



Government of India  
BHABHA ATOMIC RESEARCH CENTRE  
Radiochemistry & Isotope Group  
**Isotope & Radiation Application Division**  
Mumbai-400085



Tele: 022 25596878

**Tender No.: IRAD/14/39**

**Due Date: 20.02.2019 at 14:30 Hrs**

**Sub: Invitation to submit your quotation**

On behalf of President of India, Head, Hot cell Operation Section, Radiochemistry & Isotope Group, Bhabha Atomic Research Center invites lowest quotation in sealed envelope for the work given below as per the scope of work & technical specifications enclosed herewith.

S. No.	Description of Job	Completion Period
1.	Design, Supply, installation, testing & commissioning of a Closed Circuit Television (CCTV) Surveillance System as per annexure-A attached.	Six Months

Quotations are invited for the above system as per annexure-A on or before **February 20, 2019 up to 14.30 hrs** in a sealed envelope through registered post/speed post of Indian Postal Services only.

**The terms and conditions are given below:**

**1. Qualifying criteria for bidders:**

- 1.1 All the supervisors and workers should have valid Police Verification Certificate (PVC). The list of manpower available with firm shall be submitted along with their details of PVC.
- 1.2 Workers/labourers given by the vendor should be well experienced in Fabrication, installation and commissioning of similar type jobs.
- 1.3 All workers/labourers of the Vendor/Contractor employed for execution of job in this tender should have proper Personal Protective Equipment (PPE), the arrangement of which shall be made by Vendor/Contractor
- 1.4 All workers/labourers of the Vendor's/Contractor's Company/Firm should have valid PVC (for minimum 03 persons) not expiring during the tender period (i.e., from the date of issue of this enquiry till completion of job after getting work order).
- 1.5 The past experience of the firm in similar nature in BARC/DAE shall be made available with Work Order copy and satisfactory completion certificate from the user. Also the list on of going jobs inside BARC premises with expected completion period shall be provided.

2. The quotation envelope shall be superscripted with **Description of the job and the Tender Ref. No.** as mentioned above.
3. Authorization & service support up to two years Certificate from the OEM of the CCTV camera, NVR manufacturer and OEM of other equipment shall be submitted along with the quotations.

4. The complete quotation shall reach the following address on or before **20.02.2019 14:30 Hrs.** by **Registered Post/ Speed post.** The quotations will be opened on the same working day in Accounts Division, BARC between 1500 to 1600 Hrs.

<p>Shri. A. K. Pradhan/T. P. Rao Head, HCOS, IRAD BARC, Trombay, Mumbai- 400 085</p>
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5. **Printed Letter Head:** Quotation should be printed on the letter head; computer generated quotation is not valid.
6. **Validity of the Offer:** Validity of the offer shall be for 90 days from the date of opening of quotation.
7. **Guarantee:** Vendor shall have to give guarantee of the quality and workmanship of work done for the period of min. 12 months from the date of completion of the work.
8. **Offer of Firm:** Offer of those firms, who do not submit their quotation as per the details given in the technical specification and incomplete quotations in any respect shall not be considered.
9. The department reserves right to extend the date of opening the quotations.
10. **Payment Terms:** Accounts Division BARC Mumbai-400085 shall make full and final payment only after submission of the satisfactory work completion certificate issued from the undersigned, bill, guarantee certificate, delivery Challan and advanced stamped receipt. No advance payment is admissible.
11. **Income Tax Recovery Clause:** Income tax @ 2% will be deducted from the bill.
12. If any of the employee, consultant, or partner of the company is an Ex- BARC employee, the same must be stated in the quotation clearly.
13. **Penalty:** Any delay which is attributable to the contractor is liable for penalty @ 0.5 % per week (max 5 %).
14. **ST/VAT/PAN Number:** Quotation shall consists of Sales Tax Registration Number registered with local ST authority /CST authority, PAN number of the firm, service tax registration number etc.
15. **Safety & Security Rule:** The vendor shall follow all the safety procedures as per the normal industrial practice during the execution of the job at site. Any mishap occurring during the work due to unsafe workmanship shall be the vendor's liability. Security and transportation rules at BARC, Trombay premises shall be strictly followed.
16. **Confidential Clauses:**
- I. **Confidentiality :** No party shall disclose any information to any third party concerning matters under this contract generally, In particular, any information identified as "Proprietary" in nature by the disclosing party shall be kept strictly confidential by the receiving party shall not be disclosed to any third party without the prior written

consent of the original disclosing party This clause shall apply to the sub- contractors, consultants, advisors, or the employees engaged by a party with equal force.

