

	TP SOUTHERN ODISHA DISTRIBUTION LIMITED, BERHAMPUR		
	TECHNICAL SPECIFICATION		
Doc. Title	Specification of Security Surveillance System with CCTV Cameras		
Doc. No	SC-SSS-1	Eff. Date: 22/07/2025	
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1. SCOPE

1.1 Introduction: - Present System Architecture

TPSODL has already established a centralized Video Management System (VMS) and Video Analytics (VA) infrastructure for 40 PSS at its Control Centre, which is operational and managing surveillance across various field locations.

1.1.1 Central Control Infrastructure:

The existing central setup comprises the following server infrastructure:

Function	Server Model	Platform	Purpose
Video Management System	HPE ProLiant DL385 Gen10 Plus v2	Windows OS	Centralized VMS Server
Video Analytics	HPE ProLiant DL360 Gen10 Plus	Linux OS	Centralized VA Server

1.1.2 Software Stack:

Component	Software Name	Make/Model
VMS	SteriEYE	Vehant
VA	OKEAN	Vehant

- The VMS and VA systems are fully integrated and handle real-time video surveillance, storage, and automated analytics.
- Both servers are hosted in a secured environment at TPSODL Data Centre.

1.1.3 Connected Field Sites:

- 40 PSS (Primary Substations) are already integrated into the centralized VMS and VA system.
- These sites stream live video feeds to the Security Control Centre and generate real-time alerts using video analytics (Intrusion, Fire, Smoke, PPE violation, Face Recognition etc.).
- Communication between field locations and the Control Centre is established through secured IP-based networking infrastructure.

1.2 Scope of Work

TPSODL plans to expand its CCTV-based Security Surveillance System across its operational areas, in continuation of its efforts to enhance the visibility and security of remotely monitored Primary Sub-Stations (PSS), Customer Relationship Centres (CRC), and Stores,

This expansion includes:

- Part-A: 40 additional PSS**
- Part-B: 10 CRC locations**
- Part-C: 4 open-space Stores**

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These facilities are geographically distributed across six Circles Berhampur City, Berhampur, Aska, Bhanjanagar, Rayagada, Jeypore. Together, these circles span approximately 48,000 square kilometres.

All PSS sites will be monitored centrally via the existing Security Control Centre established at Ambagada, Berhampur City, while CRC and Store locations will have local monitoring setups with future readiness for integration into the central system.

1.2.1 Part-A: Surveillance System for Additional 40 PSS

This specification will be applicable for 40 number existing / renovated PSS. The project is proposed to be implemented for these PSS (33/11 kV) in March-2026 as per the scope mentioned. The connectivity from PSS to the security control room and Data Centre is in the scope of the owner, however, the required design of the offered system for connectivity on various medias mentioned above and cabling / accessories inside PSS as well as inside Security Control Room and Data Centre shall be in bidder's scope.

This document covers the specific requirements for complete design, demo of the system with offered equipment at Owner's premises, detailed engineering, manufacture, inspection & testing at supplier's works, packing, transportation, loading and unloading, delivery to site, storage at site, handling at site, erection, testing, commissioning, performance testing and handing over of Security Surveillance System.

All equipment, system and services covered under this specification shall comply with all current applicable statutory regulations and safety codes in the locality where the equipment is proposed to be installed. The equipment and systems shall also conform to the latest version of applicable codes and standards on the date of offer made by the Bidder unless otherwise indicated. Nothing in this specification shall be construed to relieve the Bidder of this responsibility.

Bidder to note that the proposed solution shall give more emphasis on the following aspects

- Reliability
- High Availability
- Cyber Security Resilience

The bidder's broad scope includes design, engineering, material selection, manufacturing, inspection & testing at Vendor's and/or Sub-Vendor's works, packing for shipment and delivery, unloading & storage at site, unpacking & transportation to location, erection including civil works, testing & commissioning and handing over of Security Surveillance system as defined in the subsequent sections of this specification document.

The system offered shall be state-of-the-art, of proven design for the intended application and conform to high standards of design and manufacture. The offered system shall be complete in all respects and any items, accessories etc. necessary to make the system complete is included in the scope of supply.

The specific scope requirements are detailed below-

Security Surveillance System shall be provided for security and surveillance of periphery and equipment monitoring for operations purpose.

Scope of Security Surveillance system includes the following-

- Integration and expansion of Video Management system (VMS) and Video Analytics Platform
- Networking (Local area network) at each new PSS for camera and NVR/LPU
- Additional Servers for VMS and VA in existing racks in TPSODL Data Centre at STPI, Berhampur
- Workstations to be installed at Security Control Room at Ambagada, Berhampur.
- Power supply, cabling and earthing at each PSS, for CCTV-Pole and Control Room for new IT Infra
- Support structures, brackets, junction box etc. for camera & equipment mounting
- Training for identified persons (Safety and IT Team of TPSODL)-20 days
- Manufacturers Authorization Certificate for providing service support to the major components.
- Undertaking from OEM: Installation and Commissioning under OEM supervision
- Cable laying and Integration of UPS monitoring data to existing RTU installed at respective PSS. Data

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Integration in RTU will be done by TPSODL.

- An experienced network engineer from the bidder's side shall remain available at the site until the successful completion and handover of the project.
- **On-Site Support and Internet Provisioning:**

For any configuration, integration, or commissioning activities related to cameras, NVRs, VMS servers, VA servers, LPU's, VMS software, VA software, and associated components, the concerned personnel from both the bidder and the OEM shall be physically present at the site until the system is successfully commissioned and one month of error free operation before final handover is completed. In case any online support is required for purposes such as patch updates or firmware upgrades, the bidder shall arrange the necessary internet connectivity at their own cost and responsibility.

Bidder is strongly advised to visit and examine the existing site infrastructure and other facilities and obtain all information for themselves on their own responsibility that may be necessary for preparing the Bid and entering into the contract for the package. The price bid by the bidder will be construed as the evidence that the bidder has examined the site conditions in detail and Bidder shall not raise later any claims / disputes for any additional price or extension of contractual time for completion against the Owner.

Bids shall be evaluated technically based on the following, else will be liable for rejection:

1. **Adherence to Technical Specifications of one of the Following Options:**

A. **Option 1:**

Ensure compatibility with the existing VMS and VA platforms.

B. **Option 2:**

Replace the existing VMS and VA platforms while ensuring full functionality of the current system, including:

- Integration of the already connected 40 PSS
- Seamless integration and support for the upcoming 40 new PSS

2. Adherence to scope of work
3. Deviations from the specifications
4. Submission of bid with all the details asked in the tender
5. Technical Demo with all required functionalities for both the options including compatibility check with existing VA/VMS.

1.2.2 Part-B: Surveillance for CRC Locations

TPSODL intends to deploy dome cameras across various Customer Relationship Centre (CRC) office locations. The scope includes the supply, installation, testing, and commissioning of dome cameras with the following requirements:

a) **Site-wise Local Monitoring & Storage:**

- Each location must have the capability for local live monitoring of camera feeds.
- A minimum of 90 days local storage (with appropriate memory backup/NVR solution) for video recording must be ensured.

b) **Centralized Viewing & Control:**

- Though current deployment is decentralized, the system must be future-ready to integrate with a Central Data Centre for consolidated monitoring and control.

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- Provision must exist for remote viewing (both live and recorded video) from a central location through Laptop/Desktop/TV via secured access.
- The system should support simultaneous multi-location camera viewing and data download capability from the central control point.

c) **System Compatibility:**

- All newly installed cameras and related equipment must be compatible with the existing TPSODL CCTV platform/application (please refer to existing make/model as mentioned earlier).

d) **General Requirements:**

- The bidder shall ensure proper integration, configuration, testing, and handover of the solution.
- All required accessories, cabling, connectors, mounting hardware, and network configurations should be included in the bidder's scope.

e) **Locations:**

SL	CRC LOCATION	COUNT OF CCTV CAMERA	CRC ADDRESS
1	ASKA	4	Taluka Road, Near ASKA PSS, ASKA, PIN- 761110
2	HINJLICUT	5	Canel Road, Infront of Fish market, Hinjlicut, PIN-761102
3	PARALAKHEMUNDI	3	CRC,TPSODL,Paralakhemundi,Stadium Road,Near RTO,Gajapati, PIN-761200
4	RAYAGADA	4	CRC,TPSODL,Gandhi Nagar ,Infront Of District Labour Office,Rayagada, PIN-765001
5	JEYPORE	4	CRC, TPSODL,Powerhouse Chowk, Infront of SE, Electrical Office ,Jeypore, PIN- 764001
6	MALKANGIRI	3	Sub-Collector office Road, Near Electric office, infront of Daily market, Malkangiri, PIN-764045
7	Koraput	3	Sud division Office ,Koraput, paraja street(764020)
8	Umerkote	3	Will be provided to the successful bidder
9	Phulbani	3	Will be provided to the successful bidder
10	Boudh	3	Will be provided to the successful bidder

1.2.3 Part-C: Surveillance for Open-Space Stores

TPSODL intends to deploy a comprehensive CCTV surveillance system at its open-space store, covering both outdoor areas and indoor store rooms. The system shall use Bullet, PTZ, and Dome cameras to ensure complete coverage. The system must also be compatible for future integration with the existing VMS and VA platforms already running at TPSODL.

a) **System Objective:**

To establish a CCTV system that provides:

- Reliable monitoring of open space, assets, and periphery

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- High-quality video footage (day and night)
- Scalable architecture allowing integration into central Video Management System (VMS) and Video Analytics (VA) platforms

b) Recording & Storage:

- NVR-based storage with capacity to retain 90 days of video for all cameras
- Local storage with remote playback and export capability
- RAID support preferred for data protection

c) Monitoring & Access:

- Real-time monitoring from the store control room
- Facility for remote access via secure connection (Laptop/Desktop/Mobile)
- HDMI/TV output from NVR for local display
- User-based access rights to ensure data security

d) Power & Networking Infrastructure:

- Power supply, network cabling (Cat6/optical fiber), junction boxes, poles, mounting kits etc. included in bidder's scope
- Switches (managed/unmanaged as needed), PoE injectors/adapters
- All Poles, cameras and equipment must have surge protection and earthing

e) Integration Requirement:

- The existing VMS and VA systems are already operational at TPSODL.
- While this system will run locally for now, all cameras and NVRs must be compatible and scalable for future integration into the central system.
- Any integration-related configuration required in future must be supported by the bidder without major changes in hardware.
- Exact site layout, camera positioning, and mounting point information will be provided to the successful bidder during the site survey phase.

f) Location Details:

- Bhanjanagar
- Phulbani
- Rayagada
- Taratarini-Berhampur Scrap Store

g) Bidder's Scope:

- Complete end-to-end responsibility: site survey, design, supply, installation, testing, commissioning, documentation, and training
- Ensure proper cable routing, camera angles, pole installation, and weather protection.

h) Cable Routing Requirements:

- Primary cable routing shall be through existing cable trenches wherever available.

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- Wherever existing trenches are not available, the bidder must carry out manual trenching/digging as per site requirement.
- Cables in manually dug routes must be laid with proper mechanical protection such as HDPE conduit, GI pipe, or RCC hume pipe, based on local condition.
- The supply, transportation, and laying of HDPE conduit, GI pipe, or RCC hume pipe is entirely in the bidder's scope. The final quantity and type of protective material to be used will be finalized during the site survey and detailed engineering in consultation with TPSODL's site-in-charge.
- Cable laying must follow safe routing practices, ensuring protection from physical damage, waterlogging, and electrical interference.
- Final routing plan shall be approved by TPSODL site-in-charge before execution.

i) Cable Route Markers:

Route markers shall be installed along the entire Optical Fiber Cable (OFC)/Power cable route to clearly indicate the cable path. Markers shall be placed at:

- Every change in direction
- Every 10 meters on straight runs
- At joints/splice points
- At road crossings and entry/exit points of buildings

Markers shall be made of durable, weather-resistant materials, clearly labelled with relevant cable information, and fixed firmly in the ground for long-term visibility and maintenance reference.

2. APPLICABLE STANDARDS

The design, manufacture and performance of the Security Surveillance System shall comply with all the requirements of the latest editions of international codes and standards applicable. Given below are the acceptable code and standards. The Bidder shall take Owners approval for use of other codes & standards. Nothing in this specification shall be construed to relieve the Bidder of his responsibility.

Standards		
1	IS: 9000	Basic environmental testing procedures for electronic and electrical items.
2	IS: 5572	Classification of Hazardous Areas for Electrical Installations
3	IS: 8130	Conductors for insulated electrical cables and flexible cords.
4	IS: 2148	Flame proof enclosure for electrical apparatus.
5	ANSI C 39.5 - 1974	ANSI C 39.5 - 1974 Safety requirements for electrical & electronic measuring and controlling instruments.
6	IEEE - 802.3 - 1988	Standard for Local Area Networks: Carrier Sense Multiple Access with collision detection CSMA-CD and Supplements
7	NEMA Ics Part-6-1978 (with Rev.14/80)	Types of Enclosures
8	VDE: 0815	Wiring cables for telecommunication and information processing system

If standards are not existing for any equipment or system, such equipment or system shall comply with the applicable recommended practices of the following professional institutes and established good engineering practice

- Institute of Electrical and Electronic Engineers (IEEE)
- Instrument Society of America (ISA).
- American National Standards Institute (ANSI)

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- d. Deutsche Industries Norman (DIN)
- e. International Electrotechnical Commission (IEC)
- f. Verint Deutschar Eisechnhuttenleute (VDE)
- g. Indian standard Institute (IS)
- h. All applicable laws in India

Wherever, new standards and revisions are issued during the period of the contract, the Bidder shall attempt to comply with such standards, provided there is no additional financial implication to Purchaser. In the event of the bidder offers to supply material and/or equipment in compliance to any standard other than those listed herein, the bidder shall include with their proposal, full salient characteristics of the new standard for comparison.

2.1 CYBER SECURITY REQUIREMENT

Category	Cyber Security Consideration
Authentication/Authorization	OEM/Partner/Vendor to ensure that any access requiring authentication requires strong passwords.
	OEM/Partner/Vendor to ensure that user roles can be properly segregated in multi-user environments (RBAC).
	OEM/Partner/Vendor to ensure that supplied solution supports password expiration after a specific period.
	OEM/Partner/Vendor to ensure the availability of option to change the default username and password.
	OEM/Partner/Vendor to ensure the supplied solution complies with TPSODL Password Policy.
	OEM/Partner/Vendor to share list of its personnel's having access to data and shall review the list on quarterly basis. For any changes, the updated list shall be shared with TPSODL.
	OEM/Partner/Vendor to ensure supplied solution supports Lockout Duration After Failed Logins attempt.
Transport Encryption	OEM/Partner/Vendor to ensure all communication between system components is encrypted
	OEM/Partner/Vendor to ensure SSL/TLS implementations are up to date and properly configured
Data at Rest	OEM/Partner/Vendor to ensure local data is properly protected using encryption at rest. OEM/Partner/Vendor to share details of encryption used.
Security Configurability	OEM/Partner/Vendor to ensure secure logging is available for security events. Also, logs are maintained for a period of 180 days.
	OEM/Partner/Vendor to ensure alerts and notifications are available to the user for security events
	OEM/Partner/Vendor to ensure integration of logs with inhouse SIEM of TPSODL.
Physical Security	OEM/Partner/Vendor to ensure that the product has the ability to disable external ports such as USB
Network Architecture	OEM/Partner/Vendor to share the updated network architecture for proposed solution and review it at-least once a year.
System Hardening	OEM/Partner/Vendor to share hardening document for proposed solution.
	OEM/Partner/Vendor to ensure only secured ports and services are used.
	OEM/Partner/Vendor to enable only the necessary policies and disable any unused or redundant policy layers/rules to minimize the attack surface and reduce complexity in the firewall configuration.

