

DIRECTOR GENERAL BORDER SECURITY FORCE
(PROVISIONING DIRECTORATE (MOD CELL))

Expression of Interest

Commandant (Ord)
HQ DG BSF, Prov Dte (Ord Sec)
Block No. 10, CGO Complex
Lodhi Road, New Delhi
(Tele/Fax No. 011-24367683)
Mail id: comdtord@bsf.nic.in

The Sub-group of Technical Experts on Surveillance Equipment's constituted by MHA vide their letter No. IV-1017/18/2001-Prov-I dated 05 Jul 2002 held its meeting at BSF Headquarters on 15th May 2017 and 15th June 2017 to formulate the QRs of '**Vehicle Mounted Surveillance System**'.

After detailed deliberations the referred Sub-group has formulated the QRs of '**Vehicle Mounted Surveillance System**' which are as under:-

Qualitative Requirements/specification of Vehicle Mounted Surveillance System

S.No	Specification	
01.	Vehicle mounted Surveillance system consists of Day and Night cameras, inbuilt DMC & GPS , LRF, control & Display unit and telescopic mast, mounted on the vehicle offered by the firm.	
02.	Colour Camera	
a	CMOS/CCD Colour camera	
b	Resolution-640 x 480 or better	
c	Auto and manual focus mechanism	
d	Optical magnification: 20x or better.	
e	Digital magnification : 2x,4x.	
f	Range	
	i) Detection of human target : 5km	
	ii) Recognition of human target- 2.5km	
3.	Night (Thermal) Camera :	
a	Spectral response : LWIR/MWIR or both	
b	FPA Resolution : 640 x 512 (min)at pixel pitch of 15 µm or better	
c	Auto and manual focus mechanism	
d	Optical magnification -5x (min) continuous.	
e	Electronic magnification- 2x,4x .	
f	Wide FOV	12.5 ⁰ x 10 ⁰ (min)
g	Narrow FOV	2.5 ⁰ x 2. ⁰ (max)
h	Range :	
	For Human Target	
	i) Detection – 3 km	

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		ii) Recognition – 1.5 km
		For Vehicle
		i) Detection – 5 km
		ii) Recognition – 2.5km
4.		Start up time : NMT 8 MINTS
5.		Non uniformity calibration(NUC)
6.		The EO system should be immune to glare of searchlights. It should not get damaged if faced towards Sun accidentally.
7.		It Should have the facility to stream imagery over wireless link(500 meters minimum NLOS and 2000 meters minimum LOS with coding. (Wireless link range for imagery transmission to be specified by the user at the time of indent)
8	Weight	Weight of the equipment 5 kg (Max)
	Pan & Tilt :	
9.	a	Pan movement : n x 360°.
	b	Tilt movement + 15° to -30° or better.
10.		Laser Range Finder (LRF) :
	a	Should be class 1 eye-safe.
	b	Range : Up to 5 km. for a vehicle target (Medium Vehicle) parked side ways.
	c	Range accuracy ± 5 meter minimum
11.		Global Positioning System It should be inbuilt and give co-ordinates in Lat/Lon and Indian Military Grid Reference system. The accuracy should be less than 10 meters.
12.		Digital Magnetic Compass :In built DMC should be provided for auto Northing. In accuracy should be ≤ 1° and resolution 1° or better
13.		Control Unit should have :
	a	Ruggedized LED display having size 15" (min) to be mounted in the cabin. It should also be removable for remote use.
	b	Command & Control (C2) software.
	c	Command control real time alerts. On detection of a threat in a designated area, the system should be able to generate audio/visual alarm/alert.
	d	Have provision for video output.
	e	Out-put ports for video (digital), Ethernet and for data retrieving.
	f	Control unit should have facility to display :- i) Day Camera Video ii) TI Camera Video iii) Panoramic View iv) Map View
	g	It should have facility to display lased target area on map
	h	Should have facility to get image shot whenever required
	i	Should have facility to scan user defined sector automatically.
	j	Should have facility to control all the functions of day, night pan & tilt mechanism via wired link from EO to the control unit
	k	System should support various maps formats including Raster & Vector maps
	l	Should have facility video recording capability: Advanced inbuilt

