, and configuration changes.

3.2.10 Interface to MCCP/FAAS

The contractor shall supply and install all necessary wiring and control equipment required to connect the ICCS to the FAAS in the MCCP as described in ES/SPEC-0005. The message formats shall be as described in ES/STD-0102. It is preferable that the messages be provided over TCP/IP. The cable connection and integration into the FAAS shall be under a separate contract. All ICCS faults and alarms shall be provided in a format compatible with the FAAS specification. The integration of these alarms into the FAAS is under a separate contract.

3.3 Design Requirements

3.3.1 General

To the maximum practical extent, off-the-shelf equipment shall be selected for use in the ICCS. New designs shall be approved by the Design Authority prior to manufacturing or purchasing.

A design objective is to use TCP/IP over Ethernet to connect the system elements with PoE being used to power edge devices.

A space-diversity approach to system planning shall be employed to ensure that loss of one interconnection routing does not impair the operational capability of the complete ICCS system.

3.3.2 Wiring Supervision

All signal wiring other than TCP/IP cables shall be supervised in all system modes. An alarm shall occur if any system wiring is cut or shorted to other wires or if the system devices are tampered with by unauthorized persons or environmental conditions. Ethernet elements shall be monitored with regular communication checks at least every minute.

3.3.3 Sabotage, Tampering and Survivability

Elements of the ICCS will operate in areas exposed to inmate access and shall have high resistance to damage, destruction, or conversion to other uses (including weapons). All interconnecting service must be secure against tampering, improper interception, or interference. In particular, the COD shall not provide a suspension point nor shall it have more than the

thickness of the face plate proud of the wall.

3.3.4 Human Factors

Elements of the ICCS shall conform to accepted principles of good human factors design.

3.3.5 Existing Equipment

In most installations, control and annunciation elements of the ICCS will share console space with other electrical/electronic equipment such as door controls, lighting controls, etc. and will be operated by the same staff member. In such cases it is important that effort be made to coordinate the functional and operational design of the ICCS according to accepted human engineering principles to ensure a uniform appearance and commonality of a layout to assist the operator in the performance of his duties.

3.4 Operational Requirements

3.4.1 Sample operational sequence

This is a sample operations sequence including events at the Unit and the MCCP. These samples cover a normal cell call, and acknowledge, service, and mask timeouts.

System configuration:

a) Acknowledge timeout: 1 minutes
b) Service timeout: 5 minutes
c) Mask timeout: 1 hour

Unit MCCP

<normal cell call>

03:25:23 Cell call COD button is pressed in Cell A01:
- alarm sounds at the associated Status Display,
- alarm LED on the COD illuminates,
- alarm LED on the CCD illuminates,
- Cell A01 icon on the Status Display indicates an alarm by flashing red. If the page containing Cell A01 is not currently displayed, it will be brought to the foreground, and
- 1 minute acknowledge timeout starts.

03:25:47 Correctional Officer acknowledges the alarm with their RFID card:
- acknowledge mutes the alarm,
- Cell A01 icon on the Status Display indicates acknowledged by changing to solid red, and
- 5 minute service timeout starts;

<Correctional Officer proceeds to cell, and deals with the inmate's needs>

03:28:12 Correctional Officer cancels the alarm with their RFID card at the cell door:
- alarm LED on the COD goes out,
- alarm LED on the CCD goes out,
- Cell A01 icon on the Status Display returns to the normal state, green.

<end normal cell call>

<cell call unacknowledged alarm>

04:46:21 Cell call COD button is pressed in Cell A01:
- alarm sounds at the associated Status Display,
- alarm LED on the COD illuminates,
- alarm LED on the CCD illuminates,
- Cell A01 icon on the Status Display indicates an alarm by flashing red. If the page containing Cell A01 is not currently displayed, it will be

brought to the foreground, and
- 1 minute acknowledge timeout starts.

04:47:21 Acknowledge timeout expires:
- MCCP alarm and display of unacknowledged cell call, and
- 5 minute service timeout starts;

< MCCP contacts Control Post>

<Correctional Officer proceeds to cell, and deals with the inmate's needs>

04:50:39 Correctional Officer cancels the alarm with their RFID card at the cell door:
- alarm LED on the COD goes out,
- alarm LED on the CCD goes out,
- Cell A01 icon on the Status Display returns to the normal state, green.

04:50:39 MCCP alarm removed.

<end cell call un-acknowledged alarm>

<cell call service timeout expiry alarm>

04:46:21 Cell call COD button is pressed in Cell A01:
- alarm sounds at the associated Status Display,
- alarm LED on the COD illuminates,
- alarm LED on the CCD illuminates;
- Cell A01 icon on the Status Display indicates an alarm by flashing red. If the page containing Cell A01 is not currently displayed, it will be brought to the foreground, and
- 1 minute acknowledge timeout starts.

04:46:35 Correctional Officer acknowledges the alarm with their RFID card:
- acknowledge mutes the alarm, and
- Cell A01 icon on the Status Display indicates acknowledged by changing to solid red, and
- 5 minute service timeout starts.

04:51:35 Service timeout expires:
- MCCP alarm and display of service timeout;

<MCCP contacts Control Post>

<Correctional Officer proceeds to cell, and deals with the inmate's needs>

04:52:39 The Correctional Officer cancels the alarm with their RFID card at the cell door:
- alarm LED on the COD goes out,
- alarm LED on the CCD goes out,
- OSOR required recorded for officer cancelling alarm,
- Cell A01 icon on the Status Display returns to the normal state, green.

04:52:39 MCCP alarm removed.

<end cell call service timeout expiry alarm>

<alarm mask>

04:50:56 The Correctional Officer receives approval to mask Cell A01:
- selects Cell A01 and selects "mask", and
- Cell A01 icon on the Status Display turns yellow indicating masked.

04:50:56 MCCP alarm and display of masked cell call alarm.

05:50:56 Mask timeout expires:
- Cell A01 unmasks automatically, and
- Cell A01 icon on the Status Display returns to its current state (Note b).

05:50:56 Mask timeout expires:
- MCCP mask alarm automatically removed.

<end alarm mask>

Notes:

a) Masking a cell call does not cancel any active cell call; however a cell call may be cancelled while masked.
b) There are no time-out alarms escalated from a masked cell call.
c) Unmasked cell calls return to their current state. If the cell call is active, the alarm

become unacknowledged and the alarm sounds with acknowledge and service timeouts reset.

3.4.2 Operational Details

Operationally, the masking of a cell call alarm by a Correctional Officer requires approval by the Correctional Manager or the Unit Supervisor. This is not part of the electronic system.

Acknowledgement of the alarm is not required prior to cancelling a cell call alarm at the cell. Cancellation includes implicit acknowledgement of the alarm for that cell. Only an alarm that is not cancelled prior to the expiry of the service timeout requires completion of an OSOR.

Neither the COD nor the CCD shall differentiate between acknowledged and unacknowledged alarm states. An active cell call always indicates solid red at the COD and CCD. This prevents making acknowledge state information available to offenders.

The acknowledge timeout starts when the COD is pressed in the cell. The service timeout starts upon receipt of the acknowledge input, or expiration of the acknowledge timeout.

Some facilities have pairs of control posts that are consolidated to a single location during night-time operation. The system shall allow for transfer of ICCS control and display to one alternate control post. The system shall be configurable to allow control transfers in either direction or only one direction as specified in the STR.

3.4.3 All Applications

All applications shall be implemented as browser-based or thin client applications running on servers in the CER and displayed in the control post.

All applications shall:

a) provide an on-screen legend, possibly implemented as a pop-up window, to explain icon colours and usage;
b) accept an input to toggle between French and English versions; and
c) support maintainer modifiable French and English user messages.

Application access shall be limited according to the following RFID privilege levels:

		Applications					
		Status	Monitoring	Reporting	Configuration	Maintenance	Admin
Privilege	User	Yes	N/A	No	No	No	No
	Reporter	Yes	N/A	Yes	No	No	No
	Configurer	No	N/A	No	Yes	No	No
	Maintainer	Yes	N/A	Yes	Yes	Yes	Yes
	Admin	No	N/A	No	No	No	Yes

An RFID card shall have at most one privilege assigned. The Reporter privilege will likely be assigned to Correctional Managers. The Monitoring Application is integrated only into the MCCP and does not use any card authorization.

3.4.4 Status Application

A Cell Call System is a life safety system to provide inmates with a way to initiate an alarm to call for the assistance of staff and to monitor timely responses to the alarms. The Status Application shall be the only application available at the Control Posts.

The Status Application shall:

a) be displayed on the Status Display at the control post;
b) operate independently on each display of the Status Display (multiple Status Displays are required for redundancy);
c) operate all of the Ranges from any Status Display in the responsible Control Post;
d) display a simplified floor plan of the unit – it may take multiple maps (this may be integrated into other co-located displays pending CSC approval);
e) display the status for each cell as follows:
    i. Green – the cell call is normal and operational,
    ii. Yellow – the cell call is masked,
    iii. Flash Red – the cell call is in alarm, not acknowledged,
    iv. Red – the cell call is in alarm, acknowledged,
    v. Flash Magenta – fault or tamper detected - offline, not acknowledged, and
    vi. Magenta – fault or tamper detected, or maintenance (differentiated by icon) - offline, acknowledged;
f) sound an audible status of the reader as follows:
    i. Call alarm – a continuous sound pending acknowledgement or service, and
    ii. Fault/tamper alarm – a different, lower pitch continuous sound pending acknowledgement;
g) indicate alarms with a slow flash;
h) ignore additional COD button presses while the alarm is un-cancelled;
i) display alarms in the order received;
j) show unacknowledged alarms immediately if there are no other current unacknowledged alarms;
k) if integrated with other systems, Cell Call alarms shall have display priority;
l) accept an acknowledge input to mute the alarm tone for all current visible unacknowledged alarms (no cell selection required);
m) allow acknowledgement of multiple concurrent alarms in any sequence;
n) allow cancellation of multiple concurrent alarms in any sequence;
o) in the case of multiple alarms on different screens/maps, show the next unacknowledged alarm screen/map once the previous alarm is acknowledged;
p) flash red the map selector button for all maps containing un-cancelled cell call alarms when multiple alarms occur on different screens/maps;
q) accept an input to start transfer of control to the alternate station;
r) accept an RFID card input to confirm transfer of control to the alternate station;
s) accept an RFID card input to accept control transfer at the alternate station;
t) accept an input to start return of control to the original station;
u) accept an RFID card input to confirm return of control to original station;
v) accept an RFID card input to accept return of control transfer at the original station;
w) in case of a system failure, automatically transfer control to the alternate station, if one is identified;
x) accept an input to select a single cell (no groups);
y) indicate the user selected cell with a fast flash;
z) enable mask or unmask command based on selected cell state;
aa) accept a mask/unmask input on the Status Display to mask/unmask the selected cell's cell call;
bb) accept an RFID card input at the Status Display to confirm mask/unmask a selected cell's cell call;
cc) display an unacknowledged alarm for any cell call not cancelled when it is unmasked;
dd) accept an RFID card input at the corresponding CCD to cancel an alarm whether unmasked or masked;
ee) if the service timeout has expired, assign OSOR requested to the cancelling Correctional Officer; and
ff) use icons for input and status display.

All control transfers are initiated only from the post currently responsible for the patrol and require an acknowledgement at the post receiving the responsibility – A "give" model not a "take" model.

3.4.5 Monitoring Application

The system reports unacknowledged and late service times to the FAAS in the MCCP – the application is integrated into the existing PIU system. The FAAS integration shall include:

a) display cell call acknowledge timeout alarms;
b) display cell call service timeout alarms;
c) display cell call mask alarms;
d) display cell call faults; and
e) accept acknowledge inputs for alarms.

3.4.6 Reporting Application

The Reporting Application shall provide reporting capabilities to the ICCS including:

a) be displayed on the Configuration Display;
b) accept an input to logoff the user;
c) log off the current user after five (5) minutes of inactivity; and
d) allow generation of reports as follows:
    i. All Cell Call Report: for a user selected time interval (all time intervals are 5 minute resolution and 24 hour clock) grouped by unit control post and sorted in time order including header: date, report interval and fields: unit identifier, cell identifier, alarm time, acknowledge time, service time, service officer, LATE/MASK/UNMASK tag if service is late, masked or unmasked, late interval, and OSOR received state, (Late cell call service times shall be made to stand out in the report),
    ii. Single Unit Control Post Cell Call Report: for a user selected unit control post, for a user selected time interval (all time intervals are 5 minute resolution and 24 hour clock) sorted in time order including header: date, report interval, unit identifier and fields: cell identifier, alarm time, acknowledge time, service time, service officer, LATE/MASK/UNMASK tag if service is late, masked or unmasked, late interval, and OSOR received state, (Late cell call service times shall be made to stand out in the report),
    iii. OSOR Pending Correctional Officer Report: a user selected date interval report sorted by Correctional Officer including header: date, report interval, and fields: unit identifier, cell identifier, date, time, status, and footer: count of pending OSORs, and
    iv. Correctional Officer Performance Report: a user selected date interval report of all officer performance sorted by Correctional Officer including header: date, report interval and fields: officer, in time cell calls, cell calls, percent in time cell calls, OSORs submitted, OSORs required and percent OSORs submitted;
e) allow printing of any report;
f) use touch screen input exclusively.

The data for all ICCS reports shall be maintained in a separate database as part of the ICCS. The data shall also be maintained in an auxiliary database located in a different part of the institution as a backup.

Notes:

a) Cell calls may be late, masked, or both;
b) OSORs are required for all late cell calls – no option;
c) All reports include the report type in the header;
d) All reports include the institution in the header;
e) All reports include the selection criteria in the header; and
f) All reports include a printing date and time in the footer.

Sample reports (Single Unit Control Post reports are a subset of All Units reports):

All Cell Call Report:

Select:
08:00 to 11:00 2011 September 2
Output:

All Patrols Report
2011 September 2 08:00 to 11:00 at Joyceville Institution

Unit 5

Cell	Date	Call	Ack	Service	Officer	Status	Interval Rec'd
A07	2011/09/02	08:04:22	08:04:34	08:07:55	Joe Jacobs		
B13	2011/09/02	09:54:17		09:55:33	Joe Jacobs		
A07	2011/09/02		09:56:20		Joe Jacobs	MASK	
B08	**2011/09/02**	**09:57:04**	**09:57:07**	**10:04:49**	**Joe Jacobs**	**LATE**	**00:02:42**
A07	2011/09/02		10:56:20		<Auto>	UNMASK	

3 call(s)

Unit 6

Cell		Call	Ack	Service	Officer	Status	Interval Rec'd
A04	2011/09/02	09:26:55	09:27:00	09:29:03	Jane Jacobs		
A04	2011/09/02	09:29:17		09:29:33	Jane Jacobs		
A04	2011/09/02	09:31:41	09:31:57	09:32:28	Jane Jacobs		
A04	2011/09/02		09:34:07		Jane Jacobs	MASK	
A04	2011/09/02		10:19:20		Jane Jacobs	UNMASK	

3 call(s)

Printed: 2011 September 4 14:32:14

OSOR Pending Correctional Officer Report:

Select:
2011 September 2 to 2011 September 2
Output:

OSOR Pending Correctional Officer Report
2011 September 2 at Joyceville Institution

Officer: Jane Jacobs

Unit	Cell	Date	Time	Status	Interval

0 OSORs pending.

Officer: Joe Jacobs

Unit	Cell	Date	Time	Status	Interval
Unit 5	B08	2011/09/02	09:57:04	LATE	00:02:42

1 OSORs pending.

Printed: 2011 September 5 07:09:49

Correctional Officer Performance Report:

Select:
2011 September 1 to 2011 September 30
Output:

Correctional Officer Performance Report
2011 September 1 to September 30 at Joyceville Institution

Officer	On Time Cell Calls		Submitted OSORs	
Jane Jacobs	32/33	96.97%	1/1	100.00%
Joe Jacobs	24/44	54.55%	17/20	85.00%

Printed: 2011 October 5 09:33:21

3.4.7 Configuration Application

The Configuration Application shall provide configuration capabilities to the ICCS including:

a) be displayed on the Configuration Display;
b) accept an input to log the current user out of the system;
c) log the current user out of the system after five (5) minutes of inactivity;
d) add/remove authorized RFID cards with names for User, Reporter, and Configurer privileges– this will either share/extend an existing RFID card database or require creation of one that will be used by this and other future applications.
e) create/edit descriptive information for each reader up to 30 characters;
f) create/edit descriptive information for each unit up to 30 characters;
g) assign readers to cells;
h) assign cells to units;
i) have the acknowledge timeout set to 1 minute, fixed;
j) have the service timeout set to 5 minutes, fixed;
k) have the cell call mask timeout set to 1 hour, fixed;
l) allow generation and printing of reports as follows:
    i. list by type, authorized RFID cards and names sorted by last name,
    ii. list added and/or removed authorized RFID cards and names, with authorizing RFID card, by date range sorted by date and time,
    iii. list all readers with readers grouped by unit, sorted by cell identifier, and
    iv. list all readers not assigned to a unit.
m) allow editing of English and French user text messages;
n) allow archiving Single Detail Reports to external, USB connected storage in a text format; and
o) accept input from a USB keyboard and mouse.

3.4.8 Maintenance Application

The Maintenance Application shall provide maintenance capabilities to the ICCS including:

a) be displayed on the Configuration Display;
b) all selection of Report, Configuration, Maintenance, or Admin application.
c) accept an input to logoff the user;
d) log off the current user after five (5) minutes of inactivity;
e) allow generation and printing of an fault/tamper list for a user selectable time interval;
f) cell call maintenance mask/unmask any reader in the facility – not subject to mask timeout; and
g) add/remove authorized RFID cards with names for All privileges.

3.4.9 Admin Application

The Admin Application shall provide administration capabilities to the ICCS including:

a) be displayed on the Configuration Display;
b) require an Admin enabled RFID card to access the system;
c) accept an input to logoff the user;
d) log off the current user after five (5) minutes of inactivity; and
e) allow generation and printing of reports as follows:
    i. list by type of authorized RFID cards and names sorted by last name, and
    ii. list added and/or removed authorized RFID cards and names, with authorizing RFID card, by date range sorted by date and time;
f) add/remove authorized RFID cards with names for Configurer, Maintainer, and Admin privileges.

3.4.10 Interface to Data Logger

The ICCS shall provide an output to the Data Logger described in ES/STD-0102, to provide a record of all cell call related ICCS events including:

a) System failures and restorations;
b) COD acknowledge and service timeout alarms with unit, range and cell;
c) all tamper/fault alarms with unit, cell and any available details;
d) cell call alarm acknowledges with unit and cell;
e) CCD cancellations with unit, cell and RFID data;
f) cell call masking/unmasking with unit, cell and RFID data;
g) configuration, maintenance, and admin Application logon/logoff;
h) all RFID application authorization changes with authorizing RFID card; and
i) cell call mask/unmask with unit, cell, and authorizing RFID card.

All of these activities shall be logged in plain-language (or approved abbreviation thereof) without the need for a cross-reference table. The events shall also include date and time to the nearest second.

3.4.11 Interface to FAAS

The system reports cell call alarms and faults to the MCCP. The alarms are integrated into the existing FAAS application at the MCCP.

The FAAS shall:

a) display alarms for:
    i. Un-acknowledged cell call,
    ii. Un-serviced cell call,
    iii. Cell call masking, and
    iv. Cell call tamper/fault;
b) display each alarm respectively until resolved by:
    i. Acknowledge or service,
    ii. Service,
    iii. Unmasking, and
    iv. Cell call restoration;
c) system failure and restoration; and
d) log all alarms and acknowledgements.

3.5 Environmental Requirements

The Status and Configuration displays shall operate over the following indoor environmental

conditions:

a) Temperature: 0° C to +50° C; and
b) Humidity: 0 to 90% relative, non-condensing.

3.6 Power Requirements

The Status and Configuration displays shall use VAC power within the following limits:

a) Voltage: 120 VAC ±10%;
b) Frequency: 60 Hz ±1.5%;
c) Transients: up to 5 times nominal voltage for up to 100 msec durations. Changes in the input power or any fluctuations within the above limits shall not cause damage to the unit;
d) Power: power consumption shall not exceed 100 watts per display; and
e) Power backup: all components of the system shall be supported by UPSs for a minimum of 1 hour.

3.7 Installation Requirements

The ICCS shall be installed at the site in accordance with the ES/SOW-0101, Statement of Work and the ES/SOW-0102, Statement of Work.

3.8 Documentation Requirements

All final ICCS documentation shall be provided in accordance with the ES/SOW-0101, Statement of Work.

3.9 Support Requirements

The ICCS maintenance and spares support shall be provided in accordance with the ES/SOW-0101, Statement of Work.

3.10 Training Requirements

Operator training and maintenance training on the ICCS shall be in accordance with the ES/SOW- 0101, Statement of Work.

4 QUALITY ASSURANCE

The ICCS Quality Assurance program shall be provided as detailed in the ES/SOW-0101, Statement of Work.

All on-site installation work, test plans and system acceptance testing shall be conducted in accordance with the ES/SOW-0101, Statement of Work.

5 DELIVERY

Delivery requirements for the ICCS documents, drawings, plans, manuals, etc. (where applicable) shall be in accordance with the ES/SOW-0101, Statement of Work.

Delivery requirements of the ICCS equipment shall be in accordance with the ES/SOW-0102, Statement of Work.

6 INTERFERENCE

Performance of the ICCS shall not be affected by the use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment are as follows:

a) 5 watt CB transceivers at 1 metre or more;
b) 6 watt VHF and UHF transceivers at 1 metre or more;
c) 25 mW 420-430 MHz Personal Portable Transmitters at 1 metre or more;
d) Other radio frequency transmitting, receiving and distribution equipment at 5 metres or more; and
e) Personal computer and/or computer work stations at 5 metres or more.

7 SAFETY

All ICCS electrically powered elements shall meet the applicable CSA standards.

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/SPEC-0501
Revision 2
21 January, 2002

ELECTRONICS ENGINEERING

SPECIFICATION

NURSE CALL SYSTEM FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

AUTHORITY

This Specification is approved by the Correctional Service of Canada for the procurement and Installation of a Nurse Call system, subsystem, and equipment in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service of Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services

TABLE OF CONTENTS

ABBREVIATIONS

The following abbreviations are used in this specification:

CCD	Call Cancellation Device
CER	Common Equipment Room
COD	Call Originating Device
COTS	Commercial-Off-The- Shelf
CSA	Canadian Standards Association
CSC	Correctional Service Canada
DES	Director Engineering Services
EIA	Electronic Industries Association
GFE	Government Furnished Equipment
MCCP	Main Communications and Control Post
PACP	Primary Annunciation and Control Panel
RFP	Request for Proposal
SAP	Secondary Annunciation Panel
SOW	Statement of Work
STR	Statement of Technical Requirements
TES	Terminal Equipment Space

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Service Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

1.0 INTRODUCTION

1.1 General

This specification defines the essential technical and functional requirements of the Correctional Service Canada (CSC) for the procurement and installation of a Nurse Cell System (NCS) for federal correctional institutions.

1.2 Purpose

The purpose of the NCS is to provide a means for inmates in a Health Care Unit (HCU) to indicate to the Nursing Staff that they need some form of attention, to display the location of the call originator on an annunciator panel and to record the date and time of the call sequence of events which can be used as documentary evidence.

In a Health Care Unit, a Call Ordinating Device (COD) shall be installed in each ward, a corresponding white annunciating Over door Light shall be installed over each ward door and an annunciator, complete with control equipment, will monitor the system at a local Nurse's Station. When required, strategically located Repeater Annunciators shall also monitor the system remotely. If a call is not acknowledged after a specified time delay (variable 1-15 minutes) then the call shall be automatically transferred and annunciated at the Main Communications and Control Post (MCCP) where appropriate action will be initiated.

The NCS described herein would be applicable to new institutions to be constructed. It could also be retrofitted into existing institutions whenever it becomes necessary to add a cell call capability or replace existing obsolete equipment.

1.3 Commercial-Off-The-Self Equipment

The NCS shall use commercial off-the-shelf (COTS) equipment and proven designs to the maximum extent possible. All new equipment shall meet the specified lifespan requirements. New equipment designs shall be restricted to unique interfaces and common control console.

1.4 Technical Acceptability

The Correctional Service Canada (CSC) operational environment is unique for its diversity of locations, climate exposures and the physical restrictive construction techniques of penal 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 shall maintain very high standards of dependability and reliability.

The CSC Engineering Services Division has established technical specifications and equipment standards for specific electronic security systems which are based on very specific and restrictive operational performance criteria as detailed in its Electronic Engineering Standard. Technical acceptability of these systems means that the equipment complies with the pertinent CSC specifications and standards.

The technical acceptance process shall involve system and subsystem evaluation in accordance with the applicable CSC specifications in one of CSC facilities or may be tested in a CSC facility to verify the effectiveness of the proposed technologies when subjected to the restrictive operational environment.

CSC shall also verify in depth any of the system technical specifications called up. CSC may when it deems necessary, request the supplier to arrange for a full site demonstration. CSC may rely on manufacturer's test results for specific areas of the specification where an independent test facility has conducted the test, and the facility is deemed acceptable to CSC.

It is the supplier's responsibility to make new developments in products available to CSC for evaluation. Equipment qualification is an ongoing process and can be initiated at any time by a vendor. Any vendor can have access to the CSC specifications and standards. Any new development or products should be submitted to the CSC Engineering Services Division, Technical Authority in a suitable time frame prior to any tendering process to allow for an acceptable evaluation period. The evaluation period may take up to sixteen (16) months.

1.5 Equipment Procurement

Any ordering of equipment/material before the approval of the NCS design report will be undertaken at the contractor's own risk. The Design Authority may authorize the procurement of certain long lead items at, or shortly after a preliminary design review of the proposed ICCS.

1.6 Quantity of Equipment

The quantity and location of the equipment required for CSC institutions will be contained in the specification identified in the Statement of Technical Requirements (STR)

2.0 APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of the Request for Proposal (RFP) shall form a part of this specification to the extent specified herein.

