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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 CCTV EQUIPMENT AT MILLHAVEN	
Solicitation No. - N° de l'invitation 21120-147892/A	**Amendment No. - N° modif.** 003
Client Reference No. - N° de référence du client 21120-14-2007892	**Date** 2015-03-04
GETS Reference No. - N° de référence de SEAG PW-$$HN-461-66520	
File No. - N° de dossier hn461.21120-147892	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2015-03-13**	**Time Zone** **Fuseau horaire** Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☐ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Hallman, Patti	**Buyer Id - Id de l'acheteur** hn461
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Canada

Amendment 003 is issued to address the time zone change and to answer additional questions received.

1) **INSERT:** Eastern Daylight Savings Time (EDST)
DELETE: Eastern Standard Time (EST)

2) Questions and Answers - See Questions and Answers Part 3 - Solicitation 21120-147892

3) Addition of Attachments:
- 421 CCTV Addendum MHZ in PDF
- Points of Interest on site Bidders Meeting
- ES/STD-0804 Revision 3

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED

Correctional Service Canada
Technical Services Branch
Electronics Systems

Issue 1
February 3, 2015

STATEMENT
OF
TECHNICAL REQUIREMENTS

UPGRADE

of

INTERNAL (SIDS) CCTV SYSTEMS

at

MILLHAVEN INSTITUTION

Addendum

This Statement of Technical Requirements is approved by the Correctional Service of Canada for the upgrade of the existing Hybrid CCTV System at Millhaven Institution.

ADDENDUM TO APPENDIX C - SITE SPECIFIC REQUIREMENTS

CCTV Node installation details

Nodes and associated Equipment Cabinets:

General:

The contractor must supply and install new network switches, new fibre optic and CAT6 cabling, termination bays and all necessary SFP modules, patch cords and electronic equipment cabinets to provide a complete CCTV network throughout the institution. All cabinets will be dressed and labeled to *ANSI/TIA-568* standards

Node #11 G GI Building (MHZ-115A)

The contractor must supply and install into MHZ-1 Room 115A a wall mount low profile 19" 8RU rack mount cabinet with up to 29" available depth. The provided cabinet will be key lockable. An example of an acceptable cabinet is the Hammond HLP wall mount cabinet. The contractor will install a new 12 strand OM3 50/125 fibre optic cable between MHT-1 169 and MHZ-1 115A. The supplied fibre optic cable will have all 12 strands terminated at both ends onto a 1 RU fibre termination bay using matching fibre optic connectors to existing within MHT-1 169.

The contractor must provide a suitable network switch in MHZ-1 115A to provide a network connection from MHT-1 169 to MHZ 115A. The switch will meet all specifications described in section 4.7.3 of the STR for this project. The provided network switch will also provide at a minimum 8 Gigabit PoE CAT6 ports and 2 SFP ports suitable for OM3 Gigabit connectivity.

The contractor must provide and install into the provided cabinet a slim UPS capable of supporting the network switch for up to 20 minutes run time. The provided UPS will be connected to the CCTV network and will report to the FAAS computer UPS status as is detailed in section 4.9 & 4.14 of the STR for this project.

The contractor must provide CAT6 connectivity from MHZ-1 115A to MHZ-1 113 and MHZ-2 214. The contractor will make every effort to hide all conduits in walls and ceilings and will only provide wire mold or surface mount terminations with the explicit written permission of the technical authority for this project.

Wardens and Crisis Management NVUS:

Appendix C section 182 will be amended to the following.

The contractor must provide 2 NVUS Clients as described in Appendix C of the STR section 182 with the following adjustments.

