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/GPR/110/05/2023/मोड–।/सीसुबल/ दिनांक 24 अप्रैल 2023

विषय : **"Ground Penetrating Radar (Hand Held)" के सूत्रीकरण गुणात्मक आवश्यकता/परीक्षण निर्देशों पर हितधारकों/ निर्माताओं/ विक्रेताओं की टिप्पणी के लिए अनुरोध।**

1. Ground Penetrating Radar (Hand Held)" के पुनः सूत्रीकरण गुणात्मक 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।

2. आवश्यक जानकारी/विवरण 10 मई 2023 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

3. शीघ्र प्रतिक्रिया का अनुरोध किया जाता है।

24/04/2023

(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/GPR/110/05/2023/Mod-I/BSF/ Dated, the 24 April 2023

Subject : Request for comments of stakeholders/OEM/Firms on QRs (Qualitative Requirements) & TDs (Trial Directives) of "Ground Penetrating Radar (Hand Held)""

1. The revised QRs/TDs **"Ground Penetrating Radar (Hand Held)""** 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 10 May 2023.

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.

24/04/2023

(Digendra Singh Panwar)
Dy. Commandant (Mod)

QUALITATIVE REQUIREMENT AND TRIAL DIRECTIVE FOR GROUND PENETRATING RADAR (HAND HELD)

S No.	PARAMETER	SPECIFICATION	Procedure suggested for trial for Board of Officers	Result expected / desired	Complied / Not Complied
1.	Features	i) The GPR system should be capable to detect metallic and non-metallic threats like IEDs, Pressure plates, wires and mines (Anti-Personnel & Anti-Vehicle) etc.	Physically check GPR for the detection of metallic and non-metallic objects like IEDs, pressure plate wires and mines etc, underground in specific depth.	The GPR system must be capable to detect metallic and non-metallic threats like IEDs, Pressure plates, wires and mines (Anti-Personnel & Anti-tank) etc.	
		ii) The system must provide GPR data in real time to detect, investigate and mark IEDs or suspicious objects. GPR should have option of GPS logging, mapping feature for scanning.	Physically check the system for the detection of IEDs or suspicious objects by displaying the data in real time on LCD screen to investigate and mark the threats.	The system must provide GPR data in real time to detect, investigate and mark the IEDs or suspicious objects.	
2.	i) The GPR system **should be capable** of Automatic Target Recognition (ATR) which will provide audio clue as well as visual clue on LED/LCD screen to the operator. The Firm should feed the details of following 10 ATR targets in the library of their GPR and demonstrate the procedure of uploading it to BOOs:- **Target-1** – Stell container of 7"-8" dia and a length of 10-12" filled up with sugar (simulating explosive) and a detonator. **Target-2-** A pressure cooker of 5 ltr filled up with sugar and a detonator. **Target-3** – Small steel Tiffin of 6" dia and 4" length with a AA battery. **Target-4**- 5 kg gas cylinder of available size. **Target-5** – Iron GI pipe of 2" dia and 10" length with a detonator. **Target—6** – Nail (2" length) depicting unwanted objects on ground. **Target-7** – A steel made milk can of 5 ltr (15" length minimum) **Target-8** – Detonator **Target-9**- 4 mm electric wire of 5 mtr length depicting command wire. Target-10 –b Cordex wire of 10 cm		i) Steel container of 7"-8" dia and a length of 10-12" filled up with sugar and a detonator should be buried at 45 cm depth. The GPR should be buried at 45 cm depth. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'container'**. ii) A pressure cooker of 5 liter filled up with some sugar and detonator should be buried at 30 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'Pressure cooker'.** iii) Small steel Tiffin of 6" dia and 4" length filled with sugar and a 2A battery should be buried at 5-6 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'Tiffin'.**	• The system should be capable as per the parameters mentioned in the QRs.	

	ii) GPR must detect all targets and provide audio clue as well as visual clue on LED/LCD screen to the operator.	iv) 5 kg cylinder of available size should be buried at 30 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'Cylinder'**. v. Iron GI pipe of 2" dia and 10" length with a detonator should be buried at 10 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'GI Pipe'**. vi) Nail (2" length) should be buried in horizontal position at 3-4 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'Nail-1'**. vii) Steel made milk-can of 5 liter (15" length minimum) filled with water should be buried at 50 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'Dallu'**. viii) Detonator should be buried at 10 cm. The GPR should able to detect the threat and show it to the user by way of audio or visual name as **'Detonator'**. ix) 4 mm electric wire of 5 mtr length should be buried at 10 cm. The GPR able to detect the threat and show it to the user by way of audio or visual name as **'Wire'**. x) Cordex wire of 10 cm should be buried at 10 cm. The GPR able to detect the threat and show it to the user by way of audio or visual name as **'Cordex'**. 2. Firm will also brief BOOs and demonstrate the method of updating ATR targets to the library of GPR during field trial.		