ES/SOW-0101	Statement of Work for Electronic Systems for Correctional Service of Canada Institutions
ES/SOW-0102	Statement of Work for Quality Control for installation of Electronic Systems in Federal Correctional Institutions.
ES/SPEC-0005	Specification for Main Communications and Control Post Integration Consoles
ES/STD-0802	Standard for Display and Control Panel
ES/STD-0803	Standard for Video Display Unit
EIA-310-C	Electronic Industry Association Standard for Racks, Panels and Associated Equipment

3.0 REQUIREMENTS

3.1 General

The Nurse Call System consists of a number of Call Originating Devices (COD), one or more Primary Annunciation and Control Panels (PACP), one or more Repeater Annunciators (if Required), a Secondary Annunciation Panels (SAP) a number of Overdoor Indicating Devices, Call Cancellation Devices (CCD), wires, cables, conduits, ducts, etc. and an interface with a Data Logger.

3.1.1 System Capacity

The number of control units and the number of wards served by each shall be as specified in the STR. The system shall be of a modular design and it shall be possible at a future date to add more annunciation panels and associated cell equipment to the basic installed complement without replacing the existing hardware.

3.1.2 Period of Operation

The NCS and all associated equipment shall be rated for and capable of 24 hours per day, seven days per week operation.

3.2 System Requirements

3.2.1 Call Originating Device

The COD shall be mounted on the wall near the patients bed. It shall contain a tamper proof switch, which when activated, originates a call to the PACP in the Nurse Station.

This device is located in an area continually exposed to the inmate. The COD shall be highly resistant to physical attack, tampering, liquids, jamming, abrasives, heated objects, etc.

3.2.1.1 Bed Call COD

The bed call COD shall be used by an inmate patient confined to bed in a hospital ward or Health Care Unit. It shall not furnish the inmate with material with which he or she might do injury to himself/herself or others. The unit shall consist of the following elements:

a. A latching-type receptacle mounted on a brushed stainless steel wall plate secured to a single-gang electrical outlet box.

b. A detachable cord assembly consisting of a specified length of lightweight stranded, jacketed electrical cord and a pendant cord switch having positive touch feedback and audible click. Cable grip and strain relief shall be incorporated.

Differences in institutional construction preclude a single COD design which is usable in every situation. Mounting information for each specific site application will be given in the STR.

In order to prevent damage due to excessive force the switch mechanism shall be effectively isolated from any applied load greater than that necessary to activate it. The switch mechanism shall provide a positive touch feedback and audible click to the inmate so that the inmate is fully aware of its actuation. The switch wiring shall be designed so that destruction of the unit will sever the conductors, yielding only the minimum possible length of light-gauge wire, and will not disturb the built-in wiring beyond a local junction box. The force required to operate the push-button shall be between 5.6 and 11.0 N (20 and 40 oz.). The push button shall have a minimum diameter of 2.5 cm.

3.2.1.2 **COD Procurement**

The STR shall define whether the COD will be deliverable items under the contract or will be Government Furnished Equipment (GFE).

3.2.1.3 **Prototype Approval**

When the contractor is to supply the COD as part of the system, a working COD prototype shall be provided to the Design Authority for approval prior to manufacturing or purchasing of system quantities.

3.2.2 **Primary Annunciation and Control Panel**

The PACP may be rack, desk, or wall-mounted and will usually be installed in the Nursing Station which is responsible for the supervision of an area containing a group of wards. It shall contain the following annunciations and controls:

a. one Visual Indicating Device for each bedroom in the ward;

b. one Acknowledge Call Indicating Device for the ward;

c. one Audible Indicating Device for the ward;

d. one Call Disable Device (CDD) for each bedroom in the ward;

e. one Call Disable Indicator for each bedroom in the ward; and

f. one Audio/Visual Test Indicating Device.

In addition, a means of individually cancelling each patient's nurse call shall be provided in the system. This shall be accomplished by a Call Cancellation Device which will be either:

a. a manually-operated switch located on the PACP; or

b. a key-operated switch located near the bed in the ward.

The STR will specify the type of Call Cancellation Device to be used.

3.2.3 Secondary Annunciation Panel

The SAP is located in a central location such as a control console of the Main Communication and Control Post (MCCP) and provides annunciation and status (but not control) of the complete NCS by wards. The wards are identified in the STR.

For each of these areas the Secondary Annunciation Panel shall indicate:

a. if any nurse calls have not been acknowledged or cancelled within a preset, adjustable time (1 to 15 minutes); and

b. if any COD has been disabled.

The identification of the actual cell which is unacknowledged, uncancelled, or disabled shall not be annunciated.

The SAP shall contain an Audio/Visual Test Indicating Device for checking the operability of all visual and audible annunciators on the panel. In addition, it shall contain a common Acknowledge Device and an Audible Indicating Device which shall sound for every call transfer and every call disable. The Acknowledge Device when operated shall silence the Audible Indicating Device for all existing calls.

3.2.4 Call Cancellation Device

The CCD may be located in the PACP(s) or may be located in the ward. In the latter case, the device will be exposed to inmate abuse or attack and must therefore be rugged and tamper resistant and shall be key-operated. Operating the key shall require the user to overcome a spring resistance of 113 m.n.m. to 678 m.n.m. (1 in-lb to 6 in-lb) and the key shall be removable only in the rest position. A single key shall operate all CCD's.

3.2.5 Over door Indicating Device

Each COD shall have an associated Over door Indicating Device which shall be surface mounted in the outlet box provided in the corridor above each ward door. The Over door Indicating Device shall visually annunciate upon activation of its associated COD.

3.2.6 Wires, Cables, Conduits, Ducts

The contractor shall supply all necessary terminations, cross connection cabinets, conduits, wire and cabling and any other items that may be required for the satisfactory completion of the specified system. All installation workmanship shall be performed in accordance with ES/SOW-0102, Statement of Work and all applicable national, provincial, and local electrical codes.

A wiring diagram shall be supplied in the Installation section of the Maintenance Manual to detail where module connections terminate and how wires are routed and terminated.

Conduits, cables, ducts, trays, etc. may be either GFE or supplied and installed by the contractor depending on the particular institution. The determination will be made by the Design Authority and will be identified in the STR.

Connectors provided on the ends of any cable must mate with the corresponding connector on the equipment. Adapters from one type of connector to another are not acceptable.

3.2.7 Control Equipment

The maximum feasible amount of common control equipment (power supplies, logic boards, amplifiers, etc.) shall be located in Terminal Equipment Spaces (TES) and Common Equipment Room (CER) provided for the purpose. These areas will be identified in the STR. It is preferred that only equipment such as lights, switches, actuators, etc. which the operator must access directly should be located in the Nursing Stations.

3.2.8 Repeater Annunciators

When required, Repeater Annunciators shall serve as a secondary monitor of the Nurse Call Systems. Repeater Annunciators shall be strategically located, wall, desk or rack mounted as required and shall be fitted and function in the same manner as those located at the Nurse's Stations. The Repeater Annunciators shall operate in parallel with the associated Nurse Call Annunciators located at the Nurse's Stations. Control equipment required to achieve the specified functions shall be located at the associated Nurse's Station.

3.2.9 Interface to Data Logger

The contractor shall supply and install all necessary wiring and control equipment required to interface the NCS the MCCP Data Logger described in ES/SPEC-0005, Specification.

3.3 Design Requirements

3.3.1 General

To the maximum practical extent, off-the-shelf equipment should be selected for use in the ICCS. New designs should be restricted to common interface areas, control panels and consoles, or unique devices for which an off-the-shelf item does not exist.

A design objective is to minimize the number of wires required between all elements of the system.

A space-diversity approach to system planning shall be employed to ensure that loss of one interconnection routing does not impair the operational capability of the complete ICCS system.

3.3.2 Wiring Supervision

Wiring shall be supervised in all system modes. An alarm shall occur if any system wiring is cut or shorted to other wires or if the system devices are tampered with by unauthorized people or environmental conditions.

3.3.3 Sabotage, Tampering and Survivability

Elements of the NCS must operate in areas exposed to inmate access and shall have high resistance to damage, destruction, or conversion to other uses (including weapons). All interconnecting service must be secure against tampering or improper eavesdropping interference.

3.3.4 Power Failure

Loss or restoration of primary power to the system shall not produce spurious call annunciations or outputs to the data logger. When power is returned after a power failure, the system shall resume normal operation without operator action and shall automatically start from a "no-calls-present," cleared condition with no bedrooms disabled.

3.3.5 System Failure

A system failure shall be deemed to have occurred when any required annunciation (visual or audible) is not produced or when any required control function cannot be performed. This applies to both the PACP and the SAP.

3.3.6 Human Factors

Elements of the NCS which are used directly by staff or patients (i.e., control panels, annunciators, call originating devices, etc.) shall conform with accepted principles of good human factors design.

3.3.7 **Existing Equipment**

In most installations, control and annunciation elements of the NCS will share console space with other electrical/electronic equipment such as door controls, lighting controls, etc. and will be operated by the same staff member. In such cases it is important that effort be made to coordinate the functional and operational design of the NCS according to accepted human engineering principles to ensure a uniform appearance and commonality of a layout to assist the operator in the performance of his duties.

3.3.8 **Annunciation and Control Units**

Mounting space within control posts is usually limited and the problem of determining a suitable equipment mounting location is minimized if the control panels are small. Therefore, the designer should make maximum possible use of annunciation and control devices which combine two or more functions into a single unit (e.g., a lighted push-button instead of a separate light and an unlit push-button).

The control units may use Electronic Industries Association (EIA) standard display and control panels or video display units. The design of either display and control method shall be in accordance with ES/STD-0802 or ES/STD-0803 Standards.

3.4 **Operational Requirements**

3.4.1 **Single Call**

The functioning of equipment in response to a single call when an inmate in his cell operates the COD is as follows:

a. the associated Visual Indicating Device on the PACP in the appropriate control post flashes;

b. the Audible Indication Device turns steady ON;

c. the Over door indicator device flashes; and

d. the Data Logger records the call.

NOTE: The Audible Indicating Device shall have a pleasing tone and an internal control shall be provided to adjust its audible level.

The staff member will either operate the Master Acknowledge Device causing:

a. the associated Visual Indicating Device on the PACP in the control post changes to steady ON;

b. the Audible Indicating Device silences;

c. the Over door Indicating Device changes to steady ON; and

d. the Data Logger records the acknowledgement, or

The staff member will activate the Call Cancellation Device associated with that call causing:

a. the associated Visual Indicating Device on the PACP to return to the OFF state;

b. the Audible Indicating Device silences;

c. the Over door Indicating Device shuts OFF; and

d. the Data Logger records the Call Cancellation.

Subsequent operation of the COD before the original call from it has been cancelled shall not cause a change of status of any visual or audible annunciator. Only the initial call shall be recorded on the Data Logger.

3.4.2 **Multiple Calls**

The NCS shall have the ability to satisfactorily handle multiple simultaneous calls in the same manner as single calls. If prior calls have been acknowledged and not yet cancelled, a subsequent call from another COD shall cause the Audible Indicating Device to sound again. A single operation of the Master Acknowledge Device shall silence the Audible Indicating Device regardless of the number of calls present. There shall be no change in the status of calls already acknowledged. The calls may be selectively cancelled with the associated CCD in any desired sequence, independent of the sequence in which they were initiated. Any number of calls, up to the maximum installed complement shall be capable of being separately annunciated and logged without a system overload. The Data Logger shall record:

a. each call origination;

b. each call cancellation; and

c. the acknowledgement of one or more calls (the number of calls present when the acknowledgement was made need not be recorded).

3.4.3 **Enable/Disable**

When the Call Disable Device is operated on the PACP or SAP, the associated Call Disable Indicator shall be illuminated. Any further activation of the COD shall be totally disregarded by the system including the data logger. If an unacknowledged call is present on the circuit being disabled, operation of that call disable devices shall effectively cause an acknowledgement to occur, i.e., the Audible Indicating Device shall silence, and the Visual Indicating Device and Overdoor Indicating Device shall change from flashing to steady. However, it shall not be possible to cancel a call by use

of the Disable Device. Calls may be cancelled when the circuit is in the disabled state by operating the CCD.

If an uncancelled call is still present when the circuit is enabled again, its status will become the same as if it had been acknowledged but not cancelled, i.e., Audible Indicating Device is not activated and the Visual Indicating Device and Over door Indicating Device are steady ON. The data logger shall record the disabling and enabling of each cell call circuit.

3.4.4 **Call Transfer**

If a call is not "acknowledged" or "cancelled" after a specific period of time (adjustable 1 to 15 minutes) the call will automatically be transferred to the SAP at the MCCP. All annunciations will continue normally at the PACP. There shall be no indication at the PACP that a call transfer has occurred.

At the Secondary Annunciation Panel, the call transfer shall:

a. cause a flashing of the visual annunciation for the zone which has caused the transfer;

b. sound the audible annunciator; and

c. be recorded by the data logger.

Operation of the common acknowledge device at the SAP in response to a call transfer shall:

a. cause the visual annunciation to alter from flashing to steady;

b. silence the Audible Indicating Device; and

c. be recorded by the Data Logger.

The visual annunciation of call transfer shall extinguish only when all calls transferred from that zone are acknowledged and/or cancelled. Visual annunciation of a disabled condition shall extinguish only when all cell call circuits have been enabled in that zone.

3.4.5 **Interface To Data Logger**

The NCS shall provide an output to the Data Logger described in ES/SPEC-0005, Specification to provide separate indication of all call-related activities in the NCS including:

a. call origination (zone and cell number for initial call);

b. call acknowledgement at PACP (zone number only);

c. call cancellation (zone and cell number);

d. circuit disable (zone and cell number);

e. circuit enable (zone and cell number);

f. call transfer to SAP (zone number only); and

g. call acknowledge at SAP.

All of these activities shall be logged with the time-of-day and the zone and cell number where applicable in plain-language (or abbreviation thereof) without the need for a cross-reference table.

3.4.6 **Audio/Visual Test Indicating Device**

Both the PACP and SAP shall contain an Audio/Visual Test Indicating Device which when activated shall cause all visual annunciators and the Audible Indicating Device on that panel to turn ON and remain ON until the Audio/Visual Test Indicating Device is released. Operation and release of the Audio/Visual Test Indicating Device shall not cause any change of system status with respect to calls in progress and shall not be recorded by the data logger.

3.5 **Environmental Requirements**

The NCS shall operate over the following indoor environmental conditions:

3.5.1 Temperature: 0° C to +50° C; and

3.5.2 Humidity: 0 to 90% relative, non-condensing.

3.6 **Power Requirements**

The NCS shall use VAC power within the following limits:

3.6.1 Voltage: 120 VAC ±10%;

3.6.2 Frequency: 60 Hz ±1.5%;

3.6.3 Transients: up to 5 times nominal voltage for up to 100 msec durations. Changes in the input power or any fluctuations within the above limits shall not cause damage to the unit; and

3.6.4 Power: power consumption shall not exceed 100 watts.

3.7 **Installation Requirements**

The NCS shall be installed at the site in accordance with the ES/SOW-0101, Statement of Work and the ES/SOW-0102, Statement of Work.

3.8 **Documentation Requirements**

All final NCS documentation shall be provided in accordance with the ES/SOW-0101, Statement of Work.

3.9 **Support Requirements**

The NCS maintenance and spares support shall be provided in accordance with the ES/SOW-0101, Statement of Work.

3.10 **Training Requirements**

Operator training and maintenance training on the NCS shall be in accordance with the ES/SOW-0101, Statement of Work.

4.0 QUALITY ASSURANCE

4.1 General

The NCS Quality Assurance programme shall be provided as detailed in the ES/SOW-0101, Statement of Work.

All on-site installation work, test plans and system acceptance testing shall be conducted in accordance with the ES/SOW-0101, Statement of Work.

5.0 DELIVERY

Delivery requirements for the NCS documents, drawings, plans, manuals, etc. (where applicable) shall be in accordance with the ES/SOW-0101, Statement of Work.

Delivery requirements of the NCS equipment shall be in accordance with the ES/SOW-0102, Statement of Work.

6.0 INTERFERENCE

Performance of the NCS shall not be affected by the use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment are listed in the Statement of Work, ES/SOW-0101.

7.0 SAFETY

All NCS electrically powered elements shall meet the applicable CSA standards.

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/SPEC-0603
Revision 2
17 January, 2002

ELECTRONICS ENGINEERING SPECIFICATION

FACILITY ALARM ANNUNCIATION SYSTEM INTEGRATION UNIT FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

AUTHORITY

This Specification is approved by the Correctional Service of Canada for the procurement and installation of a stand-alone Facility Alarm Annunciation System (FAAS) Integration Unit in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service of Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services

TABLE OF CONTENTS

ABBREVIATIONS

The following abbreviations are used in this specification:

CCTV	Closed Circuit Television
CER	Communications Equipment Room
COTS	Commercial-Off-The- Shelf
CSA	Canadian Standards Association
CSC	Correctional Service Canada
DES	Director Engineering Services
EIA	Electronic Industries Association
FAAS	Facility Alarm Annunciation System
FDS	Fence Disturbance Detection System
FIU	FAAS Integration Unit
GFE	Government Furnished Equipment
MCCP	Main Communications and Control Post
MDS	Motion Detection System
PA	Public Address
PIDS	Perimeter Intrusion Detection System
RFP	Request for Proposal
SOW	Statement of Work
STR	Statement of Technical Requirements
UPS	Uninterruptable Power Supply
VDU	Video Display Unit

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

1.0 INTRODUCTION

This specification defines the design, technical and performance requirements for a stand-alone Facility Alarm Annunciation System (FAAS) Integration Unit (FIU). It will normally be specified when only the FIU portion of the MCCP Integration Console requires upgrading or replacement.

The FIU is used to integrate all facility alarms and sundry security information systems into a common display and control. The integration capability of the FAAS shall also be used as a port in a transparent feed through format to present all event recording from the various institutional security systems onto a common data logging system as outlined later on in this specification.

These alarms may include but are not restricted to the following:

- Personal Portable Alarm (PPA);
- PPA Location System (PALS);
- Fixed Point Security Alarm (FPSA);
- Facility/Mechanical Alarms;
- Fire Alarm Systems;
- Inmate Cell Call Systems (ICCS); and
- All interior facility alarm systems.

The contractor shall be responsible for integrating all subsystems and shall provide all material and labour required for the design, supply, delivery, installation, testing and commissioning of the FIU. The contractor shall provide documentation and training to the extent described in this and other identified specifications.

1.1 Commercial-Off-The-Self Equipment

The system shall use commercial off-the-shelf (COTS) equipment and proven designs to the maximum extent possible. All new equipment shall meet the specified lifespan requirements. New equipment designs shall be restricted to unique interfaces and common control console.

1.2 **Technical Acceptability**

The Correctional Service Canada (CSC) operational environment is unique for its diversity of locations, climate exposures and the physical restrictive construction techniques of penal 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 shall maintain very high standards of dependability and reliability.

The CSC Engineering Services Division has established technical specifications and equipment standards for specific electronic security systems which are based on very specific and restrictive operational performance criteria as detailed in its Electronic Engineering Standard. Technical acceptability of these systems means that the equipment complies with the pertinent CSC specifications and standards.

The technical acceptance process shall involve system and subsystem evaluation in accordance with the applicable CSC specifications in one of CSC facilities or may be tested in a CSC facility to verify the effectiveness of the proposed technologies when subjected to the restrictive operational environment.

CSC shall also verify in depth any of the system technical specifications called up. CSC may when it deems necessary, request the supplier to arrange for a full site demonstration. CSC may rely on manufacturer's test results for specific areas of the specification where an independent test facility has conducted the test, and the facility is deemed acceptable to CSC.

It is the supplier's responsibility to make new developments in products available to CSC for evaluation. Equipment qualification is an ongoing process and can be initiated at any time by a vendor. Any vendor can have access to the CSC specifications and standards. Any new development or products should be submitted to the CSC Engineering Services Division, Technical Authority in a suitable time frame prior to any tendering process to allow for an acceptable evaluation period. The evaluation period may take up to sixteen (16) months.

1.3 **Equipment Procurement**

Any ordering of equipment/material before the approval of the system design report will be undertaken at the contractor's own risk. The Design Authority may authorize the procurement of certain long lead items at, or shortly after a preliminary design review of the proposed system.

1.4 **Quantity of Equipment**

The quantity and location of the equipment required for CSC institutions will be contained in the Statement of Technical Requirements (STR).

2.0 APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of the Request for Proposal (RFP) shall form a part of this specification to the extent specified herein.

ES/SOW-0101	Statement of Work for Procurement and Installations of Electronic
ES/SOW-0102	Statement of Work for Quality Control of Electronic Systems
ES/SPEC-0103	Specification for Uninterruptable Power Supply
ES/SPEC-0600	Specification for Personal Portable Alarm Systems
ES/SPEC-0601	Specification for Fixed Point Security Alarm Systems
ES/SPEC-0602	Specification for Portable Alarm Location Systems
ES/SPEC-0800	Specification for Communications and Control Consoles
ES/STD-0803	Standard for Video Display Unit
EIA-310-C	Electronic Industry Association Standard for Racks, Panels and Associated Equipment

3.0 REQUIREMENTS

3.1 General

The FIU shall provide the operator with centralized monitoring and control capability over all facility alarm annunciation systems to the extent specified in the STR. The FIU shall incorporate industrial quality and commercially available controllers and Video Display Units (VDU). The VDU shall display the status of monitored subsystems and provide software control of system features, to the extent specified herein. The FIU shall include an operator console incorporating the VDU and operator controls.

3.1.1 Period of Operation

The FIU and all associated equipment shall be design for and capable of 24 hours per day, seven days per week operation.

3.1.2 Wires, Cables, Conduits, Ducts

The contractor shall supply all necessary terminations, cross connection cabinets, conduits, wire and cabling and any other items that may be required for the satisfactory completion of the specified system. All installation workmanship shall be performed in accordance with ES/SOW-0102, Statement of Work and all applicable national, provincial, and local electrical codes.

A wiring diagram shall be supplied in the Installation section of the Maintenance Manual to detail where module connections terminate and how wires are routed and terminated.

Conduits, cables, ducts, trays, etc. may be either Government Furnished Equipment (GFE) or supplied and installed by the contractor depending on the particular institution. The determination will be made by the Design Authority and will be identified in the STR.

Connectors provided on the ends of any cable must mate with the corresponding connector on the equipment. Adapters from one type of connector to another are not acceptable.

3.1.3 Wiring Supervision

Wiring shall be supervised in all system modes. An alarm shall occur if any system wiring is cut or shorted to other wires or if the system devices are tampered with by unauthorized people or environmental conditions.

3.1.4 Sabotage, Tampering and Survivability

Elements of the system shall have high resistance to damage, destruction. All interconnecting service must be secure against tampering

3.1.5 **Human Factors**

Elements of the system which are used directly by staff (i.e., control panels, annunciators, alarm originating devices, etc.) shall conform with accepted principles of good human factors design.

3.1.6 **Annunciation and Control Panels**

Mounting space within control posts is usually limited and the problem of determining a suitable equipment mounting location is minimized if the control panels are small. Therefore, the designer should make maximum possible use of annunciation and control devices which combine two or more functions into a single unit. The system shall use Electronic Industries Association (EIA) standard video display units. The design shall be in accordance with the ES/STD-0803, Standard.

3.2 **System Configuration**

3.2.1 **Hardware**

Industrial grade FAAS central controllers shall act as an interface between the operator peripherals and the digital control panels for remote devices and subsystems. Each controller shall incorporate the following physical attributes:

- designed to operate in industrial conditions on a continuous basis;
- built to withstand a harsh, rugged work environment;
- designed with a positive pressure cooling system which passes air through an external synthetic filter element which screens contaminants, then circulates flow through the controller chassis, drives, power supply and cards;
- equipped with a security lock which shuts off keyboard access preventing any tamper activity; and
- powered by a heavy duty power supply sized with 25% spare capacity when driving all expansion ports.

Each industrial grade FAAS controller shall incorporate the following electronic features:

- microprocessor based, modular in structure;
- featuring Pentium III, or equivalent, processor;
- running at a clock speed of 500 MHZ or higher, with zero wait states;
- configured with spare expansion port(s) capability;

- equipped with a CDR;
- equipped with dynamic expandable RAM, sized to suit software requirements;
- equipped with a 3.5 inch floppy drive system; and
- equipped with a fast access hard disk with an access speed of no longer than 28 ms, sized to suit all operating and system requirements, and suitable to hold the data storage/retrieval software and archival data for a period of one year with 25% spare disk capacity.

3.2.2 **Software**

The system software shall be designed specifically for security applications and shall provide for:

- polling and demand requests to monitor status;
- processing alarms according to predefined priorities;
- executing event-initiated software programs and related background software routines;
- controlling and processing communications with operator peripherals; and
- synchronizing all system activity including interfaces to peripherals, digital control panels and all field devices

For reasons of reliability and prevention of inadvertent changes, system software including operating systems and data files shall be maintained in non-volatile memory. The contractor shall also take all reasonable measures to ensure that no computer viruses are present in the delivered system. These measures shall include controls on the use of the software during the development and integration phases, and the tests for the presence of viruses. Similarly, steps must be in place through the careful selection of the operating system to prevent any introduction of software viruses without the constant need for extensive software security measures. The system shall incorporate security featured software for authorized access control by operators, supervisors and maintenance personnel.

The system software, especially for alarm processing, shall be written in a hardware compatible programming language, operating under a real time multitasking operating system to ensure that all priority activities are presented to the operator immediately as they occur. A capability shall be incorporated to ensure that all alarm data can be configured and exported in an appropriate format that can be processed by "DOS" family of operating system software.

3.2.3 **Redundancy**

The FIU shall be configured in a fully redundant hardware and software configuration and consist of two (2) controllers and two (2) interactive peripheral VDUs, capable of sustaining a complete controller failure without affecting the operation of either the PIDS, the FAAS, or any other integrated system. Master-Slave arrangements shall not be accepted. A failure in any integration system or any system which has the display and controls integrated shall not effect the proper operation of the remainder of the equipment.

Two (2) additional interactive peripheral VDUs are required. These units shall also be in a fully redundant configuration. One unit shall be dedicated for system maintenance requirements, while the second unit shall be dedicated for operational supervisory control purposes or training related duties and may be located away from the MCCP. Neither one of these units will be mounted in the main console, but will be available in a satellite configuration as outlined below. All VDU consoles must function in a simultaneous and independent manner.

All input and output data shall be available to both controllers with a continuous dynamic update occurring in both controllers in order to allow cross-checking of input and output information between the controllers. In case of a discrepancy in the information between the controllers:

- the faulty controller shall be automatically removed from service;
- all system/operating software and current data files shall be automatically driven from the functional controller;
- a system status alarm shall alert the operator that automatic switch-over has occurred; and
- no interruption in service or loss of system status shall be perceivable when switching between controllers

Under normal operating conditions, and where the PIDS and FAAS controls are required, one of the interactive peripheral VDUs shall be dedicated to PIDS operational duties with a second VDU dedicated to FAAS operations. In the event of a controller or VDU failure, it shall be possible to combine PIDS and FAAS operations on a single VDU.