M35 – MHZ-1 113 (Crisis Management Boardroom)

The contractor must supply and install a complete network client that meets or exceeds all of the requirements detailed in ES/STD-0228 with the following inclusions:

- Monitor – The contractor will provide a 27" LED desktop monitor (1 per client).
- Client CPU – The clients supporting these monitors will be a tower style PC located with the monitor in a workstation configuration. The client will produce no more than 50db sound pressure @ 24". The client will be equipped with the following as a minimum:
  - 8GB DDR3 RAM memory
  - 256GB SATA 3 6Gb/s solid state hard drive
  - Video card with 1GB RAM memory and DirectX 9.0 support.
  - Intel i7 quad core 3.4 GHz processor with 8MB cache memory.
  - 10/100/1000 Ethernet Network Interface Card
  - Keyboard and Mouse Combo - 1000 DPI, Spill-resistant, Durable keys, Plug-and- play, USB
  - 2 – 1 KVM switch with USB and DVI
- Configuration – The clients will be configured as SIO workstations, with access to all cameras in the institution. The workstation will have the Genetec live viewer and archiver player applications installed as well as suitable software for burning CD and DVD optical disks for data removal. The OS and application will be loaded onto the SSD and the 2TB drive will be configured for local video storage.

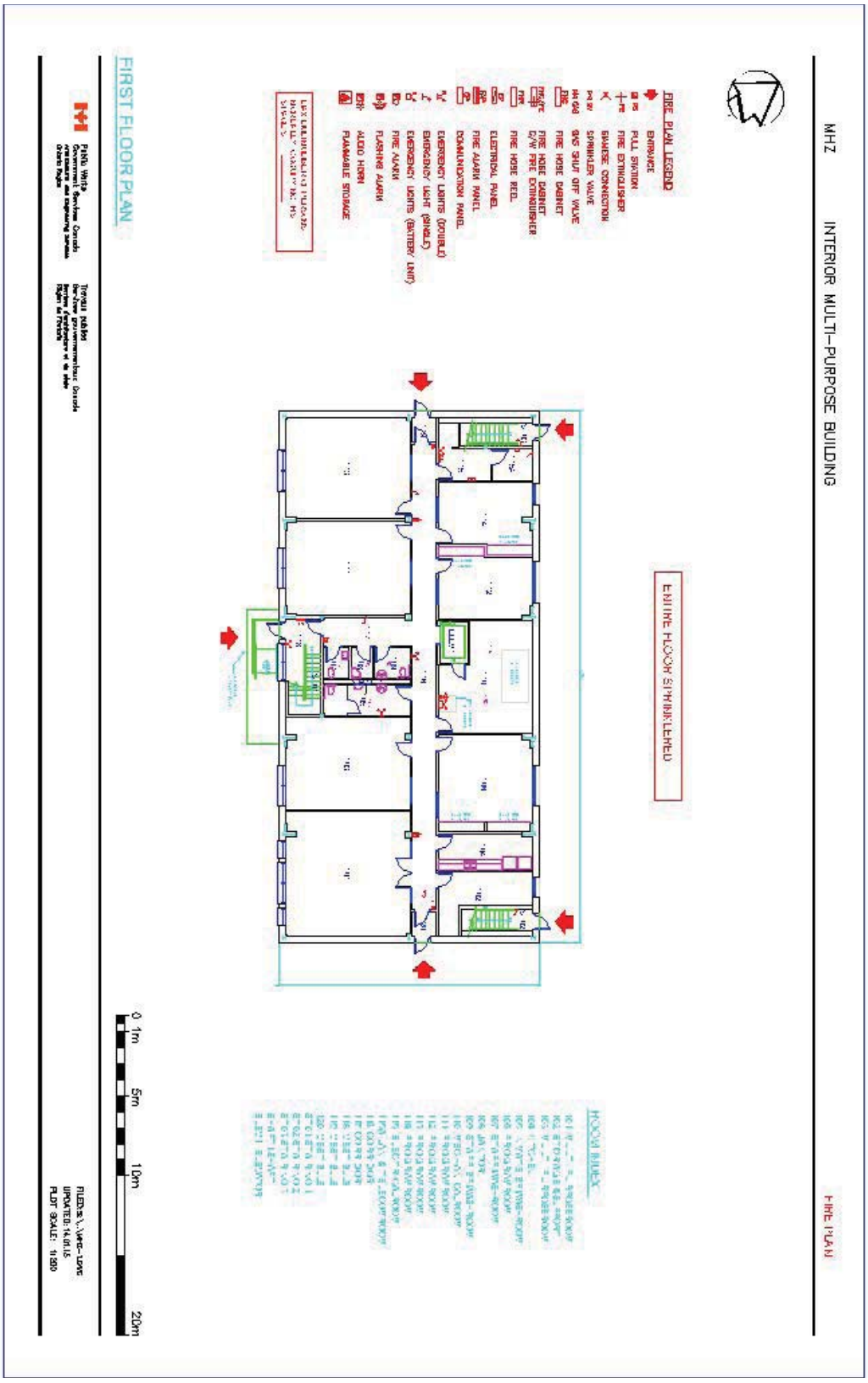
M36 – MHZ-1 214 (Warden's Office)

