संख्या. पी-63013/197/01/2024/मोड–I/सी0सु0बल/. 2774-78

भारत सरकार, गृह मंत्रालय
महानिदेशालय सीमा सुरक्षा बल
(रसद निदेशालय: आधुनिकीकरण सैल)
(Email-comdtord@bsf.nic.in)
(Fax: 011-24367683)

ब्लाक संख्या . 10,
सीजीओ काम्पलैक्स,
लोधी रोड, नई दिल्ली–03
दिनांक 28 मई 2024

वरिष्ठ तकनीकी निदेशक
The Senior Technical Director
राष्ट्रीय सूचना–विज्ञान केन्द्र, नोर्थ ब्लाक,
गृह मंत्रालय, नई दिल्ली
NIC, North Block, MHA
New Delhi
(द्वारा ई–मेल)
(ई–मेल पता : mpsugandhi@nic.in)

Sub: Request for comments of stakeholders/OEM on draft QRs & TDs

कृपया गृह मंत्रालय के पत्र संख्या IV-24011/12/2011-Prov-I(part)(CFN 3300890)-1710 दिनांक 31st Aug 2015 के सन्दर्भ में।

2. उपरोक्त विष्यान्तर्गत सूचित किया जाता है कि तकनीकी विशेषज्ञों के उप समूह द्वारा **"Counter Drone System"** के गुणातमक आवश्यकता/परीक्षण निर्देशों के मसौदें का प्रारुप दिनांक 17 मई 2024 को आयोजित सभा के दौरान तैयार किया गया, जिसको इस आश्य से प्रेषित किया जा रहा है कि उक्त उपकरण के गुणातमक आवश्यकता/परीक्षण निर्देश को गृह मंत्रालय की वैबसाईट पर 15 दिन के लिए अपलोड करने का श्रम करें।

संलग्नः उपरोक्तनुसार

28/05/2024
(दिगेन्द्र सिंह पंवार)
उप कमाण्डेंट (मोड)

प्रतिलिपि :-

1. SO (IT), North Block, MHA (Through E-mail) (E-mail address: soit@nic.in) : उपरोक्त उपकरण के गुणातमक आवश्यकता /परीक्षण निर्देशों के मसौदा को आपके सूचनार्थ एवं अग्रिम कार्यवाही हेतु प्रेषित किया जाता है।
2. IT Wing, FHQ BSF : उपरोक्त उपकरण के गुणातमक आवश्यकता /परीक्षण निर्देशों के मसौदे को सीमा सुरक्षा बल की वैबसाईट पर 15 दिन के लिए अपलोड करने का श्रम करें। आपसे अनुरोध है कि उक्त मसौदे को गृह मंत्रालय की वैबसाईट पर भी अपलोड करने हेतु निम्नलिखित पतों पर ई–मेल करने का श्रम करें:-
   (a) Technical Director, NIC, North Block, MHA
   (E-mail : mpsugandhi@nic.in)
   (b) SO (IT), North Block, MHA
   (E-mail : soit@nic.in)
3. Ops Dte (NIIE Cell), BSF : For information w.r.t your UO No.7392 dated 26 April 2024.
4. File.

भारत सरकार, गृह मंत्रालय
महानिदेशालय सीमा सुरक्षा बल
(रसद निदेशालय: आधुनिकीकरण सैल)
ब्लाक संख्या . 10,सीजीओ काम्पलैक्स,लोधी रोड, नई दिल्ली–03
(Email-comdtord@bsf.nic.in)
(Fax: 011-24367683)

संख्या. पी-63013/197/01/2024/मोड–।/सीसुबल/2774-78 दिनांक 27 मई 2024

विषय : **"Counter Drone System" के गुणातमक आवश्यकता/परीक्षण निर्देशों पर हितधारकों/ निर्माताओं/ विक्रेताओं की टिप्पणी के लिए अनुरोध।**

"Counter Drone System" के गुणातमक आवश्यकता और परीक्षण निर्देशों को परिशिष्ट 'ए' के रुप में संलग्न किया गया है। हितधारकों/निर्माताओं/विक्रेताओं से अनुरोध किया जाता है कि वे उस उत्पाद की विस्तृत एवं स्टीक जानकारी दें। साथ ही प्रत्येक पैरामीटर के अनुरुप अपने उत्पाद के सही विवरणों को प्रस्तुत करें । सिर्फ 'अनुपालना' या ' अनुपालना नहीं' वाली टिप्पणी स्वीकार नहीं की जाएगी।