3.2.4 **Operator VDUs**

The primary "operator to system" interface for the display of alarm annunciation and for the command of an operator controlled functions on the FAAS shall be via colour VDUs.

To eliminate confusion during an emergency situation, VDU screens shall have dedicated areas for alarms, operator prompts, operator commands, as well as time, day and date information.

To enhance operator understanding, full facility graphics, complete with language descriptions, shall be used throughout to display and describe all system activity and instruction. The FAAS VDU shall each be capable of generating a minimum of sixteen graphic maps. All descriptions, alarm messages and operator instruction prompts shall be user definable in order to accurately describe unique institution configurations as well as future changes to perimeter/facility areas and operational requirements. Language of preference (French or English) to be determined by location as specified in the STR.

A typical graphic map shall incorporate the following display features as applicable to the area of presentation:

- location of the alarms;
- identification of the alarms; and
- emergency instruction and operator prompts.

The system graphics shall reduce information clutter to a minimum with the appropriate use of icons, especially to display alarm identification and location. The following colours shall be supported for alarm information:

- green/light blue normal,
- red alarm, and
- purple failed.

The operator displays for the FAAS system shall be based on a 14" high resolution colour CRT with a minimum matrix size of 640 x 350 individually addressable pixels. The VDU shall be capable of displaying, as a minimum, the colours white, black, red, green, blue and all combinations of the primary colours in order to provide flexibility in colour map displays.

All map displays shall be able to be configured and reconfigured from a user friendly graphic software package, accessed from the maintenance menu.

3.2.5 **Operator Controls**

The colour VDUs for the FAAS system shall use a "Touch Screen" employing resistive membrane or surface acoustic wave technology (or equivalent). Plain language descriptions shall be utilized to initiate all system functions, minimizing operator activity and decision making. Typing mnemonic abbreviations or using unlabelled or numerical function buttons is unacceptable. When a function key is touched on the screen, the VDU shall lead the operator through the predefined functions by asking for a choice of options or menus. At every step of alarm processing, a help screen shall be available to guide the operator through system operation. The help screen shall contain information about

functions currently available to the operator.

3.2.6 **Maintenance/Satellite VDUs**

The maintenance and the satellite VDUs shall be based on a l2" diagonal high resolution monochrome presentation. The maintenance VDU shall be located in the MCCP. The satellite VDU shall be remotable up to 500 feet. Specific location detail shall be stipulated in the STR. Further operational requirements and parameters for these VDUs are detailed in subsequent sections entitled FAAS System Menus and FAAS Maintenance Functions, sections respectively.

3.2.7 **Maintenance/Satellite Controls**

The maintenance and satellite VDUs shall have an associated keyboard with an integral key-lock switch for command and data input. Multi-level password protection shall be available in software to limit maintenance and satellite access, assignment and editing capability to authorized personnel only. All passwords shall be user definable.

3.2.8 **FAAS Menus**

The FAAS Menus shall permit display and control of various system functions, including for the operator:

- a user definable checklist and an emergency instruction set;
- the capability to acknowledge, reset alarms for all FAAS systems;
- the ability to clear fail and diagnostic alarms;
- scanning of all applicable FAAS maps; and
- the ability, if provided by the input device, to perform alarm system test(s).

The maintenance/satellite menus shall permit control of the following:

- system time and date;
- activation or deactivation of any alarm system device;
- generation of status, test and statistical reports for alarm systems and other field devices with available inputs;
- viewing of equipment configuration;
- assignment of menus and accessibility for operators;

- creation of checklists and emergency instruction prompts; and

- simulation of alarms for operator training.

3.3 FAAS Alarm Processing

3.3.1 Alarm Priorities

The FIU controller shall have multiple levels of priority for displaying alarms. Each possible alarm type shall be assigned a separate priority level as defined in the STR. All alarms shall be held in non-volatile memory. The FIU controller shall rank the alarms, displaying highest priority alarms at the top of the list and lowest priority alarms at the bottom. The total number and type of alarms to be processed shall also be displayed.

When multiple alarms occur, the first received, highest priority alarm shall be displayed on the VDU until processed by the operator. Then the next highest priority alarm shall be displayed until processed, etc. If a higher priority alarm is received before a lower priority alarm is processed, the high priority alarms shall replace the lower priority alarm on the VDU. The lower priority alarm shall then be retained in memory and be redisplayed after the higher priority alarm has been processed.

The operator shall have the capability of stepping through the list of alarms and dealing with the alarms in any order. If at any time the operator is viewing an alarm which is not the highest priority alarm present in the system, the operator shall have the option of returning directly to the highest priority alarm by activating a single control.

3.3.2 Alarm Simulation Priority

The FIU controller shall be capable of distinguishing between simulated and genuine alarm inputs. In the event that a genuine alarm is received while the alarm simulation is in use, the FIU computer shall:

- cancel all existing simulated alarms;

- ignore any additional simulated alarms; and

- display the genuine alarm.

The FIU controller shall only accept simulated alarms when there are not genuine alarms in the system.

3.3.3 **Alarm Processing**

Activation of any alarm from a FAAS subsystem, connected to the FIU controller shall cause the following action:

- full, plain language description and graphic display of the alarm condition, type and location
- audible signal, flashing alarm condition and emergency instruction set presentation
- acknowledgment of the alarm by the operator as his only course of action
- assignment of alarm causes by the operator by choosing from a predefined menu of causes.

3.3.4 **Alarm Interface**

Alarm inputs shall be accepted by the FIU and output signals provided to the output points in the form of form C dry contact closures, opto-isolated outputs or via an RS-232C or RS-485 interface as required by the alarm sensors. The type of interface required for each alarm sensor is detailed in the STR.

Any system which is not capable of a bi-directional communication link or which uses a data transfer protocol which is asynchronous or not compatible with the FAAS will not effect the functionality of the FAAS or any other integrated system.

3.4 **Facility Alarm Systems**

3.4.1 **Data input**

Bi-directional data links shall be provided in order to receive the following information from the Motion Detection System and the Fence Disturbance Detection System:

a. Alarm annunciation;
b. System test annunciation;
c. System fail annunciation;
d. System fail cancel;
e. Alarm information data (where applicable); and
f. Test alarm data and results (where applicable).

These messages shall be available using form C dry contact closures, opto-isolated outputs, or an EIA standard RS-232-C or RS-485 data link as required by the FAAS subsystems.

3.4.2 **Data Output**

The FIU controller shall provide output messages directed towards the FAAS subsystems as follows:

a. Alarm acknowledge;
b. Alarm cancel; and
c. System test (where applicable).

Output controls shall use the bi-directional data link as required in section 3.2.3.1, using form C dry contact closures, opto-isolated outputs or an EIA standard RS-232-C or RS-485 data link, as required by the FAAS subsystems.

3.4.3 **Miscellaneous Inputs**

Where applicable, secondary outputs from Inmate Cell Call Systems, Nurse Call System, etc. shall be FIU software controlled and switchable on a system by system basis. In general, only the information from those alarm systems being monitored will be relayed for use by the operator.

3.4.4 **Data Protocol**

All RS232 or RS485 signals provided to, and received from, the FIU should conform to either the Senstar-Stellar Sennet or StarCom protocols. Any driver required for another protocol will be the responsibility of the contractor.

3.4.5 **Fire Alarm System**

When required as stated in the STR, the contractor shall relocate the Fire Alarm annunciation panel to allocated space in the MCCP console, and provide an integrated alarm annunciation function in the FIU. The contractor shall provide all cables and mounting hardware including a new control panel if specified to complete this task. The functionality and the integrity of the Fire Alarm Panel must not be compromised, and must be able to function independently as a standalone system.

3.5 **Time/Date Information**

The FIU controller shall generate accurate time/date information, suitable to act as a central generating unit of this information for all systems forming part of the MCCP. Interface to the various systems shall be in either parallel or serial form, as required. The availability of both types of output ports shall be provided to allow for future expansion or interfacing.

3.6 **Data Logging**

3.6.1 **General**

The FIU controller shall provide data logging (ASCII coded text activity archive) storage of over 100,000 lines of subsystem events on hard disk storage. On demand, activity archive stored events shall be sorted by type and/or date and transferred to DOS formatted floppy disks or sent to a printer to provide a hard copy of FIU and integrated subsystems events. For each event, the activity file shall show the date, time and event description.

3.6.2 **Event Definition**

Data logged events will include all status changes of monitored subsystems including FAAS alarms, alarm acknowledgement, alarm clear/reset, UPS failure or bypass, FIU controller switch-over, etc

3.7 **Printer Status**

The printer status shall be monitored by the FIU controller. Failure of the printer or a "paper-out" condition shall generate an alarm.

3.8 **Status Panel**

3.8.1 **General**

The FIU shall contain a status panel containing indicators and controls for the major FIU units. The status panel shall also contain status lights for the UPS.

3.8.2 **FIU Status Functions**

The status panel shall provide the following indicators and controls:

a. FIU controller fail indicator; and

b. Active FIU computer selection control.

3.9 **UPS Integration**

The contractor shall connect UPS power into all FIU equipment racks. The UPS will be provided as GFE and will be in accordance with Specification ES/SPEC-0103. Power shall be taken from the VAC regulator output or from an equivalent point in a distribution panel if available. All FIU equipment shall be connected to the UPS power. UPS status shall be monitored as per section 3.8.1.

4.0 MECHANICAL CONFIGURATION

4.1 General

The FIU equipment shall be installed in at least two distinct and separate units: an operator console and equipment racks. Displays and controls including GFE required by the operator shall be installed in a contractor provided operator console. Other equipments shall be installed in EIA standard 19-inch racks located in the CER or other location as required by the STR. All racks and console bays shall include side panels and rear doors. Requirements for raised flooring, cable entrances and/or rack cooling ducts shall be specified in the proposal.

4.2 Console Design

The operator console shall be ergonomically designed to provide the operator with a logical, easily understood display and control layout. All displays shall be clearly viewable and all controls shall be easily reachable from a seated position. The console shall contain a work surface at normal desk height not less than 18 inches in depth and extending the full width of the console. The work surface shall be covered with a scratch-resistant plastic covering. Detailed design requirements will be outlined in the STR.

The contractor shall provide a separate table or attachment to the console for mounting the MCCP operator telephones; if an attachment is provided, it shall not cause the telephones to block any display or control. The contractor shall provide a standard non-tip swivel-base chair with casters and arms for the FIU operator. Specification ES/SPEC-0800 shall apply to the console design.

4.3 Printer Rack

The FIU contractor shall provide a separate rack or stand to be located near the operator console for mounting the printer. The printer rack shall be readily movable.

4.4 Console/Rack Colour Schemes

The operator console, telephone table/attachment and printer rack shall be covered with a high quality paint using a standardized colour scheme. Racks for other equipment shall utilize a common-colour scheme for racks, end panels and doors.

4.5 Environmental Requirements

The FIU shall operate over the following indoor environmental conditions:

4.5.1 Temperature: 0° C to +50° C; and

4.5.2 Humidity: 0 to 90% relative, non-condensing.

4.6 **Power Requirements**

The system shall use VAC power within the following limits:

4.6.1 Voltage: 120 VAC ±10%;

4.6.2 Frequency: 60 Hz ±1.5%;

4.6.3 Transients: up to 5 times nominal voltage for up to 100 msec durations. Changes in the input power or any fluctuations within the above limits shall not cause damage to the unit; and

4.6.4 Power: power consumption shall not exceed 100 watts.

4.7 **FAAS Maintenance Functions**

Monitoring the FIU and the FAAS subsystems shall be made available through the FAAS controller and the maintenance and satellite VDUs. User-definable password protection shall be provided to limit access to authorized personnel.

The following information shall be available to the standby data logger via the EIA standard RS-232-C port, as well as displayed on the maintenance and satellite VDUs.

4.7.1 **FAAS Maintenance Functions**

The FAAS maintenance menus shall allow:

a. Automated FIU systems and equipment fault diagnostics;

b. Two-way data interface with FAAS subsystems to provide information such as test activation and results, status reports, etc . . . , where applicable;

c. FIU data base cross check information;

d. Processor unit error monitoring; and

e. Statistical FAAS activity summary for alarms on a system by system basis, since the previous request for this data.

4.8 **Installation Requirements**

The FAAS Integration Unit shall be installed at the site in accordance with the ES/SOW-0101, Statement of Work and the ES/SOW-0102, Statement of Work.

4.9 **Documentation Requirements**

All final FAAS Integration Unit documentation shall be provided in accordance with the ES/SOW-0101, Statement of Work.

4.10 **Support Requirements**

The FAAS Integration Unit maintenance and spares support shall be provided in accordance with the ES/SOW-0101, Statement of Work.

4.11 **Training Requirements**

Operator training and maintenance training on the FAAS Integration Unit shall be in accordance with the ES/SOW-0101, Statement of Work.

5.0 QUALITY ASSURANCE

5.1 **General**

The FAAS Integration Unit Quality Assurance programme shall be provided as detailed in the ES/SOW-0101, Statement of Work.

All on-site installation work, test plans and FIU acceptance testing shall be conducted in accordance with the ES/SOW-0101, Statement of Work.

6.0 DELIVERY

Delivery requirements for the FAAS Integration Unit documents, drawings, plans, manuals, etc. (where applicable) shall be in accordance with the ES/SOW-0101, Statement of Work.

Delivery requirements of the FAAS Integration Unit equipment shall be in accordance with the ES/SOW-0102, Statement of Work.

7.0 INTERFERENCE

Performance of the FIU shall not be affected by the use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment shall be in accordance with the ES/SOW-0101, Statement of Work.

8.0 SAFETY

All FAAS Integration Unit electrically powered elements shall meet the applicable Canadian Standards Association (CSA) standards.

CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS

ES/STD-0221
Revision 4
February 2014

ELECTRONIC ENGINEERING STANDARD

FIXED NETWORK COLOUR CAMERA FOR ENCLOSURE

FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

AUTHORITY

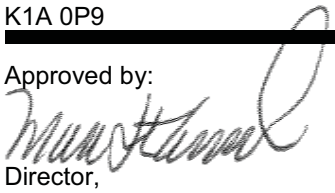
This Standard is approved by the Correctional Service Canada for the procurement and installation of this item in Canadian federal correctional institutions.

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Approved by:



Director,
Electronics Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0		Original issue
1	7.1	Imager changed to ¼ inch or larger
	7.9	Remove numeric quantity on AGC, just yes
	7.12	Added iris requirement
	7.12 – 7.17	Renumber paragraphs
2	6.1	Added CMOS imager
3	All	Reorganized and cleaned to new format
4	Definitions	Removed
	2.1	Added reference IEC EN 61000-4-3, Radiated RF immunity
	3.2.2.4	Changed humidity to non-condensing 20%-90%
	3.3.1	Interference now uses IEC EN 61000-4-3, Radiated RF immunity

TABLE OF CONTENTS

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol

1 INTRODUCTION

1.1 Overview

.1 This standard defines the requirements of Correctional Service Canada (CSC) for a fixed focus, network capable camera to be mounted in an enclosure for use at federal correctional institutions. The camera is for deployment in either existing indoor enclosures or Fixed Outdoor Camera Enclosures (ES/STD-0205).

1.2 Purpose

.1 The cameras are deployed for both observation and evidentiary use.

.2 These cameras are for deployment in outdoor fixed enclosures such as:

- .1 facility perimeter; and
- .2 outdoor walkways.

.3 These cameras are for deployment in existing indoor fixed enclosures such as:

- .1 indoor hallways;
- .2 gymnasiums;
- .3 weight rooms;
- .4 passage doors/barriers; and
- .5 explosive environments.

.4 The camera is used indoors where enclosures already exist and are being reused. New indoor installations must use Fixed Network Colour Dome Cameras (ES/STD-0232) except for new installations in explosive environments.

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

.1 Access to non-government specifications is the responsibility of the contractor.

- IEC EN60529 – International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
- IEC EN60950-1 – International Electrotechnical Commission Information technology equipment – Safety
- IEC EN61000-4-3 – Electromagnetic compatibility Part 4-3
- IEC EN62262 – International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
- IEEE 802.3at – IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
- IEEE 802.3u – IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T
- ES/STD-0205 – Electronics Engineering Standards Fixed Outdoor Camera Enclosure
- ES/STD-0232 – Electronics Engineering Standards Fixed Network Colour Dome Camera

3 PHYSICAL

3.1 Dimensions

.1 The camera with lens must:

.1 measure less than 75mm high;
.2 measure less than 100mm wide;
.3 measure less than 250mm long;

3.2 Environment

.1 For use either in indoors enclosures or in outdoor heated enclosures.
.2 The camera must:

.1 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
.2 be capable of continuous operation;
.3 start and operate from 0°C to 50°C;
.4 start and operate from 20% to 90% non-condensing humidity;

3.3 Interference

.1 The camera must be certified compliant to IEC EN 61000-4-3, Radiated RF immunity.

3.4 Reliability

.1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

.1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

.1 The camera must retain its configuration over a power cycle.

.2 The image sensor must:

- .1 include automatic or remote back focus;
- .2 have a minimum of 480,000 pixels (horizontal x vertical);
- .3 have day (colour) and night (black and white) modes;
- .4 automatic removable infrared cut filter for day/night transition;
- .5 have 0.5 lux or less minimum required illumination for day mode;
- .6 have 0.1 lux or less minimum required illumination for night mode;
- .7 include Automatic Gain Control (AGC);
- .8 include extended dynamic range processing;

4.2 Lens

.1 The camera lens must:

- .1 have a 35° to 80° or greater horizontal angular view vari-focal lens
- .2 be approved by the manufacturer of the camera for that camera;

4.3 Video

.1 The video encoding must:

- .1 support H.264 configurable I-frame frequency of at least 3 per second;
- .2 support H.264 constant bit rate transmission mode;
- .3 support H.264 frame rate transmission mode;
- .4 support at least 3 levels of H.264 image quality;
- .5 support at least 3 levels of MJPEG image quality;

.2 The video output must:

- .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
- .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
- .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

.1 The camera must:

.1 interface over IPV4 TCP/IP;
.2 be able to operate on 100Base-TX (IEEE 802.3u);
.3 connect using an RJ-45 connector;
.4 be ONVIF compliant;

5.2 Power

.1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

.1 The camera model must be identified as “Certified” or “Supported by Design” in the current Genetec Omnicast Supported Hardware camera list.

CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS

ES/STD-0223
Revision 4
July 2015

ELECTRONIC ENGINEERING STANDARD

PAN/TILT/ZOOM NETWORK COLOUR DOME CAMERA

FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

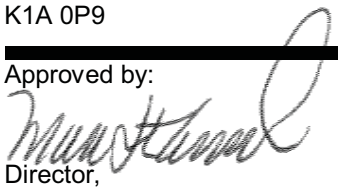
AUTHORITY

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Approved by:



Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	Paragraph 7.12 Paragraph 7.21	Optical zoom increased to 30x Added electronic image stabilization
2	All	Reformat and indoor/outdoor standard merge
3	Definitions	Removed
	2.1	Added reference IEC EN 61000-4-3, Radiated RF immunity
	3.2.2.3	Changed humidity to non-condensing 20%-90%
	3.3.1	Interference now uses IEC EN 61000-4-3, Radiated RF immunity
4	2.1/3.3.1	Change IEC EN 61000-4-3, Radiated RF immunity to IEC EN 55024, Immunity characteristics
	3.2.1.11	Removed smoked dome
	5.2.1	Added operate from external 24VAC power source

TABLE OF CONTENTS

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
PTZ	Pan Tilt Zoom
TCP/IP	Transmission Control Protocol/Internet Protocol

1 INTRODUCTION

1.1 Overview

.1 This standard defines the requirements of Correctional Service Canada (CSC) for a pan, tilt, zoom (PTZ), network capable, dome camera for use at federal correctional institutions. PTZ cameras are deployed to allow detailed examination of areas typically covered by fixed cameras or areas without regular evidentiary coverage.

1.2 Purpose

.1 The cameras are deployed primarily for observation use. Given they may be pointed anywhere, they are not assumed to be evidentiary coverage.

.2 These cameras are for deployment for all outdoor PTZ camera locations.

.3 These cameras are for deployment for all indoor PTZ camera locations.

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

.1 Access to non-government specifications is the responsibility of the contractor.

- IEC EN55024 – International Electrotechnical Commission Information technology equipment – Immunity characteristics – Limits and methods of measurement
- IEC EN60529 – International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
- IEC EN60950-1 – International Electrotechnical Commission Information technology equipment – Safety
- IEC EN62262 – International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
- IEEE 802.3at – IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
- IEEE 802.3u – IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

.1 The camera case and dome must:

.1 measure a base diameter less than 250mm;
.2 measure from base to top of dome of less than 400mm excluding any mount;
.3 weigh less than 5kg excluding mounting hardware;

3.2 Environment

.1 The camera case and dome must:

.1 meet or exceed IEC EN60529 IP66 dust and water resistance when mounted;
.2 if deployed within 5 metres of inmates, meet or exceed IEC EN62262 IK10 impact resistance;
.3 if surface mount, have threaded openings for conduits;
.4 if pendant mount, have all cables enter through the attachment pipe;
.5 if pendant mount, have no other openings in the enclosure excluding the dome assembly;
.6 have a threaded plug to seal all unused openings;
.7 have set-screws to secure all conduit and plugs from inside the dome;
.8 have tamper resistant heads on all externally accessible screws;
.9 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
.10 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;

.2 The camera must:

.1 be capable of continuous operation;
.2 start and operate from -40°C to 50°C;
.3 start and operate from 20% to 90% non-condensing humidity;

3.3 Interference

.1 The camera must be certified compliant to IEC EN 55024, Immunity characteristics.

3.4 Reliability

.1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

.1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

.1 The camera must retain its configuration over a power cycle.

.2 The image sensor must:

.1 include automatic or remote back focus;
.2 have a minimum of 480,000 pixels (horizontal x vertical);
.3 have day (colour) and night (black and white) modes;
.4 automatic removable infrared cut filter for day/night transition;
.5 1.0 lux or less minimum illumination for day mode;
.6 0.1 lux or less minimum illumination for night mode;
.7 include Automatic Gain Control (AGC);
.8 include extended dynamic range processing;

4.2 Lens

.1 The camera lens must:

.1 have a horizontal field of view optical zoom range including 3.5° to 50°;
.2 be integral to the camera assembly;

4.3 PTZ

.1 The PTZ must:

.1 have a pan range of 360° continuous (endless);
.2 have a minimum tilt range of 180°;
.3 include automatic image inversion at 90° tilt;
.4 have a minimum pan and tilt speed of 0.1°/sec or slower;
.5 have a maximum pan and tilt speed of 100°/sec or faster;

4.4 Video

.1 The video encoding must:

.1 support H.264 configurable I-frame frequency of at least 3 per second;
.2 support H.264 constant bit rate transmission mode;
.3 support H.264 frame rate transmission mode;
.4 support at least 3 levels of H.264 image quality;
.5 support at least 3 levels of MJPEG image quality;

.2 The video output must:

.1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
.2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
.3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

.1 The camera must:

.1 interface over IPV4 TCP/IP;
.2 be able to operate on 100Base-TX (IEEE 802.3u);
.3 connect using an RJ-45 connector;
.4 be ONVIF compliant;

5.2 Power

.1 The camera must be a Type 1 or Type 2 powered device operating from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, 3, or 4, or operating from an external 24VAC power source.

5.3 Video Management System Compatibility

.1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.

CORRECTIONAL SERVICES CANADA
FACILITIES BRANCH
ELECTRONIC SECURITY SYSTEMS

ES/STD-0227
Revision 1
2015 July

ELECTRONIC ENGINEERING STANDARD

COLOUR MONITOR

FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

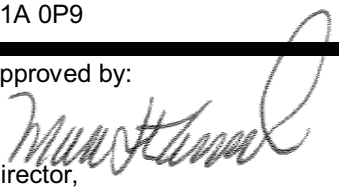
AUTHORITY

This Standard is approved by the Correctional Service Canada for the procurement and installation of this item in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Technical Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Approved by:



Director,
Electronics Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0		Original issue
1	All	Reorganized and cleaned to new format with connector , resolution, contrast, mounting, and angle of view added

TABLE OF CONTENTS

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
HDMI	High Definition Multimedia Interface
IEC	International Electrotechnical Commission
VESA	Video Electronics Standard Association

1 INTRODUCTION

1.1 Overview

.1 This standard defines the requirements of Correctional Service Canada for a colour monitor to be used as part of systems at federal correctional institutions. This standard deals only with display monitors and does not apply to any touch screen monitors.

1.2 Purpose

.1 The most frequent use of the monitor is for the display of Closed Circuit Television video streams. The monitors are typically deployed as parts of control and observation systems located in:

.1 Main Control and Communications Post;
.2 Movement Control Posts;
.3 Living Unit Control Posts; and
.4 Visits and Correspondence Offices.

2 REFERENCES

2.1 Specifications and Standards

- IEC EN60950-1 – Information Technology Equipment Safety
- IEC EN55024:2010 – Information technology equipment – Immunity characteristics – Limits and methods of measurement
- VESA FDMI – Video Electronics Standards Association Flat Display Mounting Interface Standard
- HDMI v1.0 – High Definition Multimedia Interface
- DVI rev. 1.0 – Digital Video Interface

3 PHYSICAL

3.1 Dimensions

.1 The monitor visible screen diagonal measurement will be specified in the Request for Proposal.
.2 The monitor must have VESA FDMI compatible threaded inserts.
.3 The monitor must have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;

3.2 Environment

.1 The monitor must:

.1 be capable of continuous operation;
.2 start and operate from 5°C to 40°C;
.3 start and operate from 20% to 80% non-condensing humidity;

3.3 Interference

.1 The monitor must be certified compliant to IEC EN55024, Immunity characteristics;

3.4 Reliability

.1 The monitor must have a Mean Time Between Failures of at least 25,000 hours.

3.5 Safety

.1 The monitor must meet IEC EN60950-1 or the Canadian Standards Association equivalent.