The contractor must supply and install a complete network client that meets or exceeds all of the requirements detailed in ES/STD-0228 with the following inclusions:

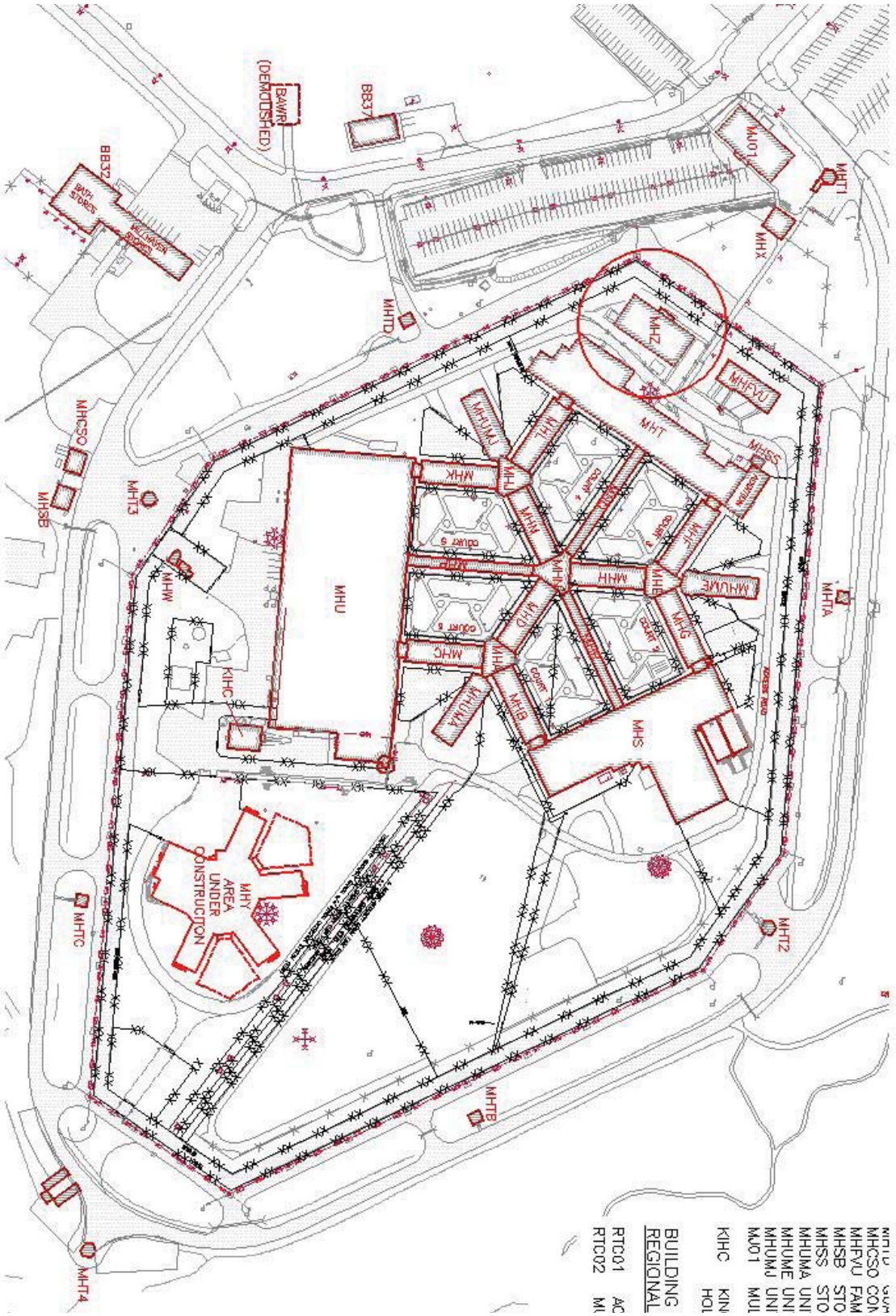
- Monitor – The contractor will provide a 27" LED desktop monitor (1 per client).
- Client CPU – The clients supporting these monitors will be a tower style PC located with the monitor in a workstation configuration. The client will produce no more than 50db sound pressure @ 24". The client will be equipped with the following as a minimum:
  - 8GB DDR3 RAM memory
  - 256GB SATA 3 6Gb/s solid state hard drive
  - Video card with 1GB RAM memory and DirectX 9.0 support.
  - Intel i7 quad core 3.4 GHz processor with 8MB cache memory.
  - 10/100/1000 Ethernet Network Interface Card
  - Keyboard and Mouse Combo - 1000 DPI, Spill-resistant, Durable keys, Plug-and- play, USB
  - 2 – 1 KVM switch with USB and DVI
- Configuration – The clients will be configured as SIO workstations, with access to all cameras in the institution. The workstation will have the Genetec live viewer and archiver player applications installed as well as suitable software for burning CD and DVD optical disks for data removal. The OS and application will be loaded onto the SSD and the 2TB drive will be configured for local video storage.