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	Configure reliable internal/external NTP servers.
	Integrate RADIUS or TACACS+ with Check Point FMS authentication and enable the settings
Disposal	OEM/Partner/Vendor to work with TPSODL to destroy or erase data stored to prevent unauthorized retrieval of sensitive data.
	OEM/Partner/Vendor to provide Undertaking on Deletion of Data or any information withheld as part of engagement post completion of project.
Asset Identification	OEM/Partner/Vendor to share list of all the assets installed as part of the proposed solution (HBOM and SBOM).
Contingency Plan	OEM/Partner/Vendor to share the Disaster Recovery/Business Continuity Plan for the proposed solution.
	OEM/Partner/Vendor to ensure availability of necessary spares to meet RPO of 15 mins and RTO of 4 hours.
Vulnerability Assessment & Penetration Testing	1. OEM/Partner/Vendor to conduct VAPT of the supplied solution from a 3rd party CERT-In empaneled security auditor (once annually) and submit necessary reports to TPSODL and subsequently conduct confirmatory testing.
	Scope of VAPT Testing shall include but not stay limited to:
	Configuration and rule-based review: Server of each type including workstation
	Web services and interface Assessment
	Configuration and rule-based review: Field Devices of each type
	Grey-box Testing of Application and database
	2. OEM/Partner/Vendor shall also extend full support in closure of vulnerabilities as part of audit/assessments conducted due to statutory & regulatory requirements for compliance purpose during the course of project.
Cyber Security Incident Documentation	OEM/Partner/Vendor team to work with TPSODL team for capturing of necessary artefacts, forensic data, sequence of events, Root Cause Analysis, etc. related to all cyber security incidents.
Systems Security Management	OEM/Partner/Vendor shall ensure implementation of security patches, cumulative service packs, releases, and version upgrades of applications during the course of project cycle.
	All upgrades and patches shall be implemented at no extra cost to TPSODL.
	OEM/Partner/Vendor to document and implement a process for the update of anti-virus and malware prevention signatures. The process must address testing and installing the signatures.
	OEM/Partner/Vendor shall submit status of upgrades and patches applied on monthly basis to TPSODL.
Countries of Prior Reference	OEM/Partner/Vendor to ensure products from Countries of prior Reference shall not be part of proposed solution.
Audit and Compliance	OEM/Partner/Vendor to ensure proposed solution complies with ISO 27001, ISO 27017 framework & CEA guideline and shall submit necessary artefacts in this regard.
	Partner shall also participate with TPSODL in providing necessary artefacts, evidences, data etc. as & when required as part of internal and external audit requirements.
Change Management	OEM/Partner/Vendor to ensure all changes post production in the supplied solution are captured and records of the same are shared with TPSODL as & when required.

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Posting of data on Public Forum	OEM/Partner/Vendor shall refrain from posting any data regarding the existing project on public forums without written consent from TSODL.
NDA	OEM/Partner/Vendor shall ensure availability of NDA prior to transitioning system to Production environment.

3. BIDDER'S QUALIFYING REQUIREMENTS

Bidder's evaluation / assessment shall inter-alia include

- Bidders work / manufacturing facilities
- Manufacturing capacity, details of works executed.
- Details of plant and machinery, manufacturing and testing facilities.
- Past experience and performance, certificate need to be submitted.
- Customer feedback;

Bidder shall submit proof of all the above with the bid, else may be rejected by the owner.

Security Surveillance bidder must meet all of the following qualifying criteria:

- The Bidder shall be either manufacturer of critical components or shall be a manufacturer's authorised system integrator of the Security surveillance system specified in this document. In latter case, the bidder shall give backup guarantee from the OEM for satisfactory performance as specified in this document.
- The bidder should have implemented Security surveillance system of similar type and complexity at 3 nos. industrial/commercial/health/educational sites at least in the last 5 years including integration with third party systems such as video management system, command & control, various field devices, etc. and shall be in continuous trouble-free operation for at least last 1 year.
- Bidder must have experience to deploy IP based CCTV Surveillance System with minimum 250 nos. IP cameras in a Server/VMS based system with Video Analytics in a single order in last seven years. Copy of Work Order and Copy of Completion Certificate / Final Acceptance Test Certificate from the client are to be submitted.
- For future expansion, the surveillance system should be independent of camera make and shall support at least 10 different makes of camera. (List of Supported Camera Makes to be submitted by the bidder)
- CCTV OEM should have direct presence in India since last 5 Years. Documentary evidence to be submitted. Bidder shall have the capability to integrate the new Security Surveillance system being offered.
- Bidder Should have ISO - 9001, 14001, 27001 Certification. Certificate should be attached.
- For Offered Cameras, the bidder shall submit the STQC approved compliance report.

4. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150 cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m

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8	Wind Speed	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	Equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (gbeing acceleration due to gravity)

TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed as high as 300 Kmph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

5. DESIGN REQUIREMENTS

Part-A: Surveillance System for Additional 40 PSS

This section details the design requirements to be applied for proposed Security Surveillance system

Design requirements of overall Security Surveillance system

Security Surveillance system shall be designed in such a way that the existing integrated Control Room Security system (VMS and VA platform) to be expanded and to other new PSS locations consisting of Dome and Bullet cameras, Video Management software (VMS) camera license and Video Analytics license. Necessary NVR/Local Processing Unit (LPU) and local networks (interconnected through cables, network components, servers, work stations etc.) shall be considered to meet the system requirement and overall compatibility.

Following design criteria shall be considered while designing the Security Surveillance system-

1. The system shall be flexible and user-friendly for operation by security personnel.
2. The system shall be designed to provide real time monitoring of events & alerts (both Picture and Video format), logging and historization with MIS reporting. The monitoring shall include all components of the offered system.
3. Workstation based Graphical User Interfaces (GUIs) shall be provided for real time monitoring and operations in security cabin at main gate and operation control room displaying real time & historical information, alerts, video feeds etc. of all the subsystems of the offered Security Surveillance systems.
4. All critical components of the proposed Security Surveillance system shall have self-diagnostic feature to detect failures/abnormalities etc. All such conditions shall be displayed in real time on the respective GUIs in security cabin and main control room.
5. System shall be designed to take care of fail-safe requirements during emergency conditions.
6. All computers supplied as a part of this specification shall be workstation grade suitable for 24x7 operations
7. Operating System shall be based on latest version of applicable Windows OS for both Workstations and Servers
8. The VMS & VA application software shall be from the same OEM or different OEM as per the following condition

A. Option 1: For Same OEM

Ensure compatibility with the existing VMS and VA platforms.

B. Option 2: For different OEM

Replace the existing VMS and VA platforms while ensuring full functionality of the current system, including:

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- Integration of the already connected 40 PSS
 - Seamless integration and support for the upcoming 40 new PSS
9. Alerts shall be categorised in to at least three priority levels and shall be user configurable.
 10. Every alert shall appear on the operating display in a chronological way based on priority. It shall be possible to acknowledge and reset the alerts by the operator based on the pre-set criteria.
 11. Operator screens shall be based on graphical schematics with visualisation using maps and situational awareness. All such schematics shall be user configurable.

Design requirements of Video Management System (VMS) & Video Analytics Platform

Design and selection of VMS & VA components shall be based on following criteria

1. Proposed Video Management System (VMS) & VA software
 - A. Option-1: Shall be from same existing OEM with additional license as per this tender bill of material.
 - B. Option-2: The proposed VMS and VA software shall be from a different OEM, with licenses as per the tender BoM, including additional licenses required to integrate the already installed systems.
2. Power over Ethernet (PoE) shall be the default mode of supplying power to the cameras for cable distances not exceeding 80 meters, else fibre optic cable shall be considered for video transmission along with necessary media converters and separate power supply arrangements.
3. Indoor or outdoor cable laying shall be secured at 300mm below the floor level.
4. All the active components of the VMS such as cameras, switches, servers etc. shall be powered through UPS power supply. UPS along with batteries shall be housed in a perforated / ventilated enclosure.
5. All outdoor components such as network switches, power supply unit, media converters, camera etc. shall be compliant to IP67.
6. Camera shall be provided for monitoring, recording and alert generation for
 - a. All operational areas such as open switchyard, panel rooms, ACDB/DCDB rooms, etc. general surveillance purpose
 - b. New cameras shall be included with Server based VA license to detect Human and Vehicles entering from gate
 - c. Server based Face recognition software license for min 100 people/camera with the system
 - d. Server based VA license to detect the Personal Protective Equipment-PPE Kit such as Helmet, Gloves, Safety Shoes etc.
 - e. Server based VA license to monitor digital fences for Perimeter Intrusion detection
 - f. Server based VA license for detection of fire or smoke in outdoor switchyard
7. Live feed from operational cameras shall be made available in the Security Control Room VMS and VA platform over the network provided by TPSODL.
8. Camera locations shall be selected in such a way that the entire/major part of premises shall be covered without any blind spots. Bidder shall provide the necessary documentation to demonstrate.
9. The distance between two cameras for perimeter monitoring shall not exceed 40 meters.
10. The location of the camera and their field of view shall be coordinated with the lighting layout such that field of view of camera is well lit and there shall be no lighting glare on camera lens.
11. Mail / SMS notification to the concerned in the event of any alert.
12. NVR/LPU at each PSS shall store the video feed recording data for 30 days and the VA system at Security Control Room/PSS LPU shall store the data and alerts for 30 days.
13. A Local Processing Unit (LPU) shall be proposed at each PSS for on-site video analytics processing. The LPU will transmit analytics data to the Central Video Analytics (VA) platform. In the event of network unavailability, the LPU will store the analytics transaction data locally and automatically push

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it to the Central VA platform once the network connection is restored.

14. The NVR/LPU shall have the provision to get connected to a standard monitor to show the data in case of any disruption of connectivity between PSS and the Security Control Room.
15. Earthing shall be done for all CCTV mounting poles without exception.
16. The laying, splicing, and all related works of the Optical Fiber Cable (OFC) shall be in the scope of the bidder.
17. The laying and all related works of the Armoured Cat-6 Cable shall be in the scope of the bidder.
18. Wherever a suitable trench is available, the OFC/ Cat-6 cable shall be laid within the existing trench.
19. In locations where trenching is required, the bidder shall carry out digging up to a depth of 1.5 meters.
20. The OFC/ CAT-6 cable shall be properly covered using GI pipes or HDPE/HDPP pipes, as per site requirements, to ensure mechanical protection.

Design requirements of Networking

1. The network shall be designed in such a way that it shall tolerate single point failures to avoid total shut down.
2. The network shall be designed to have provisions of minimum 50% spare bandwidth under worst loading scenario while all components are connected and are operating normally.

LAYOUT REQUIREMENTS

3. The Security Surveillance system design shall meet the requirements on the finalised Substation layouts.
4. Bidder shall submit the BOQ and layout drawings to suitably design the overall layout for installation of the system indicating location of Cameras, power source, NVR, local storage etc.

Part-B: Surveillance for CRC Locations

The security surveillance system at the Control Room Complex (CRC) shall be designed to ensure complete coverage of all critical indoor and immediate outdoor areas using only dome cameras, with monitoring and recording done locally within the CRC premises.

- IP-based dome cameras shall be installed to cover indoor areas.
- Where necessary, weatherproof dome cameras shall be used for limited outdoor coverage such as entry gates and immediate perimeter zones.

Following design criteria shall be considered while designing the Security Surveillance system-

1. All cameras shall be high-resolution, IP-based, and suitable for their specific installation environment (indoor/outdoor).
2. Camera feeds shall be recorded on a Network Video Recorder (NVR) installed inside the security cabin located within the CRC.
3. Live monitoring shall be carried out locally from the security cabin using display monitors connected to the NVR.
4. All necessary equipment including network switches, power adapters, display units, and mounting accessories shall be installed inside the security cabin for centralized operation.
5. The system shall support 24x7 recording with a minimum of 30 days storage capacity.
6. Though current deployment is decentralized, the system must be future-ready to integrate with a Central Data Centre for consolidated monitoring and control.
7. Provision must exist for remote viewing (both live and recorded video) from a central location through Laptop/Desktop/TV via secured access.

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8. The system should support simultaneous multi-location camera viewing and data download capability from the central control point.
9. Earthing shall be done for all CCTV mounting poles without exception

Part-C: Surveillance for Open-Space Stores

The security surveillance system for the open store shall be designed to ensure comprehensive coverage of the entire premises, including entry/exit points, peripheral boundaries, material stacking zones, and other critical areas.

- **Bullet Cameras** shall be installed to provide fixed, high-resolution views of designated areas such as entry gates, boundary walls, and storage sections.
- **PTZ (Pan-Tilt-Zoom) Cameras** shall be strategically positioned to enable dynamic monitoring of wide areas, with capabilities for manual or auto-patrolling, zoom-in on activities, and tracking of intrusions or unauthorized movements.

The system shall be designed for 24x7 monitoring with the following provisions:

1. All cameras shall be IP-based and suitable for outdoor installation with appropriate weatherproof.
2. The video feed from all cameras shall be recorded continuously on an NVR with minimum 180 days of storage capacity.
3. Network switches, power supplies, and required accessories shall be installed inside the dedicated security cabin.
4. Display monitors for live viewing shall be provided at the security cabin for real-time surveillance.
5. The system shall be scalable and compatible with the proposed Video Management System (VMS).
6. Earthing shall be done for all CCTV mounting poles without exception.
7. The laying, splicing, and all related works of the Optical Fiber Cable (OFC) shall be in the scope of the bidder.
8. The laying and all related works of the Armoured Cat-6 Cable shall be in the scope of the bidder.
9. Wherever a suitable trench is available, the OFC/ Cat-6 cable shall be laid within the existing trench.
10. In locations where trenching is not available, the bidder shall carry out digging up to a depth of 1.5 meters for laying the cable with HDPE/ GI pipe as required.
11. The OFC/ CAT-6 cable shall be properly covered using GI pipes or HDPE/HDPP pipes, as per site requirements, to ensure mechanical protection.

6. OPERATION AND MAINTENACE REQUIRMENTS

Real time monitoring of Security Surveillance alerts and live video stream is proposed from Security Control Room for security and operational monitoring of entire Primary Substation. Workstation based Graphical User Interfaces (GUIs) are proposed for achieving the purpose. It shall be possible to retrieve historical data in video clips from these stations for post event analysis.

The system shall be easy and user-friendly suitable for operation by security personnel. System shall have fail-safe features for emergency conditions.

Bidder shall provide facilities for carrying out online and offline maintenance of the components supplied as a part of the system. In general, this should include adequate testing equipment, tools, safety devices and other accessories. Bidder shall provide the details in their bid.

Upgrades & Modifications

Bidder shall continuously keep the Owner informed of all Software and Hardware upgrades as & when these

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are released. Bidder shall provide end of life support for minimum 10 years for the system, even if no upgrades are implemented. The system referred above includes Bidder's own as well as third party components.

Training

The Bidder shall include in his offer, training for Owner engineers. The training shall cover development, integration, installation and commissioning of both software & hardware components of the system. Bidder to consider 20 man-days training for Owner's personnel.

The Bidder shall provide Classroom as well as hands-on training on the system. All required training materials such as system catalogues, test instruments, demo equipment and simulation jigs, etc. shall be provided by the Bidder. The training shall equip the Owner's engineers for installation, commissioning, operation and post-warranty maintenance of hardware, software (Operating System, Administration and Applications), protocols and all third-party systems.

All clauses related to Transport, Lodging & Boarding, Local transport for Owner's personnel etc. shall be as per the defined terms and condition in the GCC. Bidder shall indicate their Training facilities including test tools and simulation facilities. Bidder shall provide the training calendar & details of topics considered for the equipment offered.

Training Requirement

Bidder shall provide training to the Owner's personnel on the operation and maintenance of the system supplied.