4 OPERATIONAL

4.1 Monitor

.1 The monitor must:

.1 retain its configuration over a power cycle;
.2 have a minimum horizontal resolution of 1920 pixels;
.3 have a minimum vertical resolution of 1080 pixels;
.4 have an aspect ratio of 16:9 or 16:10;
.5 have a maximum black to white response time of 5ms;
.6 have a minimum static contrast ratio of 3000:1;
.7 have a minimum horizontal viewing angle of 178°;
.8 have a minimum vertical viewing angle of 178°; and
.9 use light emitting diode backlighting;

5 INTERFACE

5.1 Ports

.1 The monitor must:

.1 have a female DE-15 D-SUB video input receptacle (VGA connector); and
.2 have a Type A High Definition Multimedia Interface video input receptacle (HDMI connector) compatible with HDMI v1.0 or later;
.3 have a Digital Video Interface – Digital video input receptacle (DVI-D) compatible with DVI rev. 1.0 or later;

5.2 Power

.1 The monitor must be powered from 110 VAC nominal.

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/STD-0228
Revision 0
13 October, 2004

ELECTRONICS ENGINEERING STANDARDS

NETWORK VIDEO USER STATION CLOSED CIRCUIT TELEVISION

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services
7 Oct 04

RECORD OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue.

1.0 SCOPE

This standard defines the requirements of a Network Video User Station (NVUS) in Closed Circuit Television (CCTV) systems used by Correctional Service of Canada (CSC).

2.0 GENERAL

NVUSs are used in security surveillance and assessment applications in institutions. The NVUS provides control and monitoring of CCTV equipment in a client-to-server configuration. The system shall use common off-the-shelf operating systems and computers. The system shall require user login and passwords to view recorded and live video. User video access and priorities are defined in the system configuration. The system shall be capable of having a minimum of 32 NVUS stations logged into the system.

3.0 ENVIRONMENTAL CONDITIONS

The system shall meet all operational requirements over the following operating range:

3.1 Temperature: 5° C to 40° C; and

3.2 Humidity: 20 to 80% relative, non-condensing.

4.0 POWER REQUIREMENTS

The equipment shall use standard commercial VAC power within the following range:

4.1 Voltage: 120 VAC ±10%;

4.2 Frequency: 60 Hz ±1.5%; and

4.3 Power: power consumption shall not exceed 400 watts.

5.0 MECHANICAL REQUIREMENTS

The dimensions and weight shall not exceed the following:

5.1 Width: 450 mm;

5.2 Height: 200 mm;

5.3 Depth: 450 mm; and

5.4 Weight: 30 kg.

6.0 DESIGN REQUIREMENTS

6.1 The unit must be self contained and the NVUS computer must fit in a standard 19" rack.

6.2 The control functions must be usable with either a mouse or LCD touch screen.

6.3 Memory Backup shall protect timer settings in the event of power failure.

6.4 All test points on the NVMS computer shall be clearly labelled and easily accessible for calibration and maintenance.

6.5 All equipment shall be modular with plug-in circuit cards and assemblies.

6.6 The design Mean Time Between Failure (MTBF) shall be at least 10,000 hours.

6.7 Emergency repair or parts and labour for detective NVMSs shall be available within 24 hours after notification of equipment unserviceability to any authorized dealer service centres across Canada.

7.0 TECHNICAL REQUIREMENTS

The NVUS shall meet the following requirements:

7.1	Video Format:	NTSC (colour and black/white);
7.2	Video Frame Rate:	30 frames/second/channel (max);
7.3	Video Freeze:	yes
7.4	Video Output:	SVGA;
7.5	Audio:	Synchronized with video input;
7.6	Interface:	100Base-T/10Base-T (auto fallback); and
7.7	Protocol:	Internet Interface Protocol.

8.0 FUNCTIONAL REQUIREMENTS

The NVUS shall interface to the network and provide access and control of all CCTV surveillance and assessment systems as follows:

8.1 General

a. User login shall be through password protection that limits the user to specific cameras, both live and recorded.

b. The Graphic User Interface (GUI) shall provide mapping functions to display camera locations. Cameras can be selected by camera number, or by dragging and dropping to a display.

c. Alarms shall be able to be displayed on the map or through a text message.

d. The system shall log all user operations.

8.2 Viewing

a. Ability to have live and recorded viewing of a minimum of 16 cameras.

b. Full control of all Pan/Tilt/Zoom (P/T/Z) cameras through user login of access rights to predefined cameras. Minimum of 16 priority levels to access cameras.

c. Ability to set up guard tour and multiple camera sequences.

d. Ability to display video in single, quad or step format.

e. Full duplex audio capability. The GUI application provides the ability to control talk paths and listen to audio inputs at camera locations.

f. Any live or recorded camera in the system shall be accessible through the single GUI interface without the need to change screens or applications.

8.3 Recording

a. Ability to set record mode to automatically start recording on any appropriate alarm input, for example, a signal from the Fence Detection System.

b. Ability to set record mode to stop when it receives any reset signal (one input per video input);

c. Ability to manual initiate record mode.

d. Ability to initiate record mode on motion.

e. Ability to initiate record mode based on time.

f. Ability to be configured to stop recording when the hard drive is full, or configured to overwrite the oldest files.

g. Provide an open or closed contact when the NVUS stops recording for any reason.

8.4 **Playback**

a. Ability to control playback speed.

b. Ability to have multiple view playback.

c. Ability to export single images and video sequences.

d. Ability to search for motion in continuous recordings.

e. Ability to search video sequences based on either date, time or motion.

8.5 **System**

a. Capable of triplex operation: record, search and playback simultaneously.

b. Placing the unit into either the Search or Playback mode shall not interrupt any recording in process.

c. Searching and viewing of stored images, and reconfiguration of system parameters shall be available via a TCP/IP connection through a LAN. Any remote access software required shall be provided for installation on a standard Windows based computer; and

d. Transfer viewing software automatically to the CD when downloading audio and video for archive purposes. It should be possible to review the archived audio and video from any CSC PC with Windows XP without additional software.

e. Should indicate Power on/off; Hard Drive Full Alarm; Time/Date; and Recording; on the operator console;

f. Should have controls for Power on/off; Record; Play/Stop; Forward/Reverse Field Advance; Time, Date and Recording Mode on the operator console;

g. Control signals available on the back of the NVUS shall include Automatic Alarm Input; and Manual Alarm Input;

h. System messages must be contained in a log file available for downloading or printing.

i. Multiple users shall be able to share common resources, with individual users being assigned different system access capability with password protection.

9.0 INTERFERENCE

The NVUS performance and video quality shall not be affected by the presence or use of standard CSC electronic equipment. The units shall work at the following distance limits:

9.1 CB transceivers at 1 metre or more;

9.2 VHF or UHF transceivers (25W) at 1 metre or more;

9.3 Other radio frequency transmitting, receiving and distribution equipment at 5 metres or more; and

9.4 Personal computers and/or computer work stations at 5 metres or more.

The NVUS shall not interfere with any standard electronic equipment used at the institutions.

10.0 SAFETY

10.1 The NVUS must be CSA, UL, ULC or CE approved, as required by law.

- END OF TEXT -

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/STD-0229
Revision 3
19 April, 2010

ELECTRONICS ENGINEERING STANDARDS

NETWORK VIDEO RECORDER CLOSED CIRCUIT TELEVISION

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services

RECORD OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue.
1	6.4 Design Requirements	Delete requirement for local control
	6.14 Design Requirements	Delete requirement for directly attached computer
	7.4 Recording Frame Rate	Delete “minimum compression”
	7.5 Frame Storage Option	Delete
	7.6 Selectable Compression	Delete
	7.8 Primary Storage	“Hot Swappable” Hard Drives
	7.14 Failure Indication	Change to message to the FAAS on failure
	7.15 Disk Full	Delete
2	7.13	Added requirement for Fail-Over Archiving
	7.14	Added requirement for Fail-Over Directory
3	4.3 Power	Increase to 600 watts maximum
	5.3 Depth	Increase to 600 mm
	7.1 Video Format	Determined by cameras
	7.4 Recording Frame Rate	Increase to 20 maximum simultaneous inputs
	7.7 RAID 5	Added 4TB minimum
	7.15	Added requirement for RAID 1 OS solid state drives

1.0 SCOPE

This standard defines the requirements of a Network Video Recorder (NVR) in Closed Circuit Television (CCTV) systems used by Correctional Service of Canada (CSC).

2.0 GENERAL

NVRs are used in security surveillance and assessment applications in institutions. The NVR records real time video and audio streams transmitted from network video cameras or NTSC-IP Video Converters.

3.0 ENVIRONMENTAL CONDITIONS

The system shall meet all operational requirements over the following operating range:

3.1 Temperature: 5° C to 40° C; and

3.2 Humidity: 20 – 80% non-condensing.

4.0 POWER REQUIREMENTS

The equipment shall use standard commercial VAC power within the following range:

4.1 Voltage: 120 VAC ±10%;

4.2 Frequency: 60 Hz ±1.5%; and

4.3 Power: power consumption shall not exceed 600 watts.

5.0 MECHANICAL REQUIREMENTS

The dimensions and weight shall not exceed the following:

5.1 Width: to fit standard 19” rack mount;

5.2 Height: maximum 6RU (Rack Units);

5.3 Depth: 600 mm; and

5.4 Weight: 30 kg.

6.0 DESIGN REQUIREMENTS

6.1 The unit must be self contained.

6.2 The unit must fit in a standard 19" rack.

6.3 The NVR shall be based on common off-the-shelf computers and operating systems.

6.4 All function controls for NVR configuration and operation shall be available through remote access software.

6.5 Power Failure Recovery shall enable the NVR to resume functioning in the same state that it was in at the time of the power failure.

6.6 Memory Backup shall protect timer settings in the event of power failure.

6.7 All test points on the NVR shall be clearly labelled and easily accessible for calibration and maintenance.

6.8 All equipment shall be modular with plug-in circuit cards and assemblies.

6.9 The design Mean Time Between Failure (MTBF) shall be at least 10,000 hours.

6.10 The unit shall provided remote diagnostics to indicate recording failure or video loss from an IP camera or IP encoder.

6.11 The recorder shall utilize user login, password and rights management such as to limit users' access to specific cameras, both live and recorded.

6.12 The recorder system shall provided user rights and priorities to control of P/T/Z cameras.

7.0 TECHNICAL REQUIREMENTS

The NVR shall meet the following requirements:

7.1 Video Format: Determined by camera;

7.2 Audio: Synchronized with video input (when equipped);

7.3	System Recording Rate:	up to 120 Mbits/sec;
7.4	Recording Frame Rate:	maximum 20 simultaneous inputs @ 640 x 480 pixels, 30 frames per second per input;
7.5	Recording Capacity:	Shall have the ability to connect to external local RAID storage drives to a minimum of 4 external RAID chassis. Limited only by hard drive capacity;
7.6	Primary Storage:	Hot Swappable Hard Drives (capacity as per STR);
7.7	RAID 5:	Internal storage shall be 4TB RAID 5 as a minimum (depending on storage requirement);
7.8	Watermark:	The video must contain some form of watermark or fingerprint so that any attempt to tamper with the recorded digital image may be detected.
7.9	Interface:	100Base-T/10Base-T (auto fallback);
7.10	Protocol:	Internet Interface Protocol; and
7.11	User Display:	HTML-based GUI.
7.12	Failure Indication:	Message to the FAAS when NVR stops recording for any reason
7.13	Fail-Over Archiving	To be provided (The RAID 5 feature of the NVR is NOT considered redundant archiving. Additional archiver(s) that will automatically take over recording of the cameras assigned to an NVR that has completely or partially failed, in excess of a single RAID Drive, must be provided.)
7.14	Fail-Over Directory	To be provided (The Fail-Over Directory may reside on the Fail-Over Archiver)
7.15	Operating System	The operating system for the unit shall be contained on two (2) solid state drives configured as RAID 1 storage. The OS shall NOT be installed on the RAID 5 video array.

8.0 INTERFERENCE

The NVR performance and video quality shall not be affected by the presence or use of standard CSC electronic equipment. The units shall work at the following distance limits:

8.1 CB transceivers at 1 metre or more;

8.2 VHF or UHF transceivers (25W) at 1 metre or more;

8.3 Other radio frequency transmitting, receiving and distribution equipment at 5 metres or more; and

8.4 Personal computers and/or computer work stations at 5 metres or more.

The NVR shall not interfere with any standard electronic equipment used at the institutions.

9.0 SAFETY

9.1 The NVR must be CSA, UL, ULC or CE approved, as required by law.

- END OF TEXT -

CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS

ES/STD-0232
Revision 2
February 2014

ELECTRONIC ENGINEERING STANDARD

FIXED NETWORK COLOUR DOME CAMERA

FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

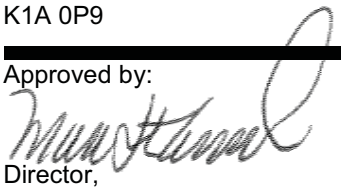
AUTHORITY

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Approved by:



Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	All	New structure and change to merge indoor and outdoor.
2	Definitions	Removed
	2.1	Added reference IEC EN 61000-4-3, Radiated RF immunity
	3.2.2.3	Changed humidity to non-condensing 20%-90%
	3.3.1	Interference now uses IEC EN 61000-4-3, Radiated RF immunity

TABLE OF CONTENTS

TABLE OF ABBREVIATIONS

Abbreviation	Expansion
AGC	Automatic Gain Control
CSC	Correctional Service Canada
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol

1 INTRODUCTION

1.1 Overview

.1 This standard defines the requirements of Correctional Service Canada (CSC) for a fixed focus, network capable, dome camera for use at federal correctional institutions.

1.2 Purpose

.1 The cameras are deployed for both observation and evidentiary use.

.2 These cameras are for deployment for all outdoor fixed camera locations **except**:

.1 facility perimeter;

.3 These cameras are for deployment for all indoor fixed camera locations **except**:

.1 observation cells;

.2 principal entrance panoramic;

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

.1 Access to non-government specifications is the responsibility of the contractor.

- IEC EN60529 – International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
- IEC EN60950-1 – International Electrotechnical Commission Information technology equipment – Safety
- IEC EN 61000-4-3 – International Electrotechnical Commission Radiated RF immunity
- IEC EN62262 – International Electrotechnical Commission Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts
- IEEE 802.3at – IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
- IEEE 802.3u – IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

.1 The camera case and dome must:

.1 measure a base diameter less than 200mm;
.2 measure from base to top of dome of less than 175mm excluding any mount;
.3 weigh less than 2.5kg;

3.2 Environment

.1 The camera case and dome must:

.1 meet or exceed IEC EN60529 IP66 dust and water resistance when mounted;
.2 meet or exceed IEC EN62262 IK10 impact resistance;
.3 have threaded openings for conduits;
.4 have a threaded plug to seal all unused openings;
.5 have set-screws to secure all conduit and plugs from inside the dome;
.6 have tamper resistant heads on all externally accessible screws;
.7 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
.8 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;

.2 The camera must:

.1 be capable of continuous operation;
.2 start and operate from -40°C to 50°C;
.3 start and operate from 20% to 90% non-condensing humidity;

3.3 Interference

.1 The camera must be certified compliant to IEC EN 61000-4-3, Radiated RF immunity

3.4 Reliability

.1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

.1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

.1 The camera must retain its configuration over a power cycle.

.2 The image sensor must:

- .1 include automatic or remote back focus;
- .2 have a minimum of 480,000 pixels (horizontal x vertical);
- .3 have day (colour) and night (black and white) modes;
- .4 automatic removable infrared cut filter for day/night transition;
- .5 have 0.5 lux or less minimum illumination for day mode;
- .6 have 0.1 lux or less minimum illumination for night mode;
- .7 include Automatic Gain Control (AGC);
- .8 include extended dynamic range processing;

4.2 Lens

.1 The camera lens must:

- .1 have a 35° to 80° or greater horizontal angular view varifocal lens
- .2 be approved by the manufacturer of the camera for that camera;

4.3 Video

.1 The video encoding must:

- .1 support H.264 configurable I-frame frequency of at least 3 per second;
- .2 support H.264 constant bit rate transmission mode;
- .3 support H.264 frame rate transmission mode;
- .4 support at least 3 levels of H.264 image quality;
- .5 support at least 3 levels of MJPEG image quality;

.2 The video output must:

- .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
- .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
- .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

.1 The camera must:

.1 interface over IPV4 TCP/IP;
.2 be able to operate on 100Base-TX (IEEE 802.3u);
.3 connect using an RJ-45 connector;
.4 be ONVIF compliant;

5.2 Power

.1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

.1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.

CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS

ES/STD-0233
Revision 2
February 2014

ELECTRONIC ENGINEERING STANDARD

INDOOR NO-GRIP CORNER MOUNT NETWORK COLOUR CAMERA

FOR USE IN FEDERAL CORRECTIONAL INSTITUTIONS

AUTHORITY

This Standard is approved by the Correctional Service Canada for the procurement and installation of this item in Canadian federal correctional institutions.

Acquisition of a camera for the identified purposes that is not in compliance with this standard must be approved by the Design Authority.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Approved by:

Director,
Electronic Security Systems

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	All	New document structure and addition of TCP/IP and PoE interfaces.
2	Definitions	Removed
	2.1	Added reference IEC EN 61000-4-3, Radiated RF immunity
	3.2.2.3	Changed humidity to non-condensing 20%-90%
	3.3.1	Interference now uses IEC EN 61000-4-3, Radiated RF immunity

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CSC	Correctional Service Canada
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MJPEG	Motion Joint Photographic Experts Group
MTBF	Mean Time Between Failures
ONVIF	Open Network Video Interface Forum
PoE	Power over Ethernet
TCP/IP	Transmission Control Protocol/Internet Protocol

1 INTRODUCTION

1.1 Overview

.1 This standard defines the requirements of Correctional Service Canada (CSC) for an indoor, fixed focus, network capable, corner mounted, no-grip camera for use at federal correctional institutions.

1.2 Purpose

.1 The cameras are deployed for both observation and evidentiary use.

.2 These cameras are for deployment only in:

.1 observation cells;

2 REFERENCES

2.1 Specifications, Standards, and Statements of Work

.1 Access to non-government specifications is the responsibility of the contractor.

- IEC EN60529*International Electrotechnical Commission Degrees of protection provided by enclosures (IP Code)
- IEC EN60950-1*International Electrotechnical Commission Information technology equipment – Safety
- IEC EN 61000-4-3 – International Electrotechnical Commission Radiated RF immunity
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- IEEE 802.3at*IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment 3: Data Terminal Equipment (DTE) Power via the Media Dependent Interface (MDI) Enhancements
- IEEE 802.3u*IEEE Standards for Local and Metropolitan Area Networks: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100 Mb/s Operation, Type 100BASE-T

3 PHYSICAL

3.1 Dimensions

.1 The camera case must:

.1 measure less than 300mm in all dimensions;
.2 weigh less than 2.5kg;

3.2 Environment

.1 The camera case must:

.1 meet or exceed IEC EN60529 IP65 dust and water resistance when mounted;
.2 meet or exceed IEC EN62262 IK10 impact resistance;
.3 have tamper resistant heads on all externally accessible screws;
.4 be grip-less and anchor-free;
.5 have a permanently affixed label on the interior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;
.6 have a permanently affixed label on the exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement;

.2 The camera must:

.1 be capable of continuous operation;
.2 start and operate from 0°C to 50°C;
.3 start and operate from 20% to 90% non-condensing humidity;

3.3 Interference

.1 The camera must be certified compliant to IEC EN 61000-4-3, Radiated RF immunity

3.4 Reliability

.1 The camera must have an MTBF of at least 25,000 hours.

3.5 Safety

.1 The camera must meet IEC 60950-1 or the CSA equivalent.

4 OPERATIONAL

4.1 Camera

.1 The camera must retain its configuration over a power cycle.

.2 The image sensor must:

- .1 include automatic or remote back focus;
- .2 have a minimum of 480,000 pixels (horizontal x vertical);
- .3 have day (colour) and night (black and white) modes;
- .4 automatic removable infrared cut filter for day/night transition;
- .5 have 0.5 lux or less minimum illumination for day mode;
- .6 have 0 lux minimum illumination for night mode;
- .7 if required for night mode, use invisible illumination (typically infra-red LEDs);
- .8 include Automatic Gain Control (AGC);

4.2 Lens

.1 The camera lens must:

- .1 provide a view of the entire floor and all four walls of a room at least 3.5m x 3.5m including the walls to which it is attached from the mounting height to the floor;
- .2 be approved by the manufacturer of the camera for that camera;

4.3 Camera Case

.1 The camera case must:

- .1 have a programmatically controlled visible LED indicator to show when the video feed is being observed;

4.4 Video

.1 The video encoding must:

- .1 support H.264 configurable I-frame frequency of at least 3 per second;
- .2 support H.264 constant bit rate transmission mode;
- .3 support H.264 frame rate transmission mode;
- .4 support at least 3 levels of H.264 image quality;
- .5 support at least 3 levels of MJPEG image quality;

.2 The video output must:

- .1 include an on-screen, programmable character generation overlay capability with a minimum of 8 visible characters;
- .2 support at least two simultaneous H.264 video streams at 30 frames per second with at least 480,000 pixel resolution;
- .3 support at least two simultaneous video streams, one H.264 and one MJPEG at 15 frames per second with at least 480,000 pixel resolution;

5 INTERFACE

5.1 Ports

.1 The camera must:

.1 interface over IPV4 TCP/IP;
.2 be able to operate on 100Base-TX (IEEE 802.3u);
.3 connect using an RJ-45 connector;
.4 be ONVIF compliant;

5.2 Power

.1 The camera must be a Type 1 powered device operating solely from Power over Ethernet (PoE) compliant with IEEE 802.3at Class 0, 1, 2, or 3.

5.3 Video Management System Compatibility

.1 The camera model must be identified as “Certified” or “Supported by Design” in the Genetec Omnicast Supported Hardware camera list.

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/STD-0804
Revision 3
10 January, 2008

ELECTRONICS ENGINEERING STANDARDS

UNINTERRUPTABLE POWER SUPPLY ELECTRONIC SYSTEMS

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services

11 Jan 08

RECORD OF REVISIONS

Revision	Paragraph	Comment
3	6.11	Go into BYPASS MODE on equipment failure

1.0 SCOPE

This standard defines the technical and performance requirements of the Correctional Service of Canada (CSC) for Uninterruptable Power Supplies (UPS) use in federal correctional institutions.

2.0 GENERAL

Electronic security systems are powered by standard commercial VAC power. Most institutions have gas/diesel powered engine generators to provide emergency backup power to essential security systems to maintain operations during loss of commercial power. Normally the time respond for the backup generator to come up to speed, stabilize and switch power is too long for most electronic systems. To bridge the gap between loss of commercial power and the response time for the generator, an UPS system is used. The UPS will switch off once the generator has stabilized or the commercial power has returned. The UPS has rechargeable batteries that supply power through a DC to AC inverter. These batteries are being charged when either the commercial power or the generator is providing the power.

3.0 ENVIRONMENTAL REQUIREMENTS

The UPS system shall meet all requirements over the following operating range:

3.1.1 Temperature: 0° C to 50° C; and

3.1.2 Humidity: up to 95% non-condensing.

4.0 POWER REQUIREMENTS

The UPS system shall be recharged from standard commercial single phase VAC power or emergency backup generator VAC power within the following operating range:

4.1 Voltage: 120 VAC ±10%;

4.2 Frequency: 60 Hz ±3%; and

4.3 Transients: up to 5 times nominal voltages and for 100 msec durations.

Any change in the source of the input power or any fluctuation within the above limits shall not cause damage to the system nor shall it cause a change in its mode of operation.

5.0 MECHANICAL REQUIREMENTS

The UPS System shall have a size and weight compatible with the location where it is intended to be installed. The UPS System size and weight shall allow the use of existing unaltered accesses to bring it into the installation location.

6.0 DESIGN REQUIREMENTS

6.1 The UPS shall operate in a stand by mode and must immediately (within one cycle) provide rated power as described in Section 6.0 if any of the following occur:

a. loss of commercial power; and

b. commercial power is outside the limits as specified in Section 4.0.

6.2 The UPS shall be capable of supplying the full load for >one hour without mains or emergency generator power.

6.3 The system shall be capable of full charge within four hours after restoration of mains power.

6.4 The UPS shall provide a low battery power alarm to indicate that 15 minute spare battery capacity is remaining.

` 6.5 If a low battery voltage condition exists; upon the return of commercial power the system shall automatically; verify the integrity of the mains power, provide mains power to the load if it is within acceptable limits, cancel low battery voltage alarm and recharge the batteries.

6.6 The system shall be disconnected from the load and shall handle the following conditions without damage to itself or any other equipment:

a.	Momentary overload:	>5 seconds at 200% of rated load;
b.	Short term:	>5 minutes at 110% of rated load; and
c.	Low Battery Voltage:	Adjustable and set to inhibit damage to the batteries. If this condition occurs, the inverter shall also be turned off.

6.7 Upon the return of commercial power, the system shall return to the stand by mode after it has verified the integrity of the commercial power.

6.8 The system shall automatically synchronize the inverter output frequency to the mains VAC power.

6.9 In stand by mode, synchronization shall be continuous.

6.10 In the on-line mode, the system shall synchronize its output to the mains VAC power after it has verified the integrity of the mains power and before returning to the stand by mode.

6.11 In the event of an equipment failure, the system shall automatically go into BYPASS MODE, feeding commercial power directly to the load powered by the equipment.

6.12 There must be clear labelling of and easy access to all controls and test points that are required during calibration and testing.

6.13 All equipment must be modular with plug-in circuit cards and assemblies that are replaceable without the use of test equipment. A standard extender board shall be included with the equipment.

6.14 All equipment must be designed and built to high quality standards and have a designed MTBF (Mean Time Between Failure) figure of at least 5 years.

6.15 All equipment must have a label, permanently affixed to the exterior of the unit, which identifies the manufacturer, the model or assembly number, the serial number and the mains power requirement.

7.0 TECHNICAL REQUIREMENTS

The output requirements of the UPS system shall meet the following:

7.1	Voltage:	120 VAC ±5%, adjustable under load;
7.2	Frequency:	60 Hz ±3%;
7.3	Regulation:	steady-state output shall not change by more than 2% of the nominal voltage for load changes from 0 to 100% of rated load;
7.4	Output Noise:	<1 V p-p;
7.5	Power Factor:	1.0 to 0.8 leading or lagging;
7.6	Harmonic Distortion:	<5%. No single harmonic shall exceed 3% under all operating conditions, from no load to full load;
7.7	Filtering:	input and output power lines filters to prevent the conduction of radio interference to the subsystems which it is powering;

7.8 Transients: transient output voltage due to sudden changes of AC load, Input voltage, load on battery, or any other cause shall be <±10% of the nominal voltage and shall return to normal within 3 cycles; and

7.9 Synchronization: output frequency shall automatically synchronize to the mains input frequency if it is between 58.5 and 61.5 Hz.