- क्या आप मूल उपकरण निर्माता/विक्रेता हैं?
- यदि विक्रेता मूल उपकरण निर्माता का विवरण देता है।
- मूल उपकरण निर्माता से प्राधिकरण प्रमाण पत्र।
- उत्पाद की मूल सूची।
- उत्पाद ब्रोशर एवं साहित्य रचना का ब्यौरा

1. आवश्यक जानकारी/विवरण 11 जून 2024 तक निम्नलिखित पते पर भेजे जा सकते हैं।

रसद निदेशालय, सीमा सुरक्षा बल
लेवल–8, ब्लाक–10,
केन्द्रीय कार्यालय परिसर, लोधी रोड,
नई दिल्ली–110003
ईमेलः– comdtord@bsf.nic.in

2. शीघ्र प्रतिक्रिया का अनुरोध किया जाता है।

Mail 28/05/2024

(दिगेन्द्र सिंह पँवार)
उप कमाण्डेंट (आधुनिकीकरण)

Government of India
Ministry of Home Affairs
Directorate General Border Security Force
(Prov Dte: Mod Cell)
Block No.10, CGO Complex, Lodhi Road, New Delhi-03
(Fax: 011-24367683, Email-comdtord@bsf.nic.in)

No. P-63013/197/01/2024/Mod-I/BSF/ 27478 Dated, the 28 May 2024

Subject : Request for comments of stakeholders/OEM/Firms on QRs (Qualitative Requirements) & TDs (Trial Directives) of "Dragon Search Light (DSL)"

The draft QRs/TDs **"Counter Drone System"** 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.
- Original catalogue of the product
- Brochure/Literature of the product

2. The required information/details may please be forwarded at the following addresses by 11.06.2024.

Directorate General BSF,
Level-8, Block No. 10,
CGO Complex, Lodhi Road,
New Delhi-110003
Email: comdtord@bsf.nic.in

3. An early response is requested.

28/05/2024

(Digendra Singh Panwar)
Dy. Commandant (Mod)

Appendix-'A'

QRS & TDS OF COUNTER DRONE SYSTEM

1. Trial/ technical evaluation of equipment will be conducted by a Board of Officers (B.O.O) in the presence of vendor or representative of firm to assess actual performance of the equipment.

2. All specifications/ parameters of equipment mentioned in the QRs will be checked by B.O.O during trial by ascertaining/ verifying in the following ways:

(a) PHYSICAL CHECK: - In this category, specifications of the equipment will be checked by B.O.O. physically as per QRs/ TDs.

(b) FUNCTIONAL CHECK: - In this category, Vendor/ Supplier will show practically all features/ configurations to the board of officers during trial.

(c) SUBMISSION OF CERTIFICATE: - Specification which cannot be checked due to lack of testing facilities/ expertise, certificate(s) will be provided by the vendor, issued by a Government Authorized Laboratory/ International accredited laboratory or OEM as specified against the parameter, and will be acceptable by B.O.O. during trial.

(d) POC (PROOF OF CONCEPT):- Vendor will give a functional demonstration of the anti-drone system at any site suggested by procuring agency.

S/No	QRs / Technical Specifications	Trial directives	Remarks
1.	General Description:		
	(a) The Anti-Drone System/ Equipment should provide Multi Sensor based complete and comprehensive solution with regards to UAS detection, tracking, identification, and neutralization.		
	(b) The system should be Vehicle Mounted (Preferably 4X4) OR Static system (As per User Requirement)		
	(c) All the sub-systems including integral power solutions should be transportable and capable of deployment on rooftop of buildings/ unprepared surfaces. Ruggedized boxes with handle & latches with locking device should be provided for carrying all the equipment.		

