No. IV-21011/38/2009-Prov-I
Government of India
Ministry of Home Affairs

26, Man Singh Road, Jaisalmer House,
New Delhi, 5.10.2009

To

The DGs:Assam Rifles/BSF/CISF/CRPF/ITBP/NSG/SSB/BPR&D

Subject:-QRs/Technical Specifications for the Security Gadgets -regarding

The QRs/Technical Specifications for the following Security Gadgets have been accepted and approved by the Competent Authority in MHA:-

1. IP Camera Based Video Surveillance System (Annex-A) S
2. Flap Gate(Annex-B) S
3. Half Height Turnstile Gate(Annex-C) S
4. Revolving Search Light(Annex-D) S
5. Handy Cam(Annex-E) S
6. Ultra Violet Desktop(Annex-F) S

2. Henceforth, all the CPMF's should procure the above items required by them strictly as per the laid down Technical Specifications/QRs.

05/10/09

(R.S.Sharma)
Director (Prov)

Copy to:-

DD(Procurement),MHA

Copy for information to:-

PS to JS(PM),MHA

## IP BASED CCTV SYSTEM

Annex - A

The system should consist of following major components:

1. IP cameras
2. Recording and database Servers
3. Storage Hardware
4. Software
5. Networking components

### A VMS SERVER SOFTWARE

1 The VMS software should consist of an MS-SQL 2005 or better based Main Directory Database, Automated synchronised Failover database, Automated failover recording, Recording Server for video, Digital Virtual Matrix, Incident Reports, Alarm Management, Network Management System and Watchdog modules. All the related software licenses should be the part of the offered system.

2 The VMS should be provided with at least 5 concurrent system administration licenses ( or as defined by the user) so as system administration can be distributed depending on the sub division of the surveillance areas.

3 The VMS Server should maintain a catalog of settings for all the client, servers and IP cameras in the system. The VMS should detect signal loss and have the capability to alert the systems administrator

4 The VMS Archive Server should offer the capability to be installed on multiple servers to enable distributed archiving architecture on the LAN or WAN. Preferably VMS software licensing should not restrict the number of server to be used for recording so as we will have freedom to add the servers on later date to spread the recording on geographically different locations/zones to counter natural disaster or zonal architecture. If offered software need such licensing then at least 5 additional recording server licenses should be provided ( or as defined by the user).

5 The VMS Archive Server should support up to 100 camera connections ( or as defined by the user) in single database configuration database server .

6 The VMS Archive Server, for video and audio, should support and manage (32) camera connections from IP cameras and video Encoders each at 25FPS PAL and 4CIF resolution (704x576PAL) and (50) cameras at 25FPS PAL and 2CIF resolution (352x288 PAL), 100 cameras at 25FPS and CIF resolution. But considering the reliability factor none of the servers should be loaded with more than 32 cameras during initial design and

recording should be spread on at least two servers. Each server should have independent external storage with 8TB storage disks (or as specified by the user).

7 The VMS should be able to set each camera frame rate, bit rate and resolution independently from other cameras in the system, and altering these settings should not affect the recording and display settings of other cameras. This should be applicable even if multi channel encoders are used. The VMS should **utilize multicast** network communication for video monitoring.

8 The VMS should have a built-in Digital Video Matrix Switcher functionality without the need of any additional software license.
   a) The Virtual Matrix Switch should provide a full matrix operation of IP video to digital (computer) screens or analog monitors.
   b) The Virtual Matrix Switch should have the capability of creating various camera sequences.
   c) The Virtual Matrix Switch should have the capacity to interface with legacy video walls via a CCTV keyboard connected to Encoder, Decoder or the client PC

9 The VMS should support web based clients connecting to the VMS system via the Internet

10 The VMS should support a built-in Watchdog module
   a) The Watchdog should monitor operation of all services and automatically restart them if they are malfunctioning.
   b) The Watchdog should be responsible for restarting the application or in a last resort restart the server in case of malfunction of software components.

11 The VMS should be based on a true open architecture that allow for use of non-proprietary PC and storage hardware that should not limit the storage capacity and should allow for gradual upgrades of recording capacity

12 The VMS Server should be of the most recent computer technology and should cover the VMS requirements.
   i To provide an advanced and reliable system the operating system should be Window Server (Latest version)/Linux Server (Latest version).

13 The VMS should allow **Windows OS (latest version).**

14 The VMS should provide alarm dry contact interfaces to allow for any alarm input initiating any action in the VMS system.
   a) The VMS should transmit dry contact information over the IP Digital Transmission Network.

15 The VMS Should support **bidirectional audio communication** and transmission signals over the IP Digital Transmission Network without the

need of any additional license. If licensing is required all the channels should be provided with audio licenses for each camera.

