

INTEGRAL COACH FACTORY , CHENNAI- 600 038

**SCHEDULE OF TECHNICAL REQUIREMENTS FOR SUPPLY AND
INSTALLATION OF CLOSED CIRCUIT TELEVISION (CCTV)
SURVEILLANCE SYSTEM IN COACHES OF INDIAN RAILWAYS**

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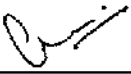
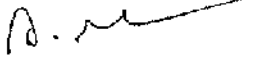
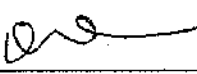
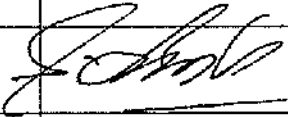
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Changes data on Rev.04

Sl. No.	Month / Year of issue	Revision / Amend.	Clause No.	Reason for Revision/Amendment
1	August-2016	05	<u>Changes</u> 2.1	<u>Point 9 revised as under</u> Suitable Data cables shall be used.
			3.1	<u>Para (v) added as under</u> The firm should have Pan India presence of maintenance facilities having skilled maintenance staff at least on main cities i.e. Mumbai, Delhi, Kolkata, Chennai, Lucknow, Bhopal etc.

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1.0 Introduction

1.1 General

This Schedule of technical requirements describes the **CCTV Surveillance System** to be supplied and installed for IR passenger coaches.

The contractor shall be responsible for all works required in this Schedule of Technical Requirements (STR) with regard to Design, supply, testing and commissioning of CCTV System.

1.2 Climatic conditions

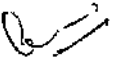
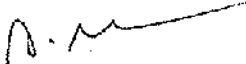
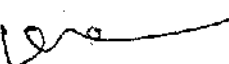
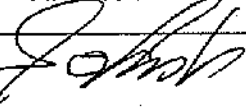
The coaches will be operated under the climatic conditions shown in Table below:

Description	Limiting Values
Ambient temperature	-10°C to 50°C
Altitude	Sea level to 600 mtrs
Humidity	Max. 95% RH

1.3 Functional Requirements

The functional requirement of the CCTV system shall include the following :

- i. System shall facilitate facial recognition for unambiguous identification of the target person by giving high resolution images .
- ii. Facial recognition in low light condition especially in aisle area during night time .
- iii. The system should be suitable for mobile application for use on railway coaches and should be able to withstand vibrations and shocks that are encountered.
- iv. Shall have sufficient storage on a removable media for retrieving data on intermediate stations by authorized person viz. RPF.
- v. Recorder should have safety storage/emergency recording function. i.e in case of HDD failure the data should store on additional storage device (SD card)
- vi. Recorder should have in-built diagnostics with indication to log internal function or hardware failure.
- vii. The recorder should support date & time, GPS location & speed of vehicle, channel title, unique ID and should appear at bottom left / right.

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viii. System should have the following interfaces:

- M12 / M23 industrial connector for Ethernet.
- PoE Ethernet ports for the direct power supply to the cameras thus reducing the cabling.
- HDMI / VGA / Composite video output port for direct Monitoring of output.
- Alarm ports
- USB ports
- GPS interface
- GPRS/ CDMA mobile communication

ix. The System Software should support below functionality.

- Vehicle information management – i.e Vehicle location via Google Maps interface
- Video search, playback & download function by means of remote device.

x. In case of loss of video signal to NVR due to failure of any one or all the cameras due to any reason, there shall be visual indication in the NVR for respective camera.

2. Scope of Supply

This STR covers requirements for supply and installation of CCTV system in coaches. The CCTV system shall include NVR (Network video recorder), Camera and accessories. The supply and installation shall be as per drawing enclosed in the tender document.


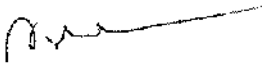
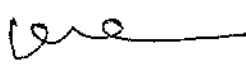

2.1 Major Items

1) Components with requirements of Recorded video Analysis feature

1	Camera
2	Network Video Recorder with HDD and SD Card
3	Panic button & talk back facility (optional)
4	Software
5	Interconnecting cables and power supply of 110V DC/ 12V DC
6	Special tools
7	Comprehensive Annual Maintenance Contract

2) Necessary software shall be provided for retrieving and viewing the recordings.

3) The contractor shall be fully responsible for integrated testing and commissioning of the CCTV system.

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- 4) The contractor shall supply the Entire CCTV control system viz NVR, control equipment & accessories in a concealed enclosure with IP protection with lock and key along with relevant hardware / fasteners required for installation. Lock shall be of Southco/EMKA/Dirak make or similar.
- 5) The control system shall be installed in the coach in the place earmarked.
- 6) The contractor shall provide all the documents as listed below
 - i. Description of CCTV system aggregates with drawings.
 - ii. Test certificates issued by reputed International Agencies / NABL accredited lab shall be submitted for cameras, NVR, Cables and other important items as specified in the Technical specifications
 - iii. Interface plan
 - iv. Operation and maintenance manual (soft copy & hard copy @ 2 per coach)
 - v. Spare parts catalog (soft copy & hard copy @ 2 per coach)
 - vi. Manufacturer Authorization Letter from the OEM
- 7) Electrical Cables that CCTV system to power supply in the coach should meet RDSO specification ELRS/SPEC/ELC/0019 Rev.2 Feb.2011 (or Latest Revision).
- 8) The contractor shall maintain the stock of CCTV system aggregates and supply of spares for at least 5 years from the date of commission of CCTV system.
- 9) Suitable data cables shall be used.
- 10) Separate offer for Panic button with talk back facility.