S/No	QRs / Technical Specifications	Trial directives	Remarks
	(d) Detection, tracking and neutralization of swarm drones approaching simultaneously from multiple directions.		
	(e) It should integrate all detection sensors and identify threats to provide operator with a composite air situation picture.		
	(f) Facilitate selection and management of responses for countering UAS, using jammer systems.		
	(g) Fast switching between wideband detection and wideband jamming modes to neutralize advanced UAS types which use multiband switching system.		
	(h) The Command-and-Control Centre should have capability to operate sensors and carry out soft kill (and Hard Kill, if available). The fused target data from multiple sensors must be provided to operate for quick decision making.		
	(j) System should not detect and Jam cellular communication bands.		
	(k) The following is the expected composition: - (i) RF Detector (ii) 3D radar (iii) RF and Satellite Navigation Jammer System (iv) EO/ IR (Optional, if required by User) (v) Spoofing/ Takeover (vi) Hard Kill (Optional, if required by User) (vii) Command and Control Centre (C2 Centre) (viii) Packing (ix) Transportation		
2.	Detection Unit:		
	(a) The system should be able to detect Drones/ Unmanned Aerial Systems (UAS)/ RPAs.	The BOO will verify the functional capability of the detection of the system as demonstrated by firm during trial.	

S/No	QRs / Technical Specifications	Trial directives	Remarks
	(b) The detection should be carried out with the help of combination of following sub-systems i.e. RADAR, RF Detector, (EO/ IR, optional) etc. as per requirement.	The BOO will verify the functional capability of the detection with the help of combination of sub-system i.e. Radar, RF detector, (EO/ IR, if available) as demonstrated by firm during trial.	
	(c) The field of view should be 360° azimuth coverage.	The firm will demonstrate and BOO will verify the same.	
	(d) The System should classify and provide alerts to the user through audio & visual alarm to the system operator at the system control, when any Drone/ Unmanned Aerial System (UAS)/ Remotely Piloted Aircraft (RPA) is detected.	To be checked and verified by BOO physically/ functionally.	
	(e) The false/ fail alarms should not be more than 5%. Further, false alarm is categorized as (i) Positive false alarm (alarm raised while in actual drone was not available). (ii) Negative false alarm (alarm not raised while drone was approaching to own restricted location).	The firm will provide OEM certification and BOO will verify the same.	
	(f) The system should be able to operate at temperature range of minus (-) 30 degree to plus (+) 55 degree Celsius.	The firm will provide National/ International accredited lab certificate/ report in this regard. The user may call for trial under specified conditions in one or more locations.	
	(g) Detection Time: Maximum 10 seconds after entering into the respective specified detection range.	The firm will demonstrate and BOO will verify the same.	
	(h) The detection capability should be both during day & night under all weather conditions.	The firm will demonstrate and BOO will verify the same.	
	(j) The system should be able to detect up to 100 target drones or more simultaneously.	The firm will provide OEM certification and BOO will verify the same to the extent possible.	
	(k) The system should be able to detect the target drones flying upto 250 Km/Hr.	The firm will demonstrate and BOO will verify the same. (Efficiency to be tested at slowest and fastest speed).	

S/No	QRs / Technical Specifications	Trial directives	Remarks
	(l) The system should be able to detect all types of drones including non – metallic drones.	To be checked and verified by BOO. OR Firm will submit certificate from Govt. lab/ NABL accredited lab/ International accredited lab. OR The firm will provide OEM certification and BOO will verify the same.	
	(1) RADAR: The RADAR should have following capabilities:-		
	(a) The radar should have ability to provide 360° coverage in azimuth. The following minimum capabilities are expected: -		
	(i) 3D Radar (ability to provide Range, Azimuth & Height, and Speed of UAS)	The firm will demonstrate and BOO will verify the same.	
	(ii) Azimuth Coverage: 360°	The firm will demonstrate and BOO will verify the same.	
	(iii) Elevation coverage: Above Ground Level and +70°or more	The firm will demonstrate and BOO will verify the same.	
	(iv) Average update rate in C2: Min of 5 Sec or better	The firm will demonstrate and BOO will verify the same.	
	(v) Target Location Accuracy: ± 10 meters or better	The firm will demonstrate and BOO will verify the same.	
	(vi) Track-While-Scan (TWS) capability	The firm will demonstrate and BOO will verify the same.	
	(vii) The system should be ruggedized EMI/ EMC compliant.	The firm will provide National/ International accredited lab certificate/ report in this regard.	
	(viii) Ability to initiate, detect and track UAS track in the presence of clutter.	The firm will demonstrate and BOO will verify the same.	
	(ix) Minimum Range: 200 m or better	The firm will demonstrate and BOO will verify the same.	
	(x) Self-calibration capability i.e. the radar should be able to assess the environment conditions like (weather, co-existing Noise etc.) and decide appropriate Transmission Wave pattern, without the requirement of operator's	The firm will provide National/ International accredited lab certificate/ report in this regard.	

