GOVERNMENT OF INDIA
(Ministry of Home Affairs)
COMMUNICATION & IT DIRECTORATE
CENTRAL RESERVE POLICE FORCE
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No. B.V-7/2024-25-C(UAV)-QR CELL Dated, the 25 June'2025

To

1. The DsG: AR, BSF, CISF, ITBP, NSG, SSB and BPR&D
2. Director, DCPW

Subject: QRs/TDs OF "SMALL UAV FOR ISR PURPOSE (150 MIN ENDURANCE)" REGARDING.

I am directed to refer to the subject mentioned above and to say that the QRs/TDs of "Small UAV for ISR Purpose (150 Min Endurance)" have been approved by the DG CRPF after due deliberations as per recommendations of CAPFs sub-group and experts from DCPW.

This is for favour of information and further needful action please.

Encl:-As above

(Megh Raj)
DIG (Equipment)
Communication & IT Branch
Directorate General C R P F

No. B.V-7/2024-25-C(UAV)-QR CELL Dated, the 25 June'2025

Copy to:-

1. Mrs. Sugandhi, Technical Director, North block, MHA with request to upload the QRs/TDs of "Small UAV for ISR Purpose (150 Min Endurance)" on MHA website (e-mail ID: mpsugandhi@nic.in) please.

Encl:-As above

(Megh Raj)
DIG (Equipment)
Communication & IT Branch
Directorate General C R P F

QRs/TDs of Small UAV for ISR purpose (150 Min Endurance)

S N	Parameter	Specifications	Trial Directives
1	**UAV (As a system)**		
1.1	Aerial Vehicle-01 No		BOO will check practically.
1.2	Ground Control Station- 01 No		
1.3	Remote Video Terminal -01 No		
1.4	One Payload assembly consists of A) Day Camera Only B) Night Camera Only C) Day & Night camera payload (Both) D) Integrated day and night camera (As per user requirement)		
1.5	Data link Equipment/ Antenna -01 No		
1.6	Battery/Battery set for each Aerial Vehicle-01 No		
2	**Drone Characteristics**		
2.1	Nomenclature	Small UAV for ISR (150 Min) (Tolerance 5 Min), 2 to 15 KG + 10% Tolerance (MTOW)	BOO will check practically.
2.2	Design	Fixed Wing/Hybrid (As per drone rules 2021)	BOO will check practically.
2.3	Role	Intelligence, Surveillance, Reconnaissance	BOO will check practically.
2.4	Launch and recovery (in meter)	Automatic vertical take-off and landing (VTOL) up to 80m within an area of 10X10m & then loiter	BOO will check practically.
2.5	Aural Signature (In dB)	≤40 dbs at 300 m above AGL	The firm will submit certificate of Govt Lab. Or NABL/ILAC accredited laboratory.
2.6	Propulsion system	Electrical with rechargeable batteries	BOO will check practically.
2.7	Payloads carrying capability	The Payload should have Gyro based stabilized. Housing should be available for relevant payload with locking and auto tracking of the selected target in the video imagery.	BOO will check practically.
2.8	Flight modes	a) Fully autonomous Mode	BOO will check practically.
		b) loiter at a defined waypoint	
		c) loiter mode	
		d) Target tracking mode	