- II. “Restricted information” categories under section 18 of the Atomic Energy Act, 1962 and “Official secrets” under section 5 of the Official Secret Act, 1923: Any contravention of the above mentioned provisions by any contractor, sub- contractor, consultant, advisor or the employee of a contractor will invite Penal consequences under the aforesaid legislation.
- III. Prohibition against use of BARC’s name without permission for any publicity Purpose. The contractor or Sub contractor, consultant, advisor or the employees engaged by the contractor shall not be use any public purposes through any media like press, TV, or internet, without the prior written approval of BARC.

(A. K. Pradhan)  
Head, HCOS  
BARC

**(For and on behalf of President of India)**

## TECHNICAL SPECIFICATION

### Chapter 1.

#### General:

The purpose of this tender is to enhance the CCTV surveillance system for general area surveillance of blind zones, vehicles & personnel movement within those zones of the AHCAF, IRAD. It shall help in monitoring the various activities of the zones, which are generally not under the visual to the security personnel and in order to detect unwarranted/ unauthorized activities.

It is indented to install network cameras at the access of personal entry, material/movement into the facility, operation in the water pool, personal access into the hot cell, operating area of hot cell and entry through turnstile gate. Backyard, front side of the buildings and connecting and leading roads towards the buildings. It is proposed to monitor these cameras in the monitoring room (G17-C) on the LED monitor by interfacing with NVR (Network Video Recorder) at Central Monitoring Station (CMS) on full HD 42" monitor if required.

- 1.1 Network PTZ camera shall be mounted on the poles or on wall at different locations for outside surveillance purpose.
- 1.2 Network bullet cameras shall be mounted on wall at different locations to monitor the movement of persons/vehicles.
- 1.3 Network Dome cameras shall be mounted on wall at different locations to monitor the pool operations, personal movement around the hot cell and operating areas.
- 1.4 All outdoor cameras shall min. be in IP-66 housing.
- 1.5 All outdoor items for cameras like JB's. power supply etc. shall be in water proof and dust proof enclosures.

## Chapter 2.

### The Scope of Work:

- 2.1 This CCTV system shall be comprised of one monitoring location, in local control room/building, **Annexure-I** indicate the devices location chart.
- 2.2 There should be a command and control system for indication of fire, Radiological alarm and other indications in nearest guard house.
- 2.3 All Entry Points (Including Rolling Shutters) to the facility should be provided with two cameras for redundancy with at least one hidden camera.
- 2.2 The proposed system items shall be mentioned in the Bill of Material (BOM) with required quantity as given in **Annexure-II**. As specified in detailed technical specifications attached as **Annexure -III**.
- 2.3 The Scope of the work includes design, inspection, testing, delivery, supply, installation, commissioning of the system as per technical specifications, documentation & handing over of the system.
- 2.4 It shall include pre-dispatch inspection & testing at suppliers work /premises of all components to be used in the system.
- 2.5 It shall include packaging & safe delivery of all the components / materials to be used in this system.
- 2.6 It shall include Project Documentation, which shall be done and handed over in three sets of hard copy & Three CDs. Documentation shall include documents like Project handover report, Site Acceptance test, as built layout of cable and Camera Installations, layout details, interconnection schematics, Camera Nomenclature and Operational procedure manuals, maintenance procedures, trouble shooting tips & repair maintenance guide. Offer shall include above report preparation and submission.
- 2.7 Camera mounting pole/fixtures shall be provided and installed wherever required to mount the outdoor cameras as per site requirement.
- 2.8 It shall include installation at site of various components, cameras, laying of control, network & power cables, JB's for cameras, NVRs, and LED monitors.
- 2.9 It shall include excavation of soft/Hard soil, Cabling & Conduit work wherever needed. The rates quoted shall be inclusive of all the material required for job such as clamps, spacers, saddles, mounting on wall etc. The rates shall be quoted as supply & installation rates per meter basis or total job. All the underground cables shall be laid in GI Conduit/ HDPE pipe.
- 2.10 The rates for all the items have to be quoted for supply & installation of the indented quantity. For cables rate shall be per meter basis for supply. Installation rate shall include all the accessories required for cabling & labour rates. Installation rate shall be applicable for the executed quantity which is installed and in case only supply is executed supply rate shall be applicable.
- 2.11 The price quoted by the vendor should include all the expenses incurred in commissioning of all cameras with power supply, accessories and other devices complete with related software if any.

