

**Guidelines for**

**Virtual real time view of activities in Training Centers using**

**IP address based Network Video Recorder (NVR) CCTV cameras**

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## 1. Specifications

The specifications outlined in this section are aimed at ensuring a minimum standard setup of CCTVs at each Training Center in short-term skilling schemes of Haryana Skill Development Mission (HSDM). Each Training Center will have to accordingly make necessary addition/ modification in order to comply with these specifications at earliest.

All skilling batches going to start operations after issuance of these specifications will have to ensure compliance from the beginning. All existing training partners (TPs) going to open new training centers have to ensure compliance for these norms from the start. All existing training centers will have to ensure compliance at earliest. Due diligence and/ or inspection protocol of Training Centers will appropriately include review of compliance on these specifications.

### i. IP Camera

The image/ video quality of camera should be of high standards and the hardware should be ready to operate in all environments and all weather. Installation of the camera shall cover all the areas where monitoring and surveillance is required for the training centers, including, academic instruction, assessment and marking of attendance. Cameras should be placed such that all the concerned candidates should be visible in each frame being captured. Few relevant parameters and specifications thereof are listed below for easy reference:

Parameter	Specification
Image sensor & Effective Pixels (Resolution)	1/3" or better CMOS Progressive Minimum (2 MP), D1 or better
Electronic Shutter	1/30 to 1 / 10,000 s or better
Min illumination/ light sensitivity (Colour) or better	Minimum 0.5 lux (30 IRE, F 1.2) or better
Backlight Compensation	ON/OFF

IRIS Control	DC or Automatic
Focus	Automatic / Manual
Automatic Gain Control	Automatic / Manual
Colour, Brightness, Contrast	Configurable functionality Required
Frame Rate	Minimum 12 FPS
Lens type	2-8mm Varifocal lens or better
Video	
Day and Night functionality	Automatic, Color, Mono
IR illuminator	Illuminator may be Internal or external & visibility should be at least 15 m
Video Resolution	Minimum D1 or better
Video Streams	Individually configurable 02 video streams
	(H.264, MPEG IV)
Video Compression	
Recording & Viewing	Dual H.264 or better, lossless compression required
Audio	
Audio support	Required in line with other details specified below under microphone
Audio Compression	Minimum G.711 or better AAC48KHz or better
Two-way audio	Optional
Input / Output	01 IN & 01 OUT
Interface	RJ-45 for 10/100 base-T Ethernet
Upgrade	Through web browser, online, firmware upgrade
Network Protocols/ other protocols compatibility and support	IPv6, TCP/IP, HTTP, DHCP, UDP, DNS, SMTP, RTP, RTSP, SNMP protocols/Should meet all functional requirement of the project
Alarm Event	Events / alerts send via FTP, HTTP, email, Pre-Post alarm video buffering.
Alarm I/O	1 potential Free 1 In & 1 Out
Compliance	ONVIF Profile S or better
Security	
Password Protection	Required
HTTPS encryption	Required
IEEE 802.1X	Required
General	

Operational temperature °C	0°C to 50 °C
Humidity	0 to 80% RH non-condensing
Power	PoE (Upto 15.4 Watt) OR eAC24V/ DC12V, 100- 230VAC
Certifications	UL and CE/ EN/ FCC
Local Storage	
SD card support	Apart from NVR/ server, Camera should support SD card up to 32 GB. In the event of failure of connectivity to the local machine / servers the camera shall record video locally on the SD card automatically. After the connectivity is restored these recordings shall be automatically merged or can be merged manually as & when required with the server recording such that no manual intervention is required to transfer the SD card based recordings to server.

## ii. Microphone and Portable recorder

Audio captured in classroom, lab or during interview/ other proceedings, etc. will have to be of the best quality for ensuring Speech Analytics using an appropriate analytics software used by MSDE/ State.

The microphone/ lapel/ portable digital recorder placement should be close to the trainer/ instructor/ assessor/ inspector in order to capture his/her speech clearly for enabling a meaningful Speech Analytics later. Audio footage recorded will have to be stored for transfer to/ fetch from an authorized remote system, separately from CCTV footage. This audio footage will be compared with audio on CCTV footage for a match to ensure compliance.

Minimum Specifications for microphone and portable digital recorder are as follows:

- Omni-directional / lapel microphone

- Portable digital recorder, wearable on person
- Tempo change (VSA) function for adjusting the speed from 0.5 to 1.5 times (in 0.1 increments)
- Powered by batteries, USB power or optional AC adapter
- 16 bit PCM .wav format

### **iii. Network Video Recorder (NVR) or Local Server with NVR functionality**

Supports a Broad Range of IP Cameras and NVR supports H.264, MPEG-4, M-JPEG, and other higher formats for recording from multiple ONVIF compliant IP camera models.

