

**Correctional Service Canada
Technical Services Branch
Electronics Systems**

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**ELECTRONICS ENGINEERING
SPECIFICATION**

**LIMITED CALL INTERCOM 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 Perimeter Intrusion Detection System (PIDS) in Canadian federal correctional institutions.

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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
GFE	Government Furnished Equipment
LCIS	Limited Call Intercom System
MCCP	Main Communications and Control Post
PTT	Push-to-Talk
RFP	Request for Proposal
SOW	Statement of Work
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 essential technical and functional requirements of the Correctional Service Canada (CSC) for the procurement and installation of a Limited Call Intercom System (LCIS) for federal correctional institutions.

1.2 **Purpose**

The purpose of the LCIS is to provide a means of two-way (half-duplex) voice communication between an attendant at a master control station and another staff member at a remote station.

The primary use of the system is to enable staff in remote locations to pass queries or status reports to a master control station. The attendant at the control panel can then use the system to further communicate with the specific remote location if required.

The LCIS 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 Limited Call Intercom capability or replace existing obsolete equipment.

1.3 **Commercial-Off-The-Self Equipment**

The LCIS 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. CSC may when it deems necessary,

request the supplier to arrange for a full site demonstration. CSC shall verify in depth any of the system technical specifications called up. 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 LCIS 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.

1.6 Quantity of Equipment

The quantity and location of the LCIS equipment required for CSC institutions will be contained in the specification identified in the Request for Proposal (RFP).

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

3.0 **REQUIREMENTS**

3.1 **General**

The contractor shall design, supply, install, test and provide documentation and training for an LCIS in accordance with the Specifications, Standards and Statement of Works specified in Section 2.0 of this specification.

3.1.1 **System Configuration**

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

- a. Control Station consisting of a control panel and a telephone handset/speaker combination;
- b. Remote Stations consisting of a microphone/speaker combination, a call button (if specified) and an enclosure;
- c. Common equipment (amplifiers, power supplies, switchers, a voice tape recorder, etc.);
- d. Interconnecting wiring, cables, etc.; and
- e. Conduit, ducts, outlet boxes, etc.

3.1.2 **Period of Operation**

The LCIS 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 **General**

The LCIS shall provide satisfactory sound distribution within each designated area of the institution. The equipment shall produce high speech intelligibility throughout the area covered by the system at all normal microphone distances. The system shall be free of audible transients as circuits are selected and disabled and microphones are switched.

3.2.2 Control Station

The control station, consisting of a control panel and a telephone handset or microphone/speaker combination, allows an operator controls over a number of remote stations. The location of the control station will be identified in the STR.

3.2.3 Control Panel

The control panel shall contain the necessary controls and annunciators to permit the operator to have independent control over each remote station. Only one half-duplex voice path between the control station and any of the remote stations may exist at one time.

The required physical configuration of the control panel and the number of remote stations may vary with each particular application and will be specified in the Statement of Technical Requirement.

3.2.4 Handset or Microphone/Speaker

A handset or microphone/speaker combination (as specified in the STR) shall be supplied with each control panel. The handset/microphone shall contain a PUSH-TO-TALK (PTT) switch to enable a selected voice path. This switch shall be a non-latching type which automatically disables the transmitter/microphone when released. The location of the speaker (mounted on the control panel or in a separate enclosure) and the requirement for a volume control will be detailed in the STR.

3.2.5 Remote Station

Different types of remote station assemblies may be required depending on the specific application:

- a. indoor ceiling/wall-mounted (e.g., living units);
- b. indoor desk top mounted (e.g., office); or
- c. outdoor wall-mounted (e.g., exterior doors).

The assemblies for outdoor mounting shall be rugged, weather proof units capable of satisfactory operation under the environmental conditions specified in this specification.

All assemblies shall have high resistance to damage and destruction due to deliberate physical abuse. The contractor shall submit a prototype sample of each type of assembly for approval by the Design Authority prior to proceeding with the procurement of system quantities.

3.2.6 Handset or Microphone/Speaker

The handset or microphone/speaker combination shall be capable of transmitting/handling the required power levels and shall be compatible with the enclosure in which they are housed. The requirement for a volume control will be defined in the STR.

3.2.7 Call Button

In some installations (i.e., wall-mounted), the intercom assembly shall incorporate a CALL button enabling a person at a remote station to signal the attendant at the control station. The STR will specify if this option is required.

3.2.8 Enclosure

The intercom enclosure shall be physically rugged to prevent damage by physical abuse. The STR will specify whether the enclosures are Government Furnished Equipment (GFE) or are to be supplied by the contractor.

3.2.9 Common Equipment

Where feasible and practical all common equipment (e.g., power supplies, logic boards, amplifiers, etc.) shall be located in the Terminal Equipment Spaces 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.

To the maximum practical extent, off-the-shelf equipment shall be selected for use in the LCIS. 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.

3.2.10 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.

3.2.11 **Interface to Voice Tape Recorder**

The contractor shall supply and install all necessary wiring and control equipment required to interface the LCIS to a good quality Voice Tape Recorder (if required).

3.3 **Design Requirements**

3.3.1 **General**

To the maximum practical extent, off-the-shelf equipment should be selected for use in the system. 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 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 LCIS shall have high resistance to damage, destruction, or conversion to other uses (including weapons). All interconnecting service must be secure against tampering or improper interference. Elements of the system shall be isolated from one another to prevent the passage of contraband between inmate and visitor.

