No. IV-21011/1/2010-Prov-I
Government of India
Ministry of Home Affairs

26, Man Singh Road, Jaisalmer House,
New Delhi, 18.1.2010

To

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

Subject: - QRs/Technical Specifications for the security related equipments -regarding

The QRs/Technical Specifications for the following security related equipments have been accepted and approved by the Competent Authority in MHA;-

(i) Shot Gun/Spas Gun
(ii) Armour Plates fir Snipers
(iii) Laser Grip for Glock Pistols
(iv) UBGL
(v) Lay Tuning (Road Blocker)
(vi) Slithering Rope
(vii) Commander Torch
(viii) Sonic Defenders-Hearing Protection Device
(ix) Robot
(x) Bullet Proff Jacket Full Body Protection(360 degree)
(xi) Non Magnetic Tool Kit
(xii)Gas Mask

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

3. The trial directives for the following items have also been approved by the Competent Authority in MHA

(a) Mini Remotely operated vehicle-F/X
(b) Electro Stun Gun
(c) Light Support Weapon

18/1/10

(R.S.Sharma)
Director (Prov)

Copy to:-

DD(Procurement),MHA

Copy for information to:-

PS to JS(PM),MHA

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QUALITATIVE REQUIRMENTS/SPECIFICATIONS FOR ROBOT

1. **General**. Ruggedised, military grade scout robot for surveillance capable of operating in all types of terrain, including marshy land, and in all weather environment including fog and smoke. The robot should be capable of maneuvering itself through remote control into a position of advantage and observe and transmit video/audio during day/night in all weather conditions with low latency/lag.

2	**Chassis (Robot).**		
	(a)	Dimensions	40 cm x 40 cm x 20 cm or less (L x W x H).
	(b)	Weight	Not more than 3.5 kgs.(excluding accessories which should not weight more than 1.5 kg).
	(c)	Body Colour	Black
	(d)	Speed	Not less than 5 Km/hour, variable speed control through remote.
	(e)	Motion system	Both wheeled and tracked, Capable of switching between tracked and wheeled operation (Manually configurable).
	(f)	Track	Removable Rubber track (for motion on wheels only).
	(g)	Noise	Noiseless operation during motion and static condition. Not more than 30db.
	(h)	Throw capability	For throwing the robot into remote locations. Capability to throw the robot minimum 5 meters. Dual side operating capability on landing. (on belly or back).
	(j)	Terrain	For all types of terrain, including marshy land and capable of crossing small and shallow puddles/water bodies.
	(k)	Water resistivity	Should be capable of negotiating water body of depth at least 1 feet and width 1 meter.
	(l)	Weather	All weather environment including rain, fog and smoke.
	(m)	Stabilization	Self stabilization.
	(n)	Inertial Measurement	Appropriate sensors should be installed to report inclination and velocity states of the robot.
	(o)	Impact resistance	7 mtrs . drop test

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3.	**Camera/Video System.**		
	(a)	Surveillance camera	Mounted on head and rear/top for 360° view.
	(b)	Camera range (For Human target)	Detection : Min 100 meter Identification : Min 50 meter Recognition : Min 30 meter
	(c)	Day/Night vision	Thermal camera with wavelength in 7-12 micrometer range.
	(d)	Camera resolution	2500 x 570 pixels or better.
	(e)	Zoom	(a) Optical Zoom : 5x or better (b) Digital Zoom : 5x or better
	(f)	IR Lamp life	Min: 1000 hrs.
	(g)	FOV	360°
4	**Audio System.**		
	(a)	Type of microphone	Super sensitive omni directional microphone.
	(b)	Microphone Sensitivity	Detect human voice at min 5 meter.
5.	**Radio System.**		
	(a)	Type	Non line of sight (NLOS). Narrow band/Ultra narrow band
	(b)	Indoor txn range (NLOS)	Minimum 35 meter.
	(c)	Out door range (NLOS)	Minimum 300 meter.
	(d)	Freq range	S band Frequency to configurable to 5 channels.
	(e)	Type of transmission	Omni Directional.
	(f)	Type of Modulation	COFDM capable of video resolution upto 704 lines PAL and NTSC, MPEG-2 and 4, Audio sampling rate 32 Khz bits per sample 12 bit switchable and data interface 115K2 baud switchable.
	(g)	Encryption	128 bits/256 bitsAES

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6. **Portable Display Unit.** Control device used by the operator to guide the robot during the mission. It should have touch screen interface and hard buttons to control robot motion, Camera parameters and audio/video parameters with the following capabilities:-

(a) Video feed from Robot
(b) Robot inertial measurement
(c) Audio feedback from robot through Earphone/Head phone.
(d) Robot health diagnostic measurements.
(e) Other features.