Building Map MHZ-1

Building Map MHZ-2



Millhaven Key Map



Gents:

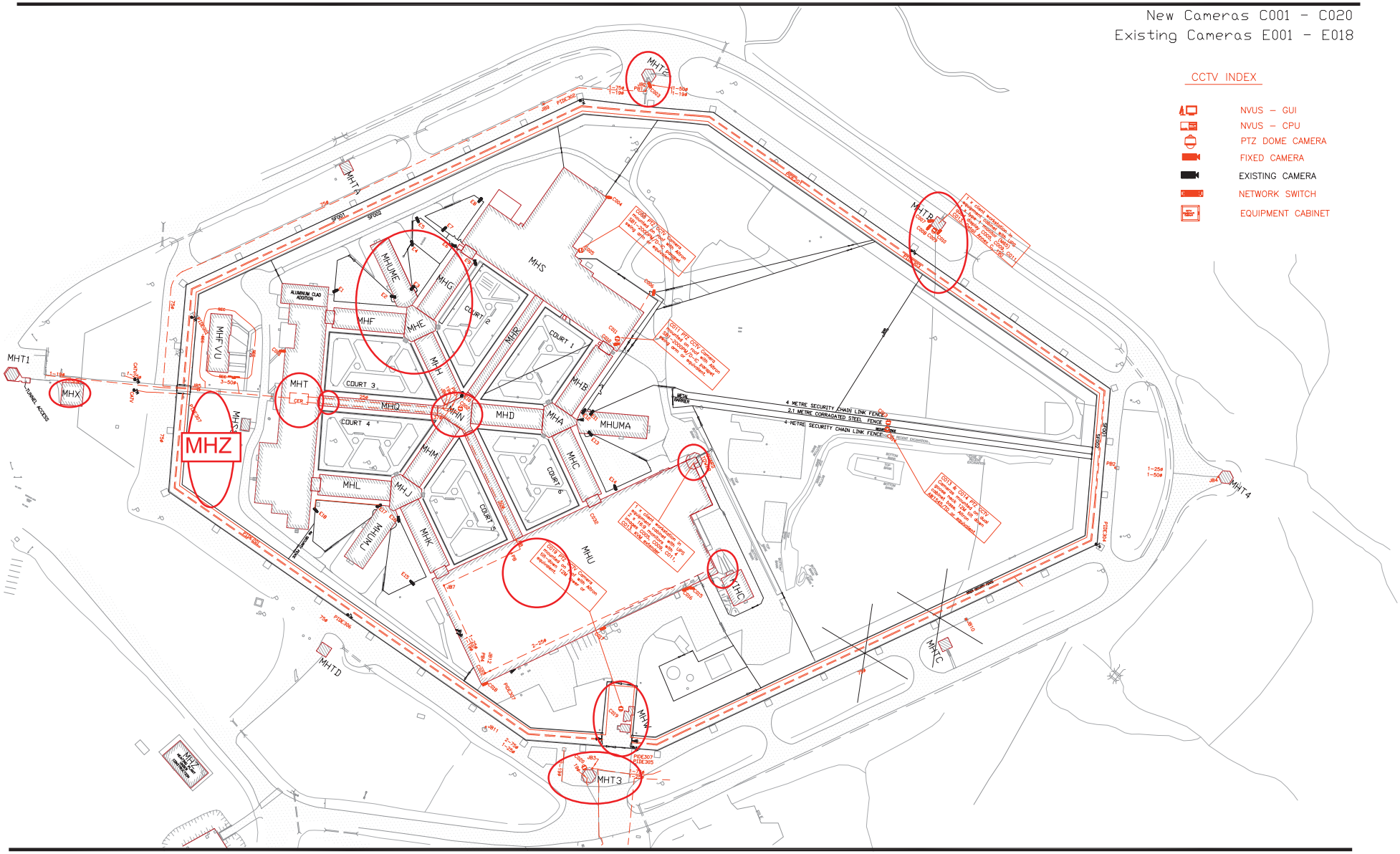
Some points of interest in today's site bidders meeting.
Attached is a site map for reference, (this map also located in Appendix H)
Corresponding map identified in red