		storage memory of 1 TB (min) exclusively to store the video should be provided in the console. The system should have facility to retrieve the stored data.
14.	Telescopic Mast:	
	a	The mast should be either pneumatic, electric or Hydraulic operated.
	b	The height of the Mast should be 15 feet (min) from the platform.
	c.	The mast should be mounted on the offered vehicle.
	d.	The mast should be strong enough to carry the payload in stand-alone positions in rough weather conditions with wind speed of min 40 knots per hour at its maximum extended position.
	e	The system must be able to provide a clear video while moving at a speed of 20 Km/per hours with mast height min 15 feet.
15.	Power Source :	
	a.	2KV or better (as per load) silent Gen Set to be provided as power source of equipment/ console and Pan & Tilt.
16.	Online UPS:	
	a	In Put voltage range 90 to 270 V, 46 to 54 Hz AC mains supply
	b	Back up of 06 hrs minimum. UPS should power the Pan Tilt, Camera, Mat, LOS Radio, and Control unit for the entire backup duration in sector scan mode. The available battery capacity should be visible on the control unit and user should get an alarm if battery capacity <15%.
	c	It should be provided with an all-weather enclosure for keeping the UPS and its batteries safe in rain and snow
17.	Batteries:	
	a	Should have Lithium ion rechargeable battery to operate TI and Day Camera, for an entire temperature area.
	b	The battery should have battery status indication showing the charge status of the battery
	c	System should be able to run 4 hrs or more in operational mode on single charge
18.	Battery Charger :	
	a	90 V to 250 V, 46 to 50 Hz AC main supply along with DC charging facilities from 12 V to 48 V.
	b	It should have charge ON and full charge indication during battery charging
19.	Environmental Specification :	
	a	The Camera, Control unit & Pan Tilt should comply with Mil Std 810F or JSS 55555 or better in respect of low & high temperature, humidity, shock, Bump & vibration. It should also comply with IP-65 or better.
20.	Vehicle: Suitable vehicle having following specification to be provided by the firm :	
	a	Should be a light petrol vehicle.
	b	Should be a 4x4 vehicle with cross country mobility.
	c	Number of doors -04.

d	Number of cylinder -04.
e	Engine Torque (Min) 200 Nm.
f	Capacity – 2000 CC (min).
g	Should have a crew cabin and an open platform for mounting mast and EO system.
h	Should be BS4
i	Gradability -30° (min)
j	Gearbox – 05 forward 01 reverse
k	Staring – Power staring.
l	Ground clearance –Min 180 mm.
m	Air condition for safety of command control system
n	Number of cylinder in engine -04 Nos.
o	Seating Capacity of cabin-05 Members.
p	Drive axle- front and rear.
q	ABS-Yes.
r	Front vehicle break- Disc Break
s	Rear Vehicle brake- Drum Brake
t	Air Bgs – Driver and Co Driver
u	Vehicle air intake system – Turbo charged

The Sub-group has decided to upload the QRs on MHA and BSF website for 15 days to invite the views/ comments/ suggestions of prospective bidders to make the QRs more broad based.

Note- All firms are requested to provide the following.

1. Original Brochure of product by OEM.
2. Detail literature about the product.
3. Comprehensive comments for incorporation in the specifications.

R.S.G.
22/6/17

(RISHIPAL SINGH)

Second-In-Command (Mod)

TRIAL DIRECTIVES OF VEHICLE MOUNTED SURVEILLANCE SYSTEM

S.No	Specification	Trial Directives
01.	Vehicle mounted Surveillance system consists of Day and Night camera, inbuilt DMC & GPS, LRF, control & Display unit and telescopic mast, mounted on the vehicle offered by the firm.	To be physically checked by the BOO.
02.	<p>Colour Camera</p> <p>a) CMOS/CCD Colour camera</p> <p>b) Resolution-640 x 480 or better</p> <p>c) Auto and manual focus mechanism</p> <p>d) Optical magnification: 20x or better.</p> <p>e) Digital magnification : 2x,4x</p>	<p>Check the National/International Accredited lab certificate/report submitted by the firm in respect of CCD/CMOS camera and Resolution.</p> <p>Check the focusing mechanism provided for automatic and manual focusing.</p> <p>Check the Optical zoom physically in the Lab as per the procedure.</p> <p>Check the digital magnification as per the procedure.</p>
3.	<p>Night (Thermal) Camera :</p> <p>a) Spectral response : LWIR/MWIR or both</p> <p>b) FPA Resolution : 640 x 512 (min) at pixel pitch of 15 µm or better</p> <p>c) Auto and manual focus mechanism</p> <p>d) Optical magnification -5x (min) continuous.</p> <p>e) Electronic magnification- 2x,4x.</p> <p>f) Wide FOV</p> <p>g) Narrow FOV</p>	<p>Place two jawans each at the range of 2.5 Kms & 5 Kms and move them. Observe them for detection and Recognition respectively.</p> <p>Check the OEM certificate or data-sheet of the firm for spectral response.</p> <p>Check the OEM certificate provided by the firm.</p> <p>Check the system for automatic and manual focusing facility.</p> <p>Check the magnification of the system in the Lab and its linearity in zoom. Also check the digital zoom as per the procedure.</p> <p>Fix the equipment on ATS (Acceptance Test Station) for HHTI available in SIW and measure the NFOV & WFOV as per the testing procedure.</p>

