

**Amendment No. 1.0 to RDSO Specification no. RDSO/SPN/TC/65/2016, Revision 4.0 for
IP Based Video Surveillance System**

1. The existing items at S. No. 4 and S. No. 31 of Table of Contents on page 4 shall be substituted as given below:-

S. No.	Items	Clause No.	Page No.
4	Technical Requirements	4.0, 4.1	8
	Technical requirements of Cloud based Architecture for Video Surveillance System	4.2	--
31	Schematic Diagram-2 of Cloud based Architecture for Video Surveillance System	29.0	45

2. The existing Clause 1.1 shall be substituted as given below :-

Clause no. 1.1:

The Specification of Video Surveillance System covers technical specification and requirement of IP based Video Surveillance Systems consisting of Fixed Box type IP colour camera, Fixed Dome type IP colour camera, P/T/Z (Pan/Tilt/Zoom) IP colour camera, Digital Keyboard, Large Format Display Monitor, PC Workstation, Server Hardware, Network Video Recorder (NVR), External Storage Device, Ethernet Switches, Wireless Transmitter/Receiver Unit, Copper to Fiber Media Convertor, Video Management Software, Video Recording Software, Graphical User Interface Client Software, Video Analytics Software, Face Recognition Software (FRS) and Cloud based Architecture for Video Surveillance System etc. for surveillance of different locations at Railway Stations and other establishments from centralized location.

3. The existing Clause 2.3 shall be substituted as given below:-

Clause No. 2.3:

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 Servers/NVRs. Servers/NVRs in turn connected to the backbone IP Network.

For Cloud based Architecture, Camera output on Ethernet shall be connected to the MPLS/ IP network through Edge devices. Cluster of stations through Edge devices shall be aggregated at nearest RPF/GRP Thana/Post through MPLS/ IP network. RPF/GRP Thana/Post in turn connected to the Cloud through MPLS/ IP network.

4. The existing Clause 2.6 shall be substituted as given below :-

Clause No. 2.6:

Tentative schematics of system implementation of IP based Video Surveillance System is shown in Diagram-1 and Diagram-2. Purchaser may adopt any other scheme of implementation as per site requirement.

Clause No.2.6 (a):

Diagram 1: It is an implementation scheme meant for Stations where Viewing, Recording, Video analytics and Face Recognition Software shall be deployed at Station on Servers/NVRs. Selected Cameras can also be monitored at Divisional HQ or at any other places on LAN/WAN or IP network.

Diagram 2: It is cloud based implementation scheme for Video Surveillance where cameras of cluster of stations shall stream video data to the nearest suitable location such as RPF/GRP Thana/Posts through MPLS/ IP network. RPF/GRP Thana/Posts in turn connected to the Cloud through MPLS/ IP network. Video Analytics and Face Recognition Software & Storage shall be deployed at the Cloud. Viewing, Monitoring and Recording of cameras for cluster of stations shall be done at RPF/GRP Thana/Posts where video streams are aggregated. Divisional HQ control rooms or any other centralized location can be connected to Cloud and MPLS/ IP network as per requirement for viewing and monitoring of selected cameras.

Clause No. 2.6 (b):

Purchaser may specify either of the schemes or combination of both scheme as indicated in schematic Diagram-1 and Diagram-2 or any other scheme of implementation as per site requirement.

5. The existing Clause 2.8 shall be substituted as given below :-

Clause no. 2.8:

The Recording shall be stored for at least 30 days at 25 FPS and Full HD resolution for Full HD Cameras and 25 FPS Ultra HD resolution for 4K UHD Cameras with H.264/H.265 Video Compression.

In case implementation is done as per Diagram-1, Video data and Alarms shall be stored for at least 30 days at Stations. In case implementation is done as per Diagram-2, Video data and Alarms shall be stored for at least 30 days (7 days where Cloud is connected) at RPF/GRP Thana/Posts.

The approximate storage capacities per Camera with H.264 Video Compression shall be as under:-

Days	Full HD Camera	4K UHD Camera
30 Days	1 TB after RAID 5/6	4 TB after RAID 5/6

6. The existing Clause 3.2 shall be substituted as given below :-

Clause No. 3.2:

The system i.e. IP cameras, NVR and Software (Video Management and Video Recording) shall be compliant to global standards ONVIF Profile ‘S’ for the interface of network video product (ONVIF – Open Network Video Interface Forum). The quoted models should appear on the ONVIF website and a confirmation certificate for the offered models to be provided for the same.