General requirements relating to the training are specified below:

- Personnel who speak understandable English and Hindi and who are experienced instructors shall conduct training courses.
- Bidder shall provide all necessary training material. Each trainee shall receive individual copies of the technical manuals and pertinent documents.
- The Owner shall be permitted to video tape all training classes.
- Class materials, including documents sent before the training classes and class handouts, shall become the Owner's property. The Owner may copy this material for in-house training and use only.
- Training sessions shall accommodate the number of candidates as per the contract.

7. TECHNICAL REQUIREMENTS OF EQUIPMENT FOR PSS

Detailed technical requirements of major components of the Security Surveillance system are described below.

Video Management system (VMS) & Video Analytics (VA) Platform

Existing VMS & VA Platform is located at Security Control Room of TPSODL, however, storage of the video streams for existing PSS is being stored locally at Substation NVR/LPU and live feed being streamed to Security Control Room from remote PSS location as per the demand.

The project scope system to be supplied includes IP based cameras along with necessary licenses, NVRs, mounting arrangements, poles, brackets, cables etc. Power over Ethernet (PoE) shall be the default mode of supplying power to the cameras for cable distances not exceeding 80 meters, else fiber optic cable shall be considered for video transmission along with necessary media converters and separate power supply arrangements. All the cameras shall be powered through UPS power supply. All outdoor components such as outdoor unit (ODU), power supply unit, media converters, camera etc. shall be compliant to IP67.

Components for the VMS & VA shall meet the following minimum technical requirements, refer the data sheet table.

- Fixed Indoor/ outdoor Camera
- Networking Requirements:
 - Network switches
 - FOP cable
- Server requirements (Additional Server Core at SCR/LPU at PSS)
- Workstation
- Power supply, cable and earthing requirements.

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6. All accessories including notice boards (you are under CCTV surveillance) is in bidder's scope at each PSS as well as at Security Control Room.

Requirements including connectivity

1. The entire system shall be capable to work over standard wired and wireless Local Area Network (LAN) as well as Wide Area Network over IP-MPLS / VSAT connectivity.
2. Each of the components of the system shall be designed for robustness and reliability having a high MTBF (Bidder to indicate the MTBF).
3. The entire system shall use latest state-of-the-art advanced technologies and shall have a guaranteed life span and support commitment in terms of spares and service for 10 years of end of life support. All the components offered as a part of the system shall be of the latest version and shall not be nearing end of life before 10 years from the date of award of contract. Bidder need to certify that the equipment being/quoted is the latest model and that spares for the equipment will be available for a period of at least 10 years and also guarantee that they will keep the TPSODL informed of any update of the equipment over a period of 10 years.
4. The Bidder shall submit a detailed techno-commercial proposal that should provide full technical details of each and every sub-system as well as devices proposed to be used within the system along with the make, model and technical data sheets. All devices should conform to international standards such as UL, ULC, FM, etc.
5. Overall system architecture should be provided clearly highlighting details of each and every component as well as its linkage to the rest of the system along with communication methodology.
6. The Bidder shall elaborate in full detail all the redundancies at various levels e.g. device, application, network, etc. designed into the whole system and explain this in a separate section.
7. Bidder shall include dashboards / reports configuration as per owner's requirements.
8. Monitoring of camera connectivity shall be possible.

8. QUALITY REQUIREMENTS, TECHNICAL DEMO & TESTING

QUALITY REQUIREMENTS

Bidder shall submit the following information along with the Technical Bid and project specific document after award of contract.

Quality Assurance Plan (QAP), Manufacturing Quality Plan (MQP), Field Quality Plan (FQP). To ensure that a well-engineered and contractually compliant system is produced. Vendor shall adhere to a quality assurance program for the preparation of all contract deliverables, which includes hardware, software and documentation. The program shall provide for early detection of actual or potential deficiencies, timely and effective corrective action, and a method of tracking all such deficiencies.

TECHNICAL DEMO SET UP AT OWNER'S PREMISES

1. Technical Demo Setup

The Bidder should arrange the components as quoted in the proposal for the demo setup at Owner's premises to showcase the features as per the specification requirements and evaluation criteria. The make & model should be same as per the bid proposal unless & otherwise specified, this means if the model numbers of all components do not meet as per the proposal, the bid is liable for rejection.

NOTE:

- a) The place & date of Demo shall be intimated at least 7 days in advance so as to make necessary arrangements.
- b) The Bidder responsibility to arrange the necessary equipment / components that are

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required for the completion of Demo.

- c) The proposed solution should include the quality aspects like user friendliness, secure, interoperability, modifiability, integrity and extensibility, maintainability, scalability and modularity etc.,
- d) It is the bidder responsibility to handover the recorded video stream of complete Demo to the Owner at the end of Demo.
- e) The Owner may provide use cases to the qualified bidders at the time of Demo in addition to the bidder's use cases.

TEST PROCEDURE

Factory Acceptance Test (FAT)

The Vendor shall submit a test specification for factory acceptance test (FAT) and commissioning tests of the Security Surveillance System for owner's approval. Vendor to submit the type test certificates, pre-FAT testing reports and document before the start of FAT at Vendor's works. The manufacturing phase of the Security Surveillance shall be concluded by the factory acceptance test (FAT) of hardware, software and components in an integrated way.

The general philosophy shall be to deliver a system to site only after it has been thoroughly tested and its specified performance has been verified, as far as site conditions can be simulated in a test lab.

Commissioning

The commissioning of the system (hardware and software) including Site Acceptance Test and one-month Trouble-free Operation post handing over shall be the responsibility of vendor. Development and customization of all software components shall be in Bidder's scope.

Adequate number of competent engineers (Hardware & Software) as approved by Owner shall be posted at site during the entire period of installation & commissioning. In addition, telecom specialists shall be deputed to site for establishing communication systems.

- a. Daily site work shall be planned and executed as per due approvals from Owner's representative.
- b. Vendor shall submit detailed site organization chart of Personnel for Owner's approval.
- c. Owner reserves the right to review the same. Vendor's commissioning engineers shall also train Owner's engineers during commissioning apart from scheduled Training.
- d. The responsibility for Installation, Commissioning, Performance Guarantee and Warranty shall remain with the vendor.
- e. The vendor shall furnish procedures, protocols and time schedules for commissioning and Acceptance Test activities.
- f. All tools (both hardware and software), test instruments, simulation jigs, documents, programming equipment etc. required for Installation, Testing & Commissioning are in the scope of bidder.
- g. All passwords, access keys etc. are the property of the Owner and shall be handed over to the Owner.
- h. All Inter-Operability Tables for interfacing to other systems shall be supplied.

Site Acceptance Test (SAT)

SAT shall cover all equipment and functions as specified for the complete system (all hardware & software) and connectivity with Owner's system. As such SAT shall cover all the tests listed in FAT along with site-specific tests including interconnections with field equipment and other systems. Apart from testing and commissioning, SAT shall include one month of continuous trouble-free operation of the complete system without major

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intervention. In case of interruptions, one-month trial shall be restarted after attending to the problem.

Vendor shall submit SAT procedure documents for owner's approval during detailed engineering.

9 PERFORMANCE REQUIREMENTS

TEST PROCEDURE

Winning bidder shall submit performance guarantee test procedure for owner's review and approval during detailed engineering.

1. Camera Performance: The Performance shall be demonstrated under all weather and lighting conditions including minimum 0.3 lux.
2. LAN Bandwidth 50%: In case the bidder is unable to meet the above performance requirements, even after utilizing opportunities for correction, the system is liable to be rejected.

10 SPARES AND SPECIAL TOOLS AND TACKLES

MANDATORY SPARES

The bidder shall supply mandatory spares which shall be strictly interchangeable with parts for which they are intended for replacement.

SPECIAL TOOLS & TACKLES

Bidder to consider and supply special tools and tackles required for erection, commissioning and maintenance of the offered system. After commissioning of the system all tools and tackles shall be handed over to Owner's team.

All tools (both hardware and software), test instruments, simulation jigs, documents, programming equipment etc. required for Installation, Testing & Commissioning are in the scope of bidder.

11 DATA SUBMISSION BY BIDDER

Bidder shall submit the following information along with the Technical Bid.

ALONGWITH BID

Bidder shall submit the following information along with the Technical Bid.

- a. Technical solutions document with detailed functionality of the System.
- b. Owner's switchyard and control room plans tentatively marked up with the Cameras, Server cabinet, etc. along with tentative BOQ considered.
- c. General Arrangement Drawings for equipment offered
- d. System architecture with all the hardware and other details
- e. Details of application software along with database architecture indicating interfaces and other details.
- f. Datasheets of major components
- g. Dully filled in schedules and data sheets.
- h. Quality Assurance Plan (QAP), Manufacturing Quality Plan (MQP), Field Quality Plan (FQP)

AFTER AWARD OF CONTRACT

The following documents shall be submitted for Owner's approval during detailed engineering:

- a) Bidder to submit all datasheets, detailed GTP of the proposed system during detailed engineering for the approval and finalization by Owner.
- b) Over all plot with outdoor & indoor cameras and other devices marked up after finalisation of the plot plan and building layouts
- c) Equipment layout at Security control room
- d) System Architecture Drawing. This drawing should show in detail of the following:
Network connections

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Protocol used
Type of interconnecting cable
All cameras, workstations, network switches etc.

- e) Functional Design Specification document
- f) Step by Step test procedures for Factory Acceptance Test (FAT) and Site Acceptance Test (SAT)
- g) Hardware, Software and Application manuals for all the equipment supplied including that of Third parties.
- h) All Software Licenses (both own & third party), key for Hardware Locks
- i) Guaranteed technical parameters & Guaranteed availability and reliability
- j) Calculation for power sizing
- k) Bill of Material listing equipment designation, make, type ratings, etc. of all the equipment supplied
- l) Operator's Manual
- m) Complete documentation of implemented protocols between various elements
- n) Diagnostic and performance evaluation software and hardware tools
- o) Details of software (Operating systems, application software, engineering tools,
- p) Final as built drawings of all Security Surveillance system as final documents in AutoCAD & PDF
- q) Technical catalogues, Test Certificates and Acceptance Test Reports.
- r) Internal test report, FAT and SAT documents with test protocol formats shall be submitted for approval at least 4 weeks before Factory Acceptance Test.
- s) SAT protocol shall be submitted for approval at least two weeks before SAT
- t) Bidder shall also furnish Original plus one copy of all System Software (OS, Application and tools) along with delivery. Bidder shall submit two copies of all the configuration, application, display, database backup of all equipment on reliable secondary media.

12 SERVICES AND SUPPORT:

- I. The bidder shall be responsible for providing required maintenance, service and necessary onsite support/OEM support for the entire contract duration from the date of successful completion of installation and commission /Final Acceptance Testing (FAT). It shall be the bidder's responsibility to replace any defective parts/ equipment's without any additional cost to the TENDERER. The defective part so replaced shall be the property of the bidder. The bidder shall keep enough spares at the SITE location/its own location during warranty period to meet SLA parameters and the cost for the spare-parts are to be borne by the bidder.
- II. Bidder is required to keep some spares during contract period to provide immediate replacement during warranty period.
- III. All the Networking equipment and spares shall be kept in good working condition and shall be repaired or replaced. In case of any equipment which is under warranty the bidder would ensure that all equipment's are repaired/ replaced.
- IV. All the electrical equipment and accessories, backup power sources, plugs, wires etc. shall be maintained and if required replaced by the successful bidder at its own cost.
- V. The Successful bidder shall also maintain an up-to-date inventory of all supported equipment and spares and make the same available for review and inspections as per requirement.
- VI. The bidder shall also be responsible for performing/carrying out preventive maintenance activity at least once in a six month which includes cleaning, dusting and upkeep of interior and exterior, realignment of the deployed equipment's, configuration backup and software up gradation/update of all hardware.
- VII. The Bidder is required to submit preventive maintenance schedule for all equipment to TENDERER from time to time. After performing preventive maintenance activities, successful bidder is required to submit the detailed report of the same. All such activities should be done preferably during non- working hours or on non-working days/holidays.

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- VIII. Shifting of any camera or related equipment within the site on need basis should be done by the bidder without any additional cost to the TENDERER during the Warranty period.
- IX. All the products should be with 5 years of warranty the Time for Replacement of Defective Product during Warranty Period is 72 hours.
- X. The successful bidder must carry out proper electrical earthing (as per IS-3043) at all the Substation where NVR, LPU, Ethernet Switch and UPS to be installed. The cost for the earthing will be borne by the bidder.
- XI. The successful bidder must carry out proper electrical earthing (as per IS-3043) at all the pole installed in the Substation where cameras to be installed. The cost for the earthing will be borne by the bidder.
- XII. The bidder is responsible for protecting all the devices or equipment from input power i.e., overload, over voltage or current, spikes, surge etc.
- XIII. Tenderer will provide electric point at single location in each Substation, thereafter, bidder is responsible for required electricity work for successful functioning of proposed surveillance system.
- XIV. Bidders must install surge protection device/equipment and distribute the raw power to all the devices of surveillance system.
- XV. Appropriate call register and ticket handling status system should be in place to log and track troubleshooting activity.
- XVI. The Bidder for better understanding may visit the site(s) with prior written permission from the TENDERER before submission of their bid. The bidders will have to do their own assessment/measurements for finalization of scope of work / supply before submission of their bids.

Service Level Agreement (SLA) and Penalties

Penalty for Delay

Type of Fault	Maximum Allowable Time to Repair	Penalty beyond allowable time.
Faults requiring no Spare Replacement	2 Working days	Rs. 1000/- per day
Faults requiring Spare Replacement	7 Working days	Rs. 2000 per day

Note: Maximum Penalty cap for penalty for delay is 10% of contract value (i.e. total capex cost) for the ordered item.

If there is a delay in delivery of the supply of hardware, applicable penalty for delay in delivery of delayed/non-supplied hardware will be levied. Due to delay in delivery, if installation gets delayed further applicable penalty for delay in installation and commissioning will also be levied for that non-supplied and non-installed hardware.

For calculation of delay any dependencies from Substation level will be excluded.

Operational Penalties:

S/N	SLA	Target	Penalties
1.	Timeline for Retrieval of video feeds from the Storage	As per SLA	Rs. 500 for every instance of late retrieval as per the SLA Note: Data Retrieval Request Through a Request Log Mechanism

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2.	*Uptime of all IT components installed at site	99.50% (at each individual component level)	For each component Above 99.50% = No penalty. 99.50 - 99.00% - >/=0.25% of QP. 98.99 - 98.00% - >/=0.5% of QP. 97.99 - 97.00% - >/=1.0% of QP. 96.99 - 96.00% - >/=1.5% of QP. Less than 96.00% - >/=2% of the QP. If the uptime goes below 95%consequently for two quarters, then in that case tenderer may terminatethe contract and forfeit the PBG.
3.	Availability of Video Recording	100% (365 x 24 hours) Excludingpower cut duration	A penalty of Rs. 1000/- per cameraper hour or part thereof shall be levied in case of unavailability of Video Recording.

*uptime mentioned here is required to achieve for each site/Substation's ITcomponents.

Note: The overall operational penalty would be generally capped at 10% and will be recovered against the quarterly payment invoice and performance bank guarantee (if required) submitted by the successful bidder.

Cyber Security SLA

S. No	Activity	Description	Timelines
1	Incident Management	Notification of Breach	1 hour
		Correction	8 hours
		RCA and Corrective Action	5 days
2	Vulnerability Management	Resolution of Vulnerability	
		Critical/High	7 days
		Medium	15 days
		Low	20 days
3	Patch Management	Application of Patches (recommended minimum n-1)	30 days

13 TRAINING

The contractor shall provide training for a batch (maximum of 20 people). Contractor personnel who are experienced instructors and who speak understandable English and Hindi shall conduct training. The Contractor shall provide all necessary training material including configuration document in advance (before FAT or during FAT). Each trainee shall receive individual copies of all technical manuals and all other documents used for training. These materials shall be sent to Employer at least two months before the scheduled commencement of the particular training course. Class materials, including the documents sent before the training courses as well as class handouts, shall become the property of Employer. Employer reserves the right to copy such materials, but for in-house training and use only. Hands-on training shall utilize equipment identical to that being supplied to Employer.