3.3.4 **Power Failure**

Loss or restoration of primary power to the LCIS shall not procedure spurious oscillations, clicks, or other unwanted noise in the speaker outputs. When power is restarted after a power failure, the system shall resume normal operation without operator action and shall automatically restart either in a "no-circuits-selected" condition or in the same state as existed before the power failure.

3.3.5 **System Failure**

An LCIS failure shall be deemed to have occurred when any required communication is not produced or when any required control function cannot be performed.

3.3.6 **Human Factors**

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

3.3.7 **Existing Equipment**

In most installations, control elements of the system 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 system 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 **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 (e.g., a lighted push-button instead of a separate light and an unlit push-button).

The LCIS may use 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 **Wall-Mounted Remote Station Operation**

The normal sequence of events relating to the use of the wall-mounted intercom station shall be as follows:

- a. a person at a remote station presses the CALL button causing:
 - (1) the annunciator light identifying that station on the control panel to flash continuously;

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- (2) a brief chime note to be automatically repeated at the control station. The chime interval shall be adjustable (from the rear of the panel) between 5 and 15 seconds. Chime volume shall be adjustable from the rear of the control panel or from the common control equipment.

Depressing the CALL button again before the control station has responded shall have no effect on the system, i.e., the chime sequence shall continue unaffected and the associated annunciator light shall continue flashing.

This condition shall persist until:

- b. the attendant at the control station depresses the push-button switch associated with the flashing annunciator light. This shall cause:

- (1) the annunciator light to change to a steady ON condition.
(2) the audible annunciator to turn OFF.

This action shall also enable the voice path between the two stations, with the remote unit in the TALK mode and the control station in the LISTEN mode.

- c. to talk to the remote station, the operator at the control station depresses the PTT switch on the handset/microphone. This shall put the remote station in the LISTEN mode. The annunciator light shall remain steady ON throughout with the audible chime annunciator OFF.
- d. when the conversation is completed the attendant at the control station once again depresses the illuminated visual annunciator switch causing it to extinguish and the voice path to be disabled.

If a new call request from a remote unit is initiated before an existing call has been completed, the system shall:

- a. if the existing call has not yet been answered:
- (1) leave the audible annunciator on.
(2) flash the visual annunciators associated with both calls.
- b. if the existing call has been answered:
- (1) flash the visual annunciator for the new call and leave the one for the existing call steady ON.
(2) the audible annunciator will not resume in this case.

In either cases a. or b. the control station operator may select any of the incoming call requests in any order by depressing the appropriate flashing push-button as per a single call.

3.4.2 Ceiling-Mounted Remote Station Operation

The operation of the ceiling-mounted remote station shall be similar to that of the wall-mounted version except that there is no call button. The request by an officer in the range to establish the voice circuit will be communicated visually to the officer at the control station. The voice path may then be enabled/disabled from the control panel in the same manner as previously detailed for the wall-mounted remote station. These remote stations shall be automatically disabled as soon as the Public Address system in that zone is activated.

3.4.3 Interface With PA System in Living Units

Provision of a suitable interface in the Living Units will permit interconnection with the PA System.

3.4.4 All Call

The control station handset shall be selected to all intercom links simultaneously by the activation of a manually operated switch. The handset transmitter shall then have established precedence at all activated remote stations. The "all call" selection shall be visually annunciated on the control panel by a steady ON indicator.

3.4.5 Pre-Announcement Chime

A brief pre-announcement chime shall be interjected onto the selected intercom link(s) subsequent to an "all call" selection. The chime shall be heard at the selected remote station(s) and the receiver of the handset at the control station.

3.5 Environmental Requirements

The LCIS shall operate over the following environmental conditions:

- 3.5.1 Temperature: 0° C to +50° C (indoor equipment),
-40° C to +55° C (outdoor equipment); and
- 3.5.2 Humidity: 0 to 95% relative, non-condensing (indoor equipment),
Up to 100% relative, condensing.

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- 3.5.3 Location indoor equipment in a sheltered environment; and
outdoor equipment includes but is not limited to extremes of sun, wind, driving rain, hail, snow, ice loading, blown sand and dust.

3.6 Power Requirements

The LCIS shall use VAC power within the following limits:

- 3.6.1 Voltage: 120 VAC $\pm 10\%$;
- 3.6.2 Frequency: 60 Hz $\pm 1.5\%$;
- 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 Restricted Visit Intercom System 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 system documentation shall be provided with a Copyright Release for the documentation delivered in support of the system. The documentation shall be in accordance with the ES/SOW-0101, Statement of Work.

3.9 Support Requirements

The LCIS 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 system shall be in accordance with the ES/SOW-0101, Statement of Work.

4.0 **QUALITY ASSURANCE**

4.1 **General**

The system 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 LCIS documents, drawings, plans, manuals, etc. (where applicable) shall be in accordance with the ES/SOW-0101, Statement of Work.

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

6.0 **INTERFERENCE**

Performance of the LCIS 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 ES/SOW-0101, Statement of Work.

7.0 **SAFETY**

The LCIS shall meet the applicable Canadian Standards Association (CSA) standards.

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