

CHAPTER - VI

Video Surveillance System

6.1. Introduction:

- 6.1.1 Video Surveillance System is an important security requirement to be provided at waiting hall, railway yards, workshops, reservation counter, parking area, main entrance/ exit, platforms, foot over bridges etc. of railway station and others railway establishments to capture images of commuters & public and to carry out analysis.
- 6.1.2 Video Surveillance System mainly consist of indoor & outdoor fixed cameras, indoor & outdoor P/T/Z dome cameras, Indoor and Outdoor IP Cameras, Single/multi channel Video Encoders, video management hardware & software, Recording servers, switches, color monitor etc. for surveillance of different locations of Railway stations and other establishments from centralized location.

6.2. System Description:

- 6.2.1 Video Surveillance System shall be preferably end to end IP based with either IP cameras or single/multi channel encoders placed along with analog camera as per site requirement.
- 6.2.2 The recording of the video shall be on an open architecture, non embedded based recorder server from reputed manufacturers like IBM/HP/Dell.
- 6.2.3 The system shall be able to work on both wired as well as wireless network. The wireless network is envisaged for extreme areas like, yards, foot over bridges and any other area in the station where cabling is difficult to install and maintain.
- 6.2.4 The entire system shall be based on non proprietary open architecture where the Video Management software can work and integrate with any make of standard cameras, and IT hardware.
- 6.2.5 Video Surveillance System to be provided at stations and other railways installations shall consist of Fixed cameras / Fixed dome camera, PTZ Dome cameras, Single/multi channel Encoders, Recording Servers and PC's to view on TFT/LCD monitors and associated Ethernet cable, fiber cable, video cable, power cable, twisted pair cable etc.

- 6.2.6 It shall be possible to integrate the surveillance system using the existing LAN / WAN infrastructure on optical / microwave backbone network of Railways.
- 6.2.7 In IP based video surveillance system, the cameras shall be provided at different locations so that the output is available as ethernet and connected to the backbone to the control room.
- 6.2.8 Each camera shall have a video at 4CIF/2CIF and 25 frames and a dual stream capability such that the viewing and recording at different resolutions and frames per second are possible.
- 6.2.9 The storage shall be on a recording server which will be a standard IBM/HP/Dell/ make PC server. The recording shall be preferably stored for atleast 7 days at 4CIF/2CIF, 25 frames per second.
- 6.2.10 In small stations, the viewing and recording shall take place in different or same PC server as required by purchaser.
- 6.2.11 Possible applications of analytics software over the IP based video surveillance system, for required number of cameras for specific stations, as defined by purchaser shall include generating various type of alarms on the basis of size of object and direction of movement. etc.

6.3. General Requirements:

- 6.3.1 Original Equipment Manufacturer of Video Surveillance System shall have base and service support in all major cities of India or through authorized partners.
- 6.3.2 Manufactured products shall have quality system compliance and shall be UL and EN and FCC certified.
- 6.3.3 The Video Management software should be able to integrate any make of standard cameras. It should be preferable that all IP cameras, Encoders connected to Analog cameras and Video management software should be from the same manufacturer as all these equipments communicate directly with each other.
- 6.3.4 All the encoders, IP cameras shall be freely accessible and programmable from the control room.
- 6.3.5 It shall be possible to view any camera from the Divisional, Zonal Headquarters and from the Railway Board at the time of emergency or when ever desired.

- 6.3.6 Every control room of surveillance system shall be capable of getting connected to the optical or other communication backbone of Railways and shall be preferably air conditioned to ensure proper reliability of video surveillance system.
- 6.3.7 The power supply available at the stations shall be 230 V / 50 Hz AC +/- 10%. All modules of the surveillance system should work using this power supply only with requisite converters, if required.
- 6.3.8 All the cameras and other modules of Video Surveillance System shall be modular in construction. In case of upgradation of such modules in future, it shall be possible to upgrade them without replacing the entire modules.
- 6.3.9 All equipments in the control room shall be mounted in 19" rack and shall be kept in AC environment.
- 6.3.10 Field equipments should have minimum operating temperature of 50° C & shall be IP 66 complaint.

6.4. Technical Requirements:

- 6.4.1 IP based Video surveillance System for all type of stations should mainly consist of the following:
- i. High resolution Fixed box type color camera with vari focal lens along with housing and mount.
 - ii. High resolution Fixed Dome type color camera with lens and housing.
 - iii. P/T/Z dome color camera (day / night) with 26X Zoom lens.
 - iv. Single/multi Channel Video encoder in case IP camera is not used with each port capable of 25 frames and 4 CIF/ 2CIF resolution. This item will not be required if cameras are IP.
 - v. Wireless Transmitter/Receiver Unit for yards etc.
 - vi. 20" LCD/TFT Monitor or viewing.
 - vii. Digital keyboard for PTZ functionality.
 - viii. PC Work Station Client Station for viewing on LCD monitor.
 - ix. Server Hardware.
 - x. Network Attached Storage (NAS) / RAID Storage Device.
 - xi. RG 11 armoured video cable.
 - xii. Armoured 3 core 1.5 sq. mm power cable.
 - xii. Armoured twisted pair shielded cable.
 - xiii. Optical fiber cable.
 - xv. Access Switches.
 - xvi. Aggregation Switches.
 - xvii. UPS.

- xviii. UTP Cat-6 cable for Network etc.
- ix. Software inclusive of server software and client software for end-to-end IP based Video surveillance system.

- 6.4.2 Fixed box type cameras shall normally be provided in Parking area, Entrance/Exit, Main Entrance/Exit, platforms, yards or any other locations decided by purchaser, whereas fixed dome type cameras shall be provided In the waiting halls, ticket counters, reservation counters, offices etc.
- 6.4.3 High speed P/T/Z dome cameras shall normally be provided in platforms, foot over bridges etc. and for general perimeter surveillance.
- 6.4.4 Wireless system shall normally be used for far away locations, where cabling is difficult to be installed & maintain like yards, extreme corners of stations etc.
- 6.4.5 Video Surveillance System consisting of various items as mentioned in Para 6.4.1 shall be as per RDSO specification and schematic shown in diagram 1.

6.5. Maintenance:

- 6.5.1 Staff are to be trained for maintenance of video surveillance system by system manufacturer and system integrator during installation & commissioning of system.
- 6.5.2 Annual Maintenance Contract should be given to system integrator for proper upkeep of system.
- 6.5.3 Necessary action is to be taken to ensure uptime better than 99.5% in consultation with manufacturer of video surveillance system & system integrator.

SCHEMATIC DIAGRAM –1 OF End to End IP BASED VIDEO SURVEILLANCE SYSTEM