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14 TECHNICAL PARTICULARS

1A. Network Dome Camera		
SL No.	Parameter	Specification
1	Image Sensor	1/2.8" 2MP PS CMOS Image Sensor
2	Max. Resolution	2560[H] X 1920[V]
3	ROM	128 MB
4	RAM	512
5	Scanning System	Progressive
6	Electronic Shutter Speed	Auto/Manual 1/3 s-1/30000 s
7	Minimum Illumination	0.007 Lux@F1.6(Colour,30IRE), 0.01 Lux@F1.6(B/W,30IRE) 0 lux (IR on)
8	S/N Ratio	>56 dB
9	Illumination Distance	30 m (98.43 ft) (IR LED)
10	Illuminator On/Off Control	Auto/Manual
11	Illuminator Number	1 (IR LED)
Lens		
12	Lens Type	Fixed-focal
13	Mount Type	M12
14	Focal Length	3.6 mm
15	Max. Aperture	F1.6
16	Field of View	111.0° (Horizontal), 59.0° (Vertical), 133.0° (Diagonal) or better
17	Iris Type	Fixed
	Professional, Intelligent	
18	IVS (Perimeter Protection)	Intrusion detection, Loitering detection, Line crossing detection
19	Smart Search	Work together with Smart NVR to perform refine intelligent search, event extraction and merging to event videos
Video		
20	Video Compression	H.265; H.264; MJPEG
21	Smart Codec	Smart H.265
22	Video Frame Rate	Main Stream: 30fps @2880x1616, 2688x1512, 2560x1440, 1920x1080, 1600x904, 1360x768, 1280x720, 640x360(16:9) 2nd Stream: 30fps @1920x1080, 1600x904, 1360x768, 1280x720, 640x360 (16:9) 3rd Stream: 30 fps @ 1280x720, 640x360, 480x272 (16:9)
23	Stream Capability	3 streams
24	Resolution	30 fps @ 2880x1616 or better
25	Bit Rate Control	CBR/VBR
26	Video Bit Rate	H.264: 3 kbps-8192 kbps H.265: 3 kbps-8192 kbps
27	Day/Night	Auto (ICR)/Color/B/W
28	BLC, HLC	YES
29	WDR	120db
30	White Balance	Auto/natural/street lamp/outdoor/manual/regional custom

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31	Gain Control	Auto/Manual
32	Noise Reduction	3D DNR
33	Motion Detection	OFF/ON (4 areas, rectangular)
34	Region of Interest (RoI)	Yes (4 areas)
35	Defog	Yes
36	Image Rotation	Pan Range/Rotation Range -350°/Tilt Range-75°
37	Privacy Mask	4 Area
	Alarm	
38	Alarm Event	motion detection, tampering detection, recording notification,
	Network	
39	Network	RJ-45 (10/100 Base-T)
40	SDK and API	Yes
41	Protocol	SFTP, IPv6, IPv4, DNS, RTCP, NTP, RTP, HTTP, HTTPS, SNMP V1/V2/V3, TCP/IP, PPPoE, UPnP, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, ONVIF (Profile S, Profile G, Profile T), unicast, Multicast
42	Cyber Security	AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, WSSE, account lockout, syslog, video encryption, IP/MAC filtering, HTTPS, trusted upgrade, trusted boot.
43	Interoperability	Profile G, S, T supported
44	User/Host	20 (Total bandwidth: 64 M)
45	Storage	FTP;/ SFTP;/ Micro SD Card (support max. 256 G); NAS
46	Browser	IE: IE8, IE9, IE11, Chrome, Firefox
	Mobile Phone	IOS; Android
	Certifications	
47	Certifications	CE-EMC: Electromagnetic Compatibility Directive FCC Part 15, BIS, STQC approved compliance, MTBF Certificate from STQC
	Power	
48	Power Supply	12V DC/PoE (802.3af)
	Environment	
49	Operating Conditions	minus 10 to +55°C
50	Protection Grade	IP66 or better
	Structure	
51	Casing	Inner core: Metal Cover: Plastic
52	3rd party Analytics support	The camera should support 3rd party Analytics.
53	Mount	Wall Mount/ Pole Mount

1B. Network Bullet Camera		
SL No.	Feature	Specification
	Camera	

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1	Image Sensor	1/2.8" CMOS
2	Max. Resolution	2560x1920 (5MP)
3	ROM	4 GB
4	RAM	1 GB
5	Scanning System	Progressive
6	Electronic Shutter Speed	Auto/Manual, 1/5s - 1/32000s
7	Minimum Illumination	0.006 Lux@F1.6(Colour), 0.0006 Lux@F1.6(B/W), 0 lux (IR on)
8	S/N Ratio	≥ 52 dB
9	Illumination Distance	40~ 50 m (IR)
10	Illuminator Number	4 (IR LED)
	Lens	
11	Lens Type	Motorized vari-focal
12	Mount Type	φ14
13	Focal Length	2.8 mm-12 mm or better
14	Max. Aperture	F1.6 ~ F3.3
15	Field of View	114° ~ 32° (Horizontal), 68.8° ~ 21.5° (Vertical), 138° ~ 35.9°(Diagonal)
	Professional, Intelligent	
16	IVS	Intrusion, tripwire, loitering detection, people gathering
17	Smart Object Detection	Abandoned object; Missing object
18	Smart Search	Work together with Smart NVR to perform refine intelligent search, event extraction and merging to event videos
19	Video Metadata	Object Detection: People, Vehicle (4-wheeled, 2-wheeled); Attribute Extraction: People (gender, clothing colour, bag, hat), Vehicle (bike, bus, car, motorcycle, truck, colour); Re-Search Extraction; Path Extraction, Smart Motion Detection, Smart VCA (Intrusion detection, Loitering detection, Line crossing detection, Unattended object detection, Missing object detection, Face detection, Crowd detection.
20	Smart Sound Detection	Yes
	Video	
21	Video Compression	H.265; H.264; MJPEG
22	Video Frame Rate	Main stream: 30fps@2560x1920,2048x1536,1920x1440,1600x1200,1280x960,800x600,640x480 (4:3) Sub stream: 30fps @ 1920x1440, 1600x1200, 1280x960, 800x600, 640x480 (4:3) Third Sub stream: 30fps @ 1280x960, 800x600, 640x480 (4:3);
23	Stream Capability	3 streams
24	Resolution	30 fps @ 2560x1920 (5MP)
25	Bit Rate Control	CBR/VBR
26	Video Bit Rate	H.264: 32 kbps-16384 kbps; H.265: 12 kbps-11776 kbps
27	Day/Night	Auto (ICR)/ Colour/ B/W
28	WDR	120db
29	White Balance	Auto/natural/street lamp/outdoor/manual/regional custom
30	Gain Control	Auto/Manual
31	Noise Reduction	3D DNR
32	Motion Detection	OFF/ON (4 areas, rectangular)
33	Region of Interest (RoI)	Yes (4 areas)
34	Defog	Yes
35	Image Rotation	0°/90°/180°/270°

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	Alarm	
36	Alarm Event	Audio detection, camera tampering detection, cybersecurity events (brute force attack event, cyberattack event, quarantine event), digital input, manual trigger, motion detection, periodical trigger, recording notification, SD card life expectancy, shock detection, system boot
	Network	
37	Network	RJ-45 (10/100 Base-T)
38	SDK and API	Yes
39	Protocol	IPv4; IPv6; HTTP; TCP; UDP; ARP; RTP; RTSP; RTCP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; QoS; UPnP; NTP; Multicast; ICMP; IGMP; PPPoE; SNMP
40	Cyber Security	Access list, CSRF protection, digest authentication, HTTPS, IEEE 802.1x, Password protection, secure boot, signed firmware, brute force attack event, cyberattack event, quarantine event, user access log, user account management, Built-in FIPS 140-2 Level 2 certified Trusted Platform Module (TPM)
41	Interoperability	ONVIF G,S,T & M
42	User/Host	20 (Total bandwidth: 64 M)
43	Storage	FTP;/ SFTP;/ Micro SD card (support max. 512 GB); NAS
44	Browser	IE: IE 9 and later Chrome: Chrome 102 and later Firefox: Firefox 88 and later
45	Mobile Phone	IOS; Android
	Certificate	
46	Certifications	CE-EMC: Electromagnetic Compatibility Directive FCC Part 15, BIS, STQC approved compliance, MTBF Certificate from STQC
	Ports	
47	Audio Input/audio compression	1 channel (RCA port),
48	Audio Output	1 channel (RCA port)
	Power	
49	Power Supply	12 VDC ($\pm 30\%$);/ PoE (802.3af)
	Environment	
50	Operating Conditions	minus 10 to +60°C /less than 95%
51	Protection Grade	IP66 or better
	Structure	
52	Casing	Metal
53	3rd party Analytics support	The camera should support 3rd party Analytics.
54	Mount	Wall Mount/ Pole Mount, With mounting accessories

1C. Functional Requirement Specification for Video Management Software (VMS) License	
S. No.	Description
1.	The VMS license shall be able to get integrated with existing VMS central Software platform and shall be Scalable, Client Server based, Enterprise level capable to integrate new as well as exiting IP camera of any make model in the VMS system. It shall be capable to expand by adding additional camera license and server in the same VMS platform.
2	The Offered VMS Software license should be ONVIF (S,G,T and M) Compliant. The Declaration of ONVIF shall be available on ONVIF Official Website www.onvif.org in the Conformant Devices. VMS OEM to Submit a Valid Certificate to Substantiate the Proof.
3.	The OEM shall have existing ONVIF membership for open integration with 3rd party system / devises integration to meet project objective and functionality.
4.	Should record H.264 / H.265, MPEG4 or MJPEG in at minimum 25 fps at minimum Full HD (1080p) resolution for 30 days

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S. No.	Description
6	Supports RTP over UDP, RTP over TCP and http streaming
7	Should support multiple brand IP camera and encoders
8	Should support dual streaming and recording at different qualities of videos
9	Option to do recordings on NAS, iSCSi, DAS, local or network drive. Defining different drive for each individual camera
10	Should have ability record audio along with video in same recording file.
11	Pre-buffer and Post buffer recordings up to 20 minutes
12	Calculate storage size based on number of cameras, days and drives available in the system at full resolution and frame rate.
13	Option to record at low frame rate in no-alarm condition, and at high frame rate in alarm condition, with post-alarm high framerate recording interval setting up to 5 mins, configurable independently for each of the cameras.
14	Export recordings in SEF (Secured export format) / .avi / .mp4 / .asf formats. Must be playable in any OS Windows or Linux or Unix or Apple Mac
15	Export recording possible in client and remote PC also with proper authentication
16	Option for Window-Pop up, Email, Sound alarm on recording or video loss
17	Storage and Bandwidth calculation: Recording size estimation for each hard disk attached to the server. Option to check disk size of individual camera
18	Image Enhancement on recorded videos. The image enhancement should be able to enhance videos of fog, rain and low light conditions
19	The option of email and Video Pop up on Low disk space event. The system should alert user on low disk space event
20	Automatic archiving after set number of days and automatic recording deletion after disk full
21	The software should comply that all client to server and server to server communications are compressed and encrypted and connection specific key should be 256 bit AES and data encryption should be 256 bit AES.
22	VMS software should have the Encryption algorithm of 1024 / 096-bit RSA and hashing of SHA -512 for tamper proof data. VMS OEM must be CMMi Level-3 certified and listed on www.cmmiinstitute.com
23	The exported video should be saved in SEF (Secure Export Format) / AVI / MP4 / ASF with option to digitally sign the exported video files; to allow verification of exported video files, to confirm files are non-tampered, at any time
24	In the event of failure of connectivity to the central server the camera shall record video locally on the SD card automatically. After the connectivity is restored, VMS shall support these recordings to be automatically merged with the server recording such that no manual intervention is required to transfer the SD card-based recordings to server.
25	Live View possible for upto 144 live videos and upto 64 playback videos simultaneously on 1 screen or multiple monitors using software video wall.
26	VMS software should support using 2 simultaneous streams from the camera, and automatic switching to high resolution stream in full screen mode. VMS software should intelligently capture any of the 2 streams from the camera, only when required, to use minimal resources.
27	VMS server software and VMS client software should support capturing multicast streams from the cameras. VMS client software should support option to capture live video from VMS server OR from camera.
28	It should support live view and Playback from minimum 10 clients- Both local and remote

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1C. Functional Requirement Specification for Video Management Software (VMS) License	
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29	Customized camera views based on: User input number of cameras. User chosen shape and size. View sequencing with user driven time interval. Configure and use one or more 'customized camera views', with user defined rows and columns in the customized camera view, and ability to merge any nearby cells to allow one or more bigger size hot-spots in the customized camera view.
30	Live view and Playback available at the same time with Playback window of live view window
31	Instant Playbacks available as window pop up on click of an event from Event Screen
32	Image Enhancement Analytic available in Playback. Option to sharpen the video image, adjust brightness, adjust contrast, switch to black and white or colour, edge detection on/off, add custom text, print support.
33	Playback Navigation View with Recording server, camera list, and calendar view displaying recorded video availability for each day in the calendar, 24-hour time-line indicating recorded video availability and detailed 10 mins time line indicating recorded video availability. Clicking on any of the time lines allows video playback from the timestamp associated with the point of click on the time line.
34	E-map should support map presets, allowing users to switch to specific region within the map E-map from different sources should support using multiple images and quick access links to switch from one image to other map preset of another image. E-Map should support displaying area of camera view coverage on the map.
35	Two-way audio communication between camera and VMS. Option to send/broadcast Audio to multiple cameras
36	VMS OEM should have ISO latest certificates: ISO 9001:2015 / 27001
37	Ability to view live video on iOS/Android phones or devices with or without installing proprietary Apps.
38	Ability to receive alerts on Mobile phones with SMS.
39	PTZ Control on Mobile App and Remote Locations
40	VMS and Mobile App support for multiple sites spread across WAN to be controlled and viewed from central location.
41	Remote Administration over internet.
42	Option for RTSP, HTTP, RTSP over HTTP streaming or both simultaneously at individual camera level.
43	Option to Transcode to lower bit rate stream at recording server level.
44	Authentication parameters (username, password) for streaming to remote clients.
45	Automatic discovery of devices using UPnP and/or ONVIF
46	No software limit on number of cameras supported in single recording server
47	Add all cameras with single click. Apply settings to multiple cameras of same model with single click.
48	Automatic Health check-up and VMS should always run fully optimized, to ensure no loss of functionality.
49	Add multiple recording servers under same management server.
50	User role-based cameras and feature access. Define users with passwords and access to only specific cameras and to only specific type of alarms Support for user profiles and policies like periodic password expiry, locking user on pre-defined number of successive failed login attempts.