- 2.12 It shall include O&M training on CCTV system.
- 2.13 OEM Authorization letter/Certificate is required for all CCTV items mentioning tender specific reference no. for extension of product supply, service support and minimum 2 years spare availability.
- 2.14 It shall include warranty for all the components, parts & assemblies supplied and installed against defects in material & workmanship for a period of at least TWELVE Months commencing upon the date of acceptance by the user.

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## Annexure-I

### List of CCTV System Devices & their locations

S.No	Location	Type of Camera	NVR	Location of NVR	Special Requirement
1.	Personnel entry(Near Turnstile Gate)	IP Bullet Camera	16 CH NVR	G 17C Monitoring Room	Wall Mount
2.	Personnel entry after Turnstile(focusing both lanes)	IP Bullet Camera			Wall Mount
3.	Material/movement through rolling shutter	IP Bullet Camera			Wall Mount
4.	Personal access into the hot cell	IP Bullet Camera			Wall Mount
5.	Access of compressor room	IP Bullet Camera			Wall Mount
6.	Access of AHU room	IP Bullet Camera			Wall Mount
7.	Operating areas of hot cell	IP Dome Camera			Wall Mount
8.	Hot cell Rear side (Surveillance)	IP Dome Camera			Wall Mount
9.	Water Pool Operations (Surveillance)	IP Dome Camera			Wall Mount
10	DM plant area	IP Dome Camera			Wall Mount
11	Rear Road of CFB	IP 25X IR PTZ			Wall Mount
12	A-Block,CFB Behind	IP 25X IR PTZ			Wall Mount

## Annexure-II

### Bill of Material

Item	Descriptions	Qty
<b>I)</b>	<b>SUPPLY</b>	
1.	IP PTZ CAM,1080P,WDR, <b>25X ZOOM</b> ,IR,H.265/H.264,PoE+,IP66, 2MP, 25X optical zoom, True WDR, 120db, 328ft, (100m) IR range, Face detection analytics, Onboard micro SD card storage up-to 128 GB, ONVIF S & G complaint, Wall mount bracket, UL, CE, FCC certified. <b>Approved Make: Sony, Bosch, Honeywell, Vivotech, Pelco</b>	2 Nos. (1Spare)
2.	1/3" CMOS, 3 MP, 2.7-12 mm MFZ, 24 IR LEDs, PoE, H.264 TDN IR Indoor/Outdoor <b>Network</b> Bullet Camera, Onvif profile-S compliant <b>Approved Make: Sony, Bosch, Honeywell, Vivotech, Pelco</b>	10 Nos.
3.	Performance series IP <b>4 MP</b> day night IR <b>RUGGED Dome</b> Camera Varifocal 2.7-12 mm	4 Nos. (1Spare)
4.	16 Channel Network Video Recorder with PoE Ports, Hot Swappable HDD's, Onvif profile-S <b>Approved Make: Sony, Bosch, Honeywell, Vivotech, Pelco</b>	1Nos.
5.	4TB Surveillance HDD <b>Approved Make – Seagate, WD</b>	2 Nos.
6.	CAT-6 Cable UTP	5 Box.
7.	Server with client software for Monitoring Room	1 No
8.	42'' Full HD Monitor	1 No
9.	Supply of HDMI Cable-15 mtrs	1 No
10.	4 U rack for NVR with power supply	1 No
11.	Magnetic Proximity Switch for shutter	3
12.	Contact Condition Monitor Electronics	2+1 Nos
13.	Supply of 3 core, 1sq. mm power flexi cable	200 Mtrs
14.	Supply of 1" GI Conduit <b>Make - Branded</b>	200 Mtrs.
15.	Supply of 1" SS Conduit <b>Make - Branded</b>	100 Mtrs.
<b>II</b>	<b>SERVICES</b>	
1.	Laying of CAT-6 Cable	1220 Mtrs.
2.	Laying of GI conduit	200 Mtrs.
3.	Laying of SS conduit	200 Mtrs.
4.	Installation & Commissioning of CCM	2 Nos
5.	Installation & Commissioning of cameras & NVR	As required



## Chapter 3.

### Technical Specifications for Supply, installation, wiring, testing & commissioning of Network CCTV Surveillance system.