<table>
<tr><th>S/No</th><th>QRs / Technical Specifications</th><th>Trial directives</th><th>Remarks</th></tr>
<tr><td></td><td>intervention.</td><td></td><td></td></tr>
<tr><td></td><td>(xi) The maximum number of targets that can be tracked simultaneously: 100 or more.</td><td>The firm will provide National/ International accredited lab certificate/ report in this regard.</td><td></td></tr>
<tr><td></td><td>(xii) Detection range:
<table><tr><th>Type of UAV</th><th>Average RCS</th><th>Min Detection rage</th></tr><tr><td>Nano UAV</td><td>Upto 0.005 m^2</td><td>2 Km</td></tr><tr><td>Micro UAV</td><td>Upto 0.01 m^2</td><td>5 Km</td></tr><tr><td>Small UAV</td><td>Upto 0.1 m^2</td><td>7 Km</td></tr><tr><td>Medium UAV</td><td>Upto 1 m^2</td><td>10 Km</td></tr></table></td><td>The BOO will verify the detection range of the system during trial.

For trial purpose following to be considered:-
Nano UAV: DJI mini or equivalent in dimensions
Micro UAV: DJI Phantom or equivalent in dimensions
Small UAV: DJI Matrice 300 or equivalent in dimensions</td><td></td></tr>
<tr><td></td><td colspan="2"><u>(2) RF Detector/ Receiver/ DF System</u>:
<u>The RF Detector/ Receiver/ DF System should have following capabilities:-</u></td><td></td></tr>
<tr><td></td><td colspan="2">(a) It should have the ability to provide 360° azimuth coverage by scanning the environment and detecting potential Drone/ UAS/ RPAs threat in the area of interest. The following minimum capability is required:-</td><td></td></tr>
<tr><td></td><td>(i) Receiver covering 400 MHz to 8 GHz covering all ISM and non-ISM bands used by commercial and military drones used for Drone/ UAS/ RPAs control, navigation and transmission systems is desired.
(Optional: Receiver covering 20 MHz to 8 GHz)</td><td>The firm will provide National/ International accredited lab certificate/ report in this regard.</td><td></td></tr>
<tr><td></td><td>(ii) The system shall be capable of tracking and locating the operator(s) controlling the drone(s). (Optional - User to specify as per requirement)</td><td>The BOO will verify the functional capability of the system if the parameter is specified by the user.</td><td></td></tr>
<tr><td></td><td>(iii) Detection range:
Micro & Small: 8 Km or better.
Medium: 10 Km or better.</td><td>The BOO will verify the detection range of the system during trial.</td><td></td></tr>
<tr><td></td><td>(iv) Average update rate in C2: 5 Sec or faster</td><td>The firm will demonstrate and BOO will verify the same.</td><td></td></tr>
</table>

S/No	QRs / Technical Specifications	Trial directives	Remarks
	(v) Elevation Coverage: At least 70° or better	The firm will demonstrate and BOO will verify the same.	
	(vi) It must have simultaneous multiple detection capability to detect Drone/ UAS/ RPAs coming from multi-directional approach.	The firm will demonstrate and BOO will verify the same.	
	(vii) Detection capability is to be independent of the need to have any library data of drones in the system. Optional- Provision of inbuilt database library to identify specific type of drone updatable on periodic basis, with facility to update library at user end.	The firm will demonstrate and BOO will verify the same.	
	(viii) RF detection system shall have the ability to detect encrypted communication signals used by Drones/ UAS/ RPAs.	The firm will provide National/ International accredited lab certificate/ report in this regard. OR The user may conduct trial in this regard subject to availability of such drone(s).	
	(3) Electro Optic and IR Sensor - OPTIONAL		
	(i) Surveillance capability- 360°	The firm will demonstrate and BOO will verify the same.	
	(ii) Capability to slew to the Radar/ COMINT sensor.	The firm will demonstrate and BOO will verify the same.	
	(iii) Auto Pan, Tilt and Zoom (PTZ) and inbuilt software stabilization.	The firm will demonstrate and BOO will verify the same.	
	(iv) Detection and recognition of type of drones.	The firm will demonstrate and BOO will verify the same.	
	(v) EO camera resolution of 1920 x 1080 pixels (full HD) or better	The firm will provide OEM certification and BOO will verify the same.	
	(vi) Video Motion Detector for automatic detection and tracking of low contrast moving drone(s).	The firm will demonstrate and BOO will verify the same.	