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		e) Real-time target tracking of designated static and moving targets.	
		f) Should be controllable in real time from the GCS up to recovery	
		g) Fully autonomous and stabilized	
2.9	Endurance (In minutes)	Min. 150 Minutes (Tolerance 5 minutes) with payload at 1000 mtr AMSL (Reduction in 10% of endurance of every 1000 meter)	BOO will check practically and firm will produce OEM certificate.
2.10	Minimum Operating altitude above ground level (AGL) **(In meter)**	1000m AGL (Above Ground Level) or more	BOO will check practically once during flight.
2.11	Maximum Launch altitude above mean sea level (AMSL)(**In meter)**	4000m AMSL (Above Mean Sea Level) or more. As per user requirement.	Firm will submit OEM certificate
2.12	Operating wind conditions (**In km/h**)	a) Take off: 30 km/h or more b) Landing: 30 km/h or more c) Fixed wing mode: 35 km/h or more	Firm will submit OEM certificate.
2.13	Cruise Speed (**In km/h)**	Minimum 40 Kmph in low wind condition	BOO will check practically Firm will submit OEM certificate
2.14	Collision Avoidance sensor	Should be available during take-off and landing (as per user requirement)	BOO will check practically and firm will produce OEM certificate
2.15	Range of live transmission (LOS) (un-obstructed & interference free)	Minimum 20 Km line of sight	BOO will check practically and firm will produce OEM certificate
3.0	Failsafe features	a) Automatic change to recovery mode after 10 seconds on communication loss, again on mission if communication restore.	BOO will check practically and firm will produce OEM certificate
		b) Automatic Return to Home/Land on battery low/imbalance.	
		c) (i) Multiple GNSS on-board for failure redundancy (ii) NAVIC -As per user requirement	Firm will submit OEM certificate.
		d) Warning on exceeding Wind limit or gust.	BOO will check practically and firm will submit OEM certificate.
		e) Warning on exceeding the UAV health parameters (Temperature, vibration and throttle limit of the system)	

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4	**Payload characteristics**		
4.1	Payloads required	(a) Electric Optic (EO) for day (b) Thermal Imager (TI) for night payload (c) Integrated day & night camera payload complying above specifications both of Day & night (As per user requirement)	BOO will check practically.
4.2	Payload and video stabilization	a) Electronic and Gimbal stabilization of video output at all zoom levels in real-time	BOO will check practically.
		b) Locking and auto tracking of the selected target in the video imagery.	
		c) 360° pan & 90° tilt control during flight for Day and Night payloads.	
		d) UAV should transmit real time imagery to GCS	
		e) Day Payload: - 0-10 KM- 1920 X 1080P or better 10-20 KM- 1280 X 720P or Better	Board will check practically real time imagery and firm will produce OEM certificate.
		f) Night Payload: - 0-20 KM- (i) 640 X 480P or (ii) 640 X 512 (as per user requirement)	
		g) Quality of video should not be affected by UAV vibrations	
4.3	Electro optic (EO) daylight Payload	a) UAV should transmit real time imagery to GCs	BOO will check practically.
		b) Resolution: 1920X1080P or better	Firm will submit OEM certificate.
		c) Optical zoom: -30X or more with minimum- NFOV 5°, maximum- WFOV ≥ 45° (wide field). Digital Zoom: - 4X or more	BOO will check practically & firm will submit OEM certificate.
4.4	Thermal imager (TI) night payload	a) Payload with 360° pan and 90° tilt control during flight.	BOO will check practically.
		b) Resolution: 640X480 Or ii) 640X512 (as per user requirement)"	Firm will submit OEM certificate.
		c) Digital Zoom: 4X or more	BOO will check practically.
		d) White and Black hot modes	BOO will check practically.

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4.5	Target Detection, Recognition, Identification		Day Payload		Board will check practically, the picture quality for detection recognition identification. Detection- Ability to distinguish an object from background. Recognition- Ability to classify the object class (Animal, Human, Vehicle, Boat etc) Identification- Ability to describe the object in details (man with weapon, hat, Uniform/Colour of cloths, type/Colour of vehicles)
			Vehicle size (4.5 x 1.5 m)	Group of 3-4 People	
		Detection	4000M	2500M	
		Recognition	3000M	1500M	
		identification	1500M	1000M	
		Detection	Night Payload		
			1250M	600M	
		Recognition	800M	500M	
5	**Ground control station characteristics**				
5.1((Option-1)	(a)GCS should be portable minimum 7-inch display with semi rugged IP 53 tablet/laptop which is compatible with GCS for surveillance Or (b) GCS should be portable minimum 10-inch display with rugged IP 65 tablet/laptop which is compatible with GCS for surveillance Or (C) (As per user requirement)				Firm will submit certificate of Govt. Lab. or NABL/ILAC accredited laboratory.
5.2 (Option -2)	Computing Hardware (as per user requirement) for 5.1 (a) or (b)				
	CPU	CPU- Clock speed minimum 2.3 GHz or better			BOO will check practically and firm will also submit OEM certificate.
	Storage	Minimum 256 GB or more for tablets Minimum 500 GB or more for Laptop (as per user requirement)			BOO will check practically and firm will also submit OEM certificate.
	RAM Memory	8 GB or more			
5.3	Battery operation	Minimum 04 hours at peak utilization with one (1) hot swappable battery.			
5.4	Battery charging time of GCS	Suitable battery charger using normal commercial supply			
5.5	Data portability	Suitable Ports for data transfer to external secondary storage devices and compatible with GCS.			