3.	Self-test	The system should have self-test feature to ensure the system operating properly with respect to the electronics and calibration between the device and the search head for its accuracy.	Switch 'ON' the system and put it in self-test mode to ensure proper operation of the system.	The system must have self-test feature to ensure the system operating properly.	
4.	The system should be able to plot the threat on LED/LCD display in real time. Operator's graphical display to be available in English language and desirable in Hindi language. Touch Screen (**Optional- To be decided by the user department at the time of indent)**		Check the detected threat indication on the LED/LCD display.	The system must display the threat in real time on LED/LCD display.	
5.	Availability of approximate Target depth indication for the operator on screen.		Physically check by the BOO.	The system must give approximate target depth.	
6.	Inbuilt GPR pre-programs to suit or work in different ground conditions (for e.g. Uneven ground, uneven wet ground, dry ground etc)		Physically check by the BOO.	The system must have Inbuilt GPR pre-programs to suit or work in different ground conditions (for e.g. Uneven ground, uneven wet ground, dry ground etc).	
7.	Low battery Indication(Audio/ visuals)		Physically check by the BOO.	The system must give Low battery Indication either Audio/ visual after that system must run minimum 30 minute.	
8.	False Alarm 2% or less should be accepted for detection/identification of Target.		Physically check by the BOO. Take following 35 metallic and non-metallic threats like IEDs, Pressure plates, wires and mines (Anti-Personnel & Anti-Vehicle) available with the users. Make 50 pits at a distance to be decided by the BOO in a single line. Put metallic and non-metallic threats like IEDs, Pressure plates, wires and mines (Anti-Personnel & Anti-Vehicle) in 35 pits out of 50 pits randomly and make the record of 50 pits on paper in a tabular form by the BOO. The firm representative has to swap 50 pits in sequence as decided by the BOO **03 times**. Record of detection should be maintained.	The system False Alarm rate should not be more than 2%.	

		1. T-1 1 Kg Steel container .30 Mtr 2. T-2 2 Kg Steel container .40 Mtr 3. T-3 3 Kg Steel container .40 Mtr 4. T-4 4 Kg Steel container .50 Mtr 5. T-5 5 Kg Steel container .50 Mtr 6. T-6 10 Kg Steel container .50 Mtr 7. T-7 5 Ltr Plastic container .50 Mtr 8. T-8 10 Ltr Plastic container .50Mtr 9. T-9 20 Ltr plastic container .50 Mtr 10. T-10 3 Kg pressure cooker .40 Mtr 11. T-11 5 Kg pressure cooker .40 Mtr 12. T-12 2 Kg cylinder .40 Mtr 13. T-13 5 Kg cylinder .40 Mtr 14. T-14 10/14 Kg cylinder .40 Mtr 15. T-15 1.5" GI Pipe (1 Mtr) .30 Mtr 16. T-16 2" GI Pipe (1Mtr) .40 Mtr 17. T-174" GI Pipe (1Mtr) .40 Mtr 18. T-186" GI Pipe (1 Mtr) .50 Mtr 19. T-19 1.5" Plastic pipe (2 Mtr) .30 Mtr 20. T-20 2" Plastic pipe (2Mtr) .30 Mtr 21. T-21 4" Plastic pipe (2 Mtr) .40 Mtr 22. T-226" Plastic pipe (2 Mtr) .50 Mtr 23. T-23 Wooden box small (1Cft) .40 Mtr 24. T-24 Wooden box Large (1Cft) .50 Mtr 25. T-25 Plastic bag small with commercial explosive .30 Mtr 26. T-26 Hand bag (1 Sqft) .30 Mtr 27. T-275 Mtr cordex bundle .30 Mtr 28. T-28 10 Mtr cordex bundle .50 Mtr 29. T-29 Plastic bag with splinter(1Sft).50 Mtr 30. T-30 Fire extinguisher .50 Mtr 31. T-31 Matka (Pot) (5 Ltr) .40 Mtr 32. T-32 Tiffin Small (Metal) (3 Ltr) .30 Mtr 33. T-33 Tiffin medium (5ltr) .30 Mtr 34. T-34 Multiple Stell rods (3) .50 Mtr 35. T-35 Fox hole (50x50 cm) 40 mtr		