#### ITEMWISE DETAILED TECHNICAL SPECIFICATIONS

##### 3.1 Item Sr No-1

##### 1/1.9 in, 2 MP Outdoor 25 X PTZ IR Ultra Low Light Dome type Network Camera

##### Desired Features

- 3.1.1 IR distance, depending on scene reflectance: up to 100 m
- 3.1.2 Multiple, selectable compression formats (H.264/MJPEG)
- 3.1.3 Excellent low light performance with down to 0 lux BW (with IR LEDs on)
- 3.1.4 Up to triple stream support
- 3.1.5 Auto tracking
- 3.1.6 Rugged outdoor housing with IP67 ingress protection
- 3.1.7 Electronic image stabilizer (EIS)
- 3.1.8 On board camera storage: up to 128 GB micro SD card
- 3.1.9 ONVIF profile S compliant
- 3.1.10 Wiper
- 3.1.11 True WDR: 120 dB
- 3.1.12 The camera can be configured to automatically detect and respond to events such as motion in the scene, alarm inputs, network failure, and/or camera tampering.
- 3.1.13 Automated responses should include: sending a notification through email, FTP, and/ or HTTP; sending a still image of the event through email and/or FTP; and recording a video clip of the event to a configured micro SDHC card. Setup can be done through a web client or from an NVR.

##### SPECIFICATIONS

##### CAMERA

Image sensor	1/1.9 in. Sony Progressive CMOS
Optical zoom	25x
Digital zoom	16x
Number of pixels (H x V)	1920x1080 (1080p)
Shutter wdr	120 dB
S/N Ratio	> 50 dB (AGC Off)
Minimum illumination	0.005 lux (color)/0.0005 lux (B/W) @ F1.6; 0 lux IR On
IR light control	On (Zoom priority/Manual)/Off
IR distance	Up to 100 m
Max aperture	F1.6 - F4.8
Focus mode	Manual/Auto/Semi-auto
Angle of view	H: 61.2° - 2.32°
White balance	Auto/Indoor/Outdoor/ATW/Manual
AGC (gain control)	Auto (Max gain limit settings for Auto)/Manual
Iris control	Auto/Manual
Electronic shutter	1/1 to 1/30,000 sec
Backlight	BLC/HLC/WDR
Compensation	
Electronic image stabilization	On/Off

Defog	On/Off
Day/night	Auto/Color/BW
<b>Operational</b>	
Pan travel	360° endless
Tilt travel	-10° to 90°, auto flip 180°
Manual pan speed	Up to 200°/s
Manual tilt speed	Up to 120°/s
Presets	250
Preset accuracy	0.225°
Preset speed	Pan: Up to 200°/s; Tilt: Up to 200°/s
Tours	8
Auto pan/scan	1 / 1
Pattern	5
Privacy masks	24
Auto resume after power failure	Yes
Motion detection	On/Off
Image rotation	Flip
Audio in / out	1 / 1
Alarm input / output	7 / 2
Auto tracking	Auto/Manual
Event	Motion Detect; Video Tamper; Audio Detect; No SD card; SD card error; SD card capacity warning; Network disconnection; IP address conflict; Illegal access
Event notification	Record (SD card and FTP), Relay output, Email, Preset, Tour, Pattern, Snapshot
<b>Electrical</b>	
Power Source	24 VAC +/- 25% and high PoE (Class 5)
AC Frequency	50Hz.
<b>Environment</b>	
Temperature	Up to 70 degree C.
Humidity	< 90% non condensing
Waterproof Standard	IP67
Wiper	Required
<b>IP Specifications</b>	
Video Compression	H.264/MPEG4
Video Streaming	Primary Stream: 1080p @ 30fps, 720p @ 60fps Second Stream: D1/CIF @ 30fps Third Stream: 720/D1/CIF @ 30 pfs
Video Resolution	1920 X 1080p
Frame Rate	Up to 720p: @ 60/50 fps Up to 1080p @ 30/25 fps
Interface	RJ45 , 10/100 Mbps Ethernet
Support Protocols	IPv4/v6, TCP/IP, UDP, RTP, RTCP, HTTP, HTTPS etc.
Users Access	>20 users
Security	Password protection, HTTPS, IEEE 802.1x etc.