Intelligent Video Analytics (IVA) for Fast Video Retrieval with support of out of focus, and camera occlusion to provide fast video retrieval.

Compatibility between the NVR and the surveillance devices are strengthened to provide more event handling options when events are detected or alarms are triggered on the IP cameras.

RAID Data NVR shall support RAID 1, 5, 6, 5+hot spare, 6+hot spare to protect the recording data against hard drive failure.

Convenient video backup to external USB storage through one-touch-autovideo-backup button to copy the data from the NVR to an external attached storage device.

## **2. LAN switch**

Switch will have to be provided at each Training Center for connecting cameras to NVR/ local Server. Minimum requirements are as follows:

It should be manageable switch, minimum 8 port 10/100 base T POE access ports. It should support all L2 functionalities along with SNMP & port level security. Should be IPV6 ready.

Switch should have non-blocking wire-speed architecture with support for both IPv4 & IPv6.

Switch should support Dual Field Replaceable & upgradable Power Supplies.

Switch should support queuing as per IEEE 802.1P standard on all ports with mechanism for traffic shaping and rate-limiting features for specified Host, network, Applications, etc.

Switch shall support minimum 0 to 50°C continuous operating temperature range and operating relative humidity: Up to 90% non-condensing.

### **3. WAN router**

Router/ functionality will have to be provided at each Training Center to ensure CCTV footage is able to be fetched remotely by HSDM. Router should have public Static IP for making it directly accessible by authorised systems. Router should be of good quality, temperature and humidity resistant, compliant with the latest industry standards and compatible with appropriate protocols for easy and secure connectivity with LAN devices as well as easy and secure accessibility from an authorised remote system.

### **4. Storage of CCTV footage (Video and Audio)**

Appropriate local storage capacity will have to be provided at each Training Center as per extant guidelines/ SOP along with a reliable archival and restoration system in place. This storage will have to accommodate all the audio/video recording from above specified cameras and audio recorder. Recording must be stored for at least 3 &1/2 months beyond training completion for each batch with proper tags for easy recognition and traceability of TC, Batch, Date/time, location, etc.

### **Nomenclature of Footage**

Scheme name, TP Code (as per HSDM designated MIS system), TC code (as per HSDM designated MIS system), Batch no. (), date (last date of footage in ddmmyyyy format). All these parameters in that order should be concatenated in a single string without space.

CCTV footage for the following events of every batch should be stored datewise till the scheme is closed by HSDM:

- Any/all activities/trainings conducted in classrooms and/laboratories
- External assessment for each batch
- All internal assessments for each batch
- Distribution of welcome kit to the candidates on batch freezing date
- Centre inspection by HSDM field officers and HQ team members
- Video footages of some particular events as advised time to time by HSDM other than those above
- Sample videos viewed during the inspection schedules as per SOP.

### **Nomenclature of the sample footage**

SAM, Scheme name, TP Code (as per HSDM designated MIS system), TC code (as per HSDM designated MIS system), Batch no. (), date (last date of footage in ddmmyyyy format). All these parameters in that order should be concatenated in a single string without space. Sampled CCTV footage, in addition to being stored safely will be uploaded to the HSDM designated IT platform and also on TP's website.

Entire CCTV footage of a batch should be stored in the training centre till the inspection schedules specified in SOP for the batch are completed.

## **5. Bandwidth**

Adequate bandwidth, (2 Mbps or more per camera) should be provided at each Training Center to ensure remote monitoring and/ or fetching of CCTV footage from an authorized remote system. Each Training Center will have to ensure that bandwidth shall not become a bottleneck in viewing/ fetching CCTV footage remotely and therefore will make necessary enhancements as demanded by HSDM to ensure the same.

## **6. Power and UPS**

Adequate power supply and UPS back-up will have to be provided for a trouble free operation of all the above specified equipment.

## **7. Review of CCTV footage (Video and Audio)**

CCTV footage(s) for review may be selected as per identified process. CCTV footages could be reviewed, inter alia, for the following particulars:

- Training deliverables (as per activity cum lesson planner)
- Trainers' skills via domain experts
- Use of training aids and methodology for more impactful learning
- Uniform/tablets distribution
- Live distance learning
- Trainers' attendance
- Involvement of trainees during the session
- Identifying uninterested and truant trainees
- Candidates' attendance in classrooms and laboratories
- Identify any malpractice during assessment