7. The existing Clause 3.5 shall be substituted as given below :-

Clause No. 3.5:

Required number of User licenses as specified by purchaser shall be provided to view a camera from required location using the network viewing management software. Licenses related compliance shall be ensured by purchaser depending upon the number of locations/ Cameras.

8. The existing Clause 3.6 shall be substituted as given below :-

Clause No. 3.6:

Vendors shall have option to quote either Server based solution or NVR based solution in accordance with Clause no. 10.0 and Clause no. 12.0 for Video Management and Video Recording or a combination of both the solutions for both the implementation schemes as per Diagram-1 & Diagram-2. Software capabilities and Storage capacities shall be same for both the solutions.

9. The existing Clause 3.9 shall be substituted as given below :-

Clause No. 3.9:

A failover Server/NVR shall be provided at Stations under Scheme-1 and at RPF/GRP Thana/Posts under Scheme-2. Failover system shall support defined number of Servers/NVRs in N : 1 configuration (Value of N to be specified by the purchaser). The failover Server/NVR shall take over the operation smoothly without any impact on the operation.

For data stored and computed at Cloud, the Cloud shall provide failover system for protection of data and operation.

10. New Clause for Cloud based Architecture for Video Surveillance System shall be added as Clause no. 4.2 below:-

Clause No. 4.2: Technical Requirements of Cloud based Architecture for Video Surveillance System:-

4.2.1 Stations shall be connected to nearest RPF/GRP Thana/Posts through MPLS/ IP network. The required bandwidth shall be calculated as per number of Full HD and 4K UHD cameras at Station.

4.2.2 For calculating bandwidth, data rate of Full HD Camera at Full HD resolution & 25 FPS shall be approximately 3 Mbps per Camera and 8 Mbps per Camera for 4K UHD Cameras at Ultra HD resolution & 25 FPS with H.264 compression.

4.2.3 There shall be Edge Devices at Stations to which cameras are connected. Edge Devices shall stream the Video data of cameras of stations to the nearest RPF/GRP Thana/Posts or any other locations through MPLS/ IP network. Subsequently, RPF/GRP Thana/Posts shall be connected to the Cloud.

The Edge Devices at stations shall also be capable of interfacing Station Cameras to the Cloud as per requirement of the purchaser.

4.2.4 The Edge Devices shall be capable of buffering the Video data and Alarms to its internal storage when connection to the MPLS/ IP network is temporarily unavailable.

When the network recovers, the data on Edge devices shall automatically be transferred to the Server/NVR installed at respective RPF/GRP Thana/Post without any impact on the system operations.

4.2.5 Server/NVR for Video management and Video Recording shall be provided at RPF/GRP Thana/Post for viewing, monitoring and recording of cameras aggregated from cluster of stations. The Video and Alarm data of minimum 30 days (7 days where Cloud is connected) shall be stored at RPF/GRP Thana/Post.

The Video and Alarms of selected cameras/locations shall also be accessible to Divisional HQ/any other centralized location or other clients through MPLS/ IP network as per requirement of purchaser for monitoring and viewing.

4.2.6 For Viewing and Monitoring of Cameras of all such stations, requisite numbers of PC Workstations and Large format display monitors shall be provided at RPF/GRP Thana/Post.

4.2.7 There may be a provision for Viewing and Monitoring of camera streams at Divisional HQ/ any other centralized location or other Clients connected to MPLS/

IP network as per requirement of purchaser. Number of Clients shall be specified by the purchaser.

4.2.8 Video Analytics and Face Recognition System & Storage shall be deployed at the Cloud. System at RPF/GRP Thana/Post shall provide video streams of requisite no. of cameras to the Cloud for running Video Analytics and Face Recognition Software.

In case VMS is required for operation of Video Analytics and Face Recognition Software at Cloud, same may be provided at Cloud or as specified by the purchaser.

All Video data and alarms generated by Video Analytics and Face Recognition Software at the Cloud shall be available at RPF/GRP Thana/Posts and Divisional HQ/ any other centralized location or any other clients through Cloud.

4.2.9 All Video data and alarms generated through Video Analytics and Face Recognition System at the Cloud & Storage shall be made available by Cloud at any point of time within last 30 days or as specified by the purchaser for post analysis.