Micro SD support	SD card up to 128 GB
Browser Support	Internet Explorer 8
O.S.	Windows 7, 32/64 bits
Communication	Onvif profile -S
<b>Regulatory Standards</b>	
Emission	EN 55022, FCC etc.
Immunity	EN50103-4
Safety	EN 60950-1, EN60950-22
ROHS	EN 50581

### 3.2 Item Sr. No-2

#### **1/3" CMOS, 3 MP, 2.7-12 mm MFZ, 24 IR LEDs, PoE, H.264 TDM IR Indoor/Outdoor Network Bullet Camera,**

##### **Desired features:**

- 3.2.1 4 MP (20 fps) and Full HD 1080p (25/30 fps) image with 1/3" 3 MP sensor
- 3.2.2 True Day/Night capability, vivid color pictures by day and clear black-and-white pictures at night with ICR
- 3.2.3 Should be excellent low-light performance with 3D Noise Reduction, saving storage and bandwidth together with H.264 High Profile codec
- 3.2.4 IR LEDs should provide up to 100 ft (30 m) of illumination in dimly lit or nighttime scenes
- 3.2.5 Smart IR technology for even distribution of IR
- 3.2.6 Waterproof (IP66) camera housing for outdoor installations
- 3.2.7 2.7-12 mm F1.4 motorized focus/zoom lens
- 3.2.8 Configurable motion detection and camera Easy to Install and Use
- 3.2.9 Built-in PoE (Power over Ethernet) and 12 V DC inputs where PoE power is unavailable
- 3.2.10 Remote configuration, motorized zoom adjustments and auto focus
- 3.2.11 Should support up to 128 GB micro SDHC (Class 10) card for local video storage when network is interrupted
- 3.2.12 Onvif Profile S compliant

## SPECIFICATIONS

### **Camera**

Image Sensor	1/3" 3 megapixel progressive scan CMOS
Effective Pixels	2304 (H) x 1296 (V)
Electronic Shutter Speed	Auto/Manual, 1/3(4)-1/100000 s
Min. Illumination	0.1 lux, F1.4 (Color); 0 lux (IR LEDs on)
S/N Ratio	More than 50 dB
<b>Camera Features</b>	
IR Distance	Up to 100 ft (30 m), depending on scene reflectance

Day/Night	Auto(ICR)/Color/BW	
Backlight Compensation	BLC/HLC/DWDR	
White Balance	Auto/Manual	
Gain Control	Auto/Manual	
Noise Reduction	3D	
Privacy Masking	Up to 4 areas	
<b>Lens</b>		
Focal Length	2.7-12 mm	
Max. Aperture	F1.4	
Focus Control	Auto	
Horizontal Angle of View	86°-28°	
Lens Type	Motorized focus/zoom	
<b>Video</b>		
Compression	H.264 (Main/High/Baseline Profile)/MJPEG	
Resolution	3 MP (2304x1296), 1080p (1920x1080), 720p (1280x720), D1 (704x576/704x480), CIF (352x288/352x240)	
Frame Rate	Main Stream	3 MP (1-20 fps), 1080p (1-25/30 fps)
	Sub Stream	D1, CIF (1-25/30 fps)
Bit Rate	H.264: 4-8192 kbps	
Corridor Mode	Support required	
<b>Network</b>		
Ethernet	RJ-45 (10/100Base-T)	
Protocol	IPv4/IPv6, HTTP, HTTPS, TCP/IP, UDP, UPnP, ICMP, IGMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPoE, DDNS, FTP, IP Filter, QoS	
Compatibility	ONVIF Profile S, CGI	
Max. User Access	20 users	
Mobile App	HonView Touch for iPhone, iPad, Android Phone and Tablet	
Auxiliary Interface		
Memory Slot	Micro SD (128 GB)	
<b>General</b>		
Power Supply	PoE (802.3af), 12 V DC	
Power Consumption	8.5 W max. (IR LEDs on)	
Working Environment	-22°F to 140°F (-30°C to 60°C); 10% to 100% RH, condensing	
Ingress Protection	IP66	
Dimensions	8.46" x 3.56" (214.8 x 90.4 mm)approx.	
Regulatory	FCC, Part 15B, Class B	