2.2 Submission of Technical offer

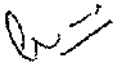
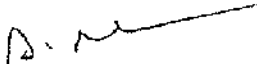
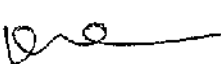
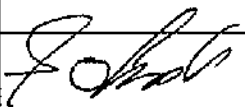
The tenderer shall submit the following as the part of technical offer:

- i. Technical offer for CCTV system along with the relevant datasheets
- ii. Clause wise comments against all clauses of this STR
- iii. All required certificates as mentioned in the technical specifications.

2.3 Contractor Responsibility

The contractor shall be responsible for the overall design and engineering of CCTV in accordance with the Scope of Supply and Work.

The installation method and location point of all equipments comprising of CCTV shall be designed by the contractor and approved by consignee in order to avoid any mechanical interference with the other equipment of the vehicle.

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2.4. Design

Control system for CCTV shall be as a module with necessary ports for cabling and all items should be kept in a single enclosure with the specified locks. Cameras fitted in the coach shall not project out/visible more than 25mm from the ceiling.

2.5 Commissioning and Testing

2.5.1 Contractor shall perform the integration at consignee premises. It is the responsibility of the contractor to integrate all components of CCTV system in each coach and demonstrate satisfactory performance of the complete system to the consignee. Wherever the system has been installed in more than one coach of the train, the contractor shall network the CCTV system over the entire formation by providing necessary cabling. Wherever talkback feature has been opted by the consignee, the same shall be integrated with driver/guard.

In existing coaches where retro fitment of CCTV system is planned, standalone CCTV system will be provided.



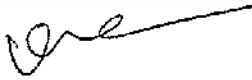
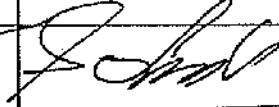
2.5.2 Contractor shall be responsible for carrying out performance tests of the CCTV. Consignee will have the right to witness any of these tests at any stage of test progress. The commissioning test of the complete vehicle will be performed by contractor for the CCTV assembly at consignee premises. The contractor shall submit all test documents, Test procedures and check sheets to consignee for approval as per agreed time schedule. The contractor shall submit all necessary information, test procedures and check sheets for the integration test for approval of consignee.

2.6 Packing

Contractor shall ensure proper packing of the CCTV equipment to avoid damage during transit, handling and storage.

2.7 Certifications

All the camera models & NVR shall carry the mandatory certifications mentioned in the specification & same shall be duly submitted along with the offer, otherwise the offer would be rejected.

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2.8 Warranty

The CCTV system shall be warranted for a period of three years from the date of commissioning.

2.9 Training

The contractor shall provide training to Railway personnel / staff of User Railways in the operation and maintenance of CCTV system and software.

2.10 Handing over of CCTV System

The contractor shall commission and hand over the complete CCTV system in accordance with the time schedule approved by consignee. The contractor shall provide the instructions for proper storage, handling and logistic function of components supplied by the contractor.

2.11 CAMC: The contractor shall enter into a Comprehensive Annual Maintenance Contract with user for three years for maintaining the CCTV system.. The firm shall coordinate with user during Scheduled maintenance Viz. Quarterly, half yearly, annual maintenance as required for trouble free and proper functioning of the CCTV system including repair/ replacement of defective/ malfunctioning items. Firm shall list out in the offer consumable items with unit cost and source of supply which will be required for the Scheduled maintenance so that the user can keep a stock of these items. Tenderers shall quote rate for this maintenance contract separately along with the offer for CCTV system.

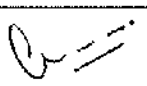
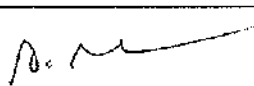
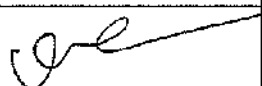
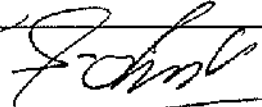
2.12 Works Tender:

If the procurement along with installation and commissioning of CCTV system is done through Works tender, Railways can follow the existing guidelines for eligibility criteria and credentials. It should be ensured that for the purpose of similar work, Railways can define the same in broad based manner. While evaluating the offers clause by clause, compliance of clause 3.1 should be ensured.

3. Technical Requirements

3.1 General

- (i) The contractor shall be responsible for meeting all the requirements in STR and submission of all the required data for CCTV system design.
- (ii) Bulk and regular orders shall be considered for CCTV systems offered by firm or their OEM which are proven one and should have been successfully installed in at least 100 coaches and performed satisfactory at least 2 years of Indian Railways / Indian Metro Railways / International Railways for rolling stock application."