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1C. Functional Requirement Specification for Video Management Software (VMS) License	
S. No.	Description
51	Complete server logs including login access, system settings change, archiving events, video or recording loss and all activity done by administrator or any other user in the system. VMS software should be able to capture all edge-based analytics alarms supported by the camera; and add these to VMS alarms database. All alarm handling configuration should be available for these alarms, similar to any other native alarms generated by the VMS Watchdog for monitoring VMS processes and identifying any issues and resolving them. Any issues observed, which are outside VMS software control (eg offline cameras, offline servers, network loss, storage failure, incorrect configuration etc) should be displayed as 'System notifications'. The 'System notification' window cannot be closed by the operator. Any 'System notification' should be removed automatically from the list, when the related issue is resolved. Automatic daily back up of VMS configuration. It should be possible to use this configuration back up to restore the configuration, in case of OS reinstallation on the computer hosting VMS software.
52	User configurable scheduled daily alarm reports generation and scheduled daily alarm reports e-mails to pre-defined recipients.
53	VMS software should allow use of multiple sub-networks - (a) Input sub-network - cameras and VMS servers (b) Output sub-network - VMS servers and VMS clients Storage sub-network - network storage devices and VMS servers
54	The VMS software should use off-line licensing. Internet connectivity should not be required for VMS software license management. The VMS software licenses once activated should remain valid for hardware life, unless hardware/OS is changed / updated, the activated license should continue to function. The VMS software licenses should be linked with computer hardware on which VMS software is hosted. The VMS software license should NOT be linked with the camera devices, to ensure cameras can be replaced any time, as and when required.
55	Should support multiple brand IP camera, encoders and DVRs. No restriction on camera hardware. VMS OEM must have presence in India for last 5 years.
56	Should support ONVIF protocol including Profile-S, G & T.
57	VMS should be capable to integrate community surveillance cameras of any make and type; as long as the cameras are ONVIF Profile S, G and T certified. Viewing, and record retrieval capabilities from ICCC via edge gateway should be possible if required in future at no extra cost. VMS software API / SDK should be available for the same, and integration will be in ICCC scope through VMS software API/SDK.
58	The Offered Video Management Software (VMS) Application should Valid Application Audit Certificate from a CERT-IN Empaneled Agency for the VMS Application, to Mitigate Cyber Security Attacks. The Application must have already undergone Audit Certification/Auditing on or before the Bid Publishing Date. The Audit Certificate must be Submitted as a Documentary Evidence/Proof.

1D. VMS Management Server Hardware with storage drive	
Parameter	Specification
Dimensions	748.79mm×482.0mm×42.8mm (29.47"×18.98"×1.69") (L×W×H, suspension loop included) or better as per system requirement
Main Processor	16 core or higher as required, Intel Xeon/AMD processors with compatibility of Windows Server 2019 or latest Operating System
Operating System	Windows Server 2019 or latest
Controller	Single controller or better
RAM	2GB*4 DDR4, up to 1TB, ECC memory or better
Power Redundancy	1+1 redundant power or better

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Network	2X 10 Gigabit ports supported
VGA	1
USB	2*USB3.0 ports
Quantity of Hard Drive	2 * 960GB SSDs or better
Installation	Standard rack-mounted support or better as per system compatibility

1E. Functional Requirement Specifications for Artificial Intelligence Based Video Analytics Platform		
Parameters	Specifications	
Platform-wise features	Single Unified System	Unified AI Based Video Platform - The existing unified AI-based video analytics platform shall be seamless integrated with any OnVIF compliant IP Camera (existing/new both) and additional VA licenses in existing Video Analytics Platform. This VA platform shall be supplied with required additional licenses, server and storage for alerts data upto 7days. It shall be capable to real-time insights, enhanced situational awareness, and scalable deployment across diverse environments.
	Mobility	The application should effectively show mobility characteristics across Android mobile devices (Smartphone/Tablets) with responsive designs, certain offline functionalities, data synchronization, and Security.
	Integrations	a) Integration Capability- The platform's integration capabilities include seamless connectivity with any VMS, ICCC, sensors, and external systems through APIs, allowing for streamlined data exchange and real-time analytics. b) It shall support flexible integration with legacy systems and future expansions, enabling a unified interface for centralized monitoring, control, and advanced AI-driven insights across diverse technologies. c) Seamless integration capability with Edge Analytics Cameras (old/new IP). d) Ability to push relevant Metadata to any third-party system.
	User and role management	The system should have an interface to manage (CRUD) users/groups with varying rights and responsibilities including the modifications of rights capabilities.
	Cloud compatibilities	Deployment Mode - The unified AI-based video analytics platform supports multiple deployment modes, including hybrid, multi-cloud, and deployment on hyperscalers, Public & Private cloud for robust scalability. It also offers a fully on-premises solution for organizations requiring complete control over data and infrastructure.
	Information Security	The system should comply with all global security best practices, regulatory directives, encryptions, access control rights, disaster recovery, and others. The platform is highly scalable and secure, integrating encryption and role-based access control (RBAC) to safeguard data. OEM must be having CMMi Level-3 certification and listed on www.cmminstitute.com
	Architecture Flexibility	Centralized Deployment: The system should enable the deployment of multiple VA use-case(s) onto a single centralized server, allowing these VAs to be accessible and utilized across various systems. For Traffic and Vehicular use-cases, the system shall be able provide all feeds at a centralized place for monitoring.

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		Distributed Architecture - The video analytics platform operates on a distributed architecture using clustering and multisite environments to ensure scalability, reliability, and efficient real-time video processing. It supports cross-site synchronization and edge processing to handle high volumes of video data from multiple locations, with load balancing and failover mechanisms providing fault tolerance. Near Edge Architecture: The video analytics platform is designed to support near-edge architecture, enabling efficient data processing closer to the source of video capture. This reduces latency and bandwidth usage by performing real-time analytics on edge devices, while still allowing integration with centralized systems for more advanced processing. The distributed model ensures seamless data flow between edge nodes and central hubs, providing scalable and resilient performance. With secure data transmission and local storage capabilities, the platform offers flexibility for on-site analytics while maintaining robust security and scalability for large-scale deployments across diverse industries. API/Microservices: - Irrespective of platform hosting destination, user can consumer Platform service (s) through APIs.
	Advanced AI/ML Compatibility	Flexible VA-Camera Linking: Users should be able to associate any VA with any camera, providing flexibility in system configuration. To ensure quality and provenness of the platform the proposed VA and VMS same OEM should have ISO latest certificates: ISO 9001:2015, ISO- 27001, ISO 14001:2015, ISO/IEC 20000-1:2018, ISO/IEC 27001:2013, ISO 45001:2018
	Advanced AI/ML Compatibility	Independent VA Management: The system must support the simultaneous deployment, enabling, disabling, and upgrading of VAs without disrupting the functionality of other VAs currently in operation.
	Development Capability	OEM must have presence in India with last 5 years
	Parallelism	User Level: Multiple users should be able to simultaneously access and modify different parts of the application without interference.
		Machine Level: The system should enable the distribution of application components across multiple machines for efficient processing and scalability.
	Scalabilities	Platform shall be highly scalable, allowing it to easily adapt to growing demands. It supports the addition of new cameras, sensors, and third-party integrations without compromising performance. Whether deployed on-premises, in the cloud, or across hybrid environments, the platform can handle increasing data volumes and computational workloads, ensuring continuous, efficient operation as the system expands.
GUI-based Features	Live View	The system will include a dashboard providing a centralized overview of cameras, alerts, and use-cases. This dashboard will offer tools to generate reports, manage use-case configurations, and make modifications. The main dashboard (landing page) will display, frequently-used features like:

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		Live Footage: The system shall be able to display live video feeds from selected cameras. Search: Users can search and choose specific cameras to view live footage. Floating Grid View: The live feed shall be viewed in grid layouts with various camera combinations upto 16 at a time, in multiple combinations (2x2, 4x4, 3x3, 1x6 etc) Dynamic Camera grouping: Users can create and save groups of cameras for quick access. Customized camera view: User can also save their preferred camera combinations (as 'Preferred Cameras') for automatic display of their feeds upon login. Auto-rotate: The system shall allow for automatic changing of camera footage if enabled (using toggle) one after another.
	Notifications	Auto Email/SMS: System shall be able to configure predefine email/sms using external Email/SMS Gateway account.
		Navigation tabs: The dashboard shall include navigation options (common for all pages) for accessing different system functions and performing various tasks.
	Business Intelligence Dashboard(s)	A dedicated dashboard shall display statistics on critical and high-priority alerts, including time-to-action, acknowledged or unacknowledged, and details of escalation cases. Users can view/download the summary (graphs, maps) and generate detailed reports with filters, search options. Dashboard Architecture - Should support nested dashboard (s) architecture, comprising Master dashboard and associated contextual dashboard. Each showcasing its own interactive count cards. -- Multi site dashboard, Global console, Local site dashboard -- Role based dashboard Single click on an item from the alerts list: Shall have feature of Single click on a Card would redirect you to an Alert page where it shows list of alerts for the selected analytics/cameras. Filters - Date, Analytics, Camera(s), Camera Group(s), Time range etc. Data Visualization Charts - Line, Bar Chart, and Pie Charts Trend data: Hourly, Daily, Weekly, Monthly, Yearly
	Alert Monitoring	The system shall provide a user interface for viewing, searching, and downloading alert details based on camera, location, time range, or use case. Users must be able to open individual alerts to view specific details such as time, location, camera name, and use case type. The alert details screen shall allow users to download associated video or image files, add comments, flag alerts for annotation, and mark incorrect alerts requiring human review.
		Periodic search: Users shall be able to search for alerts at specified intervals, such as daily, hourly, or minutely.
		Offline search: All search filters and options available for online videos will also be accessible for offline (manually uploaded) videos.
		Use-case specific search: Users shall be able to filter search results based on one or multiple use cases.
		Attribute-based search: Advanced search options will be available to filter results based on object attributes like colour, clothing, gender, and object classification.

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	System Health Monitoring	It should shows connect camera(s) status - - Total cameras, - Down camera, - Duration of camera down, - Location of cameras in tabular form. Filters - date, camera, time range
		It shall show Server(s) components status like RAM usage, CPU usage, GPU usage, Disk usage, Temperature, total uptime or as configured.
	SOP	Platform is capable of creating customizable SOP(s) on the basis of criticality and severity of alerts & notifications.
		Notifications: The system must be able to send notifications (via web, app, Mail, SMS) for all detected use-case violations. Each notification will include details such as alert name, timestamp, description, image, and use-case type. Users can view details, snooze, or dismiss alerts.
		Notification Customization: Authorized users shall be able to customize notifications by: Configuring different sound alerts for different analytics Enabling or disabling specific alert types. Prioritizing alerts (e.g., critical alerts only). Setting time-based alerts (e.g., 2-4 PM). Specifying camera, camera group, or location for alerts. Choosing alert display page within the application.
		Alert Acknowledgement: The authorized user shall be able to mark use-case or camera specific alerts as high priority, critical alerts and set mandatory call to action - Acknowledged, Resolved, or Escalate. Later, the system should show those alerts in the list with call to action taken using the label clearly in different colour schemes. In case, the user fails to take specified call to action, the system shall show reminder (if pre-configured) with a timer and the alert would be escalated to user at higher in the hierarchy (as configured).
		Alert Escalations: The system shall provide tools for the user to configure/manage escalation hierarchy (level 1, level 2) and then the follow-up actions, reminder time, and time-frame to (say within 5 minutes) take the acknowledgement for all the users with access to critical alerts. This will also notify other relevant users about the recent configurations via Email, SMS, or Web/In-app notifications.
	User Preferences	The system shall offer customizable features for each user, including: 1. Count format (e.g., Indian or International). 2. Date format preferences. 3. Notification settings (sound on/off, same/different sounds, only for specific use-cases). 4. Ability to show or hide specific alert notifications on individual or multiple pages of the interface. 5. Selection of preferred cameras for live feed display on the main page.
	Camera Manager	The system shall be able to provide a dedicated interface for managing cameras, including:
		Camera Views and Statistics: Users can view cameras in list or map format, with stats such as total no. of cameras, enabled, disabled, down, and location.

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		Camera Management: Users can view camera details, generate and download camera reports, add, remove, or modify cameras, and view configured use cases for each camera. Bulk Camera Configuration: Camera settings, zones, and use cases can be configured for multiple cameras simultaneously. VMS Camera Integration: The system shall be able to connect to various VMS platforms, import cameras, and configure use cases for these integrated cameras. Camera Groups: Users can view groups of cameras with associated details like camera name, and location. Camera Reference Images: Users can capture and store reference images for each camera (usually when a fully set-up camera starts capturing the images) for comparison purposes (specially when the current camera image is not as it was during the configuration).
		The system shall support integration with various Video Management System (VMS) platforms, allowing the import and configuration of cameras from these platforms. It should enable the definition of use cases for the integrated cameras. Alerts generated from the VMS shall be monitored and managed within the Video Analytics (VA) platform, with notifications available in both image and video formats.
	Activity tracker	The system shall have an interface to view the trails of user's session and activities - actions, modules worked on, impacted modules, etc.
	Downloads	The system shall keep track of all downloads (e.g., reports, videos, summary reports) under progress.
	Role Management	The system shall allow the admin to control the access of what a user or group can do, like accessing specific modules, locations, managing cameras, or controlling other users' privileges. This ensures efficient administration by granting access based on individual needs.
	User Management	The system shall provide an interface to create, enable, and disable users. It should also include features like showing user stats - (total users, total enabled users), assigning of a group to a user and modifying the user's access to various modules of the system.
	Rule Management	The system shall allow users creation and save a set of filters called rule by combining conditions, for example, Object type (Person, Animal), Gender (Male, Female), Clothing (Upper body, Lower body, Colour), and/or Accessories (Handbag, Backpack, Baggage). This ensure a for quick and easy filtering instead of setting individual values each time.
	Category Management	The system shall allow users to create and manage categories. A category (like "Banned Person") shall act as a predefined response to specific situations. You create it by combining: Actions: Define a type of an alert or alarm should trigger (e.g., siren, notification). Analytics type: Choose analytics type to trigger the action (e.g., "Intrusion"). Face or image: Link the category to a specific person or object image. Working Methodology: Event triggers action: Upon chosen analytics type even occurs (e.g., someone enters a restricted zone), the system shall check for associated categories. Category dictates response: once associated face is detected, the defined action within that category triggers (e.g., sounding an alarm).

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	Offline Video Ingestion	The system shall be capable to process offline videos (manually uploaded) in the same way as live video feeds, though on a dedicated intuitive UI, - upload video using USB, or drag n drop, configure use-case, get alerts, etc. This shall include configuring use-cases, giving access to specific users, generating alerts, showing detailed view, allowing search filters, and providing detailed reports of detected violations.
	Scheduling	The user shall be able schedule any use case for a specific duration - minutely/hourly/daily/weekly. The system shall also allow the user to create multiple zones/area of interests to be monitored and then select a use case to activate for a specific duration of the day.
Use-case-specific Features	Camera Edge Analytics	Camera Edge Analytics: The system shall be able to get integrated with existing /new camera to receive edge camera analytics alerts like the incidents of camera tempering etc using edge camera detection. The system shall detect a camera tempering incident when a camera is partially or fully Defocused, Covered, View Changed, Flash-lighting, and Spray painted.
	Face Detection and Recognition	The system shall analyze video feeds and extract the faces of people appearing in the camera view for upto 5 camera. The system shall then show various information about the detected faces. The user also be able to:
		Face Upload: Store the details of the faces along with details- name, age, designation, etc. using bulk upload.
		Configuration: Configure system to receive alerts for specific (individual's) faces with place, timestamp, emotions, camera names, etc.
		Face Search: Search (individual's) faces to detect the presence of an individuals at specific gate, premise, or area.
		Filters: Apply filters using attributes like, age, gender, cloth, etc. and search alert details of historical data.
		Dashboard: View the stats on the dashboard.
	PPE detection	The Central VA platform shall be capable to detect PPE Helmet, Shoe, Gloves violations at the PSS premise in the selected camera filed of view(FoV).
	Fire & Smoke	The Central VA platform shall be capable to detect the incident of Fire & Smoke at the PSS premise in the selected camera filed of view(FoV)
	Perimeter Intrusion	The Central VA platform shall be capable to detect Perimeter Intrusion at fencing area of the PSS premise in the selected camera filed of view(FoV)
	Vehicle Detection	The Central VA platform shall be capable to detect and capture the images of vehicle entering at the PSS premise in the selected camera filed of view(FoV)
	NVR Alert Integration with VA:	The system shall support integration of all alerts generated at the NVR level into the Video Analytics (VA) platform. These alerts shall be available in both image (snapshot) and video clip formats within the VA system for monitoring and further analysis.