16 The VMS should provide a reporting utility for tracking but not limited to the following options. Video and images should be stored with reports for documenting events.

a) Alarms, Incidents, Operator logs, Service requests
b) The Email Alert should be generated in responds to alarms triggered in VMS software and sends out email alerts to a preconfigured list of recipients.
c) It should be possible to export the settings of various entities within the VMS i.e Archiver, Directory, cameras etc.. It should be possible to print these reports.
d) It should be possible to get reports on past events by querying the audit databases. It should allow the search by User Logon, Entity Configuration, Incident, Alarm, Application Failure, Equipment Failure.

17 The VMS should provide alarm management module without the need of any additional license.

a) The alarm management should be able to set any monitor or groups of monitors to automatically display cameras in response to alarm inputs.
b) The alarm management should be able to reset automatically or manually alarmed video.
c) The alarm management should allow for multiple modes of alarm handling capability, these modes to be programmed within the same system.

**18 The VMS should have support a Internet Gateway server application without the need of any additional license**

a) The Internet Gateway server should allow clients to view good quality video streams from remote locations, over the internet, over firewall and proxies
b) The Internet Gateway server should manipulate the video data to adjust the video stream type and properties to the connection type depending on the available bandwidth.
c) The Internet Gateway server should transcode MPEG4 streams to MJPEG streams in order to overcome the MPEG4 issues related with limited bandwidth connections, such as video artifacts, thus providing a MJPEG stream that maintains high quality images and automatically adopts the frame rate to the connection bandwidth.
d) The Internet Gateway server should support all video stream types, including live, archive, instant replay, video sequences, and video on alarm.

e) The Internet Gateway server should have only one TCP port exposed to the internet, thus masking the video servers, encoders and cameras from direct connections coming from external networks.

f) The Internet Gateway server, in collaboration with the Gateway server, should provide remote users full functionality in a transparent way; the remote user will use the system normally despite the fact that the connection goes through the Internet Gateway

**A VMS CLIENT**

1 The VMS client should consist of Monitoring application, an Archive Player

2 Application, alarm handling, virtual matrix capability, and all other user related features. Preferably Client license should work on concurrent user basis so as user should get the privilege to login from any computer in the network rather than restricting to specific monitoring PC. The VMS client should perform the following applications simultaneously without interfering with any of the Archive Server operations (Recording, Alarms, etc.):

a) Live display of cameras
b) Play Live audio
c) Broadcast audio to remote locations
d) Live display of camera sequences
e) Live display of panoramic camera views
f) Control of PTZ cameras
g) Playback of archived video and audio
h) Playback of panoramic camera clips
i) Retrieval of archived video and audio
j) Instant Replay of live video and audio
k) Instant Replay of panoramic camera clips
l) Use of graphical controls (maps)
m) Configuration of system settings
n) Execution of system macros

3 The VMS client applications should support any form of IP network connectivity, including: LAN, WAN, VPN, Internet, and Wireless

4 The VMS client applications should support IP Multicast (UDP) and Unicast (UDP) video and audio streaming.

5 The VMS client applications should automatically adapt to the network topology and use the best available method to receive streaming video.

6 The VMS client applications should provide an authentication mechanism, which verifies the validity of the user.

7 VMS Client MONITOR Application

a) The Client Monitor application should allow for live monitoring of video and audio.
   i The Monitor should enable view of up to 25 video tiles simultaneously on a single monitor.
   ii The IP Based VMS Should provide more than 15 tile layouts on each of the VGA monitors independently including below formats
      1) Full screen, Quad, 3x3, 4x4, 5x5, 1 + 9 (One large and 9 small view), 1+11 (One large and 11 small view), 1+12 (One large center tile and 12 small view), 1+15 (One large and 15 small view), And more

b) The VMS Monitor application should allow operators to view an instant replay of any camera or audio input (microphone).
   i The operator should be able to define the amount of time he wishes to go back from a predefine list or through a custom setup period.
   ii The operator should be able to control the playback with play, pause, forward, and speed buttons.

c) The VMS Monitor application should allow operators to add bookmarks to recorded clips of video or audio

d) The operator should be able to choose and trigger an action from a list of available actions included but are not limited to:
   i View camera in a video tile
   ii View Map or procedure in a video tile
   iii Starting/stopping PTZ pattern
   iv Go to PTZ Preset
   v Sending alert messages

e) The VMS Monitor application should display all cameras attached to the system regardless of their physical location on the network.

f) The VMS Monitor application should display all camera sequences created in the system.

g) The VMS Monitor application should allow for unlimited cameras sequences, which can be run independently of each other on either digital monitor tiles or analog CCTV monitors.

h) The VMS Monitor application should allow operators to control (Pause/Play, skip forwards, skip backwards) Camera Sequences, without affecting other operators' ability to view and control the same sequence.

