GOVERNMENT OF INDIA
(Ministry of Home Affairs)
Communication & IT Directorate
CENTRAL RESERVE POLICE FORCE
EAST BLOCK-7, SEC-1, R.K. PURAM, NEW DELHI-110066

(Tele/Fax No-011-26107493, Email-Id: comncell@crpf.gov.in)

No. B.V-7-C/2024-25-C(UAV)-Q Dated, the Jan'2025

Subject:- REQUEST FOR COMMENTS OF STAKEHOLDERS /OEM/FIRMS on Draft QRs & TDs of "Small UAV for ISR Purpose (90 Minutes)".

1. The Draft QRs/TDs of "Small UAV for ISR Purpose (90 Minutes)" is attached as **Appendix 'A'**. The OEMs/Vendors are requested to forward information of the product, which they can offer and also forward correct specifications of their system against each parameter. Only complied or not complied remarks will not be accepted. The firms are also requested to furnish the following details: -
   - Whether you are OEM/Vendor?
   - If vendor details of OEM.
   - Authorization certificate from OEM.

2. The required information/details may please be forwarded at the following addresses by 07 **Feb'2025**.

   Communication Directorate, CRPF
   East Block-7, Sec-1, R.K. Puram, New Delhi-110066
   Email: comncell@crpf.gov.in

3. An early response is requested.

22/1/25

(Amit Taneja)
DIG (Equipment)
Communication & IT Branch
Directorate General, C R P F

Draft QRs/TDs of Small UAV for ISR Purpose (90Min Endurance)

S N	Parameter	Specifications	Trial Directives
1	**UAS (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. It can be (a)Day & Night payload (01 No for each) or (b)Integrated day and night payload -01 or for mapping drone (a) 2-D mapping payload (b)3-D mapping payload (As per user requirement, the user can choose any payloads for trial and settle with one of the above before order)		
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 (90 Min), 2>W<=8KG	BOO will check practically.
2.2	Design	Rotorcraft	BOO will check practically.
2.3	Role	Surveillance, Reconnaissance and DRI during day & night operation (2D & 3D Mapping as per user requirement)	BOO will check practically.
2.4	Launch and recovery mode	Automatic vertical takeoff and landing (VTOL) within the area of 10X10 m	BOO will check practically.
2.5	Aural Signature	≤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	Capable to carry EO for day and Thermal imager for night one at a time (As per user requirement) Or Integrated day & night. (As per user requirement.) and Mapping payload. (As per user requirement) 360° pan & 90° tilt control during flight for day and night payloads	BOO will check practically.

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2.8	Flight modes	a) Fully autonomous Mode	BOO will check practically.
		b) Fully autonomous and stabilized	
		c) Hover at defined waypoint	
		d) Remote piloted mode (RPV Mode) and target tracking mode.	
		e) Waypoint Navigation (Pre-defined as well as dynamically adjustable waypoints during flight)	
		f) Should be controllable in real time from the GCS up to recovery	
		g) Real time target tracking of designated static and moving targets.	
2.9	Endurance	Min. 90 Minutes with day or night or integrated payload at MSL or Min 45 min for mapping payload	BOO will check practically
2.10	Minimum Operating altitude above ground level (AGL)	1000m AGL (Above Ground Level) or more.	BOO will check practically
2.11	Maximum Launch altitude above mean sea level (AMSL)	4000m AMSL (Above Mean Sea Level) or Decrease in 10 percent endurance for increase in every 1000m.	Firm will submit OEM certificate
2.12	Operating wind conditions	a) Take off: 40 km/h or more b) Landing: 40 km/h or more c) Operate: 40 km/h or more	Firm will submit OEM certificate.
2.13	Cruise Speed	Minimum 45 Kmph or more MSL	Firm will submit OEM certificate.
2.14	Collision Avoidance sensor	Should be available during take and landing omnidirectional.	BOO will check practically and
2.15	Range of live transmission (LOS) (un-obstructed & interference free)	Minimum 10 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/sudden voltage drop	
		c) (i)Multiple GNSS on-board for GPS failure redundancy (ii)(including NAVIC-as per use requirement)	Firm will submit OEM certificate.
		d) Auto-Return to home and land on exceeding Wind limit or gust or rainstorm.	BOO will check practically and firm will submit OEM certificate.
		e) Auto-Return to home and land on exceeding the UAV health parameters (Temperature, vibration and throttle limit of the system)	

		f) Should support one motor failure during flight	Firm will submit OEM certificate.
4	**Payload characteristics**		
4.1	Payloads required	Electric Optic (EO) for day (Colour), Thermal Imager (TI) for night payload Or Integrated day and night payload (As per user requirement) or Minimum 24 megapixel camera for 2D mapping payloads and 5X24 MP camera for 3D mapping payload	BOO will check practically.
4.2	Payload and video stabilization	a) All payload should be Gimbal stabilized on board	BOO will check practically.
		b) Video output should be digitally stabilized at all zoom levels	
		c) Quality of video should not be affected by UAV vibrations.	
		d) Colour camera with 360° pan & 90° tilt control during flight	
		e) Single payload assembly housing for day/night camera or integrated both day and night camera in one payload case (as per user requirement)	
4.3	Electro optic (EO) daylight Payload	a) UAV should transmit real time imagery to GCs	BOO will check practically.
		b) Resolution: 1980 X 1080	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) Colour camera with 360° pan and 90° tilt control during flight.	BOO will check practically.
		b) Resolution: 640 X 480 pixels or better	Firm will submit OEM certificate.
		c) Digital Zoom: 4X or more	BOO will check practically.
		d) White/Black hot modes	