1F. Industrial Grade Local Processing Unit (LPU) at PSS for VA		
S.No	Parameter	Specification
1	Processor	latest Gen Intel Core i9 with 2.1 Ghz processor or better
2	Chipset	Intel H610
3	Graphics	Intel UHD Graphics 630
4	Memory	16 GB DDR5 or higher as required
5	GPU Support	1*full size Mini-PCle

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6	Ethernet	2x1G RJ45
7	USB	2xUSB3.0
8	Video Port	1xHDMI/DVI-D port and 1xVGA/DP port
9	Serial Port	2 x RS-232/422/485 ports
10	Storage	1x internal SATA port for 2.5" HDD/ SSD
11	EMC	CE/FCC Class A
12	Compatibility	Shall be compatible with Video Analytics software. Undertaking from Video Analytics OEM on Letterhead Shall be submitted for compatibility and Performance

1G. 16 Channel Network Video Recorder (NVR)		
SL No.	Feature	Specification
1	Internal HDD	Should have 30 days recording backup (Bite rate-2048Kbps) storage capacity. It should be Expendable.
2	Processor	Industrial-grade processor
3	IP Camera Input	16 channels
4	Operating System	Embedded LINUX/Windows
5	User Interface	Web, Local GUI
6	Video Output	1 VGA:1920 × 1080, 1280 × 1024, 1280 × 720 1 HDMI:3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720 Heterogeneous video source output for HDMI and VGA
7	Video Compression	H.265+, H.265, H.264+, H.264, MJPEG
8	Decoding Capability	AI Disabled: 2 Channel 32 MP@25 fps, 2 Channel 24 MP@25 fps, 4 Channel 16 MP@30 fps, 5 Channel 12 MP@30 fps, 8 Channel 8 MP@30 fps, 10 Channel 6 MP@30 fps, 12 Channel 5 MP@30 fps, 16 Channel 4 MP@30 fps AI enabled: 1 Channel 32 MP@25 fps, 1 Channel 24 MP@25 fps, 2 Channel 16 MP@30 fps, 4 Channel 12 MP@30 fps, 6 Channel 8 MP@30 fps, 8 Channel 6 MP@30 fps, 8 Channel 5 MP@30 fps, 12 Channel 4 MP@30 fps
9	AI by NVR	Face detection, Face recognition, Perimeter protection, SMD Plus
10	AI by Camera	Face detection, Face recognition, Video metadata (Human, Motor vehicles, Non-motor vehi- cles), Perimeter protection, SMD Plus, Stereo analysis, Crowd distribution, People counting, ANPR, Vehicle density, Heat map
11	Resolution	32 MP, 24 MP, 16 MP, 12 MP, 8 MP, 6 MP, 5 MP, 4 MP, 3 MP, 2MP, 720p, 960p, D1, CIF, QCIF
12	Network Bandwidth	AI disabled: 384 Mbps incoming, 384 Mbps recording and 384 Mbps outgoing AI enabled: 200 Mbps incoming, 200 Mbps recording and 200 Mbps outgoing
13	Video Display Split	Main screen: 1/4/8/9/16 , Sub screen: 1/4/8/9/16
14	Perimeter Performance AI by NVR (Number of Channels)	4 Channels, 10 IVS rules for each Channel
15	Perimeter Performance of AI by Camera (Number of Chan- nels)	All Channels (16 Targets/s)
16	SMD Plus by NVR	8 Channels: Secondary filtering for human and motor vehicle, Reducing false alarms caused by leaves, Rain and lighting condition change
17	SMD Plus by Camera	All Channels (32 Targets/s)

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18	Metadata Performance of AI by Camera (Number of Channels)	8 Channels
19	Audio Input / Output	1/1 Channel RCA
20	Audio Compression	G.711a, G.711u, PCM, G726, AAC
21	Alarm Input / Output	4 / 2 Channel
22	Hard Disk	2 SATA ports, Each disk can contain up to 20 TB.
23	Multi-channel Playback	Up to 16 Channels
24	Interface Ports	2 USB Ports (1 front USB 2.0 port, 1 rear USB 3.0 port), 1 RS232, 1 RS485
25	Ethernet	1 x (10/100/1000 Mbps Ethernet port, RJ-45)
26	Protocols	HTTP, HTTPS, TCP/IP, IPv4, UDP, NTP, DHCP, DNS, SMTP, UPnP, DDNS, Alarm Server, Multicast, P2P, Auto Registration, iSCSI, ONVIF 23.12(Profile S, Profile T, Profile G), CGI, SDK
27	Power Supply	12 VDC, 4Amp
28	Certification	CE, FCC, RoHS, BIS

1H. 32 Channel Network Video Recorder (NVR)		
S.No	Features	Specifications
1	Internal HDD	Should have 30 days recording backup (Bite rate-2048Kbps) storage capacity. It should be Expendable.
2	IP Camera Input	32 Channel
3	Main Processor	Intel Quad-core Processor
4	Operating System	Embedded LINUX
5	Two-way Talk	1 Channel Input, 1 Channel Output, RCA
6	Interface	2 HDMI (up to 3840 x 2160, Different Source), 1 VGA
7	Resolution	3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768
8	Multi-screen Display	1st Screen: 1/4/8/9/16/25/36 2nd Screen: 1/4/8/9/16
9	OSD	Camera title, Time, Video loss, Camera lock, Motion detection, Recording
10	Compression	H.265/H.264/MJPEG
11	Resolution	12MP, 8MP, 6MP, 5MP, 4MP, 3MP, 1080P, 1.3MP, 720P etc
12	Bit Rate	16Kbps ~ 20Mbps Per Channel
13	Record Mode	Manual, Schedule (Regular, MD (Motion Detection), Alarm, IVS), Holiday, Stop
14	Record Interval	1 ~ 120 min (default: 60 min), Pre-record: 1 ~ 30 sec, Post-record: 10 ~ 300 sec
15	Trigger Events	Recording, PTZ, Tour, Alarm Out, Video Push, Email, FTP, Snapshot, Buzzer and Screen Tips
16	Video Detection	Motion Detection, MD Zones: 396 (22 × 18), Video Loss and Tampering
17	Tracking Trigger Event	Zoom, Tracking, Recording, Preset, Snapshot, Alarm, etc.
18	Search Mode	Time /Date, Alarm, MD and Exact Search (accurate to second)
19	Playback Function	Play, Pause, Stop, Rewind, Fast play, Slow Play, Next File, Previous File, Next Camera, Previous Camera, Full Screen, Rep
20	Backup Mode	USB Device/Network/ eSATA Device

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21	Interface	4 RJ-45 Ports (10/100/1000Mbps)
22	Ethernet Port	4 Ethernet Ports Joint Working or 4 Independent 1000Mbps Ethernet Ports
23	Network Function	HTTP, HTTPs, TCP/IP, IPv4/IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, Alarm Server, IP Search
24	HDD Mode	Support Global HDD Hot-spare, Enterprise-level HDD
25	USB	4 USB Ports (2 USB 2.0, 2 USB 3.0)
26	RS232	1 Port, for PC Communication and Keyboard
27	Power Supply	AC100V ~ 240V, 50 ~ 60 Hz
28	Operating Temperature	-20°C ~ +70°C

1I. 64 Channel Network Video Recorder (NVR)		
S.No	Features	Specifications
1	Internal HDD	Should have 30 days recording backup (Bite rate-2048Kbps) storage capacity. It should be Expendable.
2	IP Camera Input	64 Channel
3	Main Processor	Intel Quad-core Processor
4	Operating System	Embedded LINUX
5	Two-way Talk	1 Channel Input, 1 Channel Output, RCA
6	Interface	2 HDMI (up to 3840 x 2160, Different Source), 1 VGA
7	Resolution	3840 × 2160, 1920 × 1080, 1280 × 1024, 1280 × 720, 1024 × 768
8	Multi-screen Display	1st Screen: 1/4/8/9/16/25/36 2nd Screen: 1/4/8/9/16
9	OSD	Camera title, Time, Video loss, Camera lock, Motion detection, Recording
10	Compression	H.265/H.264/MJPEG
11	Resolution	12MP, 8MP, 6MP, 5MP, 4MP, 3MP, 1080P, 1.3MP, 720P etc
12	Bit Rate	16Kbps ~ 20Mbps Per Channel
13	Record Mode	Manual, Schedule (Regular, MD (Motion Detection), Alarm, IVS), Holiday, Stop
14	Record Interval	1 ~ 120 min (default: 60 min), Pre-record: 1 ~ 30 sec, Post-record: 10 ~ 300 sec
15	Trigger Events	Recording, PTZ, Tour, Alarm Out, Video Push, Email, FTP, Snapshot, Buzzer and Screen Tips
16	Video Detection	Motion Detection, MD Zones: 396 (22 × 18), Video Loss and Tampering
17	Tracking Trigger Event	Zoom, Tracking, Recording, Preset, Snapshot, Alarm, etc.
18	Search Mode	Time /Date, Alarm, MD and Exact Search (accurate to second)
19	Playback Function	Play, Pause, Stop, Rewind, Fast play, Slow Play, Next File, Previous File, Next Camera, Previous Camera, Full Screen, Rep
20	Backup Mode	USB Device/Network/ eSATA Device
21	Interface	4 RJ-45 Ports (10/100/1000Mbps)
22	Ethernet Port	4 Ethernet Ports Joint Working or 4 Independent 1000Mbps Ethernet Ports

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23	Network Function	HTTP, HTTPs, TCP/IP, IPv4/IPv6, UPnP, RTSP, UDP, SMTP, NTP, DHCP, DNS, IP Filter, PPPoE, DDNS, FTP, Alarm Server, IP Search
24	HDD Mode	Support Global HDD Hot-spare, Enterprise-level HDD
25	USB	4 USB Ports (2 USB 2.0, 2 USB 3.0)
26	RS232	1 Port, for PC Communication and Keyboard
27	Power Supply	AC100V ~ 240V, 50 ~ 60 Hz
28	Operating Temperature	-20°C~+70°C

1J. 16-Port PoE Gigabit Switch		
Sr. No.	Parameter	Specification
Hardware		
1	Layer	Layer 2
2	Data Transmission Port	Port 1-16: 16 × RJ45 10/100/1000 M (PoE) Port 17-18: 2 × RJ45 10/100/1000 M (uplink) Port 19-20: 2 × SFP 1000 M (uplink)
3	Power Supply	100V AC-240V AC
4	Operating Temperature	-10 °C to +55 °C (+14 °F to + 131 °F)
5	Operating Humidity	5%-95% (RH)
6	Power Consumption	Idling: 7W Full load: 190W
Performance		
7	Capacity	52 Gbps
8	Packet Forwarding Rate	29.76 Mpps
9	Packet Buffer Memory	4 Mbit
10	MAC Table Size	8K
11	Communication Standard	IEEE802.3, IEEE802.3u, IEEE802.3x, IEEE802.3ab, IEEE802.3z
PoE		
12	PoE Standard	IEEE802.3af, IEEE802.3at, Hi-PoE, IEEE802.3bt
13	PoE Power	190 W
14	PoE Pin Assignment	PoE/Hi-PoE: 1, 2, 4, 5 (V+), 3, 6, 7, 8 (V-)
15	Statics Protection	Air discharge: 8 kV Contact discharge: 6 kV
16	Thunder-proof	Common mode: 4 kV Differential mode: 2 kV
17	Certificate	FCC, DOT approved & TTP Listed

1K. CAT6 Armoured Cable		
Sr. No.	Parameter	Specification
1	Technical parameters	Cat 6, 23 AWG U/UTP, Inner FR-PVC Jacket IEC 60332-1 Rated, ECCS Corrugated Tape Armor (Thickness >= 0.125mm), Outer HDPE Jacket Operating Temperature: -20 to +70Deg, Rodent Resistant Outdoor Cable

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2	Suitable for 1GBASE-T with Min. 250Mhz of Bandwidth
3	4 Twisted Pair alongside PE / PVC Cross Separator
4	Conductor: 23AWG Solid Annealed Bare Copper
5	Insulation: High Density Polyethylene, Diameter 1.0 ± 0.05mm
6	PVC Inner Jacket
7	Aarmor: ECCS Corrugated Tape, >= .125mm
8	UV Resistant HDPE Outer Jacket
9	Cable Outer Diameter: 10.7 ± 1.5 mm
10	Operating Temperature: -20°C to +70°C
11	Bend Radius: 20 X Cable Diameter (Min.) or Better
12	Conductor Resistance: <= 9.38 Ω /100m
13	Resistance Unbalance: 5% Max
14	Mutual Capacitance: <= 5.6nF/100m
15	Putup : 305M
16	RoHS Complied

1L. 6 Core Armoured Outdoor Fiber Cable		
Sr. No.	Parameter	Specification
1	Technical parameters	6 Core Singlemode (OS2) 9/125 Fiber Cable, ITU G.652.D, ECCS Armoured Uni-Tube Filled with Thixotropic Jelly, UV-HDPE Jacket, Strength Member 2 No. of Steel Wires embedded in HDPE Jacket
2		Application: The fiber cable should be installed in Outdoor, Duct, Trenches & Underground application.
3		Features: The fiber cable should have excellent features of Tensile, Crush, Water Prevention with Jelly &/Or Moisture Barrier Tape
4		Cable Construction
5		Uni-tube (Central Loose Tube) with colour coded fibers
6		Central Loose Tube: PBT Loose Tube filled with Thixotropic Jelly
7		Armouring: Corrugated ECCS Tape Armouring (0.155 mm Nominal thickness)
8		Outer Sheath: UV Resistance HDPE
9		Moisture Barrer : Water Blocking Tape Under Armor
10		Strength Member: 2 No. of Steel Music Wires (>= 1.0mm) embedded in HDPE Jacket
11		Physical / Mechanical Characteristics
12		Outer Diameter: 7.5 +/- 0.5 mm
13		Nominal Jacket Thickness: 1.5 mm
14		Tensile Strength: >= 1000 Newton (IEC 60794-1-2-E1)
15		Bending Radius: <= 20*OD (IEC 60794-1-2-E11) (OD=Cable Outer Diameter)
16		Crush Resistance: >= 2000 Newton/100mm (IEC 60794-1-2-E3)

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17	Water Penetration: Meets IEC 60974-1-2 (24 Hr, 3Meter Sample, 1Meter Height)
18	Weight: <= 65 Kg/km
19	Environmental Characteristics
20	Operating Temperature: IEC 60794-1-2-F1 @ -20°C to +70°C
21	Storage Temperature: EC 60794-1-2-F1 @ -30°C to +60°C
22	Installation Temperature: EC 60794-1-2-F1 @ -15°C to +60°C
23	Safety: ROHS to be mentioned in data sheet
24	Optical Characteristics
25	Fiber Type: SM (9/125) OS2 as per G.652.D
26	Max. Attenuation: 0.35 dB/km @ 1310nm, 0.22 dB/km @ 1550nm
27	Mode Field Diameter @ 1310nm: 9.2 +/- 0.4 µm
28	Dispersion: ≤ 3.5 ps/nm.km & ≤ 18 ps/nm.km
29	Fiber cut of Wavelength: ≤ 1320
30	Cable Cut of Wavelength: ≤ 1260
31	Zero Dispersion Wavelength: 1300-1324 nm
32	Zero Dispersion Slope: ≤ 0.092 ps/nm².km
33	Coating Diameter: 245 ± 10 µm
34	Cladding Diameter: 125 ± 0.7 µm
35	Fiber Curl: ≥ 4 m radius curve
36	Cladding Non-Circularity: ≤ 1%
37	Mode Field Concentricity error: ≤ 0.6 µm
38	Coating/Cladding Concentricity Error: ≤ 12 µm

