

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
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No. B.V-7-C/2024-25-C(N/UAV)-Q

Dated, the April'2025

Subject: - REQUEST FOR COMMENTS OF STAKEHOLDERS /OEM/FIRMS
on Draft QRs & TDs of "Nano UAV".

1. The Draft QRs/TDs of "Nano UAV" 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 6 **May'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.


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

Draft QRs/TDs of Nano UAV

SN	Parameter	Specifications	Trial directives
1	Nano UAV (As per drone rule 2021) system should consist of the following sub-systems: -		
1.1	UAV Bird with battery pack	Board will check it practically and will ensure that items are available as per tender publication.	
1.2	Ground Control station with data link equipment		
1.3	Daylight & night Camera Payload		
1.4	Universal Battery Charger with Power Supply System		
2	Nano UAV characteristics:-		
2.1	Role	Personal soldier Surveillance, air platform of very small size of close range surveillance and detection during day and night.	Board will check it practically during day and night and will ensure that UAV equipped with these features.
2.2	Launch and Recovery mode (In meter)	i) Vertical Take Off and Landing (VTOL) or Hand Launch and Belly landing within an area of 2m x 2m clearing or less	Board will check practically by within the shown area and will ensure that payload should not get damaged during recovery of UAV.
2.3	Aural Signature (in dB)	≤40dBs at 40 feet Above Ground Level	The firm will submit certificate of Govt. Lab. or DRDO or NABL accredited or ILAC accredited laboratory.
2.4	Payloads carrying capability	Should have capability to carry electro Optic (EO) for day and Thermal Imager (TI) for night one at a time. Or Integrated day & Night payload. (As per user requirement)	Board will check practically.
2.5	Flight Modes	a) Semi autonomous vertical take off or hand launch. b) Semi autonomous vertical landing or belly landing. c)Hover at defined waypoint d) Semi Autonomous waypoint navigation (pre-defined as well as dynamically adjustable waypoints during flight) e) Remote Piloted mode for video based user navigation. f) Vision based Semi Autonomous Target Tracking of fixed and moving targets. g) Should be controllable in real time from the GCS up to recovery. h) Fully autonomous in outdoor environment.	Board will check practically.
2.6	Endurance (In minutes)	20 minutes or more with all payloads at Mean Sea Level.	Board will check practically with maximum payload up to launch altitude of 1000 meter Above Mean Sea Level (AMSL).

SN	Parameter	Specifications	Trial directives
2.7	Operating Altitude (In feet)	100 feet AGL (Above Ground Level) or more.	Board will check practically by flying the UAV.
2.8	Launch Altitude (in meter)	2000m AMSL (Above Mean Sea Level) or more	Firm will submit OEM certificate.
2.9	Range of Operation (In Km)	Minimum 1.5 km line of sight	Board will check practically.
2.10	Cruise Speed (In km/h)	20 km/h or more	Board will check practically and firm will submit OEM certificate.
2.11	Operating Wind Conditions (In knots)	a) Take off: 10 knots or more b) Landing: 10 knots or more c) gust: 15 knots or more	Board will check it practically or firm certificate will be accepted in this regard.
2.12	Fail safe features	a) Automatic Return to Home/ Land on low battery	Board will check it practically.
		b) Single GPS on-board	Firm will submit OEM certificate.
2.13	Propulsion system	Electrical with rechargeable batteries	Board will check it practically.
3.	<u>Payload characteristics:-</u>		
3.1	Payloads required	a) Electro Optic (EO) for day (colour) b) Thermal Imager (TI) or IR for night c) Integrated day & night payload. (As per user requirement)	Board will check practically after fitting the required payloads and ensure that UAV working satisfactorily.
3.2	Payload and Video Stabilization	a) Video output should be digitally stabilized at all zoom levels.	Board will check practically all parameters
		b) Quality of video should not be affected by UAV vibrations.	
3.3	Electro optic (EO) Daylight Payload	a) Resolution: 1280 X 720 pixel or better	Board will check it practically and ensure daylight payload working as per their parameters and firm will submit OEM certificate for resolution and FOV.