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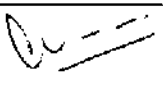
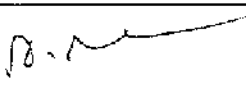
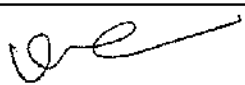

- (iii) If the contractor is not the OEM of CCTV system, then the contractor shall have technical tie up / collaboration or joint venture with the OEM and shall submit documentary evidence to the satisfaction of Railways.
- (iv) IP Rating shall be for Dust protection with dehumidifying membrane, IP-66 to IEC 60529 and the camera shall be vandal proof (Impact rating IK-10 to IEC62262). Railway Certificate for vibration shall conform to EN50155 . To ensure ruggedness of the CCTV system in rolling stock application ,all the components/ system should be compliant to international standards EN50155,EN60529,EN60068,EN50121 and EN61000.
- (v) The firm should have Pan India presence of maintenance facilities having skilled maintenance staff at least on main cities i.e. Mumbai, Delhi, Kolkata, Chennai, Lucknow, Bhopal, etc.
- (vi) Necessary proof of documents for the above shall be submitted.

3.2 CCTV Camera

- (i) The camera shall be IP type suitably selected to work in day / night in respect of resolution, clarity of images and illumination condition for on-train application and shall be of proven design. The mounting of camera shall be unobtrusive, flushed with or recessed into the interior panel.
- (ii) Number of cameras and their location inside the coach shall be as per the tender drawing.

3.2.1 IP Camera shall conform to the following specification:

Parameter	Specification
Type	Micro DOME camera
Image sensor	1/3" C-MOS
Lens	2.8mm min.
Resolution	Minimum 1.3 MP
Min. illumination	1.0 Lux (Colour), 0 Lux (B/W)
Day & Night	Auto (IR) / Day /Night
Dimension Range (Approx)	Dia.100 -130mm , H 50 -110mm
Power supply	PoE with M12/M23 connector
Weight (approx.)	850 gram

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3.3 NETWORK VIDEO RECORDER (NVR)

The Network Video Recorder (NVR) shall be of Rugged design with high resistance to vibration and impact Dust-resistant in a metal enclosure . The mounting of NVR shall be done at the location as per the tender drawing.

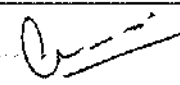
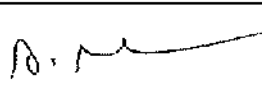
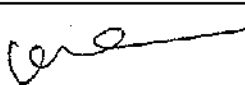
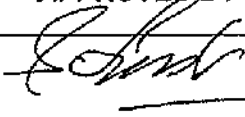
Network Video Recorder (NVR) shall conform to the following specification:

Parameter	Requirement
Video	Shall support 8 ports & compatible with IP cameras
Recording / Play back	Shall support real time video recording and playback
Storage	1) One 2.5" HDD with minimum capacity of 2 TB. However the capacity should be sufficient enough to record maximum resolution videos for 30 days minimum @ 24 hours per day. 2) One SD card with 32 GB capacity.
Interface	1) GPS antenna 2) Power input 3) Network interface 4) PoE port with M12/M23 connector 5) USB port 6) Serial interface, I/O terminal 7) GPRS/ CDMA mobile communication
GPS	Device shall be compatible to support GPS for real time location and speed tagging of video stream.
Power Input	Train lighting voltage is 110V DC. The contractor shall provide suitable converter to convert the train lighting voltage to required device input voltage.
Dimension range (approx.)	250 x 190 x 140 mm

3.4 Software System Requirement

3.4.1 Requirements of Recorded Video Analysis Feature

- i. Software shall enable play back of recorded video stream.
- ii. One or more video streams can be selected and shown simultaneously in a multiple display.

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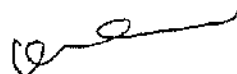
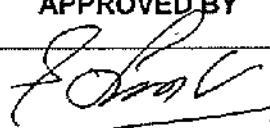
- iii. The sequences of interest can be flagged with markings on the time bar. These sequences can then be exported by the software and either written to the analysis PC in a file or copied onto CD-ROM or DVD or USB storage.
- iv. Enlarging the images to emphasis key details shall be possible.
- v. Software shall have the GPS interface to enable the operator to get the information regarding Train Location , Speed etc.

3.4.2 The contractor shall provide, as a minimum, the following:

- 1) Diagnostics & Maintenance Software
- 2) User Manual for Diagnostics & Maintenance Software
- 3) Two backup copies-of application software
- 4) Test Software

All software supplied for the system designed structurally and logically, fully documented, thoroughly tested in a systematic manner such that they can achieve high quality in terms of safety, reliability, testability, traceability and maintainability.

The contractor shall ensure that no license is required to use software supplied along with the equipment and there are no restrictions attached to the use of any information supplied by the contractor which might later prevent or hinder the user from using system for viewing the video using the software.

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