1M. 6/12/24 Fiber Port, LC or SC Single mode Fiber Panels		
Sr. No.	Parameter	Specification
1	Technical parameters	12/24Fiber Port in 1U x 19" LIU Loaded with Single mode OS2 LC or SC Adapters & LSZH Pigtails along with Splice Trays
2		The Fiber Panel shall have Telescopic Sliding Shelf for easy smooth maintenance add/move/changes.
3		The optical fiber Pigtails shall be factory loaded inside each individual Port of the panel. Pigtails shall be LSZH with Single mode 9/125µm fiber
4		Panel shall have Min. 4 No. of Cable Entry Slots at back of the Panel supplied with Cable Holders inside Panel.
5		Completely Enclosed without any open area to avoid any Rodent Entry
6		Pigtail Parameters Loaded inside Panel shall meet below mentioned requirements: -
7		Pigtail Buffer Jacket Material: LSZH complying to IEC 61034-1, IEC-60332-1, IEC-60754-1
8		Connector Insertion loss should be better than 0.35 dB
9		Return Loss >= 50 for UPC and >= 65 for APC
10		Attenuation: 1310/1550: 0.3 /0.2 dB/KM

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11	RoHS Complied, Meets ANSI/TIA 568.3-D
12	Repeatability: <= 0.2DB 1000 Times Mating Cycles

1N. LC-SC OS2 Single mode Duplex Fiber Patch Cord, 1 Meter & 3 Meter		
Sr. No.	Parameter	Specification
1	Technical parameters	Fiber Patch Cord, LC Duplex - SC Duplex, 9/125µm OS2 Single mode Duplex Zip Cord (<= 2.0mm), IL <= 0.35dB, RL>= 50dB, LSZH Jacket IEC 60332-1, Operating Temperature -40°C to +85°C, Meets ANSI/TIA 568.3-D
2		Cable: LC/LC or LC/SC or SC/SC, 9/125µm OS2 Single mode Duplex Zip Cord (<= 2.0mm). OEM Name shall be mentioned on the patch cord cable.
3		Connectors: The optical fiber patch leads shall comprise of Single mode 9/125µm fiber
4		Connector Insertion loss <= 0.35 dB
5		Return Loss >= 55 for UPC and >= 65 for APC
6		Jacket Material: LSZH complying to IEC 61034-1, IEC-60332-1, IEC-60754-1
7		Length: 3 Meter
8		Attenuation: 1310/1550: 0.35/0.20 dB/KM
9		Operating Temperature: -40°C to +85°C
10		Repeatability: <= 0.2DB 1000 Times Mating Cycles
11		OEM Name shall be printed on the Patch Cord Cable.
12		RoHS Complied, Meets ANSI/TIA 568.3-D

1O. LC-LC Single mode Armoured LSZH Fiber Patch Cord		
Sr. No.	Parameter	Specification
1	Technical parameters	Fiber Patch Cord, LC Duplex - LC Duplex, Spiral Steel Armoured, 9/125µm OS2 Single mode Round Cord (4.0 +/- 0.2mm) IL <= 0.3dB, RL>= 50dB, LSZH Jacket IEC 60332-1, Operating Temperature -20°C to +70°C, Meets ANSI/TIA 568.3-D, Length 3 Meter
2		Spiral Steel Armor (<= 1.8mm Diameter) , Aramid Yarn, Tight Buffer Fiber
3		Connectors: The optical fiber patch leads shall comprise of Single mode 9/125µm fiber G652.D
4		Connector Insertion loss <= 0.3 dB
5		Return Loss >= 50 for UPC and >= 55 for APC
6		Jacket Material: LSZH complying to IEC 61034-1, IEC-60332-1, IEC-60754-1
7		Length: 3 Meter
8		Attenuation: 1310/1550: 0.35/0.22 dB/KM
9		Operating Temperature: -20°C to +70°C
10		Repeatability: <= 0.2DB 10 Times Mating Cycles
11		Tensile Strength: 750N
12		Crush Resistance: 1000N/100mm

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13	RoHS Complied, Meets ANSI/TIA 568.3-D
----	---------------------------------------

1P. CAT 6 SF/UTP FR-PVC Cable		
Sr. No.	Parameter	Specification
1	Technical parameters	Cat 6, 23 AWG Bare Copper Solid Conductor SF/UTP (Overall foil and braid shield) FR-PVC Jacketed Cable, roll of 305 Mtr, in accordance to ANSI/TIA 568 C.2, IEC 60332-1, IEC 60754 -1, IEC 60134 and ISO/IEC 11801-2nd Edition, 250 Mhz Bandwidth, RoHS Complied, UL 444, 7.4 mm Nominal Diameter
2		Suitable for 1GBASE-T with Min. 250Mhz of Bandwidth
3		4 Twisted Pair alongside PE / PVC Cross Separator
4		Conductor: 23AWG Solid Annealed Bare Copper
5		Conductor Diameter: 0.55 ± 0.025mm
6		Insulation: High Density Polyethylene, Diameter 1.05 ± 0.05mm
7		Core Wrapping: Overall PET tape
8		Shielding: Overall AL-PET Tape (Mylar)+Tinned Copper Conductor Braiding
9		Jacket: Grey colour FR-PVC complying to IEC 60332-1 Flame Rating,
10		Cable Outer Diameter: 7.3 ± 0.50 mm Nominal
11		Operating Temperature: -20°C to +70°C
12		Bend Radius: 8 X Cable Diameter (Min.) or Better
13		Conductor Resistance: £ 9.38 Ω /100m
14		Resistance Unbalance: 4% Max
15		Mutual Capacitance: £ 5.6nF/100m
16		Delay Skew: 45ns Max.
17		Pulling force: 115 N Max.
18		RoHS Complied

1Q. 10 TB Surveillance Grade Hard Disk Drive		
Sr. No.	Parameter	Specification
1	Capacity	10TB
2	Form Factor	3.5-Inch
3	Connector/Interface	SATA
4	Transfer Rate	up to 265MB/s
5	Disk Speed (RPM)	7200 RPM
6	Cache Size	256MB
7	Operating Temperature	0°C to 65°C
8	Certifications	CE, FCC, RCM, UKCA, TUV, UL

1R. 6U/9U Wall Mount Indoor Rack		
Sr. No.	Parameter	Specification
1	Technical parameters	6U/9U, 19" 550mm Depth, Wall Mount Networking Enclosure

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2		It should confirm to DIN 41494 or equivalent standard
3		It should be welded construction with steel frame
4		Lockable tough ended glass front door
5		19" mounting angle made of formed steel
6		Powdered coated standard finish
7		Top & Bottom welded cover with vented & cable entry exit cut outs
8		2 pair of 19" mounting rails
9		1U Cable Manager
10		Roof Mounted Fan Unit
11		230V AC, 6 way, 5 /15 Amp Power Distribution Unit
12		Mounting Hardware set.
13		OEM should be ISO-9001, ISO-14001, ISO-45001 certified.

1S. 6U/9U Wall/Pole Mount Outdoor Rack		
Sr. No.	Parameter	Specification
1	Technical parameters	6U/9U, 19" IP55 Rated Outdoor Pole Rack - 550mm Depth or as per requirement
2		Compact design, welded structure with front accessible
3		Front Door with Filter, Louver & Lock
4		90CFM, 230V AC Fan - 2 Nos, front door
5		Pole Mounting Bracket
6		Powder Coated Surface
7		6 Socket PDU 5 Amp - 1 No.
8		Horizontal Cable Manager 1U loop type - 1no.
9		H/W screws (20 Nos/pkt) 2 pkt

1T. 3 KVA Online UPS system with 60 min Battery backup		
Sr. No.	Parameter	Specification
1	Capacity (in kVA / kW)	3kVA/2.7kW 1-Phase Input / 1-Phase Output with IGBT Rectifier with Inbuilt Battery
2	Input Voltage Range	110-280VAC
3	Input Frequency Range	40 - 70Hz
4	Nominal Output voltage	200/208/220/230/240 VAC
5	O/P Voltage	200/208/220/230/240Vac
6	Efficiency(Min)	88%
7	Out put Socket	Output Socket. Minimum 3 nos - Indian Socket
8	Backup Required	60 min
9	Display	LCD
10	RS485 Port & SNMP enabled	Require
11	Protocol	Modbus
12	Product IP	IP 20

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13	Inbuilt Automatic Bypass	Require
14	Intelligent Battery Management	Require
15	Battery Deep Discharge Protection	Require
16	ECO Mode	Require
17	Manufacturer	QMS: As per ISO 9001: 2008
		EMS: As per ISO 14001: 2004
		ISO 45001: 2018 Factory calibration lab of manufacturer shall be NABL accredited in India
18	ROHS	Require
19	Enclosure	Metal/Steel Heavy Duty 17U, Floor standing, purpurate, Fan for Heat dissipation, metal door, lock & key, with fittings/accessories. UPS and Batteries shall be kept inside the enclosure.

1U. Surge Protection Device (SPD)		
Sr. No.	Parameter	Specification
1	Interface Connections	RJ45 Female Connector
2	Maximum Operating Voltage (Uc)	58V-60V DC
3	Discharge Current	Maximum discharge current - 16KA & Impulse Discharge current 4 kA
4	Protection Level	<1000V (L/L); < 700V(L/PE)
5	Maximum Capacitance	<5.0 pF @ 1 MHz
6	Data Line Protection	RJ45 10/100/1000 Ethernet
7	IEEE 802.3af and 802.3at compliant for PoE and PoE Plus	Yes
8	Operating Temperature	0 to 65° C
9	Failsafe Mode	Transmission Cut off - Fault mode 2
10	Mounting	Wall Mount, Suitable fitting to be provided for mounting
11	Additional Feature	The Ethernet Surge Protector should be compatible with the Cameras and other active components as in the BOQ, and should support PoE/ PoE+ power to the cameras.
12	Earthing	The Ethernet Surge Protector should be properly grounded.
13	OEM criteria	OEM should not be technically rejected in any Govt. tender in India.

1V. 6 Meter Self-supporting Cylindrical CCTV Pole		
Sr. No.	Parameter	Specification
1	Height	6 meter above ground surface Bottom section: 3-meter Middle Section: 2-meter Top Section: 2 meters
2	Foundation	Minimum 1m
3	Pole Diameter (Outer)	Bottom section: 139.7mm Middle Section: 114.3mm Top Section: 88.9mm
4	Bottom Base Plate	300mm x 300mm x 6mm
5	Material	GI

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6	Mounting Facility for	CCTV Camera, Junction Box
7	Design	Pole with climbing facility. An upper cap/sealing arrangement to ensure water resistance inside the pole.
8	Surface Coating	Silver
9	Design	Round
10	Wall Thickness Mm	3.5.mm
Pole Installation		
11	Depth	1.2 M depth from Road Level
	PCC Diameter	0.4 M Dia from top to bottom
	PCC	M20 Grade(1:1.5:3)
	Pedestal PCC	M20 Grade(1:1.5:3) Height-150MM After Road Level

1W. 8 Meter Self-supporting Cylindrical CCTV Pole		
Sr. No.	Parameter	Specification
1	Height	8 meter above ground surface Bottom section: 4-meter Middle Section: 2-meter Top Section: 1.5 meters
2	Foundation	Minimum 1m
3	Pole Diameter (Outer)	Bottom section: 139.7mm Middle Section: 114.3mm Top Section: 88.9mm
4	Bottom Base Plate	300mm x 300mm x 6mm
5	Material	GI
6	Mounting Facility for	CCTV Camera, Junction Box
7	Design	Pole with climbing facility. An upper cap/sealing arrangement to ensure water resistance inside the pole.
8	Surface Coating	Silver
9	Design	Round
10	Wall Thickness Mm	3.5.mm
Pole Installation		
11	Depth	1.2 M depth from Road Level
	PCC Diameter	0.4 M Dia from top to bottom
	PCC	M20 Grade (1:1.5:3)
	Pedestal PCC	M20 Grade (1:1.5:3) Height-150MM After Road Level

1X. Armoured Power Cable		
Sr. No.	Parameter	Specification
1	Category	3 core 2.5 sq mm Armoured Power Cable
2	Material	Annealed Bare Electrolytic Grade, Copper conductor as per IS:8130/84, Multi strand conductor
3	Insulation Material	Extruded PVC type B or better as per IS 5831
4	Inner Sheath material	Extruded PVC

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5	Armouring Material & Size	G.I Steel round wire as per IS3975
6	Outer Sheath	Extruded PVC
7	Certification	As per applicable IS code

1Y. Armoured Serial Cable		
1	RS 485 Cable	Armored 4 Pair, 24 AWG Tinned Copper, PE Insulation, Overall Foil + Tinned Copper Braid (90%) Shield, PVC Outer Jacket

1Z. 8-Port POE switch		
S.No	Features	Specifications
1	Ports	2x 100/1000 speed SFP ports with modules
		6x10/100/1000 speed RJ45 ethernet Port.
		Auto sensing/ Auto negotiating Ports
		Must have console port.
		IPv4&6&6 Ready
2	Performance	Should have wire speed Switching Capacity
3	Standards & Protocols	General: IEEE 802.1AX Link Aggregation, IEEE 802.1D MAC Bridges, IEEE 802.1p Priority, IEEE 802.1Q VLANs
		IEEE 802.1s Multiple Spanning Trees, IEEE 802.1v VLAN, IEEE 802.3af and 802.3at Power over Ethernet, Security: IEEE 802.1X Port Based Network Access Control/Port level mac binding.
4	Security	Switch port Security, MAC Security
5	Management Features	command-line interface; Web browser; configuration menu; out-of-band management; SNMP Manager; Telnet; RMON1,SSH
6	Power Suply	AC 120V- 260V, DC 12V-72V
7	Operating Temperature	-20°C~+70°C
8	Relative humidity	5 to 95% (non-condensing)
9	PoE Output Power	Min 78 W

2A. 43" LED Industrial		
S.No	Features	Specifications
1	General	
2	Display Size	43 inch
3	Screen Type	LED
4	Colour	Black
5	Smart TV	Yes
6	Resolution Standard	4K
7	Resolution (pixels)	1,920 x 1,080
8	Dimensions	
9	Width x Height x Depth (without stand)	970 mm x 571 mm x 58 mm
10	Connectivity features	

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11	No of HDMI Port	2
12	No of USB Port	2
13	Wi-Fi Type	Wi-Fi Certified 802.11a/b/g/n
14	Built In Wi-Fi	Yes
15	Bluetooth	Yes
16	Ethernet (RJ45)	1
17	Headphone Jack	Audio/Headphone Outputs: 1 (Rear Hybrid with Headphone Out, Audio Out and Subwoofer Out)
18	Digital Audio Output	1 Bottom
19	Analog Audio Input	Yes
20	RF Connectivity Input	1 Side
21	Audio features	MPEG1/2 Layer1, MPEG1/2 Layer2, MPEG1/2/2.5 Layer3, AAC, HEAAC, WMA, WMA Pro, LPCM, IMA-ADPCM/MS-ADPCM, AC3, EAC3
22	Number of Speakers	2
23	Speaker Type	Bass Reflex Speaker
24	Sound Technology	Dolby Digital, Dolby Digital Plus, Dolby Pulse, Dolby AC-4, DTS Digital Surround
25	Surround Sound	S-Force Front Surround
26	Speaker Output RMS	20 W
27	Power features	
28	Power Consumption	74 W, 0.5 W (Standby)
29	Remote control features	
30	RF Capable	Yes
31	Smart tv features	
32	Operating System Present	Yes
33	Operating System	Android
34	Screen Mirroring	Yes
35	Video features	
39	Upscaling	Yes
40	Other Video Features	Gamma Engine (Colour Space Mapping Dynamic Contrast Anti-Aliasing), HDR10+ Decoding, HDR10, HLG, Chromecast built-in, DLNA, Miracast
41	Storage	2 GB RAM, 8 GB Storage

2B. 12 U Network Rack	
S.No	Minimum Requirement Description
1	Rack should be ISO Certified Brand and support mounting of all models of Router, Switches, DVR/NVR, Optical Repeater, Line Amplifier, Battery charger and Battery Bank.
2	Should be 12U Height Rack and have 19" mounting bracket in front & rear and wall mountable with side panels, Front Glass Door with lock.
3	Fans 90 CFM 230 VAC with min 2 cooling fans on top and 01 Panel LED light

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4	PDU Horizontal 8 Nos. female socket - Indian standard Round Pin 6A/16A dual type with 2 Nos of 16A MCB.
6	Cable Manager, Wall Mounting Hardware & other accessories should be available from day one
7	CU Earth rail with 06 points with screws and insulators (Electronic Earth Bus)
8	Load Rating Minimum 80 Kg load and 100 Kgs overall
9	Bidder should provide Separate electronic earthing (<2ohm) at location of above device installation and separate electronic earthing BUS BAR should be provided inside the RACK. Body Earthing should be separate from electronic earthing.