8.0 FUNCTIONAL REQUIREMENTS

8.1 The system shall provide a visual indication for the following conditions; INVERTER ON, MAINS POWER OFF, BATTERY DISCHARGING, BYPASS STATUS and LOW BATTERY ALARM.

8.2 The system shall provide outputs in the form of dry contact closures for the following; SYSTEM FAILURE, MAINS POWER OFF/ON, BATTERY DISCHARGING, SYSTEM BYPASSED and LOW BATTERY ALARM.

8.3 The system shall have the following controls; MANUAL BYPASS SWITCH, DC BREAKER, INVERTER ON/OFF and CHARGER FLOAT/EQUALIZE.

8.4 The system shall be equipped with meters to show the following; BATTERY VOLTAGE, BATTERY CHARGED/DISCHARGE CURRENT, AC LOAD VOLTAGE and AC LOAD CURRENT.

9.0 INTERFERENCE

UPS System performance shall not be affected by the presence and use of standard electronic equipment used at the institution. Minimum distances are:

9.1 CB transceivers at 1 metre or more.

9.2 VHF and UHF transceivers at one metre or more.

9.3 Other radio frequency transmitting, receiving distribution equipment at 1 metre or more.

The system shall not interfere with any standard electronic equipment used at the institution.

10.0 SAFETY

The UPS shall meet all CSA & UL requirements for power conversion equipment in a controlled environment.

- END OF TEXT -

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/SOW-0101
Revision 3
15 April 2004

ELECTRONICS ENGINEERING STATEMENT OF WORK

PROCUREMENT & INSTALLATION OF ELECTRONIC SECURITY SYSTEMS

AUTHORITY

This Statement of Work is approved by Correctional Service Canada for the procurement and installation of all telecommunications and electronic security systems, subsystems, and equipment in Canadian penal institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service of Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services
15 Apr 04

RECORD OF REVISIONS

Revision	Paragraph	Comment
3	10.1 – Manuals and Drawings	Added equipment operating software
	10.4 – Documentation Format	Added equipment operating software

TABLE OF CONTENTS

ABBREVIATIONS

The following abbreviations are used in this specification:

ATP	Acceptance Test Plan
CM	Corrective Maintenance
COTS	Commercial-Off-The-Shelf
CSC	Correctional Service Canada
DA	Design Authority
DCR	Design Change Request
DES	Director, Engineering Services
DL	Deficiency List
FDR	Final Design Report
MRT	Mean Response Time
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair
PDR	Preliminary Design Report
PM	Preventative Maintenance
PW&GSC	Public Works & Government Services Canada
QA	Quality Assurance
RFP	Request For Proposal
SOW	Statement of Work
STR	Statement of Technical Requirement

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

1.0 INTRODUCTION

This Statement of Work (SOW) defines the work and responsibilities for the design, procurement, installation, test and integration of all telecommunications and electronic security equipment in CSC Institutions.

The SOW provides guidelines, procedures and responsibilities to the contractor and/or the project officer for the implementation of all telecommunications and electronic security systems in CSC facilities.

All work performed shall adhere to this SOW, CSC Specifications, Standards and Statement of Technical Requirements (STRs).

1.1 Commercial-Off-The-Shelf Equipment

The contractor shall use commercial off-the-shelf (COTS) equipment and proven designs to the maximum extent possible. All new equipment shall meet the specified lifespan requirements. New equipment designs shall be restricted to unique interfaces and common control console.

1.2 Technical Acceptability

The Correctional Service Canada (CSC) operational environment is unique for its diversity of locations, climate exposures and the physical restrictive construction techniques of penal 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 shall maintain very high standards of dependability and reliability.

The CSC Engineering Services Division has established technical specifications and equipment standards for specific electronic security systems which are based on very specific and restrictive operational performance criteria as detailed in its Electronic Engineering Standard. Technical acceptability of these systems means that the equipment complies with the pertinent CSC specifications and standards.

The technical acceptance process shall involve system and subsystem evaluation in accordance with the applicable CSC specifications in one of CSC facilities or may be tested in a CSC facility to verify the effectiveness of the proposed technologies when subjected to the restrictive operational environment.

CSC shall also verify in depth any of the system technical specifications called up. CSC may when it deems necessary, request the supplier to arrange for a full site demonstration. CSC may rely on manufacturer's test results for specific areas of the specification where an independent test facility has conducted the test, and the facility is deemed acceptable to CSC.
It is the supplier's responsibility to make new developments in products available to CSC for evaluation. Equipment qualification is an ongoing process and can be initiated at any time by a vendor. Any vendor can have access to the CSC specifications and standards. Any new development or products should be submitted to the CSC Engineering Services Division, Technical Authority in a suitable time frame prior to any tendering process to allow for an acceptable evaluation period. The evaluation period may take up to sixteen (16) months.

1.3 Equipment Procurement

Any ordering of equipment/material before the approval of the final design report will be undertaken at the contractor's own risk. The Design Authority may authorize the procurement of certain long lead items at, or shortly after the preliminary design review.

1.4 Quantity of Equipment

The quantity and location of the equipment required for CSC institutions will be contained in the specification identified in the STR.

2.0 APPLICABLE DOCUMENTS

CSC Specifications, Standards and STRs are approved by the Director of Engineering Services (DES) for the procurement and installation of all telecommunications and electronic security systems in all CSC facilities. These documents promulgate DES policy and shall not be modified or changed without prior consultation and approval of the Director. The documents of the issue in effect will form part of the Request for Proposal (RFP) issued by the contract authority.

3.0 REQUIREMENTS

3.1 The contractor shall:

a. Design, procure or manufacture, install, test and document the installation of all electronic security and telecommunications systems in accordance with the CSC specifications, standards and STR;

b. Provide the operator and maintenance training in accordance with the CSC requirements;

c. Provide the maintenance support and spares in accordance with the CSC maintenance requirements;

d. Provide quality assurance (QA) to ensure equipment performance and reliability are in accordance to CSC requirements;

e. Provide warranty coverage to include spare parts provision and equipment repair;

f. Provide a program schedule to show all major elements from a contact award to completion of the warranty period and shall include anticipated time of occurrence, interrelationships between events, and time scale; and

g. Be responsible for the integration of the proposed system to any existing telecommunications and electronic security systems.

h. Provide a lightning protection system for the installation of all electronic security systems/equipment in the CSC facilities. As a minimum, surge suppression type lightning arrestors shall be required for all power, communications and antenna cables/wires entering or leaving a building.

4.0 SYSTEM DEVELOPMENT

The contractor shall design systems and equipment to meet all of the requirements stipulated in the applicable CSC specifications. The system design shall be modular and address the following criteria:

a. ease of operation and maintenance;

b. optimize and concentrate control functions and capabilities;

c. enhance the security of the working environment, extend staff capabilities to observe and control; and

d. minimize the number and types of display and control devices.

4.1 Preliminary Design

The preliminary design baseline shall be established by the review and approval of the preliminary design report (PDR) by the Design Authority (DA) or his designate. Specifications, drawings and the approved PDR shall make up the preliminary design baseline.

The contractor shall prepare and submit two (2) copies of the PDR to the Design Authority and one (1) copy to the Contract Authority at least ten (10) days prior to the PDR meeting. The PDR shall consist of:

a. performance specifications with functional block diagrams of the proposed system. The technical analysis and equipment performance data shall verify system requirements;

b. preliminary equipment layouts including control consoles and racks;

c. list of off-the-shelf equipment with part number, model number, manufacturer and the quantity of each item;

d. list of custom designed equipment with model number and the quantity of each item;

e. functional schematics for all custom designed equipment;

f. conceptual drawings for all custom designed equipment;

g. a proposed product assurance plan;

h. a proposed maintenance plan;

l. proposed sparing plan; and

j. proposed training plan.

4.2 **Preliminary Design Review**

The PDR meeting shall be convened by the contractor to review the PDR contents. The contractor shall provide the venue and all of the necessary facilities. The Design Authority will identify any portions of the PDR that are not acceptable to CSC.

4.3 **Final Design**

The final design baseline shall be established by the review and approval of the Design Authority of the final design report (FDR). It establishes the start of change control in equipment design and performance. The FDR shall consist of:

a. all elements of the preliminary design baseline;

b. control console mockups, ergonomics considerations, etc., as necessary;

c. drawings and operational descriptions for the custom designed equipment including interface specifications;

d. Installation drawings and instructions; and

e. availability model and analysis updates to reflect the final system design and hardware selection.

The FDR shall be prepared to good commercial practice. Two (2) copies shall be submitted to the Design Authority at least ten (10) working days before the FDR meeting.

4.4 **Final Design Review**

The final design review meeting shall be convened to review the contents of the FDR. The contractor shall provide the venue and all of the necessary facilities. All of the contractor's staff responsible for the system/equipment engineering shall be available.

4.5 **Design Change Control**

Design changes shall be in accordance with the following procedure:

4.5.1 **Type I.** Changes that affect cost, schedule, reliability, maintainability, or availability shall be submitted as a design change request (DCR).

Changes shall not be actioned until specifically directed in writing by the Design Authority through the Contract Authority.

4.5.2 **Type II.** Changes to correct a design error without affecting cost, schedule, reliability, maintainability, or availability shall not require a DCR.

Changes shall be reported to the Design Authority and the final design baseline shall be updated by the contractor. The Design Authority will review and acknowledge the change.

4.6 **Design Change Request (DCR)**

Type I changes shall be forwarded to the Design Authority through the Contract Authority on DCRs initiated by either the contractor or the Design Authority.

DCRs shall be reviewed and approved before implementation and shall include:

a. specification requirement being effected;

b. final design baseline element being changed;

c. description of the design change;

d. reason for the change;

e. impact on cost, schedule, reliability, maintainability and availability; and

f. trade-off recommendations.

4.7 **In-Plant Testing**

Details of in-plant tests are contained in the ES/SOW-0102, Statement of Work. In-plant tests shall be performed according to the Design Authority approved procedures.

Equipment with deficiencies as the result of the in-plant tests shall be subject to retest. The Design Authority reserves the right to add or modify tests.

5.0 SYSTEM INSTALLATION

The contractor shall be responsible for ensuring that sufficient site utilities are available. No work will be permitted at the site before the approval of the Design Authority. All installation activities shall be conducted in accordance with ES/SOW-0102, Statement of Work.

5.1 Schedule

The contractor shall provide a detailed work schedule for the installation activities. This schedule shall reflect the complete implementation plan by identifying the nature of the work to be performed and the area affected.

5.2 On-Site Inspections

Design Authority or an appointed CSC representative shall perform ongoing inspections of the contractor's activities. These inspections shall verify compliance with the project requirements, the quality of work performed and assess the contractor's progress in relation to the approved schedule. Installation deficiencies requiring corrective action will be brought immediately to the contractor's attention in writing.

5.3 On-Site Coordination

Design Authority shall be responsible for the appointment of an on-site CSC representative. This representative will handle all site related manners and will periodically inspect the installation.

When electronic system installations are part of a construction program or a major redevelopment that involves Public Works & Government Services of Canada, the electronic system installation contractor shall coordinate all activities with the relevant site manager and shall comply with this SOW.

5.4 Facility Criteria

The contractor shall provide the facility criteria data in the proposal. Details as to the power, cooling, space and/or other requirements relating to electronic security system installation at the site must be provided. Final facility criteria information must be provided as part of the FDR.

5.5 Installation Design

The system installation design and planning shall make maximum use of existing ducts, conduits, and other cable routing facilities. Where this is not possible, the contractor shall design and install facilities in a manner acceptable to the Design Authority.

5.6 **Subcontractor Supervision**

The contractor shall provide an on-site supervision of all subcontractors. The subcontractors shall abide by the regulations of this Statement of Work and the conditions in the contract.

5.7 **System Checkout**

Before conducting the formal on-site testing for the CSC acceptance, the contractor shall conduct and document a system checkout to assure the system readiness for formal testing and on-line operations. The test sheets used for the system checkout shall be signed by a company representative and provided to the Design Authority at least seven (7) days prior to the scheduled date of the Acceptance testing. The Design Authority will verify readiness through review of the checkout report. The report may be used as reference during the formal witnessed testing for acceptance.

5.8 **As-Built Drawings**

Thirty (30) days after the system installation acceptance, the contractor shall deliver a complete set of equipment and installation as-built drawings for Design Authority's review and approval. Within thirty (30) days after CSC approval, two (2) complete sets of revised drawings shall be delivered to the Design Authority.

The contractor shall update these drawings throughout the warranty period by the design control procedures. Within thirty (30) days of completion of the warranty period, the contractor shall deliver one (1) set of final revised drawings reflecting all changes to the Design Authority. Upon final CSC approval, the contractor shall deliver two (2) sets of original prints of the final drawings.

6.0 SYSTEM ACCEPTANCE

System acceptance shall occur when the acceptance testing has been completed according to the ES/SOW-0102, Statement of Work and when all of the other requirements of the contract have been completed to the satisfaction of the Design Authority. A final acceptance certificate signed by the Design Authority shall certify the system acceptance.

On-site system acceptance testing shall not begin until all of the on-site iInstallation activities have been completed.

6.1 Acceptance Test Plans (ATPs)

The contractor shall provide ATPs for all system, subsystem and equipment tests for Design Authority review and approval. The requirements for the ATP are detailed in the ES/SOW-0102, Statement of Work.

6.2 System Testing

The contractor shall conduct the approved ATP and record the results. The Design Authority or an appointed CSC representative shall witness the tests.

6.3 Deficiency Lists (DL)

The contractor shall prepare and submit a list of deficiencies divided into three categories:

a. Visual/Mechanical,

b. Operational, and

c. Technical/Functional.

6.4 Technical Acceptance

Upon verifying that all of the deficiencies have been corrected, the Design Authority shall issue a letter of Technical Acceptance.

7.0 QUALITY ASSURANCE (QA)

The QA program shall include quality control and system tests/verification programs to verify that new design and off-the-shelf equipment requirements have been met. System tests/verification will be conducted by the contractor in-plant and on-site, and may be witnessed by the CSC representatives where appropriate. The system shall pass all tests before approval will be given to commence the operator and maintenance training programs and warranty period.

7.1 Quality Control Program

The contractor shall provide a description of their internal quality control programs for CSC review and approval. CSC reserves the right to audit and verify that all materials destined for use in CSC systems have been thoroughly inspected and that QA procedures are applied during production and testing.

7.2 System Test Program

The contractor shall prepare and provide the documents describing: number, type and details of equipment, subsystem and system tests for CSC review and approval. These documents must be approved before any formal testing and will consist of the following:

7.2.1 System Test Plan.

This plan shall contain the test philosophy, the tests to be conducted, the pass-fail criteria, the retest requirements, and the instructions for the validation and the sign-off of all final design baseline requirements.

Before witnessing these tests, the CSC representative will perform a visual and mechanical inspection to ensure that the system installation meets the requirements of ES/SOW-0102, Statement of Work.

7.2.2 Test Procedures. These procedures shall ensure that:

a. all equipment supplied meets the performance specification;

b. each subsystem meets the applicable performance requirements; and

c. the overall system meets the performance requirements.

d. test procedure contains the step sequence for each test to be conducted, and the expected results.

7.2.3 **Contractor Testing.**

All tests are conducted by the contractor and may be witnessed by an appointed CSC representative. Tests are conducted as stipulated in the approved plan and procedures. The contractor shall inform CSC at least five (5) working days before the test start date.

7.2.4 **Test Reports.**

The contractor shall submit final copies of the test results for CSC review and approval within ten (10) working days of the completion of the testing. Two copies of the report shall be submitted and shall include:

a. a summary description of the tests;

b. test results consisting of completed test procedures verified by a CSC representative;

c. incident reports, including analysis and corrective action; and

d. results of any retest.

8.0 TRAINING

The contractor shall develop, document and conduct training for both the operational and the technical staff. The training shall be conducted on-site at the institution in the period designated by the schedule.

8.1 Classroom Training

Classroom lectures and demonstrations will be conducted on-site to train operations staff in the use and technical personnel in the maintenance of the systems.

8.2 Training Documentation

The contractor shall develop and deliver a complete training plan to the Design Authority for comments and approval. This plan must be submitted to CSC at least thirty (30) days in advance of the training date to allow for CSC review. As a minimum, the training material shall contain:

a. training plans for CSC operations trainers and technical personnel;

b. manuals for each student to add notes;

c. training aids; and

d. student materials.

Training material shall be provided in the language that is dominant at the site (French in Quebec). Sufficient copies of all student materials shall be provided by the contractor at the beginning of the training course to assure one copy for each student. CSC shall stipulate the number of staffs who are to be trained. Upon approval by the Design Authority, two (2) copies of all material shall be delivered to CSC.

9.0 MAINTENANCE and SPARES

The contractor shall provide maintenance and spares support plans according to the ES/SOW-0102, Statement of Work for the Design Authority approval. These plans shall be submitted according to the schedule.

9.1 Maintenance Plan

The maintenance plan shall describe the philosophy, the Preventive Maintenance (PM) procedures and schedules, the Corrective Maintenance (CM) methods and response times, Mean-Time-To-Repair (MTTR) for all systems. The plan shall recommend tools, jigs and test equipment, and detail the recommended manning method for the system. Issue of the final maintenance support plan will be contingent on Design Authority approval.

9.2 Spares Plan

The spares plan shall list the required spares and recommended quantities. The quantity recommendations shall be supported by system availability and reliability analysis and available experience data. The bidder shall identify spare parts and components by their original manufacturer's code, cross-referenced to the equipment vendor's part number.

9.3 Spares List

The spares list shall identify the following:

a. the spare parts and the subassemblies with the recommended quantities;

b. the cross-reference listings between the vendors and the original manufacturer's codes;

c. the unit and extended prices for stocking; and

d. the expected life or the annual consumption of each part.

The contractor shall maintain the spares plan through to the end of the warranty period, and shall ensure that any changes because of approved design changes are incorporated in the spares list.

9.4 Test Equipment

The contractor shall provide a list of test equipment required for the on-site maintenance of the system within thirty (30) days from Design Authority's acceptance of the final design.

10.0 DOCUMENTATION

All final documentation in hard-copy format shall be in a 3-ring binder with all foldout pages having reinforced ring holes.

10.1 Manuals and Drawings

The following items make up the final documentation requirements:

a. Operator Manual,

b. Maintenance Manual,

c. Installation As-built Drawings,

d. Equipment As-built Drawings, and

e. Equipment Operating Software.

The contractor shall prepare and submit all manuals and drawings to the Design Authority for review and approval. The manuals and drawings will be approved when all changes have been satisfactorily incorporated. All drawings must be produced with AUTOCAD (latest available version)

10.2 List of Equipment

The contractor shall provide a list of equipment itemizing the location, quantity, model number, serial number and revision level of all installed equipment.

10.3 Baseline Measurements

The contractor shall provide a copy of the final test results. These results will be used as a reference baseline measurement for monitoring system degradation over time.

10.4 Documentation Format

All manuals, documentation including as-built drawings, lists of equipment and baseline measurements shall be submitted as per the following schedule:

- One (1) hard-copy version of all documentation.

- One (1) electronic version of all documentation in a ‘read-only’ format on a 3½ inch diskette medium; suitable for duplication without any special requirements.

- One (1) electronic version of all documentation in a full 'read-write' format to serve as a master of the documents and drawings.

- all software requirements to access the electronic versions of the documentation.

- One (1) CD containing the equipment operating software.

10.5 **Operator Manuals**

The contractor shall provide CSC approved manuals to support the operation of the system in the format as outlined in section 10.4 of this specification. These manuals shall be prepared to the best commercial standards. Photo copies shall not be accepted. All hard-copy versions shall be on paper stock 8 ½" x 11" and shall be presented in a 3-ring binder. The manuals shall comply with the following format and content requirements:

a. title page;

b. revision notice page, lined, with columns for revision numbers, dates and initials;

c. table of contents;

d. warnings and cautions;

e. introduction - general information including a description of equipment or system and summary of capabilities;

f. theory of operation including an explanation of all major system components;

g. detailed description and use of all user accessible computer screens; and

h. block diagrams.

A hard copy draft version of the manual(s) shall be submitted for CSC approval on or before the date given in the schedule. Upon acceptance and approval by the Design Authority, a total of two copies shall be provided for use during the warranty period. The contractor shall update these manuals through the warranty period and provide revision bulletins to record manufacturers' recommended modifications, etc. during the life of the equipment.

Within thirty (30) days of the warranty expiry date the contractor shall submit one (1) set of final, updated manuals for CSC approval. Following the final CSC approval, the required number of sets of operator manuals shall be delivered to the Design Authority in the format as specified in section 10.4 of this Statement of Work.

10.6 **Maintenance Manuals**

The contractor shall provide CSC approved manuals to support the maintenance of the system in the format as outlined in section 10.4 of this specification. These manuals shall be prepared to the best commercial standards. Photo copies shall not be accepted. All hard-copy versions shall be on paper stock 8 ½" x 11" and shall be presented in a 3-ring binder. The manuals shall comply with the following format and content requirements:

a. title page;

b. warranty page - explaining the warranty period and expiry dates;

c. revision notice page, lined, with columns for revision numbers, dates and initials;

d. table of contents;

e. introduction - general information including a full description of equipment or system, technical summary, specifications and detailed block diagrams;

f. theory of operation including a detailed explanation of all circuits and parts;

g. alignment and test procedures;

h. repair procedures including step by step fault finding or fault localizing;

I. block diagrams;

j. circuit schematics (clear, easy to read, foldout type);

k. complete parts list;

l. mechanical drawings, chassis layout illustrations and wiring data lists; and

m. drawings including as-built and as-installed drawings.

A hard copy draft version of the manual(s) shall be submitted for CSC approval on or before the date given in the schedule. Upon acceptance and approval by the Design Authority, a total of two copies shall be provided for use during the warranty period. The contractor shall update these manuals through the warranty period and provide revision bulletins to record manufacturers' recommended modifications, etc. during the life of the equipment.

Within thirty (30) days of the warranty expiry date the contractor shall submit one (1) set of final, updated manuals for CSC approval. Following the final CSC approval, the required number of sets of maintenance manuals shall be delivered to the Design Authority in the format as specified in section 10.4 of this Statement of Work.

11.0 PROJECT PROVISIONS

11.1 Monthly Progress Reports

The contractor shall submit monthly progress reports. These reports shall report the activities for the previous period. One (1) copy shall be delivered to the Design Authority and one (1) copy to the Contract Authority by the fifth (5th) day of each month. A review meeting may be required.

Monthly reports shall contain the following:

a. summary of the month's activities;

b. scheduled shortfalls and rescheduled dates;

c. problem areas and proposed solutions;

d. review of next month's activities;

e. summary of meetings held during the month; and

f. cash flow forecast.

11.2 Monthly Review Meetings

Review meetings shall be held at the contractor's premises, Design Authority's office, Contract Authority's office, or the site depending on the need. The contractor shall make the design staff members available upon request by the Design Authority.

11.3 Maintenance Support

During the training period, the contractor shall provide maintenance support. This support is expected to be not less than on-site coverage during the normal working day.

11.4 **Shipment and Delivery**

Contractor shall be responsible for the shipment and delivery of equipment and materials to the site. Packing, crating, and shipment of equipment shall be to good commercial practice, and any damage to, or loss of equipment shall be repaired or replaced to the satisfaction of CSC. The contractor must properly label all shipments to assure correct identification and disposition on arrival at the site, as specified in ES/SOW-0102, Statement of Work.

12.0 SYSTEM AVAILABILITY

All elements of customed and off-the-shelf equipment shall be designed to operate in a highly reliable fashion, consistent with available technology, with a minimum of system downtime due to scheduled and unscheduled maintenance. System availability will be achieved when each of the included subsystems availabilities have been proved as required.

12.1 Common Facilities

Where units or subsystems are integrated into common facilities no single failure of a component, assembly subassembly, or subsystem shall result in the failure of any other subsystem; nor result in reduced capacity or quality of performance of other subsystems or parts of it.

12.2 Single Point of Failure

The system shall be designed such that no failure of a single component, unit, subassembly or subsystem will result in failure of the next higher hierarchical elements of that subsystem or the system.

12.3 Availability Model

The bidder's technical proposal shall include a complete model and analysis of the availability of each subsystem and of the complete system being offered. This analysis shall include both MTBF and MTTR calculations and shall treat the Mean-Response-Time (MRT) as zero. This availability analysis may be based on either:

a. summation of failure rates of the individual components; or

b. the bidder's documented experience with the same equipment operating in a similar physical environment.

In either case, the source of all failure-rate shall be clearly shown.

The contractor shall maintain the availability model and analysis up-to-date throughout the contract period. A statement of impact of the proposed change would have on the availability model and analysis shall be submitted with all Type I DCRs.

12.4 Availability

Availability is the probability that the system, or subsystem will meet operational performance requirements at all time. Time includes the operating time, the active repair time and the administrative and logistic time. To calculate this availability, the contractor must include all of the pertinent factors such as:

12.4.1 **Mean Time Between Failure (MTBF)**.

The total operating time of the equipment divided by the total number of failures of that equipment.

12.4.2 **Mean Time To Repair (MTTR).**

The repair time divided by the number of failures.

12.4.3 **Mean Response Time (MRT).**

The time to respond to a call for service divided by the number of calls.

12.5 **Expected Life Duration**

This is the time during which the equipment is expected to provide useful service, without an unusual amount of service and without becoming obsolete.

13.0 INTERFERENCE

13.1 Interference to the System

Performance of the system shall not be affected by the use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment are as follows:

13.1.1 CB transceivers at 1 metre or more;

13.1.2 VHF and UHF transceivers at 1 metre or more;

13.1.3 Other radio frequency transmitting, receiving and re-distribution equipment at 5 metres or more; and

13.1.4 Personal computer and/or computer work stations at 5 metres or more.

13.2 Interference by the System

The system shall not interfere with any standard electronic equipment used at the institution, any commercial TV or radio equipment at a minimum distance of 5 metres, or any other electronic security systems at a distance of 1 metre or more.