i) The VMS Monitor application should display all cameras, sequences and analog monitors in a logical tree.

j) The VMS Monitor application operator should be able to drag and drop a camera from a tree of available cameras into any video tile or an analog monitor icon for live viewing.

k) The VMS Moniter application operator should be able to drag and drop a camera sequence from a tree of cameras into any video tile or an analog monitor icon for live viewing.

l) The VMS Monitor application should support Graphical Site Representation (Maps) functionality, where digital maps are used to represent the physical location of cameras and other devices throughout facility.

   i The VMS Maps should have the ability to contain hyperlinks to create a hierarchy of interlinked maps.

   ii The VMS Maps should be able to import maps from any graphical software supporting BMP, JPEG and/or GIF image formats.

m) The VMS Monitor application operator should be able to drag and drop a camera from a map into a video tile for live viewing.

   i The operator should be able to click on an icon in a map to initiate PTZ camera preset, run PTZ pattern, view camera in an analog monitor or send an I/O stream.

n) The VMS Monitor application should support the procedure functionality, where procedures can be triggered to appear during a certain event and can be used to provide detail written or verbal instructions to the operator as to the actions to be taken.

o) The VMS Monitor application should support digital zoom on a fixed camera's live and recorded video streams

p) The VMS Monitor application should support digital zoom on a PTZ camera's live and recorded video streams

8 The Client Workstation should have dual redundant 1GB network interface and should operate on 100/1000BT Ethernet networked and should be of the most current technology available.

9 The VMS Monitor application should provide management and control over the system using a standard PC mouse, keyboard and CCTV keyboard. Standard scroll mouse should be able to move the camera by merely clicking on the extremes of the picture in all directions and zoom function by scroll button to avoid the use of joystick keyboard and maintain the easiness of the control. Provision of the PTZ menu on GUI will not be considered as equivalent or substitute. The vendors should provide joystick keyboard as an integrated part of client workstation if they do not support this feature.

10 The VMS software must support existing PTZ cameras with complete PTZ functionality from any client workstation GUI.

**B ALARM MANAGEMENT**

1 The IP based VMS should provide alarm management and reporting module
2 The IP based VMS should notify a user on any alarm set in the system
3 The VMS user should be able to support multiple alarms
4 The VMS system administrator should be able to set for each user the maximum alarms to be viewed at one time
5 The VMS user should be able to forward alarms to other users
6 The VMS alarm management should keep audit trail of all alarm and operators related operations in a separated database.
7 The VMS alarm database should provide multi time schedule support and should be able to save the alarm database for different period of time as the recorded video schedule.

**C Integration Interface**

a) The VMS should provide an integration interface for any third party system through well defined API interface. Related license should be included in the offer.

Specifications of **Day/Night Fixed Camera**

| Sr. No. | **Specifications** |
|---|---|
| | 1/3" High Resolution CCD |
| | High Resolution, PAL |
| | Minimum Illumination : **0.2 lux color, 0.05 lux** B/w @F1.2 |
| | Digital Signal Processing |
| | DC Auto Iris |
| | **Day/Night mode**: Automatic |
| | S/N Ratio: >50db |
| | Compression : Dual MPEG4 streams |
| | Frame Rate : 1-25FPS for PAL |
| | Resolution : Adjustable from 352x288 to 704x576 at 25 FPS |
| | Bandwidth : 64Kbps to 6Mbps |
| | **Bidirectional audio capability with external audio input and output and required licenses** |
| | RTP, TRCP, TCP/IP, UDP, HTTP, IGMP, ICMP, ARP, DHCP |
| | Flash memory for upgrade of video codec and application firmware over the network |
| | 10/100 Base-T Auto sensing, Half/Full Duplex (RJ45) |
| | RS-422/485 2/4 Wires (maximum of 230 Kbps) |
| | 2 Alarm inputs, 1 Relay out |
| | Power : 12VDC ±10% and PoE |
| | Enclosure : Outdoor IP66/ Indoor as required |
| | Mount: Wall, Ceiling, Pole as required |
| | Operating Temp: 32° F to 122° F (0° C to 50° C) |
| | Humidity : 95% (Non-condensing) |
| | CE and FCC |
| | |
| | **Lenses for above camera** |
| | 1/3" Format C/CS mount |
| | Varifocal 7.5-50mm, |
| | Auto Iris |
| | Day/Night IR Corrected |