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5.6	Capability	a) Transmit control commands to UAV b) Receive UAV flight and propulsion parameters c) Receive, display and transfer real time day and night video to display unit from GCS d) Capability to control UAV while on the move. e) Record real time video in display unit. f) Capable to storing 100 or more flight routes with each route having capacity to configure minimum 70 waypoints in GCS	BOO will check practically and firm will also submit OEM certificate.
5.7	GCS application software	a) Able to control all aspect like pre-flight checks, self-tests, control of take-off/landing, payloads and Output: go/no go	BOO will check practically and firm will also submit OEM certificate for b) xvii & xviii
		b) The software should have following mission information: - i. Coordinate of target ii. Target distance. iii. AV Co-ordinates iv. Distance of AV from GCS v. AV Speed vi. Mission time vii. Payload looking angle viii. Communication link status ix. GPS Status x. Health status of AV battery. xi. UAV heading /true North indication xii. Bearing (Azimuth) of UAV from GCS. xiii. Geographic map and real time video should be displayed at all times during the flight xiv. Geographic map & real time video views should be resizable and/or switchable to allow user to switch between big map/small video and small map/big video views through a single click input. xv. Artificial horizon indicating UAV altitude. xvi. Switchable between 2D/3D views, capability to tilt/rotate 3D maps as per user input. xvii. Perpetual proprietary software of the system product support for minimum 5 years xviii. AI/ML capability for identification & detection of targets /humans /friendlies /Point of Interest (as per user requirement)	
5.8	Map formats	a) Should have the capability to integrate geo-referenced raster maps provided in commonly Digital formats as per user requirement.	Board will check practically and firm will also submit OEM certificate.
		b) Ability to display 3D maps with the digital terrain data provided. Option to switch between 2D and 3D maps in real time.	

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5.9	Remote Video Terminal (RVT)	Tablet: - Minimum 7" MIL STD-810G or more and IP 63 or More, compact. Light weight and portable with wrist/chest mountable holder (as per user requirement). UAV should be able to transmit video to RVT at a minimum distance of 3KM or more from UAV. RVT have capability to display video, map and OSD (on screen display) similar to GCS. Capable to record, playback and freeze the imagery received for AV. Sunlight readable and touch screen. Or **As per user requirement**	Board will check practically and firm will submit certificate of NABL/ILAC accredited laboratory for MIL-STD 810G or more and IP65 or more.
5.10	Payload controls	a) Selection and switch on/off of payload b) Pan, Tilt & Zoom controls c) Point payload to ground co-ordinate function d) Recording ON & OFF	BOO will check practically.
5.11	Button based/USB Joystick control	a) Full Camera Control Pan & Tilt b) Zoom In & Out Black or White Hot c) RPV Mode d) Altitude Control	BOO will check practically.
6	**Communication Link**		
6.1	Communication link equipment capability	i) Transmit control commands from GCS to UAV ii) Transmit parameter of UAV and payload to GCS iii) Transmit day and night video from UAV to GCS	BOO will check practically.
6.2	Data link	S/C band (2 Ghz to 6 Ghz) with AES encryption a) 128-bit b) 256-bit (As per User Requirement)	Firm will submit OEM certificate
7	**General System requirements**		
7.1	Weight (**In kg**)	Complete weight of the UAS not more than 45 kg and system should be packable in 3 backpacks (includes: Aerial vehicle – 01, Payload - 01 (either 01 integrated payload or 1 EO payload & 1 IR payload) Spare Battery- 01 set. GCS - 01 Data link equipment/ Antenna - 01 Cables/spares)	BOO will check practically.
7.2	Assembly/ Disassembly time (**In minute**)	Up to 20 Minutes with 2 persons.	
7.3	Environmental conditions for operation and storage	The UAV and associated systems should operate and stored at following environment conditions. i) Damp heat: 40°C ±2° at RH not less than 90% as per JSS 55555 or equivalent standard. ii) Starting operating temperature & Storage temp: -10°C to +55°C with ± 10 % tolerance. iii) Ability to withstand dust, drizzle and humid conditions	Firm will submit certificate of Govt lab or NABL/ILAC accredited laboratory