14.0 LIGHTNING PROTECTION

Surge suppression-type lightning arrestors shall be installed to protect all power, communications and antenna cables or wires entering or leaving a building.

These arrestors must be installed where the cable enters the building i.e. not in the CER or other equipment room.

Correctional Service Canada
Technical Services Branch
Electronics Systems

ES/SOW-0102
Revision 6
1 May, 2008

ELECTRONICS ENGINEERING STATEMENT OF WORK

QUALITY CONTROL FOR PROCUREMENT AND INSTALLATIONS OF ELECTRONIC SECURITY SYSTEMS

AUTHORITY

This Statement of Work is approved by Correctional Service Canada for the procurement and installation of all telecommunications and electronic security systems, subsystems, and equipment in Canadian penal institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Engineering Services, Correctional Service Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

Prepared by:

Manager,
Electronics Systems Research

Approved by:

Director,
Engineering Services
18 Aug 06

RECORD OF REVISIONS

Revision	Paragraph	Comment
3	5.1 - Design Considerations	Tabletop or wall mount power supplies/transformers
4	3.1.1 - Wiring/Cabling Methods	Wiring/cable access
	3.2.1 - AC Wiring	Power outlet strip
		Separate circuit breakers connected to opposite phases of the AC feed
	3.2.2 - AC Power Connections	Power connections via flexible armoured cable
5	Abbreviations	Additions
	1.4 – Manufactured Equipment	Approval of custom equipment
	1.5 – Commonality of Equipment	Add security screws
	3.1.1 – Wiring and cabling	Single conductor wire only on IDC connectors
		Identification of conductors
	3.1.2 – Cable/Wiring Labelling	Acceptable labelling
	3.2.1 – AC Wiring	Mounting of power strips
	3.3.4 - Labelling	Acceptable labelling of racks, boxes, etc.
	5.1 – Design Considerations	DIN rail power supplies preferred
6	2.1 – Environmental Conditions	Expand airborne containments
	2.6 – Finish Application	Change finish material definition
	2.2.2 - Plastic	Remove last sentence
	3.1.1 – Wiring/Cabling Methods	Change “Hydro Codes” to “Electrical Authority”
	3.3.2 - Enclosures	Add requirement to meet IP64

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ABBREVIATIONS

The following abbreviations are used in this specification:

AC	Alternating Current
ATP	Acceptance Test Procedure
BER	Beyond economical repair (repair cost in excess of 60% of replacement cost)
CER	Common Equipment Room
COTS	Commercial -of-the-Shelf
CSC	Correctional Service Canada
CSA	Canadian Standards Association
DC	Direct Current
DA	Design Authority
DES	Director, Engineering Services
EIA	Electronic Industries Association
EMT	Electrical Metallic Tubing
IDC	Insulation Displacement Connector
ISO	International Standards Organization
PCB	Printed Circuit Board
PVC	Polyvinyl Chloride
QA	Quality Assurance
RFP	Request For Proposal
STR	Statement of Technical Requirements

DEFINITIONS

The following definitions are used in this specification:

Design Authority	Director, Engineering Services (DES), Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Service Canada (PW&GSC) and/or the Materiel Management Division of CSC is responsible for all contractual matters associated with the system design and implementation.
Project Manager	A CSC employee and/or a contracted person designated by DES to be responsible for the implementation of the project.
Project Officer	A CSC employee and/or a contracted person designated by DES to provide technical and/or engineering services in support of the project.
Contractor	The company selected as the successful bidder.
Off-the-shelf	Equipment which is commercially, complete with field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

APPLICABLE DOCUMENTS

The following documents of the issue in effect on the date of the Request For Proposal (RFP) shall form a part of the specification to the extent specified herein.

CSA STANDARD C22.1-1986	Canadian Electrical Code - Part 1 Safety Standard for Electrical Installations
EIA STANDARD EIA-310-D	Racks, Panels and Associated Equipment
CSA STANDARD C22.2	Canadian Electrical Code - Part II
EIA RS-406/IPC-C--405A	Connectors, Electric, Printed Wiring Boards

Any other applicable industrial safety and control standards governing specific aspects for equipment and/or installations.

1.0 INTRODUCTION

1.1 General

This document defines the quality control requirements for the design, installation, testing and acceptance of telecommunications and electronic security systems in all Correctional Service Canada (CSC) facilities.

1.2 Scope

This specification has been developed to ensure high standards for the installation of electronic systems. It defines workmanship standards which may not be fully covered in subsidiary specifications. All contractor's documentation and installation procedures shall meet this specification for equipment reliability, maintainability, longevity, appearance and operational use.

1.3 Off-The-Shelf Equipment

The contractor shall provide commercial off-the-shelf (COTS) equipment wherever possible. COTS equipment shall meet or exceed the manufacturing standards as listed in this specification.

1.4 Manufactured Equipment

Where COTS equipment is unavailable or unsuitable for a specific application, the contractor may manufacture or arrange for the manufacturing of a particular item to suit the requirements. Manufactured equipment shall meet or exceed the best commercial equipment manufacturing standards. Approval of the final design, appearance and ergonomics of all custom manufactured equipment shall rest with the DES, Project Manager or CSC delegate.

1.5 Commonality of Equipment

The contractor shall provide commonality of hardware components within the design parameters ie. switch locks, racks, panels, security screws, etc. All equipment, if appropriate shall be interchangeable.

2.0 MATERIAL AND EQUIPMENT REQUIREMENTS

2.1 Environmental Conditions

All materials and equipment which is used in CSC installations shall be equal to, or better than the standards established in the original equipment and shall be chosen with due consideration being given to the intended use, safety, retention of appearance, maintainability and durability under rugged operating conditions. These materials shall be suitable to perform over the following environmental ranges:

a. **Indoor Equipment**

Temperature: 0° C to 40° C; and
Humidity: 20% to 95% non-condensing.

b. **Outdoor Equipment**

Temperature: -40° C to +50° C; and
Humidity: 0 to 100%, condensing.

Outdoor equipment shall operate reliably and not be damaged by combinations of direct exposure to the sun, wind, rain, lightning, hail, snow and ice as may be expected to occur at each institution location.

Complete assemblies of indoor equipment shall be resistant to liquid spills, airborne contaminants (dust, pollen and water droplets), shock and vibration.

2.2 Materials

2.2.1 Metals

Metals used shall be either corrosion resistant or be suitably treated to resist corrosion in all potential atmospheric conditions, including tear gas, to which the installation may be subjected.

For the connection of copper to a cadmium or galvanized surface, effective "wiping" of the copper surface shall be considered satisfactory protection.

No cut galvanized fitting shall be used without protection equal to or greater than the original galvanized surface. All parts shall be free from burrs and sharp edges.

Metal which has been cut, scraped, or drilled shall be properly treated (primed and painted) to retain a uniform appearance.

2.2.2 **Plastic**

Plastic materials must be stable and shall retain their original shape and finish over the range of operating environmental conditions specified in 2.1

No material shall be used that softens or hardens within the storage environment in a way which is detrimental to its suitability as replacement parts for existing equipment.

Metal screws shall not be threaded into plastic materials.

2.2.3 **Natural Rubber**

The use of natural rubber is prohibited.

2.2.4 **Wood**

The use of wood or wood products is not acceptable.

2.3 **Toxic Materials**

Materials capable of producing harmful toxic effects under any operating condition, equipment malfunction, or accidental cause shall not be used.

2.4 **Flammable Materials**

Materials, used either for electrical insulation or mechanical purposes which are combustible or capable of causing an explosion, shall not be used.

2.5 **Fungus and Insect Supporting Materials**

Materials capable of providing a nutrient medium for fungus or insects shall not be used.

2.6 **Finish Application**

Finish shall be applied to all surfaces where consideration of appearance and protection against corrosion, toxicity, and other deterioration exists.

Application of finish shall not impair equipment performance, and will maintain uniformity in outward appearance.

Finish materials must be scratch resistant, not react to normal cleaning products and applied so as to last at least ten years.

3.0 INSTALLATION REQUIREMENTS

3.1 Wiring and Cabling

Prior to the installation, all wires and cables shall be tested in accordance with the manufacturer's instructions and shall meet all performance parameters.

Wire and cable harnesses shall be neatly formed and clamped in position. If brackets, forms or clamps are required, these shall be the responsibility of the contractor.

All wires and cables shall be stranded. Single conductor type wires are not acceptable except when such cables are specified to terminate on an IDC type connector. This does not apply to coaxial cables with single centre conductors.

Electrical tape, masking tape, or its equivalent shall not be used on wires, cables or any installed equipment.

3.1.1 Wiring/Cabling Methods

Three (3) or more individual wires or cables which are located in one(1) cable run shall be formed into a cable harness, properly dressed, supported and securely tied with flat lacing twine or equivalent.

Wires and cables which are installed by the contractor external to consoles, equipment racks, pull boxes and junction boxes shall be contained in securely mounted conduit or cable tray systems.

Plastic PVC conduits may be used in underground installations unless otherwise specified at time of bidder's conference.

A rigid steel conduit shall be used in indoor, security sensitive areas and outdoor above-ground applications.

Signal and 120 VAC power wiring shall not be run in the same conduit, cable tray, or raceway; and shall be separated in accordance with the local Electrical Authority.

Wire splicing in cable runs shall not be permitted. All cable runs shall be continuous. If continuous cable runs are not possible, terminal block configurations are acceptable provided they are approved by the Design Authority.

Cross-connects installed on BIX. or similar blocks, must not pass across the face of the block, but must be carried around the block, so as not to impede access to the connections.

BIX, or similar, blocks are to be used for solid wire only. Stranded wires are not to be directly terminated on BIX, or other IDC terminations.

Wires in multi-conductor cables which terminate on connectors, and which are not being used, must be twisted around the cable in a neat fashion. They are not to be cut off.

Wires in multi-conductor cables which terminate on BIX or similar IDC connector blocks, and which are not being used, must be punched down on the block. They are not to be cut off.

All conductors on IDC and any other type of terminal block will be identified with a cable marker and cross referenced in the as-built drawings.

Rectangular slots shall be cut in the computer floor, underneath any cabinets, racks, and consoles, for the running of cables. These slots must constitute at least 1/2 of the available floor area. Sharp edges on the computer floor shall be supplied with suitable protection to eliminate possible nicks, tears or wear in cable insulation sheaths. Individually drilled holes for the purpose of carrying cables from the under floor to the inside of the cabinet, rack or enclosure are not permitted.

3.1.2 **Cable/Wiring Labelling**

The contractor shall label all cables and cable runs. The labelling method shall be logical and conform to industry standards.

All cables shall be identified with commercially produced or machine printed alpha numeric labels protected by clear heat shrink tubing. Hand printed labels are not acceptable.

All wiring shall be identified at both ends of the wire. The coding shall enable a technician to identify the wire or cable without referring to manual tracing methods, test equipment or as-built drawings.

Cable identification labels shall be attached as follows:

a. within 30 cm of the termination for both ends.

b. in the middle of any access point, i.e. pull box, wall shaft opening, cable tray, etc.

All individual wires shall be labelled according to a cable numbering system or wire function plan, which is acceptable to the Design Authority.

All terminal strips shall be identified with its own unique terminal number and function.

3.1.3 **Exterior Cabling**

Where a cable enters or exits an exterior box, chassis, or conduit, the cable entrance shall be completely sealed to prevent an influx of water. A drip loop shall be formed in the cable to assist in maintaining this weather tight seal.

Conduit bushings shall be used on all conduit entrances/exits.

Sharp edges on metal boxes or chassis enclosures shall be supplied with suitable protection to eliminate possible nicks, tears or wear in cable insulation sheaths.

3.1.4 **Slack**

Wires and cables shall be as short as practical, with sufficient slack to:

a. allow a minimum of three (3) reconnects due to wire breakage;

b. prevent undue stress on cable forms, wires, terminals and connections;

c. enable parts to be removed and replaced during servicing without disconnecting adjoining wires or circuits;

d. facilitate movement of equipment for maintenance purposes; and

e. provide drip loops in exterior cabling.

Slack shall be provided in junction boxes where space permits. Slack shall not exceed one single loop of cable forming the circumference of the junction box.

Slack shall be provided below equipment racks and shall be neatly coiled below the access flooring. The length of slack shall be equal to the height of the associated equipment rack. Units in drawers and slide out racks shall be provided with sufficient slack to permit removing the units without severing connections.

All cross connection wiring shall be neat and tidy, properly bundled, and tied. This procedure shall allow sufficient slack for tracing of individual wires via manual methods.

Parts mounted on a hinged door shall be wired by means of a single cable, and arranged to flex without being damaged by the opening and closing of a door. If physical separation between wires is essential so as to make a single cable impractical, more than one flexible cable may be utilized.

3.1.5 **Terminations**

All terminations relying on friction for electrical and mechanical connection shall be tested in accordance with the manufacturer's instructions and shall meet the performance requirements detailed therein.

Terminal fanning strips shall be used where a number of wires are contained in a harness, shall be used unless a multi-pin connector is provided.

Spade terminal lugs shall be used on all wiring, connections to screw-thread terminals, except where solder or other type of terminal is specified.

Where wires are connected to lugs, which are clamped under screw terminals in the form of a terminal connection strip, no more than one wire shall be attached to each lug, in order that each wire may be removed individually. This requirement will not apply in the case of common connections, daisy chain distribution circuits, or similar terminations where wires will not need to be disconnected for servicing.

No more than two (2) lugs shall be attached to each terminal.

Wire and cable insulation shall be stripped back to allow for proper connection to the lug. No bare wire shall be visible between the terminal lug and the insulator.

Terminal strips must be fastened to a hard surface using a screw, or nut and bolt. Adhesive supports to secure the terminal strip, or floating terminal strips are not acceptable.

3.1.6 **Splicing and Joining**

Splicing of wires on new installations is not permitted.

Where connectors are used on cable assemblies, they shall be a locking type which will not disengage under tension.

All joints or splices in underground cable runs shall be located inside accessible, secure, waterproof, and lockable steel enclosures. The enclosures shall be located at least one (1) metre above grade and be firmly secured to existing structures or to stub pole supports.

Splices in underground cable runs, if required to repair Crown caused damage, shall be subject to approval from the Design Authority.

Stranded conductor splices shall be held by wire binding terminals in order to prevent stray strands from causing either short circuits or grounds.

Joints and splices shall be soldered and encased in waterproof shrink tubing for protection against leaching, oxidization, moisture damage, etc.

Joints and splices shall be clearly and accurately identified on applicable as-built drawings.

3.1.7 **Shielding**

Shielding shall be secured on wires and cables to prevent accidental contacting or shorting exposed current-carrying parts, grounded metal objects, or structures.

Shielding shall terminate at sufficient distance from the exposed conductors of the cable to prevent shorting or arcing between the cable conductor and the shielding.

Ends of the shielding material shall be secured against fraying.

3.1.8 **Protection**

Wires and cables shall be strategically located and protected to avoid contact with rough, irregular surfaces or sharp edges.

Wires and cables shall be protected by suitable grommets or bushings when passing through openings in metal.

Guards or other suitable protection shall be provided on insulated high voltage cables.

3.1.9 **Support**

Wires and cables shall be properly supported with adequate strain relief to prevent excessive strain on the connections, devices, or joints of any electrical apparatus connected therein.

Adhesive supports with ty-wrap products shall not be used unless they are secured by a nut and bolt device.

3.1.10 **Clearance**

Physical clearance between wires/cables and associated heat emitting parts, i.e. amplifiers, shall be sufficient to prevent deterioration of the wires or cables. Refer to Table 19 of CSA Standard C22.1 Part 1.

3.1.11 **Inductive and Capacitive Effects**

Wires and cables, including harness wire and cables, shall be located such that inductive and capacitive effects do not adversely affect system operation. The amount of twists in paired wires shall be increased over the length of wire not covered by the cable sheath.

3.2 **Power Wiring**

The contractor shall not employ "Marette" (TM) type connectors regardless of CSA Standard C22.1 regulations. All wiring shall terminate on an insulated or protected barrier strip or terminal board, and be provided with spade terminal lugs where required.

Where control and signal wires which are run in conduit, cable-harness, or cable-trough systems, shall be run in separate wire ways. The separation shall be a physical barrier of suitable material and shall conform to applicable building codes and wiring methods.

All high voltage and/or high current terminations shall be provided with protective guard devices by the contractor. The device shall be mounted to allow for maintenance access to the terminals.

Terminal lugs shall be used on all power wiring, both VAC and VDC.

Warning labels must be installed in accordance with the CSA guidelines to warn maintenance personnel of any hazardous voltages and currents.

3.2.1 AC Wiring

AC wiring methods shall conform to all local and national wiring regulations.

Outlet boxes shall be installed such that all outlets are clear of any obstructions including wiring and cabling, and shall be easily accessible.

Power distribution within a cabinet or rack shall be via a power outlet strip, as provided by the original cabinet or rack manufacturer. A third party outlet strip is not acceptable. All power strips must be mounted into the equipment cabinet with rack mounting hardware.

All power cable installations shall be completed in a neat and sturdy fashion and shall meet all requirements of the specifications detailed herein.

Power cords within equipment cabinets and racks shall be maintained as short as practicable with due consideration for maintenance needs.

Systems which use redundant equipment, such as dual microprocessors, shall power each unit from two separate breakers connected to opposite phases of the AC feed.

3.2.2 AC Power Connections

All AC power connections from the cabinet or rack power outlet strip to the AC junction box shall be via flexible armoured cable. AC power connectors are not permitted.

3.3 Conduits, Enclosures, Cable Troughs and Raceways

3.3.1 Conduits

Conduits installed above ground, and accessible to the inmate population, shall be rigid steel.

Metal conduits installed in secure and inmate accessible areas shall be fitted with double the normal quantity of support hangars.

In locations subject to extreme temperature changes, and/or where conduit lengths are of non-standard size, the contractor shall make provisions for the inclusion of conduit expansion joints.

Rigid PVC conduits shall be used only in buried applications.

Rigid PVC conduits shall not be threaded, but may be used with approved adapters and couplings applied in a manner consistent with industry standards.

EMT conduit may be used in administrative areas, and locations which are not normally assessable to the inmate population.

Liquid-tight flexible metal conduits may be used where a flexible connection is required, i.e. cameras, microwave dishes, etc. In such applications, the length of "flex" conduit shall not exceed one (1) metre.

PVC conduits which cross roadways shall be encased in poured concrete.

The contractor shall provide a suitable means of protecting the buried conduit against damage caused by digging or excavating. The preferred method is installing a tape marker directly above the conduit path.

In addition to these requirements, the applicable industrial standards apply, including:

a. CSA Standard C22.2 No. 45-M1981 - Rigid Metal Conduit

b. CSA Standard C22.2 No. 56-1977 - Flexible Metal Conduit

3.3.2 **Enclosures**

All electrical connections, terminations, and cross connections shall be made within lockable, covered steel enclosures, using good quality locks. At least two keys must be supplied to CSC.

Outdoor enclosures shall be environmentally sealed and gasketed to provide a moisture/dust free and secure environment.

Enclosures which contain electrical equipment such as circuit breakers, relays, switches, and transformers, or cable networks, connections and terminations, shall be weatherproof and dust-tight and meet the provisions of IP64.

All enclosures such as junction boxes, racks and consoles shall be positioned for ease of maintenance, service, and connection/disconnection of cables and cable harnesses.

The contractor shall provide a proper drain hole in all enclosures which are grouted in concrete.

All floor mounted cabinets, racks, and consoles shall be secured to prevent overturning when associated drawers, shelves and movable parts are extended, or when heavy objects are placed on pull out shelves or writing tables.

In addition to the provisions stated herein, the applicable industrial standards shall apply, including:

a. CSA Standard C22.2 No. 29-M1983 for Industrial Products.

b. CSA Standard C22.2 No. 94-1976 for Special Purpose Enclosures.

3.3.3 Cable Troughs and Raceways

Cable troughs and raceways shall be continuous and shall be constructed of metal.

The contractor shall provide adequate mounting devices which will permit the use of fastening devices that will not damage conductor insulation.

Cable troughs, raceways, and fittings shall be free from burrs or other sharp edges which may cause damage to the cable or insulated conductors.

Cable troughs and raceways shall be installed as a complete system before the conductors or cables are installed.

Cable troughs may be either ventilated or solid and unless otherwise specified, shall be equipped with covers and steel guards to protect against damage.

In addition to these provisions, the appropriate standards shall apply, including:

a. CSA Standard C22.2 No. 126-M1980 - Cable Troughs and Fittings.

b. CSA Standard C22.2 No. 79-1978 - Raceways and Fittings.

c. CSA Standard C22.2 No. 62-1972 - Surface Raceways and Fittings.

3.3.4 Labelling

The contractor shall label equipment racks, junction boxes etc. The labelling method shall be logical and conform to industry standards. All equipment racks and junction boxes shall be identified with commercially produced or machine printed alpha numeric labels. Hand printed labels are not acceptable.

Identification of chassis equipment shall be located in a suitable location within the rack and affixed to the rack, not the chassis.

Approved materials used for labels include lamicoyd strip, etched metal, stamped labels, or indelible ink.

3.4 **Soldering**

On solder connections, the insulation on individual wires shall not be stripped back more than 1.5 mm from the solder area.

Soldering shall be executed so that positive electrical and strong mechanical connections are assured.

Leads shall not be wrapped more than once around the terminal.

Soldered connections on the back of connector plugs, i.e. cannon plugs, switches, relay sockets or any other device employing solder lugs, shall be insulated by means of a short length of insulating tubing placed over each wire in the connector.

"Cold" solder joints, and excessive solder on connections shall not be acceptable.

Each soldered connection shall be tested for mechanical and electrical strength to ensure that a strong connection is achieved.

Use of acid based solder flux is not permitted.

Where insulation material is subject to heating during soldering, the material shall be undamaged and the fastened parts shall not be loosened.

3.5 **Welding**

All welds shall be free of harmful defects such as cracks, porosity, undercuts, voids and gaps.

There shall be no burn through.

Weld fillets shall be uniform, smooth, and shall cover a sufficient area of the welded surface to ensure that a solid bond is achieved.

Surfaces to be welded shall be free of extraneous particles which may affect the mechanical elements of the welded area.

3.6 Crimping

Crimp connections shall be made in accordance with the manufacturer's instructions. Industry standards shall be observed at all times.

Solid conductors may be used with crimp connections where the use of solid conductor wiring cannot be avoided. In all other cases only stranded wiring shall be used on crimp connections.

Solid conductors which are connected to terminals by crimping shall be soldered as well. This provision only applies to terminal lugs. It does not apply where wires may be spliced by crimping except in the case of some LED's and indicator lights which employ pigtail leads which should be soldered or connected by screw terminals.

3.7 Cleaning

Upon completion of the installation, the equipment shall be cleaned of smudges, loose or excess solder, weld beads, metal chips, burrs, mold release agents, or any other foreign material which might detract from the intended operation, function, or appearance of the equipment.

All corrosive materials shall be removed.

The cleaning processes employed shall leave no harmful residues and shall not have a negative effect on the equipment or its parts.

4.0 GROUNDING REQUIREMENTS

4.1 General

Grounding source and distribution points shall be provided by the Crown unless otherwise specified at the bidder's conference, in the Statement of Technical Requirement (STR), or any applicable documents.

The grounding shall be such that the signal ground, equipment ground, and electrical power ground shall be connected at one point and shall follow the shortest possible path. Where necessary, ground isolation techniques shall be employed.

The path from the tie point to any ground shall be permanent, continuous, have sufficiently low impedance to limit the potential above ground, and facilitate the operation of the 'over current' devices in the circuits.

Ground conductors shall be made of copper, sized for a minimum of 200 circular mils for each 300 mm length of conductor.

Inactive wires installed in long cable or conduit runs shall be grounded to prevent stray or static electrical discharges, with proper consideration given to prevent ground loops or other grounding problems.

Installation must be such that ground loops are prevented.

4.2 Signal Ground

Signal grounds shall be used to provide a ground potential reference which is independent of the frame ground and the power equipment ground.

An insulated grounding conductor shall be connected from the equipment signal ground terminal to the main ground connection point for single units such as equipment racks.
An insulated ground plate shall be used with insulated grounding conductors for multiple units, such as common equipment room (CER) equipment, from each equipment signal ground terminal connected to the plate. The plate shall be connected to the main ground connection point by means of a single insulated grounding conductor.

4.3 **Frame Ground**

The ground connection of the receptacle may be used for the frame ground as long as that ground connection is isolated and insulated from the power equipment ground system. Such receptacles shall be clearly identified so that they will not be used to supply equipment that does not require frame grounds.

The receptacle ground connection conductor shall be insulated and isolated from the power equipment grounding system, and shall be connected from the receptacle ground connection to an isolated ground plate.

The isolated ground plate may be an insulated buss bar for low power applications,.

Size of grounding conductors shall be in accordance with the requirements of CSA Standard C22.1 Section 10 and Table 17.

4.4 **Combined Signal and Frame Ground**

Connection between the signal ground terminal and the frame ground terminal shall be part of the equipment wiring. The connection to the main ground connection point shall be similar to that for a frame ground.

4.5 **Main Ground Connection Point**

Main ground connection point shall be installed in accordance with CSA Standard C22.1 Section 10, and C22.2 No. 41.

4.6 **Ground to Chassis**

Ground connections to an electrically conductive chassis or frame shall be made by:

a. soldering to a spot-welded terminal lug.

b. soldering to a portion of the chassis or frame that has been formed into a soldering lug.

c. using a terminal on the ground wire and securing the terminal by a screw, nut and lockwasher.

When using a terminal on a ground wire which is secured by a screw, nut and lockwasher, the screw shall fit in a tapped hole in the chassis or frame, or it shall be held in a through hole by a nut.

When the chassis or frame is painted, the metal around the screw hole shall be scraped clean and plated (or tinned) to provide a corrosion resistant connection.

4.7 **Shielding**

Shielding on wire and cable shall be grounded to the chassis or frame, in the manner specified in Section 2.5.5

4.8 **Lightning Protection**

All equipment with external cabling including radiating cables or other forms of antennas which may be susceptible during lightning strikes or other static discharges shall be protected fully in accordance with the relevant safety rules and regulations.

The ground rod used for lightning protection shall be copper or copper-plated steel, and shall be a minimum of 2.5 metres in length. Where the ground conditions preclude installation of a single ground rod, multiple rods of a shorter length may be used in parallel to provide the lightning protection.

The copper ground conductor shall be fastened to the ground rod using a thermic welding technique. Clamps are not acceptable.