SN	Parameter	Specifications	Trial directives
		b) Should be able to detect human size target at 100-meter slant or more	
3.4	Thermal Imager (TI) Night or IR Payload (As per user requirement)	a) Resolution: 320 X 240 pixels or better b) White/Black Hot modes for TI payload c) Digital Zoom: 4X or more d) Should be able to detect human size target at 70-meter slant or more	Board will check it practically and ensure daylight payload working as per their parameters and firm will submit OEM certificate for resolution.
3.5	Night Recovery Beacon	Switchable (from GCS) LED light when operating with Night Payload	Board will check it practically.
4.	Ground Control Station characteristics:-		
4.1	(a) Semi ruggedized 7-inch tablet Or As per user requirement.	Compatible with Nano UAV	Board will check it practically.
4.2	Computing Hardware only for option (a)		
	CPU	Processor minimum frequency 2.9 GHz or equivalent /better	BOO will check it practically one by one all parameter, and supplier will also provide OEM certificate in this regards. Ensure all parameters are available in the equipment.
	Storage	256 GB or better	
	Memory	4 GB or more	
	Display	Minimum 8 inch – 1024 x 768 XGA sunlight readable screen, anti-glare.	
4.3	Battery Operation	Minimum two hours at peak utilisation.	Board will check practically
4.4	Battery Charging time of GCS	Should be less than 1 hour	Board will check practically
4.5	Data portability	Ports for data transfer to external secondary storage devices	Board will check practically
4.6	Interface	HDMI, USB, Micro USB, Type C, 10/100/1000 Ethernet.	Board will check practically
4.7	Capability	a) Transmit control commands to UAV. b) Receive UAV flight and propulsion parameters. c) Receive, display and record real time day and night video from UAV. d) Capability to control UAV while on the move.	Board will check capability of the system practically according the mentioned parameters.

SN	Parameter	Specifications	Trial directives
4.8	GCS Application Software	a) Geographic Map along with UAV location, UAV trajectory, camera view polygon, waypoints and flight plan.	Board will check it practically and ensure that all application is working properly.
		b) Real-time video from the UAV with on-screen display of important parameters like:- i. UAV Position (Only in outdoor) ii. Height of UAV above ground Level (AGL) in outdoor environment. iii. Distance of UAV from GCS iv. Bearing (Azimuth) of UAV from GCS v. Ground speed of UAV vi. UAV Heading/ True North indication vii. Mission time	Board will check it practically and ensure that all application is working properly.
		c) Geographic map and real-time video should be displayed at all times during the flight.	
		d) Geographic map and real-time video views window 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/button input.	
4.9	Map Formats	a) Should have the capability to integrate geo-referenced raster maps provided in at least one of the commonly used digital map formats (GIF, TIFF, DTED and SRTM etc.) or As per user requirement.	Board will check capability of the system practically according to the mentioned parameters.
		b) Should be able to work with Google Maps, application should have the capability to download maps automatically after specifying location GPS co-ordinates.	

S.N	Parameter	Specifications	Trial directives
4.10	Payload Controls	a) Selection and switch on/off of payload b) Recording on/off c) Switch on/off Night Recovery Beacon	Board will check capability of the system practically according the mentioned parameters.
4.11	Button based/USB Joystick Controls	i. Full Camera Control- a). Zoom In/Out b). Black/White Hot (only in case of TI) ii. RPV Mode iii. Altitude Control	Board will check practically.
4.12	Video	a) Video should be recorded in any commonly portable video formats (AVI/MPEG/MP4 etc) b) Video of the full flight should be recorded c) Should have capability to take image snapshots at any time during flight d) Software should be provided that will facilitate extraction of imagery from the recorded video post flight	Board will check capability of the system practically according the mentioned parameters.
4.13	Pre-flight checks	Self-test of UAV system, Output: go/no go	Board will check capability of the system practically according the mentioned parameters.
5. <u>Communication Link:-</u>			
5.1	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	Board will check capability of the system practically according the mentioned parameters
5.2	Type of link	Secured digital uplink & downlink with AES encryption.	Firm will produce OEM certificate.
5.3	Data Link	S/C band (2 Ghz to 6 Ghz) with minimum 128 bit AES encryption.	Firm will produce OEM certificate.