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4.5	Target Detection, Recognition, Identification	Should be able to detect human size target at 750m slant or more	Day Payload		Board will check practically. 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 (4.5mX1.5 m)	Group of 3-4 People	
		Detection	3000M	2500M	
		Recognition	2000M	1500M	
		Identification	1000M	1000M	
		Detection & recognition	Night Payload		
			1250M	500M	
5	**Ground control station characteristics**				
5.1(**(Option-1)**	GCS should be portable minimum 8-inch display with rugged IP 55 tablet/laptop which is compatible with GCS for surveillance or GCS should be portable minimum 10-inch display with rugged IP 65 tablet/laptop which is compatible with GCS for surveillance (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)				
	CPU	CPU- Intel core i7 quad core processor (Intel 11th generation, minimum 2.3 GHz or better			BOO will check practically and firm will also submit OEM certificate.
	Storage	1 TB for Laptop or 500 GB for tablet			BOO will check practically and firm will also submit OEM certificate.
	RAM Memory	8 GB or more			
	Display	10 inch or more – 1920 X 1200 XGA sunlight readable screen, anti-glare minimum 1000 nits			
	Keyboard & input	Touch screen			
5.3	Battery operation	Minimum 03 hours at peak utilization			
5.4	Battery charging time of GCS	Suitable battery charger using normal commercial supply			
5.5	Data portability	Suitable port for taking data and compatible with GCS			
5.6	Interface	HDMI, USB-A, USB-C, RJ-45 (LAN Port)			

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5.7	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.
5.8	GCS application software	a) Able to control all aspect like pre-flight checks, self-tests, control of takeoff/landing and payloads	BOO will check practically and firm will also submit OEM certificate.
		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 (remaining flight time in minutes) 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.	

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5.9	Map formats	a) Should have the capability to integrate geo-referenced raster maps provided in at least one of the commonly used digital map forms (GIF, TIFF, DTED and SRTM etc.)	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.	
5.10	Payload controls	a) Selection and switch on/off of payload	BOO will check practically.
		b) Pan/Tilt/Zoom controls	
		Point payload to ground co-ordinate function	
5.11	Joystick controls	a) Full Camera Control Pan/Tilt b) Zoom In/Out Black/White Hot c) RPV Mode d) Altitude Control	BOO will check practically.
5.12	Pre-flight checks	Self-test of UAV system, Output: go/no go	BOO will check practically.
6	**Communication Link**		
6.1	Communication link equipment capability	i) Transmit control commands from GCS to UAV	BOO will check practically.
		ii) Transmit parameter of UAV and payload to GCS	
		iii) Transmit day and night video from UAV to GCS	
6.2	Type of link	Secured communication links between air vehicles and GCS with minimum 128 bits encryption	Firm will submit OEM certificate
6.3	Frequency Band	System should operate on S & C frequency Band uplink and down link, preferably on license free band i.e (i)2.4 GHz or (ii)5.8Ghz or (iii) 2.4Ghz & 5.8Ghz (as per user requirement)	
7	**General System requirements**		
7.1	Weight	Complete weight of the UAS not more than 15 kg and system should be packable in 2 backpacks	BOO will check practically.
7.2	Assembly/ Disassembly time	Less than 20 minutes each	
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 at RH not less than 95%	Firm will submit certificate of Govt lab or NABL/ILAC accredited laboratory
		ii) Starting operating temperature & Storage temp: -5°C to +55°C	
		iii) Ability to withstand dust, drizzle and humid conditions	

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7.4	Portability and operation	The UAV should be battery operated portable, light in weight, compact for day and night surveillance, capable of being carried and operated by two men.	BOO will check practically.
7.5	Battery of AV	The intelligent standard lithium-based battery pack should have the back up of minimum 90 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: 2 Nos	BOO will check practically
		iii. Spare propeller set:2 nos	BOO will check practically
		iv. Spare landing gear sets: 2 nos	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. Water resistance (IP 66) back packs to carry UAS- 02 Nos	Firm will submit certificate of Govt lab or NABL/ILAC accredited laboratory
		viii. Rugged, Compact and light weight transportation box- 02 Nos	BOO will check practically
7.8	Night recovery Beacon	Switchable LED light when operating with night payload	BOO will check practically