### 3.3 Item No 3

Performance series IP 4 MP day night IR RUGGED **Dome** Camera Varifocal 2.7-12 mm

Video standard	NTSC/PAL
Scanning system	Progressive scan
Image sensor	1/3" 4 MP CMOS
Number of pixels (h × v)	2688 × 1520
Minimum illumination	0.03 lux color @ F1.4 (Color, 1/3s, 30 IRE) 0 lux B/W with IR LEDs on @ F1.4
S/n ratio	> 45 dB
Electronic shutter speed	1/3(4) – 1/100,000 s

IRdistance	Up to 148 ft (45 m), depending on scene reflectance
Smart IR	Auto/Manual
Day/night	Auto (ICR)/Color/BW
Backlight compensation	BLC/HLC/WDR (120 dB)
White balance	Auto/Natural/Street Lamp/Outdoor/Manual
Gain control	Auto/Manual
Wide dynamic range	True WDR (120 dB)
Noise reduction	3D DNR
Privacy masking	Up to 4 configurable zones
Motion detection	Up to 4 configurable zones
Region of interest	Up to 4 configurable zones
Digital zoom	16x
Lens	2.7 – 13.5 mm, MFZ, F1.4
Angle of view	104° – 28° (H), 55° – 16° (V)

### Video Compensation

Video compression	H.265+/H.265/H.264+/H.264
Resolution	4 MP (2688×1520), QHD (2560×1440), 3 MP (2304×1296), 1080p (1920×1080), SXGA (1280×1024), 1.3 MP (1280×960), 720p (1280×720), D1 (704×576/704×480), VGA (640×480), CIF (352×288/352×240)
Frame rate	4 MP at 1 – 20fps, 3 MP at 1 – 25/30fps D1/CIF at 1 – 25/30fps
Bit rate control	CBR/VBR
Bit rate	H.265: 12K – 8448 Kbps H.264: 32K – 10240 Kbps

### Network

Ethernet	RJ-45 (10/100BASE-T)
Supported web browsers	Internet Explorer (11.0+)
Supported os	Windows 7 32-bit
Protocols	IPv4/v6, TCP/IP, UDP, RTP, RTSP, RTCP, HTTP, HTTPS, SSL, FTP, SMTP, DHCP, PPPoE, UPnP, SNMP v2/v3, Bonjour, DNS, DDNS, IEEE 802.1X, QoS, NTP
Interoperability	ONVIF Profile S, Profile G
Maximum user access	20 users
Security	User account and password protection, HTTPS, IP filter, IEEE 802.1X, digest authentication, user access log, TLS1.2, AES-256, SSH/Telnet closed, FTP disabled
Event	No SD card, SD card error, SD card capacity warning, network disconnection, IP address conflict, illegal access, video tampering, motion detection
Event notification	Record (SD card, NAS, FTP), relay output, email, snapshot
Micro sd	Up to 128 GB microSDHC card, Class 10 (not included)

### Electrical

Power supply	PoE (802.3af) Class 0,
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	12 VDC
Power consumption	8.5 W max. (IR LEDs on)

### Mechanical

Dimensions	3.5" (122.0 mm × 88.9 mm)
Product weight	0.88 lb (0.4 kg)
Package weight	1.19 lb (0.54 kg)
Construction	Die-cast aluminum housing with powder coat
Construction color	RAL 9003 (White)

### Environmental

Operating temperature	-22°F to 140°F (-30°C to 60°C)
Storage temperature	-22°F to 140°F (-30°C to 60°C)
Relative humidity	Less than 95%, non-condensing
Ingress protection	IP66
Impact resistance	IK10

### Regulatory

Emissions	FCC Part 15B, EN 55032
Immunity	EN 50130-4
Safety	EU: EN 60950-1 North America UL listed to UL/CSA 60950-1
Rohs	EN 50581

## 3.4 General Requirements of Camera Accessories

### 3.4.1 Camera mounts:

The camera mount should be:

- 3.4.1.1. Of the same make as that of camera and suitable for the model number offered as specified by the manufacturer and should be an integrated unit.
- 3.4.1.2. Should be compact and indoor / outdoor type as required.
- 3.4.1.3. Should support the weight of camera and accessories such as housing, pan & tilt head in any vertical or horizontal position etc.