4.2.10 Edge Device shall have the following minimum specifications or otherwise as specified by the purchaser:-

S. No.	Parameter	:	Specification
i.	Processor	:	Intel Core i7 or higher
ii.	No. of Cores	:	2 Core
iii.	Frequency	:	3.5 Ghz or higher
iv.	Cache	:	4 MB
v.	No. of Processors	:	1
vi.	Hardware Platform	:	PC
vii.	Memory	:	32 GB DDR4 or better
viii.	Operating System	:	Windows/Linux
ix.	Hard Disk Drive	:	4 TB Serial ATA or SSD
x.	LAN/ Ethernet	:	Onboard/ on slot Gigabit Ethernet (RJ45)

11. The existing Clause 10.1.2 shall be substituted as given below :-

Clause No. 10.1.2:

Server specifications for Face Recognition Software will be same as per clause no. 10.1.1 with following additional item:-

Graphic Card: One no. GPU card of NVIDIA Tesla/Quadro series or AMD Fire pro or similar.

12. New Clause 18.4.8 shall be added as below:-

Clause No. 18.4.8:

The Video Analytic Software deployed as per Schematic diagram -2, shall be seamlessly integrated with Cloud based Architecture for Video Surveillance System.

13. The existing Clause 19.20 shall be substituted as given below :-

Clause No. 19.20:

If FRS is deployed at stations as per schematic Diagram-1, the system shall support minimum 4 nos. of camera streams on Server intended for Face Recognition Software as per Clause No. 10.1 with GPU card of NVIDIA Tesla/Quadro series or AMD Fire pro or similar.

14. The existing clause 19.25 shall be substituted as below:-

Clause No. 19.25:

Clause No. 19.25 (a):

The Face Recognition Algorithm vendor should have participated in the latest NIST (National Institute of Standards and Technology, U.S. Department of Commerce), Face In Video Evaluation (FIVE) report.

Clause No. 19.25 (b):

Face Recognition Algorithm shall have False Negative Identification Rate (FNIR) with Rank-1 (R=1), shall be less than or equal to 10% in Passenger Gate dataset type (Semi Non-Cooperative) with N = 480 and less than or equal to 70% with High Near Field of view criteria in Sports Arena dataset type (Non-Cooperative) with N = 480 of latest NIST Report (Face In Video Evaluation).

15. New Clause 19.26 shall be added as below:-

Clause No. 19.26:

Face Recognition Software deployed as per Schematic diagram -2, shall be seamlessly integrated with Cloud based Architecture for Video Surveillance System.

16. New Clause No. 20.6 shall be added for licensing of Cloud based Architecture of Video Surveillance System as below:-

Clause No. 20.6:

Vendor shall clearly mention numbers of Licenses required for Video Management, Video Recording, Video Analytics and Face Recognition to work on Cloud based Architecture of Video Surveillance System depending on numbers of Cameras, number of stations and numbers of User or as per OEM's policy.

17. The existing Clause 22.1.3 shall be substituted as below:-

Clause No. 22.1.3:

Performance of each equipment/system shall be tested to ensure compliance with the requirement of relevant clauses no. 3, 4.2, 5, 6, 7, 8, 9, 10, 11,12,13,14, 15, 16, 18 and 19 of the specification.

18. New items Cloud based Architecture for Video Surveillance System and Edge Device shall be added to the list of items in Clause no. 21.5 for Acceptance Test as below:-

S. No.	Items	Clause No.
x.	Cloud based Architecture for Video Surveillance System	4.2
xi.	Edge Device	4.2.10

19. New items Cloud based Architecture for Video Surveillance System and Edge Device shall be added to the list of items in clause no. 25.1 as below:-

S. No.	Description	Clause No.	Quantity
xxi.	Cloud based Architecture for Video Surveillance System	4.2	As specified by the purchaser
xxii.	Edge Device	4.2.10	As specified by the purchaser

20. In view of modification in clause no. 3.6, the Clause no. 25.2 shall be substituted as below:-

Note: - Vendors shall have option to quote either Server based solution or NVR based solution in accordance with Clause no. 10.0 and Clause no. 12.0 for Video Management and Video Recording or a combination of both the solutions for both the implementation schemes as per Diagram-1 & Diagram-2. Software capabilities and Storage capacities shall be same for both the solutions.

If the quantities of items asked for by the purchaser do not indicate this option clearly, the vendor may quote for equivalent quantities on his own for either of the above mentioned two solutions, or a combination of both.

21. **Clause No. 29** : Schematic Diagram-2 of Video Surveillance System (VSS) Network of Distributed Architecture at Stations shall be substituted with "Cloud based Architecture for Video Surveillance System" as below:-

29.0 Schematic Diagram – 2 : Cloud based Architecture for Video Surveillance System