**SPEED DOME IP CAMERA**

| Sr. No. | Specifications |
|---|---|
| | 1/4" CCD, F=**3.4mm to 119mm, 35X optical zoom** plus 12x digital zoom, **Day/Night** Wide dynamic range, electronic image stabilization |
| | Scalable resolution from **CIF-4CIF** 352x240 to 704x480 (NTSC) 352x288 to 704x576 (PAL) at 25 |
| | Minimum illumination 0.2 lux color and 0.05 lux B/W |
| | **Multicast** and unicast, dual-stream MPEG-4 video for independent viewing and recording, Configurable between 64 Kbps and 6 Mbps |
| | Digital signal processing |
| | Focus, Iris, BLC should have Auto/Manual |
| | Pan range **360° continuous**, Tilt -10° , +100° (with auto-flip) |
| | Manual Pan / Tilt speed 120°/sec, Preset Pan/Tilt speed 120°/sec |
| | 4 patterns with 16 areas, 99 Presets |
| | 4 alarm inputs, 1 relay outputs |
| | Privacy masking zones |
| | **Bidirectional audio capability with external audio input and output and required licenses** |
| | Remote access for configuration, viewing and control via standard web browser |
| | RTP/IP, UDP/IP, TCP/IP, or multicast IP, DNS and DHCP client |
| | Flash memory for upgrade of video codec and application firmware over the network |
| | Ethernet 10/100 Base-T Auto sensing, Half/Full Duplex (RJ45) |
| | Operating temp. **-20° C to 55° C** |
| | **Outdoor vandal proof IP66 enclosure, metal construction, wall/pole mount** |
| | Humidity : 95% (Non-condensing) |
| | FCC, CE certified |

**SVMS Server Hardware (Minimum one server per 32 cameras)**

| Sr. No. | Specifications |
|---|---|
| | The SVMS computer server 19" rack mounting. |
| | The SVMS Server should be of the most recent computer technology and should cover the SVMS minimum requirements |
| | Two Quad Core CPU Processors, 2.0GHz, 2x6MB Cache |
| | Windows (latest version)/Linux (latest version) with compatible database. |
| | 1333MHz FSB with 4GB of RAM |
| | Dual mirrored 80GB Hard Disk (7200 rpm) for OS and External RAID 5 |

| | |
|---|---|
| | configured storage array for video storage. |
| | Dual Network Interface Card - 100/1000 MB |
| | Dual/Redundant power supply |
| | Standard video display adapter |
| | CD-RW |
| | **External Direct Attached Storage** |
| | Up to fifteen (15) 1-inch-by-3.5-inch SATA II hot-pluggable 3.0 Gbps hard drives, at speeds of 7,200 RPM |
| | Loaded with 8TB (or as specified by the user) storage with hot-pluggable drives and minimum one spare drive. Maximum capacity up to 15TB using fifteen 1TB drives. (or as specified by the user) |
| | Upgradeable for dual host support providing direct connectivity to drives |
| | LED indications for System status, Power, Split mode, Activity, Drive indicator per drive, fan fault, SAS ports etc. |

**SVMS Client Workstation**

| Sr. No. | Specifications |
|---|---|
| | The SVMS Server should be of the most recent computer technology and should cover the SVMS minimum requirements |
| | Quad Core CPU Processors, 2.0GHz 2x6MB L2 Cache. |
| | MS Windows (latest version) |
| | 1333 MHz FSB with 2GB of RAM |
| | Hard Drive Space – 80GB for OS and SVMS Applications |
| | Network Interface Card - 10/100/1000 MB |
| | Video Card -256MB nVidia Dual DVI Graphics card for Dual monitor support |
| | 19" LCD TFT monitor. |
| | DVD-R/W |

**Network Switches**

| Sr. No. | Specifications |
|---|---|
| | All networking equipment should be as minimum of Layer-2 and as a minimum should support IGMP Snooping Version 2 or later. It should have minimum two 1000baseT copper ports and minimum two slots for 1000baseT fiber modules. |
| | The IP network should support Multicasting between all ports and should allow for Multicast streams to be routed between networks. |

| | |
|---|---|
| | All the edge switches should be minimum Layer-2. All Layer-2 switches must finally be brought together using 1000baseT ports to central Layer-3 core switch to be provided in control room. Connection to the servers and clients must be 1000baseT from 10/100/1000baseT ports. Connection between Layer-2 and Layer-3 switch should use 10/100/1000baseT copper or fiber interface as per distance limitation. Connection between edge switches and core switch should be in STAR/MESH configuration only. |
| | Fiber optic cables with required media converters and accessories should be used Wherever the distance between the camera and the switch is more than 90 meters. |
| | Uplink port should have sufficient speed to avoid network congestion, preferably network should not be loaded more than 70% at any stage. |

The Sysem should have following approvals.

A. CE Compliant
C. FCC Class B

( D.D. Sharma)
J.D.D/Tech, IB

(R.C. Chilkoti)
DIG, BSF, STS,

( Nitin Agrawal IPS)
DIG/Tech

(N. R. Das IPS)
DG, CISF