### 3.4.2 PTZ controller:

For PTZ cameras the required Controller should have variable speed joystick, Easy joystick for manual operation, LCD display for programming and it should be able to control the speed dome /PTZ camera for PAN / TILT / Zoom. Should supports Pelco D, Pelco P and COP-2 protocol cameras, RS-485 protocol.

### 3.4 Item No. 4:

#### 16 Channel Embedded NVR

##### Desired NVR Features

- 3.4.1 H.264/MJPEG dual codec decoding
- 3.4.2 HDMI/VGA simultaneous video output
- 3.4.3 Immediately Detect and Respond to Events such as motion in the scene, alarm inputs, a network failure and/or tampering. Automated responses include:
- 3.4.4 Sending a notification through email, FTP and/or HTTP.
- 3.4.5 Uploading still images at the time of the event through email and/or FTP
- 3.4.6 Recording a video clip of the event so it is ready to distribute to authorities.
- 3.4.7 Enabling a visual or auditory notification (a flashing light, bell or siren).

##### NVR SPECIFICATIONS

###### System

Main Processor	Dual-core embedded processor
Operating System	Embedded LINUX

###### Video

IP Camera Inputs	16 channels
Bi-directional Audio	1 channel input; 1 channel output; BNC

###### Display

Interface	1 HDMI; 1 VGA
Resolution	1920 x 1080; 1280 x 1024; 1280 x 720; 1024x768
Display Split	1/16
OSD	Camera title; Time; Video loss; Camera lock; Motion detection; Recording

###### Recording

Compression	H.264 / MJPEG
Resolution	1080p (1920 x 1080); 720p (1280 x 720); D1 (704 x 576 / 704 x 480); SXGA (800 x 600); 1.3 MP (1280 x 1024)
Recording Rate	100/120 fps @ 1080p, (100 fps @ 1080p for PAL)
Bit Rate	256 to 8192 Kbps 8-/16-channel NVRs: 1 to 8192 Kbps
Recording Mode	Manual; Schedule (Regular [Continuous], Motion Detection, Alarm, Motion Detection+Alarm); Stop
Recording Interval	1 to 120 minutes (default: 60 minutes); Pre-recording: 1 to 30 seconds.

###### Video Detection and Alarms

Trigger Events	Recording; Tour; Alarm; Email; FTP; Buzzer; Screen Tips
Video Detection	Motion Detection; Motion Detection Zones (396: 22 x 18); Video Loss and Camera Blank
Alarm Input	16 channels
Relay Output	3 channels

###### Playback and Backup

Sync Playback	1/16
Search Mode	Time/Date; Alarm; Motion Detection; Exact Search (accurate to a second)

Playback Function	Play; Pause; Stop; Rewind; Fast play; Slow play; Full Screen; Backup
Backup Mode Compatibility	USB Device; Network
<b>Network</b>	
Operating System	Windows® XP; Windows Vista; Windows 7
Protocols to be Supported	HTTP; TCP/IP; IPv4/IPv6; UPnP; RTSP; UDP; SMTP; NTP; DHCP; DNS; IP filter; PPPoE; DDNS; FTP; Alarm server; IP search
Maximum Number of Users	>=20 users
Smart Phone Compatibility	IOS; Android™
<b>Storage</b>	
Internal Storage	2 SATA ports; up to 8 TB; RAID (redundancy)
<b>Connectors</b>	
Ethernet	1 x RJ-45 port (10/100/1000 Mbps)
PoE	4 ports (IEEE802.3af)
USB	2 ports (1 on rear panel); USB 2.0
RS232	1 port, for PC communication and keyboard
RS485	1 port, for PTZ control
<b>Electrical</b>	
Power Supply (NVR)	12 V DC; 5 A
Power Supply (PoE)	48 V DC
Power Consumption (NVR)	20 W (without HDD) approx.
Power Consumption (PoE)	15 W each
<b>Environmental</b>	
Operating Temperature	14°F to 131°F (-10°C to 55°C)
Storage Temperature	-4°F to 158°F (-20°C to 70°C)
Humidity	10% to 90%
<b>Physical</b>	
Dimensions	14.8 x 11.2 x 2.1 inches (375 x 285 x 52.6 mm)
Weight (without HDD)	5.07 pounds (2.3 kg)
<b>Physical</b>	
Emissions	FCC Part 15B, CE EN55022
Immunity	CE EN50130-4
Safety	EU: EN60950-1 North America UL listed to UL/CSA 60950-1
<b>System Integration</b>	Open IP Integration ONVIF support