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	Range :	
	For Human Target	
	i) Detection -3 km	Place two jawans each at the range of 3 Kms & 1.5 Kms and move them. Observe them for Detection and Recognition respectively.
	ii) Recognition -1.5 km	
	For Vehicle	
	i) Detection - 5 km	Place the B size vehicle, in moving and stationary conditions, at different angles at a distance of 5 km & 2.5 km. Observe it for Detection and Recognition respectively.
	ii) Recognition - 2.5km	
4.	Start up time: NMT 8 MINTS	Switch on the camera. Physically check the initialization time from 'Off' to 'On' mode and note down the time by stop watch.
5.	Non uniformity calibration(NUC)	Check the system for NUC.
6.	The EO system should be immune to glare of searchlights. It should not get damaged if faced towards Sun accidentally.	Check the effect of glare of search light on the system when face towards it and check the effect of sun rays on the system when faced towards the sun.
7.	It Should have the facility to stream imagery over wireless link (500 meters minimum NLOS and 2000 meters minimum LOS with coding. (Wireless link range for imagery transmission to be specified by the user at the time of indent)	Install the wireless transmitter at HHTI end and receive the video at 2000 meters away in LOS to HHTI. Again receive the video at 500 meters away in NLOS to HHTI i.e. behind a mountain or obstacles.
8.	Weight : Weight of the equipment 5 Kg (Max)	Weight should be measure by weighing machine. Weight of the equipment should be 5 Kg (Max).
	Pan & Tilt :	Physically check the Pan & Tilt mechanism for variable speed facility precisely through console.
9.	a	Check the azimuth movement of nx360°
	b	Check the tilt movement of + 15° to -30°
10.	Laser Range Finder (LRF) :	
	a	Check the National/International Accredited lab certificate/report submitted by the firm in respect of class 1 eye-safe.
	b	To be physically checked by the BOO.
		Range :Up to 5 km for a vehicle target (Medium Vehicle) parked side ways.

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	c	Range accuracy ± 5 meter minimum	To be physically checked by the BOO.
11.		Global Positioning System It should be inbuilt and give co-ordinates in Lat/Lon and Indian Military Grid Reference system. The accuracy should be less than 10 meters.	Switch 'ON' the HHTI and check the co-ordinates of own position through inbuilt GPS.
12.		Digital Magnetic Compass :Inbuilt DMC should be provided for auto Northing Accuracy should be $\leq 1^\circ$ and resolution $1'$ or better	Switch 'ON' the HHTI and do auto northing. Note down the bearing of a point with the help of compass. Again check the bearing of that point through inbuilt DMC and then compare both the readings for accuracy and resolution.
13		Control Unit should have :	
	a	Ruggedized LED display's having size 15" (min). To be mounted in the cabin. It should also be removable for remote use.	Check the National/International Accredited lab certificate/report submitted by the firm in respect of Ruggedized OLED/LED display.
	b	Command & Control (C2) software.	To be physically checked by BOO.
	c	Command control real time alerts. On detection of a threat in a designated area, the system should be able to generate audio/visual alarm/alert.	To be physically checked by BOO.
	d	Have provision for video output.	To be physically checked by BOO.
	e	Out-put ports for video (digital), Ethernet and for data retrieving	To be physically checked by BOO.
	f	Control unit should have facility to display :- i) Day Camera Video ii) TI Camera Video iii) Panoramic View iv) Map View	To be physically checked by BOO.
	g	It should have facility of display lased target area on map	To be physically checked by BOO.
	h	Should have facility to get image shot whenever required	To be physically checked by BOO.
	i	Should have facility to scan user defined sector automatically.	To be physically checked by BOO.
	j	Should have facility to control all the functions of day, night pan & Tilt mechanism via wired link from EO to control unit	To be physically checked by BOO.
	k	System should support various maps formats including Raster and Vector maps	OEM provide certificate in this regard and to be physically checked by BOO>
	l	Should have facility video recording capability. Advanced inbuilt storage memory of 1 TB (min) exclusively to store the video should	Check the inbuilt storage memory exclusively to store the video in the console. Check the console for the facility to retrieve the stored data.