1. GI building (MHZ)
2. T building (MHT)
   - T169
   - MCCP
   - V&C
   - CER
   - Main
3. N control (MHN)
   - N basement
   - A basement
   - E basement
   - J basement
   - E control
4. E unit (MHE)
   - E unit management offices
   - 1G
5. S building (MHS)
   - S control
   - S basement
   - Segregation
   - Hospital
   - S Gallery
6. U building (MHU)
   - U control
   - U gallery
   - Kitchen gallery
   - U tower
7. ID building (MHX)
8. 2 Tower (exterior only)
9. B outpost (interior)
10. 3 Tower (exterior only)
11. Sally port (MHW)

MILLHAVEN SITE–MAP

CCTV PLAN

New Cameras C001 – C020
Existing Cameras E001 – E018



Millhaven Institution
Correctional Services Canada
Electronic Security Systems Group
Ontario Region

Millhaven Institution
Service correctionnel Canada
Systèmes de sécurité électroniques Group
Région de l'Ontario

Questions and Answers Part 3
Solicitation 21120-147892

Reference Project STR

Q32 – 4.5.1 Will the existing PIDS / SIDS / Kitchen / Living Unit Cameras be converted to h.264 formats?

<CSC> Yes all existing cameras with H.264 stream capacity will be reprogrammed for H.264 output.

Q33 – 4.8.5 Please clarify number of cameras to be recorded.

<CSC> Section 4.8.5 and 4.8.7 of this STR detail NVR Capacity.

Q34 – 4.9 Is the contractor required to integrate the camera alarms for the new 96 man living unit?

<CSC> Yes the contractor shall integrate camera alarms for up to 60 cameras.

Q35 – 4.9.1.3 Network link loss (all nodes) – please provide clarification regarding this requirement i.e. network link loss annunciation only or additional?

<CSC> Loss of a network switch will create an alarm on the S100 PIDS/FAAS system in the CER/MCCP.

Q36 – 4.15.3 – Is there a minimum amount of rack units or spare rack units to be provided for the wall mount equipment cabinets?

<CSC> Wall Mount equipment cabinets must have a minimum of 8RU, an example of an acceptable cabinet is the Hammond - HLP8UBK.

Q37 – 4.15.3.2 – Is there be a minimum amount of outlets to be provided in the power distribution strips?

<CSC> Wall mount cabinets will require a minimum of 6 outlets on a horizontal power strip.

Q38 – 4.15.3 – Are rear rails required?

<CSC> Yes, except in the wall mount cabinet.

Q39 – 4.14 – What percentage of UPS space is required for future capacity?

<CSC> Provided UPS units will meet the specification detailed in ES/STD-0804 (ES/NE-0804 French) attached.

Appendix C

Q40 – Appendix C #208 / Appendix G - 8.1.1 U Tower – Is the fibre existing as provided in the sketch or is the contractor to install a 12 strand OM3 as described in #208 of Appendix C?