<table>
<tr><th>S/No</th><th>QRs / Technical Specifications</th><th>Trial directives</th><th>Remarks</th></tr>
<tr><td></td><td>(vii) Infra Red (IR) Camera:
Image Resolution: 640 X 480 or better.
Cooling: Inbuilt.</td><td>The firm will provide OEM certification and BOO will verify the same.</td><td></td></tr>
<tr><td></td><td>(viii) EO and IR sensor should have adequate zoom to be able to identify drones from specified range.
<table><tr><td>Drone/ UAV Category</td><td>Minimum Range</td></tr><tr><td>Micro</td><td>02 Km</td></tr><tr><td>Small</td><td>04 Km</td></tr><tr><td>Medium</td><td>06 Km</td></tr></table>Optical zoom: 20X continuous or more for both day and night camera (EO & IR camera)</td><td>The firm will demonstrate and BOO will verify the same.</td><td></td></tr>
<tr><td></td><td>(ix) In case of cue by Radar, the EO and IR sensor should be able to display the target clearly and instantaneously. In case of cue by RF, EO and IR sensor should move to respective direction to enable operator to locate the target.</td><td>The firm will demonstrate and BOO will verify the same.</td><td></td></tr>
<tr><td></td><td>(x) Other System Features:
(aa) Integrated Automatic Target tracker
(ab) Inbuilt Image Enhancement
(ac) Ethernet IP interface for camera settings and pan tilt control.</td><td>The firm will provide OEM certification and BOO will verify the same.</td><td></td></tr>
<tr><td>3.</td><td colspan="2"><u>Jamming/ Neutralization Unit</u>:</td><td></td></tr>
<tr><td></td><td colspan="2"><u>SOFT KILL</u>
It should have the capability to jam Satellite based navigational systems and RF communication links which are used by the target Drones/ UAS/ RPAs for navigation and control. The following are the requirements: -</td><td></td></tr>
</table>

S/No	QRs / Technical Specifications	Trial directives	Remarks
	(a) The System should be capable of neutralizing the drones/UAVs/ RPAs. It should be able to jam RF & GNSS links independently/ simultaneously within 10 secs after initiation of jamming. Jamming Range: (i) Omni Directional : Minimum 04 Km or better (ii) Directional : Minimum 08 Km or better	The BOO will verify the functional jamming capability of the system as demonstrated by vender during trial by flying drones operating in different frequencies. The BOO will verify the functional jamming capability of the system by flying multiple drones from different directions. The number of drones used for conducting the trial will be decided by the BOO as per the availability and clearance at test site.	
	(b) The Jammer should be capable of jamming swarm of drones (up to 20 drones or more) simultaneously in specified range.	The firm will demonstrate and BOO will verify the same.	
	(c) (Optional): Drone Spoofing and Takeover Operating Frequency- ISM bands (400 MHz to 8 GHz) optional: 20 MHz to 8 GHz Range- 4 Km (Omni Directional) 8 Km (Directional)	The firm will demonstrate and BOO will verify the same.	
	(d) GUI controls to select any desired band jammer to Omni or Directional jamming independently.	The firm will demonstrate and BOO will verify the same.	
	(e) Simultaneous jamming option for the given bands below:- (i) Simultaneous jamming in all ISM bands (aa) 430-470 MHz (Band 400 MHz) (ab) 863-900 MHz (Band 800 and 900 MHz) (ac) 2,400-2,500 MHz (Band 2400 MHz) (ad) 5,150-5,250 MHz (ae) 5,250-5,350 MHz (af) 5,725-5,875 MHz (Band 5800 MHz) (ag) Any other Frequency bands as desired by procurement agency. (ii) Simultaneous jamming in all GNSS bands capability to Jam GPS, GLONASS, BeiDou, Galileo and IRNSS systems. (iii) A dedicated wideband jammer covering 400 MHz to 8 GHz.	The firm will demonstrate and BOO will verify the same. AND The firm will also provide National/ International accredited lab certificate/ report in this regard.	