5.0 ELECTRICAL/MECHANICAL DESIGN REQUIREMENTS

5.1 Design Considerations

All equipment shall be manufactured and finished with a degree of uniformity and grade of workmanship which shall comply with applicable industry standards, and the generally accepted principles of safe practice.

Exposed and moving parts that might constitute a safety hazard shall be provided with protective guards and warning labels.

All elements of the equipment shall be designed to operate in a highly reliable fashion, consistent with available technology, with a minimum of system downtime due to scheduled and unscheduled maintenance.

Where units or subsystems are integrated into common facilities, no single failure of a component, sub- assembly, assembly, or sub-system shall result in the failure of any other sub-system or reduced capacity or performance of other sub-systems or parts thereof.

The system shall be designed such that no failure of a single component, unit, subassembly, or subsystem will result in failure of the system or the next higher hierarchical elements.

All equipment shall be designed and installed to provide useful service, with minimal maintenance for a period of no less than 10 years, unless otherwise specified.

Tabletop or wall-mount power supplies or transformers shall not be used to power equipment installed within equipment racks and cabinets. Power supplies or transformers used within racks and cabinets shall be securely fastened to the rack equipment rails or side of the cabinet. DIN rail mounted power supplies are preferred.

5.2 Assemblies

The contractor (or manufacturing agent) shall apply special considerations in the execution of assembling system component parts.

Rack mounted equipment chassis; whose depth from the front face panel to the rear of the chassis exceeds 25 cm shall be equipped with rack slides.

Each assembly shall have a permanently fixed label showing the model number, serial number, and power requirements.

Materials used in assemblies shall be chosen with due consideration being given to the intended use, safety, durability, retention of appearance, and ability to resist corrosion from a variety of causes including tear gas.

In addition to applicable CSC/DES specifications, the appropriate industrial standards shall apply, including:

a. EIA-310-D Racks, Panels, and Associated Equipment.

b. CSA C22.2 No. 94-1976 Special Purpose Enclosures.

c. CSA C22.2 No. 29-M1983 Panel boards and Enclosures.

5.3 **Printed Circuit Board (PCB)**

PCBs shall be constructed of non-flammable material, preferably a glass epoxy base.

The contractor shall provide extractor devices at the front of each card assembly.
All cards shall have keyed edges to prevent accidental replacement by another type of card.

Each device shall be identified and properly labelled, showing card type, and revision number.

All PCBs shall be etched. Wire wrap connections are not acceptable.

In addition to the requirements set forth herein the appropriate industrial standards shall apply, including:

a. CSA C22.2 No.154-M1983 Data Processing Equipment.

b. CSA C22.2 No.0.7-M1985 Equipment Electrically Connected to a Telecommunications Network.

c. EIA RS-406/IPC-C-405A General Document for Connectors, Electric, Printed Wiring Boards.

5.4 **Components**

All electrical equipment, i.e. power supplies, amplifiers, etc. attached to the equipment structure shall be fastened securely and rigidly not using nuts and lockwashers.

Electrical components used in manufacturing in-house products shall be of commercial quality and shall comply with the standards of the Canadian Electrical Code, Part II.

Electronic circuit components, such as resistors, capacitors, inductors, or semiconductor devices which have no applicable standards in the Canadian Electrical Code, Part II shall comply with the test parameters as set forth in CSA C22.2 No. 154-M1983 Part 6.

6.0 QUALITY ASSURANCE REQUIREMENTS

The contractor shall provide objective evidence that the system and any major component therein have been designed, manufactured, inspected and tested under the umbrella of a quality assurance program capable of meeting the requirements of the applicable ISO Standard 9002 Series. More stringent requirements will be identified on a case by case basis, as needed.

In addition, the contractor shall develop a site-acceptance test/inspection procedure to demonstrate that all parameters of the system are fully operational and conform to the Statement of Technical Requirements.

6.1 In-plant Inspection

The equipment shall meet all functional, electrical, and visual/mechanical test parameters and shall have been fully tested and inspected by the contractor. Results shall be documented and reported to the Design Authority. Periodic inspections may be done by the Design Authority or his designated representative to verify that the equipment meets all requirements.

Particular attention shall be given to the following:

a. Inventory of received equipment.

b. Physical condition of equipment i.e.: scratches, dents, paint chips, etc . . .

c. Construction techniques, board and components accessibility.

d. Neatness, clamping and tying of wiring, cabling and harnesses.

e. Strain relief of cables and wire connections.

f. Legibility of nameplates, identification plates, and markings.

g. Safety and protective covers, warning labels and grounding.

h. Tightness of connectors, screw type fasteners, etc.

i. Soldered and weld joints.

j. Completeness.

k. Operation of drawers, adjustable and sliding parts, controls etc.

l. Shielding.

m. Cable and wire connections, ground clamps and terminal strips.

n. Type and quality of paint finish.

o. Quality of printed circuitry, etching, the electronic components and other associated parts.

p. Quality of locks, cabinets and other materials.

It must be noted that the in-plant tests are performed as a requirement of the financial arrangements and serve to guarantee that the design parameters of the FDR are followed and will meet the requirements of the applicable system specification. Sign-off of in-plant tests will not denote any form of final acceptance of the equipment and design.

6.2 Test Equipment

All test equipment shall be supplied by the contractor.
All instruments and test equipment shall be checked periodically by the QA Inspector in order to ensure accuracy of measurement. Records showing when the test equipment was last calibrated are to be provided as proof of accuracy.

6.3 Calibration

All test equipment used by the contractor shall bear a calibration seal showing the date calibrated and the due date for the next calibration.

The contractor shall ensure that the test equipment's calibration due date does not occur during the test period.

All equipment performance measurements shall be made with instruments whose accuracy and calibration guarantee that the results comply with the terms of the contract.

CSC reserves the right to furnish and/or require the use of any applicable instruments and standards in order to ascertain the accuracy of any measurements.

Test equipment suspected of being damaged or out of calibration shall be rejected by the Design Authority.

6.4 Safety Design Aspects

Particular attention is to be given to the safety design aspects of CSC installations, so as to minimize any hazards while in gaining access to, operating and servicing equipment. Such design aspects shall include the proper grounding of equipment, the installation of protective covers and warning labels over high voltage areas, the installation of warning labels on x-ray equipment, etc.

Radio and TV camera towers must receive careful attention in regards to make them accessible for servicing, especially during inclement weather.

7.0 ON-SITE INSTALLATION

7.1 Inspections

Inspections will be performed by the Design Authority or their designated representative. A thorough visual and mechanical inspection of the installation shall be performed to ensure that all applicable requirements and safety precautions have been met.

7.2 Damage to Government Property

Damage to Government property, including buildings, equipment, etc. during the course of the installation shall be made good by the contractor.

The contractor shall replace all equipment which has suffered major damage, i.e. damage which renders the equipment BER, unserviceable, or subject to deterioration.

If stocks of the applicable equipment are at such a level that replacement of the damaged items cannot be made, and the contractor cannot readily obtain new equipment in order to allow the installation to proceed without delay, the contractor shall:

a. repair the damage immediately with available materials.

b. return to the site and replace the equipment as soon as new equipment is procured.

Minor damage shall be repaired in a manner which leaves the government property in a condition equivalent to its original state and performing the original function, with no deterioration in appearance, performance, and/or reliability.

Any equipment where the paint finish becomes scratched or marred during the installation shall be completely refinished and repainted consistent with the appearance of new equipment.

Equipment shall neither be exposed to rain, nor be left out-of-doors during inclement weather. This stipulation does not apply to construction materials.

7.3 Protection of Surfaces

The contractor shall obtain approval from the appropriate Institution authority before moving heavy loads or equipment on floors, roofs and other surfaces.

The contractor shall adequately protect floors, finished surfaces and roofs from damage during the installation and shall implement special measures when moving heavy loads or equipment on them.

The contractor shall keep the floors free of oils, grease, or other materials likely to damage or discolour them.

The contractor shall provide dust protection for the equipment during the installation period, as related construction activities may occur simultaneously.

7.4 Cutting, Patching and Digging

The contractor shall perform all cutting, patching or digging necessary for the installation of the system.

The contractor shall be responsible for changes or damage to any existing work, cables or equipment by cutting, welding, drilling, or digging without prior consent from the Design Authority.

The contractor shall promptly repair any damage for which he is responsible in order to restore the facilities to their original condition.

7.5 Visual-Mechanical Inspection

Inspection shall be performed by the Design Authority or his designated representative.

Prior to the commencement of performance and operational testing, the installation shall be inspected to ensure that all applicable requirements and standards have been met.

Particular attention shall be given to the following:

a. Physical condition and positioning of equipment.

b. Neatness, clamping and tying of wire and cable harnesses.

c. Cable and wire connections, ground clamps, and terminal strips.

d. Soldered and welded joints.

e. Strain relief of cables, wire connections, and cable harnesses.

f. Cleanliness of equipment boxes under computer flooring.

g. Nameplates, identification methodology and markings.

h. Operation of drawers, adjustable and sliding parts and controls.

i. Equipment fit, fastening devices and accessibility of parts.

j. Construction and finishes.

k. Legibility of labels and tags.

l. Safety aspects, including secure provisions for climbing and working on towers.

m. Shielding.

n. Grounding.

o. Equipment Cooling Provisions.

p. Washers and lock-washers.

q. Tightness of screw type fasteners & connectors.

r. Screws, nuts and bolts shall show no evidence of cross-threading or mutilation.

s. Bottom of equipment racks etc. shall be free of debris and loose parts.

7.6 **Final System Acceptance**

The system shall be accepted when all of the following items have been completed to the satisfaction of the Design Authority and with the written certification of the project manager:

a. performance and operational tests.

b. all documentation.

c. all training.

d. all other terms and conditions.

The system warranty shall be deemed to begin at the completion of the Final System Acceptance or when the system is taken into service with accepted deficiencies, whichever comes first.

7.7 On-Site Maintenance

Building and site maintenance shall be interpreted to include all the areas in which the contractor is carrying out installation activities.

All sites and buildings shall be maintained by the contractor in a clean and tidy condition.

Upon completion of each day's work, all areas such as hallways, stairways, elevators and storage rooms used by the contractor in delivering or storing equipment shall be left in a clean and tidy condition.

The contractor shall store all electronic components not yet installed in a lockable storage room/trailer at the end of each workday. This procedure will reduce the probability of damaged and/or stolen equipment prior to system acceptance. Prior to the commencement of performance and operational testing, the installation shall be inspected to ensure that all applicable requirements and standards have been met.

8.0 DELIVERY

8.1 Packaging

All equipment shall be packaged to ensure that the equipment will not be damaged during shipment and/or delivery to the institution, as well as any associated handling on site.

Fragile components must be clearly identified and labelled.

All circuit cards, equipment modules, etc. shall be protected by the original packaging material until the equipment is placed into service.

8.2 Addressing

Address labelling shall be clearly marked in a minimum of two (2) locations on each package. The following format shall be observed:

a. Complete name of the institutional site.

b. Complete shipping address.

c. Clear description of contents.

d. Complete name of the Institutional representative.

All of the above addressing items will be provided at the Bidder's Conference.

- END OF TEXT -

CORRECTIONAL SERVICES CANADA
TECHNICAL SERVICES BRANCH
ELECTRONIC SECURITY SYSTEMS

ES/STD-xxxx
Revision 0
2013 October 07

ELECTRONICS ENGINEERING STATEMENT OF WORK

STRUCTURED CABLE SYSTEMS FOR ELECTRONIC SECURITY INSTALLATIONS

AUTHORITY

This Specification is approved by the Correctional Service Canada for the procurement and installation of a Security Patrol System in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

Director, Electronic Security Systems
Correctional Service of Canada
340 Laurier Avenue West,
Ottawa, Ontario
K1A 0P9

Prepared by:	Approved by:
Manager Electronics Security Systems	Director, Engineering Services

TABLE OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original
1	Cable	Cable upgraded to meet OM3 standards
2	Multiple	Copper cable upgraded to CAT 6

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TABLE OF ABBREVIATIONS

Abbreviation	Expansion
CSC	Correctional Service Canada
ATP	Acceptance Test Plan
CM	Corrective maintenance
COTS	Commercial-off-the-shelf
CSC	Correctional Service Canada
DA	Design Authority
DCR	Design Change Request
DES	Director Engineering Services
DL	Deficiency List
FDR	Final Design Report
MRT	Mean Response Time
MTBF	Mean Time Between Failures
MTTR	Mean Time To Repair
PDR	Preliminary Design
PM	Preventative Maintenance
PW&GSC	Public Works & Government Service Canada
QA	Quality Assurance
RFP	Request for Proposal
SOW	Statement of Work
STR	Statement of Technical Requirement

TABLE OF DEFINITIONS

Abbreviation	Expansion
CSC	Correctional Service Canada
Design Authority	Director, Engineering Services (DES) - Correctional Service Canada (CSC) is responsible for all technical aspects of the system design and implementation.
Contract Authority	Public Works and Government Services Canada (PW&GSC) is responsible for all contractual matters associated with the system design and implementation.
Contractor	The company selected as the successful bidder.
Project Manager	A CSC employee or a contracted person designated by DES to be responsible for the test and evaluation or feasibility study project.
Project Officer	A CSC employee or a contracted person designated by DES to be responsible for the implementation of the project.
Off-the-shelf	Equipment currently on the market with available field reliability data, manuals, engineering drawings and parts price list.
Custom Equipment	Equipment designed and/or manufactured specifically for a specific contract.

APPLICABLE DOCUMENTS REFERENCES

.1 The following documents of the issue in effect on the date of the Request For Proposal (RFP) shall form a part of the specification to the extent specified herein.

- .1 EIA/TIA Standard EIA/TIA-568 Commercial Building Telecommunications Wiring Standard
- .2 EIA/TIA Technical Systems Bulletin TSB-36 Additional Cable Specifications for Unshielded Twisted Pair Cables
- .3 EIA/TIA Technical Systems Bulletin TSB-40 Additional Transmission Specifications for Unshielded Twisted Pair Connecting Hardware.
- .4 International standard ISO/IEC 11801-2nd Edition: Information technology — Generic cabling for customer premises.

.2 Any other applicable industrial safety and control standards governing specific aspects for equipment and/or installations.

1 INTRODUCTION

1.1 General

.1 This document defines the quality control requirements for the design, installation, testing and acceptance of structured cable systems for use in security systems installed in all Correctional Service Canada (CSC) facilities.

1.2 Scope

.1 This specification has been developed to ensure high standards for the installation of electronic systems. It defines workmanship standards which may not be fully covered in subsidiary specifications. All contractor's documentation and installation procedures shall meet this specification for equipment reliability, maintainability, longevity, appearance and operational use.

1.3 Off-the-Shelf Equipment

.1 The contractor shall provide commercial off-the-shelf (COTS) equipment wherever possible. COTS equipment shall meet or exceed the manufacturing standards as listed in this specification.

1.4 Manufactured Equipment

.1 Where COTS equipment is unavailable or unsuitable for a specific application, the contractor may manufacture or arrange for the manufacturing of a particular item to suit the requirements. Manufactured equipment shall meet or exceed the best commercial equipment manufacturing standards.

1.5 Commonality of Equipment

.1 The contractor shall provide commonality of hardware components within the design parameters ie. switch locks, racks, panels etc. All equipment, if appropriate shall be interchangeable.

2 MATERIAL AND EQUIPMENT REQUIREMENTS

2.1 Environmental conditions

.1 All materials and equipment which is used in CSC installations shall be equal to, or better than the standards established in the original equipment and shall be chosen with due consideration being given to the intended use, safety, retention of appearance, maintainability and durability under rugged operating conditions. These materials shall be suitable to perform over the following environmental ranges:

.1 Indoor Equipment

Temperature: 0° C to 40° C; and
Humidity: 20% to 95% non-condensing.

.2 Outdoor Equipment

Temperature: -40° C to +50° C; and
Humidity: 0 to 100%, condensing.

.2 Outdoor equipment shall operate reliably and not be damaged by combinations of direct exposure to the sun, wind, rain, lightning, hail, snow and ice as may be expected to occur at each institution location.

.3 Complete assemblies of indoor equipment shall be resistant to liquid spills, airborne contaminants, shock and vibration.

3 TELECOMMUNICATIONS OVERVIEW

3.1 Structured Cabling System

.1 The design objective is a flexible network that is easy to re-configure, easy to manage and capable of incremental growth. The network is based on a structured cabling system conforming to Electric Industry Association/Telecommunications Industry Association Specification 568 (EIA/TIA-568) and Canadian Standards Association 529 (CSA 529) and using a star wired topology for the horizontal distribution with Category 6 Unshielded Twisted Pair (UTP) and 50/125 Micron Laser Optimized Fibre. The design will support Ethernet, Fast Ethernet, and network management.

4 DESCRIPTION OF WORK

4.1 General System Requirements

.1 Outline

.1 This section defines the minimum requirements for a structured cabling system to be provided on an engineered, furnished, installed, tested, and commissioned basis. Products and installation practices shall conform with the EIA/TIA documents identified in the **APPLICABLE DOCUMENTS** section of this Statement of Work.

.2 The structured cabling system includes the following basic elements arranged into backbone feeders and horizontal distribution subsystems that are cross connected or patched together in Telecom Closets or Common Equipment Rooms on Intermediate Distribution Frames (IDFs).

.1 Unshielded Twisted Pair (Horizontal)
.2 8-pin modular Telecom outlets
.3 Insulation displacement connector type terminal blocks
.4 LOF optic cable (Backbone)
.5 Fibre optic (duplex) Interconnect patch panels
.6 Patch cords for patch panels
.7 Line cords for workstation data equipment (Office Cables)

.3 Notes:

.1 3 metre leghth in standard for Office Cables
.2 All cables provided for a project shall have a GREEN jacket

4.2 Horizontal Data Cable

.1 Cable

.1 Each cable shall consist of 8 each of 24 AWG thermoplastic insulated solid copper conductors formed into four individually twisted pairs and enclosed by a jacket with the appropriate protection rating determined by Provincial codes.
.2 The cable shall fully conform with EIA/TIA-568 design requirements for 100 ohm UTP cable and fully conform with EIA/TIA-568 TSB-36 transmission requirements for Category 6 cable.
.3 Cables shall bear evidence of verified Level 6 or Category 6 and also bear evidence of certification by a recognized standard or testing body. (eg: Bearing NORDX Brand name and have length clearly marked on cable sheath)
.4 The cable bundles will be fed to locations in either a supplied cable tray or conduit system. Outlet cables will then be fed to the user locations via either pac poles or fished down hard wall offices. A pull string will remain in the conduit/cable tray for future installations.
.5 The cable run length from the IDC to the workstation location shall NOT exceed 90 metres. The combined length for patch cords for data network horizontal distribution connections shall not exceed 10 metres for an overall length from data network hub equipment to workstation equipment not exceeding 100 metres

.2 User Termination

.1 Termination at the user end will be made onto a certified Category 6 RJ45 module for data. These modules will then be housed in a certified faceplate. The faceplate to house the modules will have the capability to equip up to six each 8 pin modular jacks. Other configurations to be used will vary with locations: A duplex flush mount

faceplate for drywall applications, a duplex surface mount kit for PAC pole applications and duplex single gang outlets mounted into custom furniture with adapter plates. Surface mount kits will not exceed a 6.5 cm. protrusion from the wall. For custom furniture it is assumed that the cable runs will be fed to the outlet via raceways in the legs of furniture. For security reasons, jacks are NOT be installed in exterior walls or walls not totally part of CSC space. All cables must either terminate on a patch panel or on a faceplate, loose or unterminated cables are not acceptable.

.2 The 8 pin modular jack connectors shall comply for termination of 4 wire pairs with 24 AAWG solid copper conductors: minimum contact force of 100g and conductors separated by jack comb.

.3 Each modular outlet will be wired per EIA/TIA-568 polarization sequence, designation T568A (reference CAN/CSA T529 Clause 11.2 Figure 11-1 and Table 10-1).

.4 This illustration is a front view of the connector

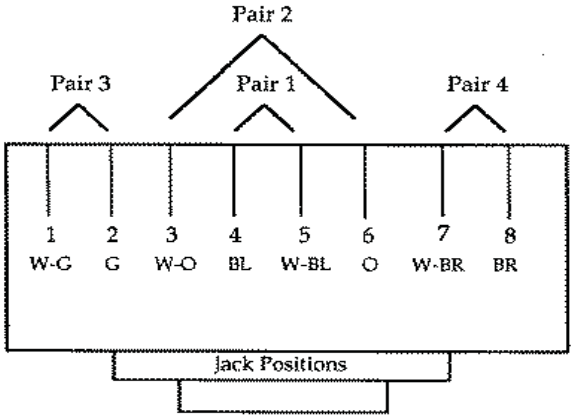

Figure 11-1
Eight-Postion Jack Pin/Pair Assignments
(T568A Type)

.1 Figure 11-1 and Table 10-1 outlines the sequencing required to construct line, office, and patch cables.

.2

.3 Each modular outlet will conform with EIA/TIA TSB 40 transmission requirements for Category 6 and will also be compatible with existing standard electrical outlet boxes.

.4 Table 10-2 outlines the correct punch down positioning when using Northern Telecom T568A BIX DVOs' , T568A ISDN QCBIX36DI and T568A ISDN QCBIX46DI Modular Jack Connectors, and T568A QPBIX Modular Patch Panels.

.5 Table 10-1

.1 Colour Codes for patch, line, and office cables

Colour Identification	Colour Code	Abbreviation
Pair 1	White-Blue	(W-BL)
	Blue	(BL)
Pair 2	White-Orange	(W-O)
	Orange	(O)
Pair 3	White-Green	(W-G)
	Green	(G)
Pair 4	White-Brown	(W-BR)
	Brown	(BR)

.6 Table 10-2

.1 Colour Codes for punch down and modular outlets

Position	Colour Code	Abbreviation
1	White-Blue	(W-BL)
2	Blue	(BL)
3	White-Orange	(W-O)
4	Orange	(O)
5	White-Green	(W-G)
6	Green	(G)
7	White-Brown	(W-BR)
8	Brown	(BR)

.7 Closet Termination

.1 Supply and installation of RJ45 Category 6 hardware for system connection in communications closet using 24 NT certified patch panels rack mounted with cable organizer panels installed for each patch panel.

.2 Active components will be connected to equipment by 8 conductor patch cords manufactured to CAT 6 compliance. Patch cords shall be stranded conductor and have a “no-snag” boot over the RJ45 connector.

.3 Multi-Level building installations will require individual patch panels be installed for each level of the building. Patch panel(s) for each level of a multi-level building must have at least 15% unused ports. The same holds true for single story, multi ICC buildings.

.8 Cable Protection

.1 All ceiling distribution cabling shall be enclosed and protected by 3/4” and 1” rigid conduit from communications closet(s) room(s) and cabinets to all user outlets located in inmate accessible areas. In areas that CSC designated as non inmate accessible, EMT zone conduit will be allowed. Conduits must have end bushings installed to protect the cable from sharp edges.

.2 Conduit containing Copper backbone cable must be designated “CAUTION SECURITY SYSTEM CABLE”

.3 Conduit containing Fibre Optic backbone cable must be designated “CAUTION FIBRE OPTIC SECURITY SYSTEM CABLE”

.9 Line cord

.1 The cabling company will supply RJ45, 8 pin modular line cords to connect owner provided data equipment to the horizontal distribution outlets at the workstation. They must be consistent with CAT 6 specification and provide end-to-end CAT 6 connectivity. Line cords shall be stranded conductor and have a “no-snag” boot over the RJ45 connector.

.10 Testing

.1 All cables/pairs will be scanned with a MicroTest Penta cable scanner or equivalent at 100 Mbs to determine DC loop resistance, near end cross talk and attenuation to meet or exceed the performance stated in EIA/TIA TSB-36 and TSB-40, noise, pair mapping and ranking. These tests must be conducted as originating from both the punch down location and modular outlet location of each cable segment.

.11 Labeling

.1 All jacks must be identified by means of labels with unique numbers These markings will be made with printed labels. The Correctional Service of Canada expects that all drops at the user end will be sequential and not out of order.

.2 The closet terminations must be identified with these same numbers marked on BIX labels adhered to BIX 20A designation strips and patch panels. The CAN/CSA 568 colour code will apply.

.3 Labels will also be placed on the horizontal wire, 6-9” from termination points. This would include closets, main cabinet, and jacks.

.12 Documentation

.1 Customer to supply CAD or Visio Version 5 floor plans when available. If CAD documents are not available, contractor will be responsible to scan hard copy of plans.

.2 Contractor to supply site plans, individual runs, risers, wire #’s, jack #’s, patch panel #’s in both hard and soft copy.

.3 All test results shall be machine printed, hand written test result sheets are NOT acceptable.

4.3 Fibre Optic Backbone Cable

.1 Cable

.1 The cable to be supplied and installed for backbone purposes shall consist of 12 strands (6 pairs) of Laser Optimized Fibre with nominal 50/125 um core/cladding diameter formed into a single cable.

.2 Optical cable shall physically conform with ANSI/ICEA S-83-596 mechanical and environmental specifications for outdoor fibre optic cable.

.3 Fibre optic cable shall conform with the requirements of OM3 as per the ISO 11801-2nd Edition standards

.2 Terminations

.1 Fibre optic cables shall be terminated to SC Physical contact Connectors shall be able to sustain a minimum of 200 mating cycles per EIA/TIA-455-21 without violating specifications. These connectors will terminate within interconnect sleeves to facilitate patching in patch panels. The maximum optical attenuation per pair of mated connectors shall not exceed 0.75 db.

.2 All fibre strands, whether used in the project or not, shall be terminated with SC type connectors and installed into a fibre patch panel: generally one duplex patch per cable (i.e. 12 connectors per panel for 12 strand fibre cable). Please note that these cables shall be SC to ST unless otherwise noted.

.3 The patch panel proposed shall provide strain relief for each fibre as an integral part of the panel design. This standard type and size of panel should be uniformly used throughout the project.

.4 Installed fibre panels shall be completed with all guides, brackets and other accessories to facilitate cable cross connect to active components for administration and management, including provisions for labeling that are consistent with EIA/TIA-568.

.3 Testing

.1 All terminated fibre media and related connecting hardware shall be tested with a power meter and certified at the conclusion of the initial installation with an OTDR, in both directions. Testing will include end-to-end attenuation testing that shall measure each fibre in one direction and compare with the calculated loss based on the manufacturers specifications and known length of cable using 850 nanometres and 1300 nanometres wavelengths. The difference in value between any two mated fibre shall not exceed 0.5 db.