2C. Outdoor Junction Box		
S.No	Features	Specifications
1	Industrial grade	Yes
2	Conformance	Min. IP66
3	Compliances	RoHS,
4	Size(mm)	600H x 400W x 300D
5	Accessories	Toughened glass window in the front door
		Document pocket
		wide range of terminals and terminal blocks
		pole mounting clamps
		natural and forced fan filter cooling solutions
		Customized cut outs on door, mounting plate
		bolted cable entry gland plate at the bottom
		CFL light
		stainless steel studs for grounding
		PDU Horizontal 3 Nos. female socket - Indian standard Round Pin 6A/16A dual type with 2 Nos of 16A MCB.

2D. Technical Specification of ANPR Camera		
S.No	Features	Specifications
1	Name	Intelligent ANPR Camera
2	Processor	High-performance embedded processor
3	Sensor Type	1/2.8" Progressive Scan CMOS
4	Minimum illumination	0.1 Lux
5	Electronic shutter	0-1ms, 0-2ms, 0-3ms, 0-4ms
6	Lens	CS mountable, fixed iris, 6mm prime lens
7	WDR	120dB
8	Plate recognition rate	95~99% (if the optimal recognition condition met)
9	Recognizable license plates	10 Arabic numbers (0-9) and 26 English letters (A-Z) License plates

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10	Triggering mode	Video triggering, coil trigger, vehicle capturing rate≥99%
11	Image output	4MP (2688 × 1520), 2MP (1920 × 1080), UXGA (1600 × 1200), 720p (1280 × 720), D1 (704 × 576), CIF (352 × 288)
12	Picture output	4 mega-pixel JPEG
13	Video compression format	H.264B/H.264M/H.264H/H.265/MJPEG
14	Network interfaces	10/100M network adaptive, RJ45 adaptor
15	Protocols	TCP(IPv4&6)/UDP/HTTP/HTTPS/RTSP/FTP/NTP/DHCP/DNS/SMTP/SNMP/UPnP
16	IO interface	3 input/2 output
17	Audio interface	1 audio input (line in)/1 audio output (line out)
18	Serial interfaces	1 RS485
19	TF card	Support SD2.0 standard Micro SD(TF) card with a maximum capacity of 128G
20	Power supply	12V DC, 24V AC, PoE+
21	Power consumption	< 20 W
22	Working temperature	-20°C ~ +60°C
23	White Balance	Full auto, auto colour temperature range, customized colour temperature
24	Capture Distance	8 m-30 m (26.25 ft to 98.42 ft)
25	Protection Level	IP67
26	3rd party Analytics support	The camera should support 3rd party Analytics.
27	Mount	Wall Mount/ Pole Mount, With mounting accessories
28	Certifications	CE-EMC: Electromagnetic Compatibility Directive FCC Part 15, BIS, STQC approved compliance, MTBF Certificate from STQC

2E. Technical Specification of PTZ Camera		
S.No	Features	Specifications
1	Form factor	PTZ
2	Sensor	1/2.8" Image Sensor
3	Day/ Night Operation	Yes, with Auto/Colour/B&W/Schedule
4	Minimum illumination	AGC On: Colour: 0.5 lux, B/W: 0.05 lux, 0 lux with IR
5	Focal Length	4.25~170 mm lens
6	Zoom	40 X optical Zoom, 32 X Digital Zoom, Auto Pan mode
7	Electronic Shutter	1 / 5s ~ 1 / 100,000 s
8	Image resolution	5MP (2560X1920)
9	Video Compression	H.265/H.265+/H.264/H.264+
10	Frame Rate and Resolution	H.265/H.264 5M (2560 X 1920) @30 fps, 2 MP (1920 X 1080) @60 FPS
11	Simultaneous Stream	Minimum 2 streams should be configurable at 1920 X 1080p simultaneously
12	White Balance	Auto/Manual/Outdoor
13	Field of view	H : 59 (W) -2.4 (T)

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14	Noise Reduction	2D DNR, 3D DNR
15	Resolution	5 MP (2592 X 1944)
16	Multiple Stream	3 VIDEO Streams
17	Frame Rate (Main stream)	30 fps
18	Video Streams	3 VIDEO Streams. Main Stream 5MP (2560x1920), 4MP (2560x1440), Sub Stream 1080P(1920X1080), Third Stream - 720P(1280x720)
19	Image Setting	white balance, brightness, contrast, saturation, sharpness, gamma curve, defog, 3DNR, HLM, EIS (built-in gyro sensor), scene mode (auto), exposure strategy (measurement window, metering mode), Privacy mask, Pixel calculator, Scheduled profile settings
20	Focus	Auto/Semiauto/Manual
21	TF card	Seamless Recording to MicroSD/SDHC/SDXC card (1TB capacity supported) and recording to network-attached storage (NAS)
22	Two-way audio	Line in, Line Out
23	WDR	120 dB
24	Audio Compression	G.711, G.711, G.726, AAC
25	Iris	Fixed
26	IR	Inbuilt IR, IR distance upto 200 mtr
27	Illumination Adjustment	Smart IR
28	Alarm	1 input, 1 Output
29	Edge Video Content Analytics	Intrusion detection, Loitering detection, Line crossing detection, Face detection, Unattended object detection, Missing object detection, SoC with built-in hardware deep learning accelerator, Object Detection [People, Vehicle (4-wheeled, 2-wheeled)], Attribute Extraction [People (gender, clothing colour, bag, hat), Vehicle (bike, bus, car, motorcycle, truck, colour), Re-Search Extraction, Path Extraction
30	Edge Storage	Built in SD card slot with support upto 128 GB SD card
31	Protocols	802.1X, ARP, Bonjour, CIFS/SMB, DDNS, DHCP, DNS, FTP/SFTP, HTTP, HTTPS, ICMP, IGMPv3, IPv4, IPv6, NTP, PPPoE, QoS (CoS/DSCP), RTSP/RTP/RTCP, SMTP, SNMP, SSL, TCP/IP, TLS 1.2/1.3, UDP, UPnP
32	Text Overlay	Date & time, and a customer-specific text etc
33	Security	HTTPS, IP Filter, IEEE 802.1X
34	Firmware Upgrade	The firmware upgrade shall be done through web interface, the firmware shall be available free of cost
35	Privacy Mask	4 Zones
36	PTZ	Pelco D, Pelco P, Protocol Support
37	PAN	360 ° endless, Manual speed 0.6°~200°/S, pre-set speed 200°
38	Tilt	-10°~90° (Auto Flip), Manual speed 0.6°~100°/S,
39	Preset	255
40	PTZ Operation	1 sequence, 1 cruise, Auto pan
41	Alarm	1 Input / 1 output
42	Ethernet Interface	1 X RJ 45
43	Certifications	UL, CE, FCC
44	Compatibility	ONVIF profile S , G ,T & M
45	Supported Web browser	Internet Explorer (8) above
46	Weather Proof	IP 66

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47	Operating Temperature	-20°C~+60°C
48	Power Supply	AC24/DC12V/POE+
49	3rd party Analytics support	The camera should support 3rd party Analytics.
50	Mount	Wall Mount/ Pole Mount, With mounting accessories
51	Certifications	CE-EMC: Electromagnetic Compatibility Directive FCC Part 15, BIS, STQC approved compliance, MTBF Certificate from STQC

15. Bill of Material (BOM)

15.1 Bill of Material (BOM) for Part-A: Surveillance System for Additional 40 PSS:

BOM							
Sl. No.	Item Description	Quantity	Unit	Unit Rate	GST%	Inclusive of Tax	All Inclusive Total Price
SUPPLY PART							
1	Additional Server Core/RAM/GPU etc for Video Management Software platform expansion as per tender scope	1	Set				
2	Additional Server Core/RAM/GPU for Video Analytics platform expansion as per tender scope	1	Set				
3	Local Processing Unit for VA at PSS	40	Set				
4	VMS Channel License	400	Nos				
5	License for Video analytics software for PPE Detection (helmet, shoes, gloves)	40	Nos				
6	License for Video analytics software for Face recognition for 50 people	40	Nos				
7	License for Video analytics software for Fire and Smoke Detection	40	Nos				
8	License for Video analytics software for Perimeter Intrusion Detection	240	Nos				
10	3 KVA Online UPS with 60 mins Battery backup and Enclosure	40	Nos				
11	General Surveillance Indoor Dome Camera	80	Nos				
12	General Surveillance outdoor Bullet Camera	320	Nos				
13	NVR 16 Channel with 10 TB 3.5" SATA Surveillance grade Hard Disk Drive	40	Nos				
14	POE Ethernet Switch: 16 Ethernet ports and 2 Fiber optic ports	40	Nos				
15	Stabilizer for UPS	5	Nos				
16	Armored CAT6 Cable	1500	Mtrs				
17	3 Core 2.5 sq mm Armored Power Cable	3500	Mtrs				
18	Armored 4 Pair Serial Cable	1000	Mtrs				

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19	6U Wall Mount Rack 550D with 5/15A PDU and 2 sets of hardware screw, 1 no. cooling fan and 1 no. shelf	40	Nos				
20	32mm HDPE Pipe, ISI marked or Telecom approved	4000	Mtrs				
21	Outdoor Junction Box; ISI marked	320	Nos				
22	2 Socket 5/15A PDU; ISI marked	400	Nos				
23	Surge Protection Device for camera	400	Nos				
24	6 Mtr Cylindrical Camera Pole with accessories and earthing	180	Nos				
25	Chemical earthing including 5 ft digging; customized	40	Nos				
26	RS 485 to RS 232 Converter	90	Nos				
27	16A Dual Pole AC MCB to be installed at ACDB panel for protection and isolation of inverter AC supply.	40	Nos				
28	16A Dual Pole DC MCB to be installed inside the rack for isolating and protecting DC supply from inverter to rack-mounted equipment.	40	Nos				

Service							
1	Installation, testing and commissioning of CCTV system at each PSS	40	Nos				
2	Installation, testing and commissioning at Control center as well as at Data Centre	1	Set				

Note: 1. Bidder has to consider required material such as any hardware or software, civil work, mechanical work, apart from the BOM mentioned above, to complete the successful installation and commissioning of surveillance system.

2. On-Site Support and Internet Provisioning:

For any configuration, integration, or commissioning activities related to cameras, NVRs, VMS servers, VA servers, LPUs, VMS software, VA software, and associated components, the concerned personnel from both the bidder and the OEM shall be physically present at the site until the system is successfully commissioned and one month of error free operation before final handover is completed.

In case any online support is required for purposes such as patch updates or firmware upgrades, the bidder shall arrange the necessary internet connectivity at their own cost and responsibility.

15.2 Bill of Material (BOM) for Part-B: Surveillance for CRC Locations:

S.No	Description	Quantity	Unit	Unit Rate	GST%	Inclusive of Tax	All Inclusive Total Price
1	General Surveillance Indoor Dome Camera	35	Nos				
2	POE Ethernet Switch: 4 Ethernet ports and 2 Fiber optic ports Managed	10	Nos				

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	Industrial grade, DC operated along with AC-DC converter power.						
3	NVR 4 Channel with 1 TB 3.5" SATA Surveillance grade Hard Disk Drive	10	Nos				
4	1 KVA Online UPS with 60 mins Battery backup and Enclosure	10	Nos				
5	3 Core 2.5 sq mm Armored Power Cable	500	Nos				
6	Armored CAT6 Cable	1000	Nos				
7	16A Dual Pole AC MCB to be installed at ACDB panel for protection and isolation of inverter AC supply.	10	Mtr				
8	16A Dual Pole DC MCB to be installed inside the rack for isolating and protecting DC supply from inverter to rack-mounted equipment.	10	Mtr				
9	6 U Wall mount rack along with power socket & all mounting accessories	10	Nos				
Service							
1	ITC of installation and commissioning of CCTV system at CRC	10	Nos				

Note: 1. Bidder has to consider required material such as any hardware or software, civil work, mechanical work, apart from the BOM mentioned above, to complete the successful installation and commissioning of surveillance system.

2. On-Site Support and Internet Provisioning:

For any configuration, integration, or commissioning activities related to cameras, NVRs, VMS servers, VA servers, LPUs, VMS software, VA software, and associated components, the concerned personnel from both the bidder and the OEM shall be physically present at the site until the system is successfully commissioned and one month of error free operation before final handover is completed.

In case any online support is required for purposes such as patch updates or firmware upgrades, the bidder shall arrange the necessary internet connectivity at their own cost and responsibility.

15.3 Bill of Material (BOM) for Part-C: Surveillance for Open-Space Stores:

S.No	Description	Quantity	Unit	Unit Rate	GST%	Inclusive of Tax	All Inclusive Total Price
1	Storage Device: for Video Storage with redundant Power Supply	4	Nos				
2	ANPR Camera and accessories with Video-Channel license for VMS	4	Nos				
3	PTZ Camera and accessories with Video-Channel license for VMS	4	Nos				
4	Perimeter Protection Camera and accessories with Video-Channel license for VMS	55	Nos				
5	3 KVA Online UPS with 60 mins Battery backup and Enclosure	4	Nos				
6	32mm HDPE Pipe, ISI marked	6000	Mtr				

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7	32mm GI Pipe, ISI marked or Telecom approved	500	Mtr				
8	3 Core 2.5 sq mm Armored Power Cable	2000	Mtr				
9	Armored CAT6 Cable	4000	Mtr				
10	6 Core Single Mode Arm OFC Cable	2000	Mtr				
11	POE Ethernet Switch: 24 Ethernet ports and 2 Fiber optic ports Managed Industrial grade, DC operated along with AC-DC converter power.	4	Nos				
12	SITC of PoE Switches (8 port)	6	Nos				
13	43" LED Industrial	4	Nos				
14	Network Accessories (12 port FMS with LC connector, LC-LC Patch cord, SFP, RJ45 etc.)	30	Set				
15	12 U Wall mount rack along with power socket & all mounting accessories	4	Set				
16	Outdoor Junction Box IP65 along with mounting accessories	65	Nos				
17	8 Mtr GI Pole for Camera Mounting with earthing	50	Nos				
18	32 Channel Network Video Recorder with redundant power Supply, 180 days of Recording	4	Nos				
19	1G SM SFP Module for above Ethernet Switch	40					
20	Media Converter (UTP to FO & FO to UTP) (Pair)	20	Nos				
21	2 Socket 5/15A PDU; ISI marked	65	Nos				
22	Chemical earthing including 5 ft digging; customised for Rack, NVR, Ethernet Switch etc.	4	Nos				
23	Route Markers for Cable Routes	100	Nos				
24	16A Dual Pole AC MCB to be installed at ACDB panel for protection and isolation of inverter AC supply.	4	Nos				
25	16A Dual Pole DC MCB to be installed inside the rack and at the external junction box for isolation and protection of DC supply from the inverter.	4	Nos				

Service							
1	ITC of installation and commissioning of CCTV system at Store	4	Nos				

Note: 1. Bidder has to consider required material such as any hardware or software, civil work, mechanical work, apart from the BOM mentioned above, to complete the successful installation and commissioning of surveillance system.

2. On-Site Support and Internet Provisioning:

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For any configuration, integration, or commissioning activities related to cameras, NVRs, VMS servers, VA servers, LPUs, VMS software, VA software, and associated components, the concerned personnel from both the bidder and the OEM shall be physically present at the site until the system is successfully commissioned and one month of error free operation before final handover is completed.

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16. POLE DRAWING

POLE FOUNDATION FOR TUBULAR POLE FOR CAMERA