(i)	Size	45cm x 35cm x 18cm or less (L x W x H).
(ii)	Body colour	Black
(iii)	Screen	10.4 x GA (optional 12.1W x GA) TFT LCD(at least 1000nits)
(iv)	System	Unix/Linux/RTOS based operating system, 1GB DDR2 expandable to 4 GB memory, processing power to ensure running of all software smoothly and with out lag.
(v)	Duration of continuous Operation	4 hrs or more on batteries and can be run by separate Power supply.
(vi)	Power source	AC Adaptor (60W, 100-240V, 50/60 Hz) and lithium Ion battery (5200 mAH and 7800 mAH (optional)).
(vii)	Out put connection	i. DV port, IEEE-1394 (fire wire), S-video, (A/V Port) ii Headphone/Earphone jack.
(viii)	Portability	Carry handle and strap.
(ix)	Security	TPM (1.2) or Kensington lock

7. **Power.**

		Robot	PDU
(a)	Consumption Time	(i) Standby mode (min) 12 Hrs	18 Hrs
		(ii) Active (min) 3 Hrs	24 Hrs
		(depending upon the use of camera, speed and IR function).	
(b)	Charging time (max)	1.5 Hrs	4 Hrs
(c)	Charger Voltage	Standard voltage.	
(d)	Charger	Same for Robot and PDU.	

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8.	**Software Features of PDU.** (a) Tracking function. Capable of autonomously tracking and following target marked by user. (b) Provide auto alarm of events based on Audio/video detection. (c) Multi image with full screen option. (d) 3D active model of vehicle. (e) Display status of batteries robot and PDU, communication link signal strength, Camera visibility and audio noise level. (f) Images capture capability. (g) Power saving mode. (h) Multiple speed option. (j) Friendly graphical user interface.	
9.	**JAUS Level II or Level III Compliance.** Component level JAUS compliance for scalability and interoperability.	
10.	**Rugged Features.** (a) Comply with Mil STD 810F and IP 67. (b) Fully rugged. (c) Vibration and drop shock resistant. (d) Hermetically sealed parts and connection.	
11.	**Proprioception Feedback System.** Inertial measurement unit for very reliable, accurate motion feedback including accelerometer and gyroscopic readings required for the smooth motion control of the systems. Also signal strength and battery health should be monitored and displayed on the PDU.	
12.	**EMC/EMI Compliance.**	Certification by accredited lab to be provided.
13.	**Accessories.**	
	(a) External battery charger	Qty one per Robot.
	(b) Spare batteries	Adequate spare batteries for continuous 72 Hrs operations.
	(c) Hard carrying case for transportation	One per Robot.
	(d) Backpack	One per Robot.
	(e) Spare wheels	2 Sets per Robot.
	(f) Spare Tracks	5 per Robot.
14.	**Final Delivered System.** The delivered system should comprise of a mobile robot and a portable display unit, equipped with a wireless communication device with sufficient bandwidth to transmit video/audio data, motion commands between the base vehicle and display unit as per the specifications mentioned in the preceding sections. The communication between the base vehicle should be encrypted suitably and be an open standard communication.	
15	**Operation.** The System shall be configured and powered up manually by operator and shall perform self health checks. Upon successful completion of these tests the operator should be able to control the platform by sending commands to the robot and also retrieve the sensor feedback from the platform with the means of a portable display unit.	

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16	**Literature.** Operating and technical literature for each discrete component of system should be in English language.
17	**Demonstration and Training.** Demonstration of the complete system with adequate qty of equipment to be given in no cost no commitment basis. In situ training of users for three days on operation, maintenance, fault and user level repairs.
18	**Self and environment.** The self diagnostic parameters should be evaluated for Vehicle battery, communication link Signal strength, Camera visibility and Audio noise levels.
19	**Repair Cover.** Repair cover to be made available at Delhi. Down time should not exceed 5 days from the fault reporting.
20	**Warranty.** Comprehensive warranty for 3 years. AMC for min 3 yrs after expiry of warranty period.

Maj Rohit Patel, TSG — Maj P R Mohanty — Maj Anurag

Maj Shaji P, 52 SAG — Maj [illegible] Upadhyay, BDU

P K Thakur — Dir (Prov)

Approved/ Not approved

(N.P.S Aulakh)
Director General, NSG