.2 The power levels of the terminated fibres shall be documented to allow the equipment vendor to select the correct strapping options for their equipment. This will prevent the receivers from being overloaded.

.3 If the attenuation measurements are not within the required specifications, an Optical Time Domain Reflectometer shall be used to find the cause and location of the power loss. Any failure will be rectified.

.4 All test results to be machine printed, and documented in duplicate and delivered complete with As-Built drawings to Corrections Canada Regional Office.

.5 The fibre optic cable testing will also include a basic light test:

.6 - on each of the fibres before installation to ensure that no damage had occurred during shipping;

.7 - on each of the fibres before termination to ensure that no damage had occurred during installation.

.4 Labeling

.1 All fibre optic cables will be identified by means of Warning Labels located on all related conduit, pullboxes and backboards.

.2 Both ends of all fibre cables will be labeled indicating destination and number of strands.

.3 All ports on each Fibre optic patch panel will be labeled to identify the backbone destinations. Both ends will be labeled with this same numbering scheme.

4.4 Cross Connect

.1 Data Cross-Connect

.1 Cross connection of the UTP horizontal cables to the tie field will be completed after testing of installed cables has taken place.

.2 Jumper wire shall be provided, if requested, and will conform with EIA/TIA TSB-40 transmission requirements for Category 6.

SASKATCHEWAN PENITENTIARY

RANGE CCTV SYSTEM

SITE ACCEPTANCE TEST PROCEDURES

REVISED ~~2013/08/28~~ 2014/01/21

Correctional Service Canada

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1.0 SCOPE

The Site Acceptance Test Procedures are conducted to demonstrate that the installed system for the expansion of the CCTV system project meets all the necessary CSC requirements and specifications.

The Site Acceptance Testing will be performed on-site to demonstrate that the installed system for the expansion of the internal CCTV conforms to its operational and functional requirements. The system tests will be performed on the installed system.

The Site Acceptance Test Procedures will be completed in the presence of at least one individual representing each of CSC and Marcomm Systems Group Inc.

2.0 QUALITY ASSURANCE

The test procedures to be followed will ensure that all equipment as well as the overall systems functionality of the installed system for the expansion of the internal CCTV meets the requirements of the applicable sections of the Quality Control Specification for the Installation of Telecommunications and Electronic Security Systems in Federal Correctional Institutions.

In the event of deficiencies, the description of the deficiency shall be recorded and addressed.

3.0 VISUAL INSPECTION

A visual inspection will be conducted of the overall installed system for the expansion of the internal CCTV. The visual inspection will ensure that all the necessary equipment is installed in a proper manner and that the complete system as outlined in the Statement of Technical Requirements of the contract has been deployed and configured correctly.

In the event of deficiencies, the description of the deficiency shall be recorded and addressed.

4.0 SYSTEM TESTS

4.1 DEPLOYED SYSTEM

The complete expansion of the internal CCTV system as described in the Statement of Technical Requirements and Amendments has been deployed on-site and is in a state ready to be fully tested and accepted.

4.2 TEST EQUIPMENT

- Site acceptance test procedures and result tables
- Installed system

5.0 TEST PROCEDURES

The following system tests shall be conducted and recorded to ensure all system components are deployed and configured in a manner consistent with the requirements detailed in the Final Design Report.

5.1 CAMERA TEST

The Camera Test is conducted to ensure that the proposed camera configuration, for all the deployed cameras, is operational and configured in a matter consistent with the requirements as outlined in the Final Design Report.

PASS Criteria:

- Camera feeds from all V&C and PIDS cameras can be viewed at 15 fps MJPEG.
- Camera feeds from all other cameras can be viewed at 30fps H.264
- Wiper controls are operational. (Where applicable)
- Camera field of view and focus are acceptable
- Visual Inspection

Procedures (For each camera)

1. Using the Genetec Config Tool, Select a camera, the selected camera feed should be viewed at 15/30 fps / Review FOV.
2. Using the Genetec Archive Player, Select a camera and review the recorded video, the video should be recorded 24/7 @ 15fps
3. Visually inspect the camera installation, at the camera location and cabinet.
4. Record Test Results.

5.2 NETWORK VIDEO USER STATION (NVUS) TEST

The Network Video User Station Test is conducted to ensure that each NVUS are operational and configured in a matter consistent with the requirements as outlined in the Statement of Technical Requirements.

PASS Criteria:

1. All NVUS are configured as per Specifications.
2. Camera views / Camera layouts are configured as per Specifications.
3. PTZ Controls are operational (Where applicable)
4. Videos can be retrieved and exported (Where applicable)
5. Visual Inspection

Procedures (For each NVUS)

1. At each NVUS location, ensure the NVUS is configured as per specifications.
2. Enable/disable Viewing of a camera.
3. Retrieve and export a short piece of video.
4. Visually inspect the NVUS installation.
5. Record Test Results.

5.3 CAMERA RECORDING

The Camera recording test is conducted to ensure that each Network Video Recorder (NVR) is recording each camera for a minimum of seven (7) days.

PASS Criteria:

1. Cameras are recording with the following settings
- Resolution – 640x480
- Frame Rate – 15fps
- Codec – MJPEG/H.264

Procedures (For video review)

1. Open Archive Player
2. Select a camera
3. Verify that at least seven (7) days of recording is present
4. Review the video of each camera and verify that each camera is recording as per the "Pass Criteria" requirements.
5. Repeat test for each camera

5.4 PIVOT 3 HARD DISK RE-BUILD

The Pivot 3 has been configured using the Pivot 3 RAID6x storage configuration. This test is to ensure that the RAID6x is properly configured.

PASS Criteria:

1. System shall remain fully operational when a Hard Disk is removed from a Pivot 3 appliance.

NOTE: It will take a couple of hours for the removed Hard Drive to rebuild.

Procedures (HDD Removal)

1. Remove a HDD from vSTAC #1 Pivot 3 Appliance #1
2. Remove a HDD from vSTAC #1 Pivot 3 Appliance #2
3. Verify that the system remain fully operational
4. Re-Install the HDD from Pivot 3 Appliance #1 into Pivot 3 Appliance #2
5. Re-Install the HDD from Pivot 3 Appliance #2 into Pivot 3 Appliance #1
6. The two HDD will now rebuild and will take a few hours
7. Repeat this test on the remaining vSTACs

5.5 PIVOT 3/GENETEC FAILOVER & SAN REDUNDANCY

Each Pivot 3 Appliance has been installed with Windows Server 2008 R2, Genetec Omnicast is the recording platform. The Genetec Omnicast is equipped with a Failover license that in the event an Appliance fails, all cameras associated are sent to the Failover Appliance (Typically vSTAC #2 – Appliance #4, vSTAC #4 – Appliance #4, vSTAC #6 – Appliance #4 and vSTAC #8 – Appliance #4).

The Pivot 3 network is equipped with a redundant Storage Array Network (SAN) switch. In the event that a switch fails, the Pivot 3 SAN shall remain fully operational.

PASS Criteria:

1. When a Pivot 3 appliance is shutdown, all cameras associated to the failed appliance will transfer to the Failover Appliance.
2. The Storage Array Network (SAN) is redundant, verify that in the event that a SAN switch fails, the system is fully operational.

NOTE: It will take a couple of minutes for the cameras to display on the NVUS units and a couple of minutes for the video to start recording on the Failover Appliance.

Procedures (Pivot 3 shutdown)

1. Shutdown Windows on vSTAC #1 – Appliance #1
2. Verify that the failed/turned off appliance shows that it is offline in Genetec Config Tools
3. Verify that a Virtual Matrix alarm appears on the PIDS and FAAS computers
4. Restart the failed/turned off appliance using the VM software
5. Verify that the failed/turned off appliance comes back online
6. Verify that the Virtual Matrix alarm clears on the PIDS and FAAS computers
7. Disconnect the power cord for SAN01 switch and verify the recording is still fully functional.
8. Restore the power to SAN01 switch
9. Disconnect the power cord for SAN02 switch and verify the recording is still fully functional.
10. Restore the power to SAN02 switch

NOTE: Depending on the state of the HDD's within the appliance, the Appliance may re-build itself if the Appliance thinks there is an error. This will take ~24hrs for the entire unit to rebuild.

NOTE: It is NOT recommended to pull the power cord, the units are to be shutdown properly. A UPS has been installed to ensure that power is always provided to the Appliances.

5.6 CAMERA VIDEO LOSS ALARMS

Each camera has been configured with a Video loss alarm when a camera fails or loses a connection to Genetec – Omnicast. The Video Loss alarm reports to the PIDS and FAAS to notify the operator of the alarm.

PASS Criteria:

1. When a camera goes offline, an alarm is presented on the PIDS and FAAS computers. The camera alarms are presented to the operator on a camera by camera basis.

Procedures (Video Loss)

1. Disconnect a camera cable from a network switch, make note of the camera ID on the CAT6 cable, make note of what network port the camera was disconnected from. Each cable is labeled.
2. Verify after 60 seconds that an alarm is presented to the operator that indicates the camera disconnected from the switch is in alarm on the PIDS and FAAS computers.
3. Reconnect the CAT6 cable in the same port from which the cable was removed from.
4. Verify that the alarm is cleared on the PIDS and FAAS once the camera returns online in Genetec – Omnicast (~2 minutes)
5. Repeat for each camera

5.7 UPS RUNTIME AND FAULTS

Each UPS is equipped with four (4) alarms that are presented on the PIDS and FAAS computers, these alarms are:

- AC Fault – AC Disconnected, running on battery
- Battery Low – The UPS battery is running low (~10 minutes of runtime remaining)
- Communication Fault – Network Cable is not connected to the network
- General Fault – Internal Fault within the UPS

For each new UPS installed, a runtime of 30 minutes is achieved.

PASS Criteria:

1. UPS provides alarms back to the PIDS and FAAS
2. Runtime of at least 30 minutes is achieved when AC not connected

Procedures (UPS)

1. Disconnect the AC at the UPS
2. Verify that an alarm is reported to the PIDS and FAAS computers within 60 seconds indicating that the AC has been lost.
3. Verify that a runtime of at least 30 minutes is achieved (this can be done by looking at the LCD display on the UPS)
4. Disconnect the network cable from the rear of the UPS
5. Verify that an alarm is reported to the PIDs and FAAS computers within 60 seconds indicating a Communication failure.

6. Reconnect the network cable to the UPS
7. Clear the Communication failure on the PIDS and FAAS
8. Let the battery on the UPS drain until a Low Battery is presented to the PIDS and FAAS computers (will occur at around 8 minutes remaining)
9. Reconnect the AC to the UPS unit and clear the AC fault alarm on the PIDS and FAAS computers.
10. Clear the Low Battery alarm on the PIDS and FAAS computers

NOTE: It may take an hour or so for the battery to recharge past the Low Battery threshold

11. Repeat the test for each new UPS installed.

5.8 VISUAL INSPECTION

For each Monitor, Switch and NVUS location a visual inspection is required to ensure the quality of the installation. The visual inspection also includes:

- Monitors Display quality
- Switch functionality
- Minimum of four (4) spare copper ports at each rack location for future
- Cable labeling
- Cable dressing

PASS Criteria:

1. Verify that the installation quality adheres to CSC Specification outlined in the Tender Process.

NOTE: Specifications released post contract award are not applicable to the installation, only the specification released with the Statement of Technical Requirements and Amendments throughout the tender process shall be used.

NOTE: Existing cabling shall not be part of this Visual Inspection test.

Procedures (Visual Inspection)

1. Perform walk through of entire site and provide comments of the installation.

6.0 SITE EQUIPMENT

6.1 DELIVERED EQUIPMENT

The following has been delivered in conjunction with the Prairies Range CCTV Upgrade Project – Saskatchewan Penitentiary.

COMPUTERS / COMPUTER COMPONENTS					
QTY	UNIT	MANUFACTURER	MODEL#	DESCRIPTION	SERIAL NUMBER
	EA	Supermicro	SYS-5015A-PHF	LANSER	
29	EA	Marcomm	RM22300	Network Video User Station	NVUS-AD-0099 NVUS-AD-0096 NVUS-AD-0100 NVUS-AD-0120 NVUS-AD-0119 NVUS-AD-0110 NVUS-AD-0122 NVUS-AD-0112 NVUS-AD-0107 NVUS-AD-0109 NVUS-AD-0104 NVUS-AD-0111 NVUS-AD-0106 NVUS-AD-0108 NVUS-AD-0091 NVUS-AD-0104 NVUS-AD-0093 NVUS-AD-0101 NVUS-AD-0097 NVUS-AD-0121 NVUS-AD-0094 NVUS-AD-0092 NVUS-AD-0105 NVUS-AD-0089 NVUS-AD-0102 NVUS-AD-0136 NVUS-AD-0095 061655P1310M00168 060912P1251M00064
1	EA	Startech	RACKONS1708	17" LCD Rack Mount With 8 Port KVM Switch	U171X1A20227
3	EA	Startech	SVECONUS10	KMV Cable	N/A
22	EA	Pivot3	vStac	VStac Server	CS1BHS1, CS19HS1, CF28HS1, CRS6HS1, CF29HS1, CF78HS1, CFB8HS1, BM29HS1, C297HS1, BM17HS1, FLBNGS1, C15CHS1, BLY8HS1, CRYCHS1, CRZCHS1, CFF9HS1, 2GPRGS1, BLTBHS1, CIFBHS1, CRW8HS1,

2	EA	Dell	R5500	Base Precision Server	74ZMKS1, 74YNKS1
CAMERAS & CAMERA COMPONENTS / ENCODERS					
QTY	**UNIT**	**MANUFACTURER**	**MODEL#**	**DESCRIPTION**	**SERIAL NUMBER**
2	EA	Bosch	NEI-368F02-21W	Corner Mount Camera	044569320319101005 044569320322101003
12	EA	Panasonic	WVSP306P	Network Camera	KLV04061, KLV04062, KLV04296, KLV04189, LKV19474, KLV04287 LKV19500, LKV19475 LKV19504, KLV04261 KLV04048, LKV19497
31	EA	Panasonic	WVSW352P	Network Camera	KLV-15096, KLV-09223 KLV-09308, KLV-09210 KLV-09213, KLV-09250 KLV-15100, KLV-15118 KLV-09198, KLV-15001 KLV-09103, KLV-09249 KLV-09039, KLV-14984 KLV-09208, KLV-09335 KLV-15110, KLV-09293 KLV-14966, KLV-09242 KLV-15012, KLV-15102 KLV-09064, MGV33087 MGV33084,MGV33069 MGV33068,MGV33077 MGV33081,MGV33079 MGV33089
4	EA	Panasonic	WVSW396P	Network Camera	LFV01256, LFV01355, LFV01255, LFV01364
45	EA	Panasonic	3DA003745AZA	Clear Domes	CUSTOM
8	EA	Panasonic	WV-Q118A	Wall-Mount Bracket	
1	EA	Panasonic	WV-NW502S	360 Degree Network Camera	LFV 09583
1	EA	Panamorph	IMV1 1-1/3	1/3" 360 Camera Lens	01031201
	EA	Axis	P8221	I/O Module	
MONITORS AND ACCESSORIES					
QTY	**UNIT**	**MANUFACTURER**	**MODEL#**	**DESCRIPTION**	**SERIAL NUMBER**
28	EA	SIIG	JU-EX0011-S1	USB Extender	ASB1210X0-060 ASB1210X0-058 ASB1210X0-053 ASB1210X0-048 ASB1210X0-045 ASB1210X0-262 ASB1210X0-251 ASB1210X0-049 ASB1210X0-143 ASB1210X0-052 ASB1210X0-059 ASB1210X0-041 ASB1210X0-035 ASB1210X0-253 ASB1210X0-038 ASB1210X0-057 ASB1210X0-037 ASB1210X0-247

					ASB1210X0-044 ASB1210X0-042 ASB1210X0-056 ASB1210X0051 ASB1210X0256 ASB1210X0249 ASB1210X0031 ASB1210X0033 ASB1210X0034 ASB1210X0055
40	EA	IOGEAR	GVE130	VGA Extender	A1A91212ABK0059 A9BA1029ABX0031 A9BA1029ABX0032 A9BA1029ABX0033 A9BA1029ABX0034 A9BA1029ABX0035 A9BAP029AB00036 A9BAN029ABR0055 A9BAN029ABR0056 A9BAN029ABR0057 A9BAN029ABR0058 A9BAN029ABR0059 A9BAU029AB00060 A1B3M313ABE0037 A1B3M313ABE0038 A1B3M313ABE0039 A1B3M313ABE0040 A1B3M313ABE0041 A1B3D313ABW0042 A1A8X222ABH0001 A1A8X222ABH0002 A1A8X222ABH0003 A1A8X222ABH0004 A1A8X222ABH0005 A1A8X222ABH0006 A1C15125AB00049 A1C1Q125ABT0050 A1C1Q125ABT0051 A1C1Q125ABT0052 A1C1Q125ABT0053 A1C1Q125ABT0054 A9B6M00TABU0036 A9B9B005ABD001 A9B9B005ABD002 A9B9B005ABD003 A9B9B005ABD004 A9B9B005ABD005 A9B9E005ABG006 A9BA7029AB40117 A1C1B125ABG0035
26	EA	Dell	P2212H	22" Monitor	ONDMRP-74261-22D-2V6U ONDMRP-74261-22D-28CU, ONDMRP-74261-22D-27VU,

					ONDMRP-74261-22D-27JU, ONDMRP-74261-22D-28AU, ONDMRP-74261-22D-287U, ONDMRP-74261-22D-28NU, ONDMRP-74261-22D-2U8U, ONDMRP-74261-22D-2VCU, ONDMRP-74261-22D-2RJU, ONDMRP-74261-22D-28EU, ONDMRP-74261-22D-28OU, ONDMRP-74261-22D-26WU, ONDMRP-74261-22D-2V7U, ONDMRP-74261-22D-2UYU, ONDMRP-74261-22D-28LU, ONDMRP-74261-22D-2VOU, ONDMRP-74261-22D-2RNU, ONDMRP-74261-22D-28JU, ONDMRP-74261-22D-2U9U, ONDMRP-74261-22D-2RLU, ONDMRP-74261-22D-2VGU, ONDMRP-74261-22D-281U, ONDMRP-74261-22D-28MU, ONDMRP-74261-22D-28FU, ONDMRP-74261-22D-2PWU,
3	EA	Panasonic	TH50PH30U	50" HD Plasma Display	MH13140156 MH13140175 MH13140154
NETWORK COMPONENTS					
QTY	UNIT	MANUFACTURER	MODEL#	DESCRIPTION	SERIAL NUMBER
10	EA	Netgear	GSM7228-100NAS	24-Port Network Switch	2BW4225700068, 2BV4225V00044, 2BV4225300075, 2BV4225200074, 2BV4225Y0000F, 2BV4225R00024, 2BV4225L00004 2BV41C5U00076 2BV2114J00072 2B4195M00003
8	EA	Netgear	GSM7352SNA	48-Port Layer 3 Network Switch	2BW4225600075, 2BW4225700076, 2BW422580004D, 2BW4225300080, 2BW4225400073, 2BW4225H0009C, 2BW4225E000B5 2BW4225500058
12	EA	Netgear	AGM731F	1000 BASE-SX SFP	1C921C5G00195, 1C921C5200206, 1C921C5400208, 1C921C5B00190, 1C921C5M0018C, 1C921C5D00192, 1C921C5500209, 1C921C5J00197, 1C921C5E00193, 1C921C5F00194

					1C92225X00A16 1C921A5B000E7
1	EA	Netgear	AXC761-10000A	10-Gig Direct Line	2LF11554000DE 2LF11556000EE 2LF1155W000E5
2	EA	Trendnet	TFC-1600	16 BAY Chassis Fiber Converter	C21152R600056 C21152R600053
14	EA	Trendnet	TFC-1000MSC	Fiber Converter	C211510C00-422 C211510C00-430 C211510C00-429 C211510C00-431 C211510C00-437 C211510C00-433 C211510C00734 C211510C00739 C211510C00732 C211510C00740 C21041OC00264 C21041OC00270 C21041OC00350 C211161C00340
UPS AND MISC. POWER SUPPLIES					
QTY	UNIT	MANUFACTURER	MODEL#	DESCRIPTION	SERIAL NUMBER
2	EA	LifeSafety Power	RD75-8	12VDC Power Supply	
1	EA	Eaton-Powerware	Connect-X	SNMP Card for UPS	111500112350381
EQUIPMENT CABINETS AND ENCLOSURES					
QTY	UNIT	MANUFACTURER	MODEL#	DESCRIPTION	SERIAL NUMBER
4	EA	Middle Atlantic	PHBL-3	3U Rack Shelf	

Notes for Delivered Items:

6.2 DELIVERED SPARE EQUIPMENT

No Spares have been purchased.

7.0 Acceptance

Notes/Deficiencies:

Maintenance Manual – Rcvd. JM.

Maintenance Training – Genetec Omnicast – Complete JM

Remove old Coax Cable – Complete – JSK

NC-141 PTZ to be raised higher to see over the fence – complete – JSK

CAT6 Patch Panel labeling to be confirmed – Worked out. JM

– All software on site – JSK

UPS Alarms will be integrated on TCCS ATP.

Upon completion of the Acceptance Test Procedure (ATP), the items noted above must be completed and verified by CSC or a CSC Representative before Final Acceptance.

By signing below, CSC Formally Accepts the Prairies Range CCTV Upgrade – Saskatchewan Penitentiary; pending of the completion of the items noted in Section 7.0.

CSC Representative - Contingently Accepted — 2014/01/21 Date (yyyy/mm/dd)

CSC Representative - Final Acceptance — 2014/06/17 Date (yyyy/mm/dd)

MSGI Representative - Contingently Accepted — Date (yyyy/mm/dd)

MSGI Representative - Final Acceptance — 2014/06/17 Date (yyyy/mm/dd)

APPENDIX A

Camera Testing

Notes for Cameras:

- NC 140 off 11N2

APPENDIX B

Network Video User Station Testing

User Station		NVUS is configured as per Specification		Camera views and layouts are configured as per specifications		Visual Inspection	
		PASS	FAIL	PASS	FAIL	PASS	FAIL
NVUS-1	CER	✓		✓		✓	
NVUS-2	SIO	✓		✓		✓	
NVUS-3	MCCP	✓		✓		✓	
NVUS-4	U6 Crisis	✓		✓		✓	
NVUS-6	MCCP	✓		✓		✓	
NVUS-5	CRISIS	✓		✓		✓	
NVUS-7	V&C 1	✓		✓		✓	
NVUS-8	V&C 2	✓		✓		✓	
NVUS-9	U6 V&C	✓		✓		✓	
NVUS-10	U6 PE E	✓		✓		✓	
NVUS-11	UNIT 6 PE W	✓		✓		✓	
NVUS-12	PIDS 1	✓		✓		✓	
NVUS-13	PIDS 2	✓		✓		✓	
NVUS-14	SIDS	✓		✓		✓	
NVUS-15	Tower D4	✓		✓		✓	
NVUS-16	MCCP	✓		✓		✓	
NVUS-17	Health Care	✓		✓		✓	
NVUS-18	E/F	✓		✓		✓	
NVUS-19	A/B	✓		✓		✓	
NVUS-20	Below MCCP (MCK)	✓		✓		✓	
NVUS-21	Rm 388 (3rd Floor)	✓		✓		✓	
NVUS-22	C5 Rm 898 DoRM	✓		✓		✓	
NVUS-23	CATWALK Yard #1	✓		✓		✓	
NVUS-24	" Yard #2	✓		✓		✓	
NVUS-25	" Yard #3	✓		✓		✓	
NVUS-26	" Yard #4	✓		✓		✓	
NVUS-27	" Yard #5	✓		✓		✓	
NVUS-28	" Observation-1	✓		✓		✓	
NVUS-29	" Observation-2	✓		✓		✓	
NVUS-30	" Observation-3	✓		✓		✓	
NVUS-31	" Observation-4	✓		✓		✓	
NVUS-32	" Observation-5	✓		✓		✓	
NVUS-33	" Observation-6	✓		✓		✓	
NVUS-34	B7 Rm469	✓		✓		✓	
NVUS-35	Seg Rm 300	✓		✓		✓	
NVUS-36	U6 CM Office	✓		✓		✓	
NVUS-37	U6 Observation Desk	✓		✓		✓	
NVUS-38	U6 - Bubble	✓		✓		✓	

→ B 3 reploom desk ?

Notes for NVUS:

- NVUS #10 - Video card U/S - Adga issue
- NVUS 21 - site moved control post cameras OK.

APPENDIX C

Pivot 3 and Genetec Omnicast Testing

VSTAC	Pivot 3 Appliance	NVR Computer Name	Pivot 3/ Genetec Failover		Pivot 3 RAID6x HDD Faults		SAN Redundancy		Visual Inspection	
			PASS	FAIL	PASS	FAIL	PASS	FAIL	PASS	FAIL
	Main Directory Dome	R3 - Electrical Rm	✓		✓		✓		✓	
	Failover Directory	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary (Failover NVR1 to NVR4 & NVR 9 to 12)	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary (Failover NVR18 to NVR22)	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary	R3 - Electrical Rm	✓		✓		✓		✓	
	Secondary (Failover NVR5 to NVR8 & NVR13 to NVR17)	R3 - Electrical Rm	✓		✓		✓		✓	

Note - Dome Electrical

Notes for Pivot 3 and Genetec Omnicast:

APPENDIX D

UPS Alarms and UPS Runtime Verification

UPS Location	UPS Size	AC Fault Reporting to PIDS and FAAS		Battery Low Reporting to the PIDS and FAAS		Communication Fault Reporting to the PIDS and FAAS		UPS Runtime (Min. 30 Minutes)
		PASS	FAIL	PASS	FAIL	PASS	FAIL	Time (minutes)
B8 Equipment Rack								
Unit #6 - New CER								
C6 Equipment Room								
B7 Equipment Rack								
Attic Dome								
Kitchen Equipment Rack								

* UPS Alarms to be integrated in ICCS/GTS system.

Notes for UPS Alarms and UPS Runtime Verification:

- All UPS alarms to PAAS to be integrated thru cell call system.

APPENDIX E

Verification Notes

Notes for Visual Verification - Major:

Notes for Visual Verification - Minor:

- First camera 11m passage to 6Vm showing opposite direction on drawing to actual orientation.
Review updated drawings