### 3.5 Item No.5:

#### 4 TB Surveillance Hard Disks

Parameters Required

4 TB HDD



Humidity Sensor	Yes
Super Parity	Yes
Low Halogen	Yes
Hot-Plug Support	Yes
Cache, Multi-segmented (MB)	128 MB
Mean Time Between Failures (MTBF, hours)	1.4M
Reliability Rating @ Full 24x7 Operation (AFR)	0.63%
Non-recoverable Read Errors per Bits Read	1 sector per 10E15
Power-On Hours per Year	8760 (24x7)
Sector Size (Bytes per Sector)	512 Bytes
Limited Warranty	5 Years
Spindle Speed	7200 RPM
Interface Access Speed (Gb/s)	6.0, 3.0, 1.5
Max. Sustained Transfer Rate OD (MB/s)	216
Average Latency	4.16 ms
Interface Ports	Single
Rotation Vibration @ 1500 Hz	12.5 rad/s <sup>2</sup>
Idle Power, Average	6.0 W
Typical Operating, Random Read (W)	9.42
Power Supply Requirements	+12V and +5V
Temperature, Operating	5 to 60 °C
Vibration, Non-operating: 10Hz to 500Hz	5.0 Grms
Shock, Operating, 2ms (Read/Write) (Gs)	70/40
Shock, Nonoperating, 1ms and 2ms (Gs)	300
Height (in/mm, max)	1.028/26.1
Width (in/mm, max)	4.010/101.85
Depth (in/mm, max)	5.878/147.0
Weight	635 grams approx.

### 3.6 Item Sr. No. 6

#### CAT 6 Cable

Twisted Pair, Insulated with High Quality Polyethylene and Unshielded Light Grey PVC Jacket with Improved Fire Retardant properties, Low attenuation and crosstalk and Low Structural return loss as per IS .

Class E CAT 6A,

Frequency (MHz) 1-500 ,

Insertion Loss (dB) 20.9

NEXT (dB) 39.9, PS-NEXT (dB) 37.1, ACR (dB) 18.6, PS-ACR (dB) 15.8,

ACRff (dB) 23.3—22.5, PS-ACRF (dB) 20.3—22.5 Return Loss (dB) 12.0, PS-ANEXT (dB) 60.0,

PS-AACRF (dB) 37.0

Propagation Delay (ns) 548

Networks Supported 10GBASE-T

Bend Radius — PVC: 1.41" (36 mm); Plenum: 1.29" (33 mm)

Capacitance Unbalance (Pair Ground) — 330 pF/100 in max.,  
Characteristic Impedance— 100 ohm  $\pm$  10% (10-500 MHz)  
Conductor — 4 pairs, 23 AWG solid bare copper,  
Construction — Internal separator, FEP insulation, dielectric tape, drain wire, aluminium /Mylar  
tape, Delay Skew — 45 nS/100 max.,  
DCR Unbalance — PVC: 3% max.;  
Plenum: 5% max.  
Insertion Loss (dB/100 m) — 18.6 @ 100 MHz; 43.8 @ 500 MHz; 50.6 @ 650 MHz  
Jacket — Low-smoke, flame-retardant LS0H/PVC  
Drain Wire — Tinned copper,  
Insulation — PVC: HOPE;  
Plenum: fluoro-polymer (FEP)  
Mutual Capacitance: 56 pF/100 m max. Nominal Velocity of Propagation:  
PVC: 66%; Plenum: 70%  
outside Diameter — PVC: 0.303" (7.7 mm); Plenum: 0.283" (7.3 mm)  
Propagation Delay Skew — 45 ns/100 m max.  
Return Loss (dB/100 m) — 21.1 @ 100 MHz; 16.5 @ 500 MHz; 15.7@650MHz, Shield —A

### **3.7 Item Sr. No. 8**

Item from Reputed make

### **3.8 Item Sr. No. 9 to 15**

Good Quality Standard items from reputed manufacturers

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