	be provided in the console. The system should have facility to retrieve the stored data.	
14.	Telescopic Mast:	
	a The mast should be either pneumatic, electric or Hydraulic operated.	To be physically checked by the BOO.
	b The height of the Mast should be 15 feet (min) from the platform	To be physically checked by the BOO.
	c The mast should be mounted on the offered vehicle	To be physically checked by BOO.
	d. The mast should be strong enough to carry the payload in stand alone positions in rough weather conditions with wind speed of min 40 knots per hour at its maximum extended position.	OEM to provide certificate in this regard
e The system must be able to provide a clear video whine moving at a speed of 20 Km/per hours with mast height min 15 feet.	To be physically checked by BOO.	
15.	Power Source :	
a.	2KV or better (as per load) silent Gen Set to be provided as power source of equipment / console and Pan & Tilt.	To be physically checked by the BOO.
16.	Online UPS:	
a	In Put voltage range 90 to 270 V, 46 to 54 Hz AC mains supply	To be physically checked by the BOO.
b	Back up of 06 hrs minimum. UPS should power the Pan Tilt, Camera, Mat, LOS Radio, and Control unit for the entire backup duration in sector scan mode. The available battery capacity should be visible on the control unit and user should get an alarm if battery capacity < 15%.	Put the complete system on the UPS. UPS should be able to run the complete system for min 04 hrs.
c	It should be provided with an all-weather enclosure for keeping the UPS and its batteries safe in rain and snow	To be physically checked by the BOO.
17.	Batteries:	
a	Should have Lithium rechargeable battery to operate TI and Day Camera, for an entire temperature area.	Check the battery provided for operating the system for its type and recharge ability.
b	The battery should have battery status indication to get the charge status of the battery	Check the battery for the battery status indication.

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	c	System should be able to run 4 hrs or more in operational mode on single charge	Operate the system with fully charged rechargeable battery(s) and put it in the operation mode. Start the counting of functional hours in Stop watch.
18.	Battery Charger : a 90 V to 250 V, 50 Hz AC main supply along with DC charging facilities from 12 V to 48 V. b It should have charge ON and full charge indication during battery charging	Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the In-put voltage from 90 to 250 volts. Again switch 'ON' the charger on variable DC power supply and check the out-put voltage by varying the in-put voltage from 12 to 48 volts. Charge a fully discharged battery with the charger and note down the total time to fully charge the battery. Check the charger for 'Charge ON' and Charge Complete indications.	
19.	Environmental Specification : a The Camera, Control Unit and Pan Tilt should comply with Mil Std 810F or JSS 55555 or better in respect of low & high temperature, humidity, shock, Bump & vibration etc. It should also comply with IP-65 or better.	Check the National/International Accredited lab certificate/report submitted by the firm in respect of the same.	
20	Vehicle: a Should be a light petrol vehicle. b Should be a 4x4 vehicle with cross country mobility. c Number of doors -04. d Number of cylinder -04. e Engine Torque (Min) 200 Nm. f Capacity - 2000 CC (min). g Should have a crew cabin and an open platform for mounting mast and EO system. h Should be BS4 i Gradability -30° (min) j Gearbox - 05 forward 01 reverse	OEM to provide certificate in this regard. OEM to provide certificate in this regard. OEM to provide certificate in this regard and to be physically checked by BOO OEM to provide certificate in this regard. OEM to provide certificate in this regard. OEM to provide certificate in this regard. OEM to provide certificate in this regard. To be physically checked OEM to provide certificate in this regard. OEM to provide certificate in this regard. OEM to provide certificate in this regard and to be physically	

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k	Starting - Power starting.	checked by BOO.
l	Ground clearance -Min 180 mm.	OEM to provide certificate in this regard.
m	Air condition for safety of command control system	OEM to provide certificate in this regard and to be physically checked by BOO.
n	Number of cylinder in engine -04 Nos.	OEM to provide certificate in this regard.
o	Seating Capacity of cabin-05 Members.	OEM to provide certificate in this regard.
p	Drive axle- front and rear.	OEM to provide certificate in this regard.
q	ABS-Yes.	OEM to provide certificate in this regard.
r	Front vehicle break- Disc Break	OEM to provide certificate in this regard.
s	Rear Vehicle brake- Drum Brake	OEM to provide certificate in this regard.
t	Air Bgs - Driver and Co Driver	OEM to provide certificate in this regard.
u	Vehicle air intake system - Turbo charged	OEM to provide certificate in this regard.

(Rishipal Singh)

Second-In-Command (Mod)