S/No	QRs / Technical Specifications	Trial directives	Remarks
	(optional: 20 MHz to 8 GHz)		
	(f) Ability to enable/disable jamming in one, several or all frequencies at a time.	The firm will demonstrate and BOO will verify the same.	
	(g) Elevation coverage: 70° or above	The firm will demonstrate and BOO will verify the same.	
	(h) Types of Jamming: (i) Sweep and barrage. Selectable any one at a time (ii) Any spot frequency in the specified frequency range. (iii) Default options to provide best jamming against drones to be specified.	The firm will demonstrate each type of jamming and BOO will verify the same.	
	(j) Should have provision for automated operation (coupled with sensor) with provision for manual override with facility to skip pre-defined friendly frequency.	The firm will demonstrate and BOO will verify the same.	
	(k) Continuous jamming: Min 30minutes or better & Cooling period: Max 5 Min or better	The firm will demonstrate and BOO will verify the same.	
	(l) Modes: (i) Default options must be loaded for effective jamming for drones operating in frequency hopping. (ii) The wide band jammer shall be loaded shall get tuned automatically to emitter frequency in auto mode of jamming.	The firm will demonstrate and BOO will verify the same.	
	(m) Optional: Software Defined Radio (SDR) Jamming capability. The jammer to have the facility of automatically self-tuning the detected frequency by use of SDR technology for opening up Jamming operation.	The firm will demonstrate and BOO will verify the same.	
	<u>HARD KILL (Optional, as per user requirement)</u> (a) The System should also be capable to neutralize the Drones /UAVs/ RPAs which operate in manual/ autonomous mode with hard kill options like Laser/ High Power Micro Wave/Electro Magnetic Pulse Gun/ Drone Catcher/ Net thrower etc. Range- 2 Km or more in case of Laser/ HPM/ EMP Gun. 2 Km or more in case of Killer drone/ kamikaze drone.	The firm will demonstrate and BOO will verify the same.	

S/No	QRs / Technical Specifications	Trial directives	Remarks
	- 4 Km or more in case of Drone Catcher via use of another Drone.		
4.	Command and Control Centre:		
	(a) Each C-UAS system will have its C2 Centre which can receive inputs from all sensors, generate the fused composite air situation and facilitate detection, classification, jamming and neutralization of hostile Drone/ UAS/ RPAs.	The firm will demonstrate and BOO will verify the same.	
	(b) Real time input from Drone Detection Radar, RF Sensor and EO and IR Camera system should be independently/ simultaneously displayed in the Operator Work Station (OWS).	The firm will demonstrate and BOO will verify the same.	
	(c) The display of each sensor must be selectable. (i) The GUI of OWS must facilitate PIP (Picture in Picture) facility. (ii) Facility to select the input of any sensors in the PIP window to be provided.	The firm will demonstrate and BOO will verify the same.	
	(d) Should be able to facilitate Display track of approaching UAS.	The firm will demonstrate and BOO will verify the same.	
	(e) GUI should have provision to accept COTS local maps/ Terrain Data. Provision to accept raster, vector and digital terrain database.	The firm will demonstrate and BOO will verify the same.	
	(f) Auto record and playback the composite air situation picture and air situation picture of individual sensors along with incidents of operator interventions.	The firm will demonstrate and BOO will verify the same.	
	(g) C2 should be able to define at least three 'No Fly zone', preferably of 3D. Scalability to be provided for increasing the No-Fly zones. No Fly zones are those, whose violation by any track will prompt auto activation of jammer, drone capture system and neutralization system (programmable).	The firm will demonstrate and BOO will verify the same.	
	(h) C2 should be able to define 3D 'Safe Zones' (i.e. the tracks picked up in the zone will be ignored). Scalability to be provide for increasing the safe Zones.	The firm will demonstrate and BOO will verify the same.	
	(j) C2 Centre should have provision to be scalable to accommodate integration of additional sensors data and other hard kill measures.	The firm will submit OEM certificate in this regard.	
	(k) C2 should be able to monitor and diagnose the health of each sub-system	The firm will demonstrate and BOO will verify the	