<CSC> The contractor will provide a new fibre as described in section 208 of Annex C of the STR.

Q41 – Appendix # 13 / # 18 - Camera 13, 14, 19 – How many winches are to be supplied in total?

<CSC> 2 winches are to be supplied in total.

Q42 – Appendix # 49; 72 – Please clarify any specific mounting instructions for camera 52.

<CSC> Contractor will provide a mounting bracket for the camera that will be welded to the underside of the staircase similar to other cameras mounted into the stairwell in units A,E & A. The contractor will replace or modify brackets where existing cameras are to be replaced with new.

Q43 – Appendix # 194 – please clarify proper section of STR. * 4.14.3 does not specify equipment cabinets
Appendix # 198 – Please clarify proper section of STR. * 4.14.2 does not specify equipment cabinets
Appendix 199 / 201 / 203 – Please clarify proper section of STR. * 4.12 does not specify equipment cabinets

<CSC> Typographical corrections for Appendix C sections 192 through 208.

Section 192 – change "section 4.14.2 of this document" to "section 4.15.2 of this document"
Section 194 – change "section 4.14.3 of this document" to "section 4.15.3 of this document"
Section 196 – change "section 4.14.2 of this document" to "section 4.15.2 of this document"
Section 198 – change "section 4.14.2 of this document" to "section 4.15.2 of this document"
Section 199 – change "section 4.12 of this document" to "section 4.15.2 of this document"
Section 200 – change "section 4.12 of this document" to "section 4.15.2 of this document"
Section 201 – change "section 4.12 of this document" to "section 4.15.2 of this document"
Section 203 – change "section 4.12 of this document" to "section 4.15.2 of this document"
Section 208 – change "section 4.14.3 of this document" to "section 4.15.3 of this document"

Questions

Q44 – Please identify the existing load at locations whereby a new UPS unit is required to power existing and new equipment.

<CSC> Contractor will provide new UPS of the following capacities.

Node 1 – 10KVA
Node 2 – no UPS required
Node 2.1 – 2KVA
Node 2.2.1 – no UPS required
Node 3 – calculate on equipment to be provided*
Node 4 – calculate on equipment to be provided*
Node 4.1 – calculate on equipment to be provided*
Node 4.2 – calculate on equipment to be provided*
Node 5 – calculate on equipment to be provided*
Node 5.1 – calculate on equipment to be provided*
Node 6 – no UPS required
Node 6.1 – calculate on equipment to be provided*
Node 7 – calculate on equipment to be provided*
Node 8 – calculate on equipment to be provided*
Node 8.1 – no UPS required
Node 8.1.1 – calculate on equipment to be provided*
Node 8.2 – no UPS required
Node 9 – no UPS required
Node 10 – no UPS required

* NOTE: where response is "calculate on equipment to be provided" all equipment in cabinet is being replaced therefore bidder can calculate the UPS load and the capacity requirement.

Q45 – Section 4.8.5 of the STR assumes a data rate of 6Mbps per camera. This assumption does not appear to be consistent with the use of H.264 compression. Please confirm that the NVR capacity should be based upon 6Mbps.

<CSC> This question previously answered.

Q46 – The provided NVR will have sufficient capacity to record up to 400 cameras at 800x600 pixels minimum, assuming a data rate of 6Mbit/second, at a frame rate of 30 fps for a minimum time period of 168 hours (~455 GByte/camera). The compression method must be H.264 Compression will be 70% where 100% is highest quality."

Are we to use the above parameters when calculating the storage space or should we use the actual camera data rates based on the camera types given in the STR to calculate the CCTV storage.

<CSC> The NVR capacity will be calculated at the size specified in Section 4.8.5 of this Statement of Technical Requirements.

Q47 – Would it be possible to electronically issue the STR addendum that was distributed at the site visit?

<CSC> STR addendum was electronically distributed 2015-02-09, and is re-attached.

Q48 – The STR in concert with ES/STD-0227 identifies a requirement to provide a 32" video monitor with a maximum power consumption of 48W. Please provide an example of a 32" product that CSC finds acceptable for this requirement.