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7.4	IP (Ingress Protection) of the UAV	IP 54 or better	
7.5	Battery of AV	The intelligent standard lithium-based battery pack should have the back up of minimum 150 minutes.	
7.6	Battery charger of AV battery	Suitable universal battery charger to charge the batteries within two to three hours	BOO will check practically and firm will submit OEM certificate.
7.7	**Accessories**	i. Field repair kit:1 Nos	BOO will check practically
		ii. Lithium based battery packs: 3Nos	BOO will check practically
		iii. Spare propeller set: 1 complete set	BOO will check practically
		iv. Spare landing gear sets: 1 complete set	BOO will check practically
		v. Associated cables & mounting: 1 Set	BOO will check practically
		vi. User, technical & maintenance manual: 1 set	BOO will check practically
		vii. Rugged, Compact and light weight transportation box -03 Nos	BOO will check practically
7.8	Night recovery Beacon	Switchable LED light when operating with night payload	BOO will check practically
8	**Miscellaneous requirement**		
8.1	Total technical life	Minimum 1000 landings	Firm will submit OEM certificate
8.2	Total product support	05 years or as per user requirement.	Firm will submit OEM certificate
8.3	Manufacturer recommended list of spares	Should be provided	BOO will check practically
8.4	Warranty	Minimum 02 years or as per user requirement	Firm will submit OEM certificate.
8.5	Life of UAV battery	200 charging cycles or 2 years, whichever is earlier.	Firm will submit OEM certificate

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9	**Additional Requirement.**		
9.1	Resistance against jamming (Optional as per user requirement)	a) GNSS denied return to home - Autonomous and safe return to home in case of GNSS loss or jamming, both during day & night, within a landing area of 10m x 10m	Firm will submit OEM certificate
		b) Auto Channel Selection - System should select best channel of operation automatically both pre-flight and during flight	BOO will check practically
		c) Frequency Hopping to improve Jamming resistance – frequency hopping methodology to be decided by user	BOO will check practically
9.2	3D Scan Capability with EO Day payload (Optional/ as per user requirement)	System Should be able to autonomously undertake 3D scan of the target area & provide a processed 3D scan image with Standard day (EO) payload.	BOO will check practically
9.3	Training simulator (Optional /as per user requirement)	Suitable simulation software module to be provided for operator training. The operator should be able to practice. 1. Doing pre-flight checks, 2. Take-off, landing, 3. Creating waypoints, flight plans, 4. Executing various flight modes, 5. Checking payload viewing coverage area and drone coverage area, 6. Drawing polygons for obstacle, no-fly zones, and geofences 7. See simulated telemetry parameters 8. Load different geographical maps with ability to switch between 2D and 3D views etc.	BOO will check practically

9.4	Swarm UAV Capability for Coordinated flights (As per User Requirement)	Coordinated flight of up to 4 AVs or more for Surveillance purpose in defined area	BOO will check practically

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