S/No	QRs / Technical Specifications	Trial directives	Remarks.
	and to display.	same.	
	(l) C2 should have feasibility to integrate with BSF network/ other services for transmission of data as well as reception of data (including the target data).	The firm will submit OEM certificate in this regard.	
	(m) Capability to operate on 24x7x365 basis.	The firm will submit OEM certificate in this regard.	
	(n) Differentiate between Drones and birds and provide alert on detection of a drone(s) only.	The firm will demonstrate and BOO will verify the same.	
	(o) The system should have Operating alert system (SMS/ Voice/ other).	The firm will demonstrate and BOO will verify the same.	
	(p) Detection capability against hovering drones.	The firm will demonstrate and BOO will verify the same.	
	(q) The system should have simulation facility for training of the crew.	The firm will demonstrate and BOO will verify the same.	
	(r) The system controller should be capable of displaying all parameters of detected UAVs/ drones like range, type, intercepted frequency etc. as per the specified technology.	The firm will demonstrate and BOO will verify the same.	
	(s) The system controller should display details of jamming signal frequencies (RF) and GNSS frequency.	The firm will demonstrate and BOO will verify the same.	
	(t) The system controller should provide event logs with details of date & time. 1000 log/30 days or more event logs backup.	The firm will demonstrate and BOO will verify the same.	
	(u) The system controller should have the facility to neutralize the target Drone/ UAV/ RPAs through selection of a soft switch/button.	The firm will demonstrate and BOO will verify the same.	
	(v) Password protection: - The system controller should have two types of password protection for operator/ administrative level for access control.	The firm will demonstrate and BOO will verify the same.	
5.	Maintenance:		
	The following to be ensured for ease of maintenance:-		
	(a) The system, its sub-systems and components should be modular for easy maintainability in field conditions. (b) Suitable self-test/ BIT checks (Power-ON BIT and Continuous BIT)	The firm will demonstrate and BOO will verify the same.	

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	should be built into the system design.		
6.	Mobility & Deployment		
	All sub-systems of C-UAS should be portable using indigenous vehicle (4x4). OR C-UAS can be deployed in static mode on uneven surfaces or at rooftop of buildings. (As desired by user). Three Op crew should be able to deploy and operate the entire system in three hours.	The firm will demonstrate and BOO will verify the same.	
7.	EMC / EMI Standardisation		
	Compliance to applicable MIL-STD-461G or equivalent International standard.	The firm will provide National/ International accredited lab certificate/ report in this regard.	
8.	Environmental Specifications of the system		
	(a) All the systems must be weather resistant/environmentally hardened as per JSS 55555/ other relevant MIL standard.	The firm will provide National/ International accredited lab certificate/ report in this regard.	
	(b) All equipment to confirm to MIL standards 810G all radio components in the system should be EMI compliant as per MIL STD 461/F/G. (i) Standard operating thermal range:- -30°C to +55°C (ii) Non-operating thermal range -40° C to +60° C (iii) Relative Humidity: 85 – 90% (iv) Altitude of operation: 5000 m AMSL	The firm will provide National/ International accredited lab certificate/ report in this regard.	
9.	Standards of packaging, transportation and other major subsystems		
	(a) The transportation case should be ruggedized as per JSS-0253-01/ equivalent standards.	The firm will provide National/ International accredited lab certificate/ report in this regard.	
	(b) All the major sub-systems to be ruggedized to meet the applicable military Standards.	The firm will provide National/ International accredited lab certificate/ report in this regard.	
10.	Power Source:		
	(a) The system should operate on AC mains (110V-270V, 50Hz) and DG Set (to be part of system).	The firm will demonstrate and BOO will verify the same.	