SN	Parameter	Specifications	Trial directives
6.	General System requirements:-		
6.1	Weight (in grams)	As per drone rule 2021, The maximum all up weight (including payload) should be ≤ 250 gms.	Board will measure weight of UAV birds with the help of weighing machine.
6.2	Assembly/Disassembly time (In minutes)	≤ 5 minutes.	Board will check practically.
6.3	Life of Nano UAV	The total technical life of Nano UAV should not be less than 750 flights	Firm will produce OEM certificate.
6.4	IP (Ingress Protection)	IP 53 or better Or As per user requirement.	Firm will submit certificate of Govt. Lab. or NABL or ILAC accredited laboratory
6.5	Environmental Conditions for Operation and Storage	<p>The UAV and associated systems should be certified for operation and storage for following environment conditions.</p> <p>i) Damp Heat: $40^{\circ}\text{C} \pm 2^{\circ}$ at RH not less than 90%</p> <p>ii) Operating temperature & Storage temp: -5°C to $+50^{\circ}\text{C}$, Tolerance $\pm 10\%$</p> <p>iii) Ability to withstand dust, drizzle and humid conditions</p>	Firm will submit certificate of Govt. Lab. or NABL or ILAC accredited laboratory.
6.6	Portability and Operation	The Nano UAV should be battery operated portable, light in weight, compact, for day and night surveillance, capable of being carried and operated by two men	Board will check practically. That system is operated by battery and being carried out and operated by two men.
6.7	Battery of AV	The intelligent standard battery pack should have the backup of minimum 20 minutes.	Board will check practically and firm will produce OEM certificate for chemistry of battery.
6.8	Life of AV Battery	Minimum 250 charging cycles.	Firm will produce OEM certificate
6.9	Battery Charger of AV battery	Suitable universal battery charger to charge the batteries up to 98% within two hours.	Board will check practically by charging battery and will ensure that it is capable to charge battery within two hours.

SN	Parameter	Specifications	Trial directives
6.10	Built-in additional power source for the GPS Tracker	The system should include a built-in GPS Tracker equipped with an independent power source, capable of transmitting co-ordinates to the ground control station (GCS) or control station for minimum 72 hours to track/Monitor the lost/crashed UAV	Board will check practically
6.11	Updated list of Mandatory spares/accessories.	Should be provided (as per user requirement)	BOO will check practically
6.12	Accessories	a) Water proof Back Packs IP66: 1 set	Board will check physically and firm will submit certificate of Govt. Lab. or NABL accredited or ILAC accredited laboratory for IP66.
		b) Field Repair kit: 1 No's	
		c) Battery packs: 3No's	
		d) Spare propeller Sets: 2 No's	
		e) Associated Cables & Mountings: 1set	
		f) Hard transportation boxes: 1set	
		g) User, Technical & Maintenance Manual: 1set	
		h) Log book : 1 set	
7	Additional Parameters (as per user requirement)		
(a)	AI assist flight stabilization.		BOO will check practically.
(b)	Map drawing from real time video.		BOO will check practically.

Note:-

- a) **All firms are requested to give your response against each parameter required in Figure/Unit where ever mentioned. In those column, vague replies like complied, yes, okay should not be endorsed.**
- b) **Any other special feature or capability that the firm can provide within above specifications and category may be given at the end of the above proposal.**