<CSC> Power consumption requirements for monitors will apply as follows.
Type 1 Monitor – Control Post Monitor 22" LED
<CSC> power consumption up to 30W
Type 2 Monitor – Advanced User Monitor 27" LED
<CSC> power consumption up to 40W
Type 3 Monitor – Power User Monitor 32" LED
<CSC> power consumption up to 50W

Q49 – The STR identifies a requirement to annunciate remote switch failures on the FAAS. Please explain this requirement in more detail.

<CSC> If a remote switch fails an alarm will be displayed on the FAAS of the S100 PIU.

Q50 – Please indicate if the 24P and 8P switches required for the lower capacity buildings need to be sourced from the same vendor utilized for the core and primary edge switches.

<CSC> The provided network switches must meet the criteria in section 4.7 of this STR.

Replace "vendor" with "manufacturer".

The new network switching infrastructure must be sourced by one switch manufacturer with the ability to interface in a multi- manufacturer manner to other manufacturers equipment should future requirements deem this necessary.

Q51 – The STR identifies a document to provide a 8P PoE/PoE+ fanless network switches. Please indicate if all 8 ports are required to support PoE+.

<CSC> Regards 8 port edge level switches - all ports must support PoE+

Q52 – CSC ES/STD-0229 (Network Video Recorder Standard) is not consistent with the NVR requirement detailed in the STR. Please identify the extent to which ES/STD-0229 is applicable.

<CSC> See section 2.1 of this STR.

2.1 Applicability

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

Q53 – There are two buildings located in the sallyport. Please confirm which building the project equipment is to be located in.

<CSC> The building closest to the outer Sallyport gate. This was identified during the site bidders meeting.

Q54 – The STR identifies a to provide 1RU workstations whereas the floor plan notes indicate 2RU maximum. Please clarify.

<CSC> Only one floor plan note indicates 2RU. change map MHS-B to read "All clients will be rack mount ***1RU*** maximum".

Q55 – Please confirm that PVC installation under asphalt will require a concrete encasement.

<CSC> This is detailed in ES/SPEC-0006 referenced and provided in Appendix I

Q56 – The STR identifies a requirement to install a fibre cable between Node 1 (MHT-169) and Node 8 (MHU-202 U Gallery). During the site visit, the possible use of an existing partial conduit path was discussed. Please provide details with respect to the existing available conduit.

<CSC> In the site bidders meeting it was identified an existing conduit can be used.

Q57 – Item 208 of the "Site Specific Requirements" indicates that a new 12 strand OM3 fibre cable is required between Node 8 and Node 8.1.1. However, the fibre layout in Appendix G indicates that this fibre is existing. Please clarify this requirement.

<CSC> As per Annex C section 208 The contractor must provide and install a new 12 strand 50/125 OM3 fibre optic cable from Node #8 to Node #8.1.1.

Q58 – Please confirm that there is an existing useable conduit path between Node 1 (MHT-169) and Node 11 (MHZ-115A).

<CSC> This was addressed in the site bidders meeting. There is a path.

Q59 – Nodes 4, 6, and 7 require two 48P network switches. Please clarify if the GB SFP requirement is for four per switch for a total of eight or if it is 2 or 8 per network switch.

<CSC> A minimum of 4 GB SFP ports per 24 Port PoE+ GB switch is required.

Q60 – The camera assignment schedule indicates that there are two cameras assigned to Node 10 (Tunnel). Is there an existing network switch at this location?

<CSC> A PoE switch with available ports is located at Node 10 as is indicated in Appendix G page 11.

Q61 – Item 194 of the "Site Specific Requirements" document indicates that there are 12 fibre strands to be terminated in B-Tower. Please confirm that the existing fibres are dark.

<DS>Appendix C Section 194 reads "The contractor must utilize an existing 6 strand 62.5/125 OM1 fibre optic cable from Node #2.1 to Node #2".

Q62 – Please clarify if there are existing conduit paths between the Unit A/E Management Offices and their associated basement node.

<CSC> The contractor must provide a conduit from Node 5 to Node 5.1 and from Node 6 to Node 6.1.