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	DG set should be able to run whole system uninterrupted for minimum 12 hours.		
	(b) UPS back-up for minimum 30 Minutes for complete system for seamless change over from AC mains to Generator supply and vice-versa.	The firm will demonstrate and BOO will verify the same.	
11.	Miscellaneous Parameters:		
	(a) The system should have ruggedized IP 67 carrying cases to keep equipment safe against damage during transportation.	The firm will provide National/ International accredited lab certificate/ report in this regard.	
	(b) Operator/ user manual will be provided by vendor (soft and hard copy).	To be checked and verified by BOO.	
	(c) Technical manual for minor repair/ maintenance will be provided by firm (soft and hard copy).	To be checked and verified by BOO.	
	(d) The firm/vendor/supplier will extend all repair & maintenance support to the users. The down time of equipment should not be more than 72 hrs in case of OEMs.	Firm will submit an undertaking.	
	(e) List of spare for minor repairs will be provided by the firm.	To be checked and verified by BOO.	
	(f) Tools for minor repairs and maintenance will be provided by the firm.	To be checked and verified by BOO.	
	(g) The system shall be scalable to integrate multiple sensors and neutralization systems at single Command and Control Centre in case multiple such systems are deployed for the protection of very large areas such as borders, industrial plants, stadiums, major airports and strategic assets etc. The feed of multiple sensors and neutralization means shall be available at a central monitoring station which should manage all systems simultaneously.	The firm will submit OEM certificate in this regard.	
	Firm will give undertaking and necessary documentation regarding point No. 12 to 16 and BOO will verify the same.		
12.	Installation & Commissioning:		
	After purchase, first time installation and commissioning of the system at the selected test site will be done by the firm / vendor / supplier.		
13.	Warranty Period:		
	The Anti-Drone System/equipment will remain under warranty period for 5 years from the date of commissioning and the firm will extend all repair and maintenance support during this period without any additional cost.		
14.	Customization:		
	After having the field trials and initial checking, if any necessary modification is required in the system as per the field requirement of the purchaser the same will be done by the firm / vendor / supplier.		

S/No	QRs / Technical Specifications	Trial directives	Remarks
15.	Software Support:		
	(a) Considering the immense challenges in the field and fast paced research, up gradation of software in time be ensured and the firm will provide the upgraded software support for 5 years after the completion of warranty period. (b) No equipment or its sub-parts including software can be declared obsolete for a period of 10 years from the date of commissioning.		
16.	Training:		
	The firm will impart Operator level training and repair / maintenance training to minimum 20 technicians / persons per system at the user premises without any additional cost for 15 days.		
17.	Misc Parameter:-		
	(a) The firm will provide Mission planner software to select the optimal deployment of system sensors and jammer, taking into account the digital elevation model (DEM) for complete system and the deployment tool based on 3D maps and provision for depicting Jammer/radar/RF shadow areas (optional as per user requirement). (b) The firm will give written undertaking Post-delivery support in India for repair/maintenance for all sub components to ensure min system down time. (c) The firm will give written undertaking on deliverable MRLS (Manufacturing Readiness Levels) to include all critical items to ensure minimum lead time. (d) The firm will provide details of SPOC (Single Point of Contact) for the system to be setup in India for training of crew for Ops and scheduled maintenance and for all issue related to the system.		

तकनीकी विशेषज्ञों के उप समूह द्वारा यह निश्चित किया गया है कि उक्त गुणातमक आवश्यकता को अधिक बेहतर बनाने के लिए गृह मंत्रालय एवं सीमा सुरक्षा बल की वैबसाईट पर विक्रेताओं/फर्मों के सुझाव प्राप्त करने हेतु 15 दिनों के लिए अपलोड किया जाए।

नोट - सभी विक्रताओं/फर्मों से निवेदन है कि अपने सुझावों के साथ निम्नलिखित कागजात संलग्न कर ई–मेल पता comdtord@bsf.nic.in पर भेंजने का श्रम करें:–

1. उत्पाद की वास्तविक विवरण पुस्तिका।
2. उत्पाद की साहित्यिक रचना का ब्यौरा।
3. गुणातमक आवश्यकताओं के उपर व्यापक टिप्पणीयॉं।

20/05/2024

(दिगेन्द्र सिंह पंवार)
उप कमांडेण्ट (आधुनिकीकरण)