Q63 – The Node 1 layout shown in Appendix G indicates that the clients for M30, M31, and M32 are to be installed in MHT-169. Items 179 and 180 of the Site Specific Requirements indicate that these clients are to be installed in MHT Room 107. Please clarify.

<CSC> Clients referenced in Sections 179 and 180 of Appendix C are to be located in the equipment cabinets in MHT-169 as per the Node 1 layout diagram on Page 1 of Appendix G.

Q64 – The Appendix F Monitor Assignment schedule indicates that monitors M35 and M36 are Type 3 (32") units. Item 182 of the Site Specific Requirements indicate that these monitors should be 27" units. Please clarify.

<CSC> Monitors M35 and M36 are to be Type 3, 32" LED monitors.

Q65 – The camera numbers and locations detailed in Appendix E do not match the provided floor plans. For example, reference drawings MHQ-1, MHS-1, MNH-1, MHT-1, MHX-1, and MHU-1. To assist in conduit take-offs, please clarify where each camera is located.

<CSC> Appendix H provided in the original STR documents included a camera numbering error. All camera and node locations are accurate and remain unchanged. The revised Appendix H is attached.

Q66 – Are there existing Omnicast monitors located in the V&C Control Post? If so, where are they currently cabled to for connection into the existing Omnicast network?

<CSC> Yes, they are cabled to Node 1, MHT-169.

Q67 – Appendix E indicates that there are 123 existing cameras (8 on 421-Key, 10 in MHA, 11 in MHE, 11 in MHJ, 2 in MHL, 2 in MHM, 8 in MHN, 37 in MHS, 14 in MHT, 18 in MHU, and 2 in MHX) to be upgraded as part of this project. Information detailing the existing Omnicast network has not been provided with the tender documentation. So that accurate conduit requirements can be derived, please indicate where each existing camera is cabled to for interconnection into the existing Omnicast network.

<CSC> There is no requirement to provide new conduit or cabling for existing cameras. Only the camera is to be replaced. Existing cameras are already connected to identified nodes on the Omnicast network. Existing cameras and node connection is identified in Appendix E.

Q68 – From Node 2.2 to Node 2.2.1, is there an existing conduit path that can be retained for this connection or is the contractor to provide a path as well repair any damaged asphalt?

<CSC> see section 196 of Appendix C of this STR.

Q69 – As there is a new wall mount rack getting installed in MHW, can Camera 019 be routed to within the new wall mount rack (Node 2.2.1)?

<CSC> see section 196 of Appendix C of this STR.
<CSC> see Appendix E reference C-19 of this STR.

Q70 – Is it to be assumed that Emergency Power is available in MHW (15A)?

<CSC> see section 196 of Appendix C of this STR.

Q71 – For Camera C013 and C014, is the contractor to provide new fiber from this tower to the closest equipment room or is there existing fiber in place that can be re-used?

<CSC> The contractor will provide a new 12 strand OM3 FO cable from camera 13/14 to the new camera tower to be provided as identified in Appendix C – section 13 and on map "Millhaven Site-Map" The existing conduit has coaxial cabling routing into U-Tower up into MHU-201 and terminated at Node 8 (MHU-202).

Q71A – For Camera C013 and C014, is the contractor to provide new electrical from this tower to the closest equipment room or is there existing electrical in place that can be re-used?

<CSC> The existing electrical is to be reused for this tower.

Q72 – Within the attached Addendum #1, Q3 and Q2 did not have an Addendum, can this please be provided?

<CSC> The Addendum to the STR was provided at the site visit in hard copy. A pdf version is being posted with this amendment.

Q73 – If the contractor requests to work night shifts, will there be any noise restrictions in certain areas (hammer drill and coring)?

<CSC> Yes, work in living units will be restricted to days and evenings. Work in other areas of the institution can be accommodated 24/7. This question was asked in the site bidders meeting.

Q74 – I have been working with Genetec and have been advised that Genetec Omnicast Ver 4.X is not supported with Cold Store storage solution, only Genetec Security Centre 5.1 and higher is supported.
Can you please confirm that the entire site is to be upgraded to Genetec Security Center?

<CSC> The CSC has consulted with Genetec and has confirmed the compatibility of both technologies in a CSC-CCTV environment.

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.

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