9.	Manual/Automatic brightness sensor or adapt to environment lighting conditions.		Physically check by the BOO.	The system must have Manual/Automatic brightness sensor or adapt to environment lighting conditions.	
10.	Separate error message for GPR and MD systems ease troubleshooting.		Physically check by the BOO.	The system must have Separate error message for GPR and MD systems ease troubleshooting.	
11.	Physical	The system should be a Hand Held GPR System. The weight of the GPR system should not be more than 4 Kg including batteries and headphones.	Check the system provided by the firm as per the user requirement of the user. Weigh the GPR system with the weighing machine.	The system provided must be as per the user requirement. Weight of GPR should not be more than 4 kg including batteries and headphones.	
12.	Physical & Technical features	Hand Held GPR system The detail physical & Technical features of the hand held unit are:-			
		(i) The system detection swath width should be 45 cms (minimum) and detection range 100 cms (maximum) underground (measure the detector swath width and check the detection range of an object dig underground). The swath width will be the length of the perimeter of search soil.	The System should be checked in following modes:- **1. GPR mode:-** **T-1** - Steel container of 5-6" dia and a length of 5-6" filled up with sugar (simulating explosive) and a detonator. (Anti personal)- 3-5 cm. **T-2** – 5 liter pressure cooker – 40 cm **T-3** – Wooden box (1 CFT) filed with sugar-50 cm **T-4** – 50 liter plastic barrel with a detonator-100 cm **T-5** - Plastic bag filled with sugar and metal splinters-20 cm **T-6** – Plastic pot of around 5 liter filled with water (simulating liquid explosive) with a detonator-30 cm. **T-7** – 4 mm electric wire of 5 mtr length-20 cm **2. MD mode:-** **T-1** -3" GI Pipe of 1 foot long field with sugar -3-5 cm. **T-2** – 1 kg steel container of 4-6" dia and 4-6" height filled with sugar-30 cm. **T-3**- 50 kg steel metal drum-100 cm. **T-4** - 5 ltr pressure cooker-50 cm. **T-5** – 4 mm electric wire of 5 mtr length- 5 cm. **T-6** 10 liter steel container-50 cm.	The system detection swath width must be as per parameters mentioned in the QRs.	

			3. Combined mode:- **T-1** – 1 kg plastic bag filled with sugar and a detonator (Anti personal mine)-3-5 cm. **T-2** - 5 ltr pressure cooker-40 cm. **T-3** – Wooden box (1CFT) fileed with sugar- 20 cm. **T-4** – 50 kg plastic barrel-100 cm. **T-5** – Plastic bag filled with sugar and metal splinters-20 cm. **T-6** – Steel container (milk balti) of 5 ltr filled with water (simulating liquid explosive) and a detonator-30 cm. **T-7** – 5 meter cordex bundle -30 cm.		
		(ii) The sensor head should be attached to a ruggedized telescopic rod assembly suitable for a standing, kneeling & prone person to scan the area.	Check the system for having a ruggedized telescopic rod assembly. A standing person should be able to scan the area with the help of the system comfortably.	The sensor head must be supported by ruggedized telescopic rod assembly for scanning the area.	
		(iii) Control unit should have facility to control the sensitivity of detection and audio volume.	Switch 'On' the system and check the detection of an object. Change the sensitivity of detection and observe its effect on detection. Check also the volume control for alarm audio	i) The control unit must have sensitivity control for detection and volume control for alarm.	
		(iv) It should give accurate depth information with a tolerance of ± 10 cm.	Place a known target underground at a known depth and check its detection with in deviation of ± 10 cm.	The system must give threat position and depth information with in permissible deviation	
		(v) It should have uniform and continuous detection throughout the sensor swath width.	Check the detection of a target at different locations under the swath width by keeping the position of detector swath fixed	The system must have uniform and continuous detection throughout the sensor swath width.	
		(vi) It should have modes i.e. metal detection mode, GPR mode and combined mode.	Switch 'ON' the system and put it in different modes as mentioned in the QRs Para and check the performance in each of the mode one by one.	The system must detect threats in different modes, as mentioned in QR.	

		(vii) It should have automatic soil compensation feature for use in mineral, sand and wet soil environment.	Check the system performance in different soil conditions like in sand, in available soil, in wet soil & salt mixed soil.	The system must have an automatic soil compensation feature to neutralise the mineral soil environment and perform effectively without affecting the sensitivity.	
		(viii) It must be capable to detect all type of mines/IEDs in all soil conditions.	Check the detection of the system for available mines/IEDs dug in different soil conditions as in Para (viii).	It must be capable to detect all type of mines/IEDs indifferent soil conditions	
		(ix) The audio alarm should be through inbuilt buzzer / speaker and head phone Vibration alarm alongwith audio/visual alarm **(Optional- To be decided by the user department at the time of indent)**	Check the detection alarm in system control unit and also through head phone.	The system must give audio alarm through inbuilt buzzer / speaker and head phone.	
		(x) The system should be operated on rechargeable battery. The battery should run the system for minimum 8 hours continuously operational mode on single charge.	Physically check the system operation on rechargeable battery provided. Check the continuous run time of the system on fully charged rechargeable battery provided and note down the continuous run time.	The system must operate on rechargeable battery. The battery must run the system continuously for 8 hours on single charge.	
		(xi) A suitable battery charger should be provided to charge the battery/ batteries within 5 hrs (**maximum**).	Charge a fully discharged battery with the battery charger provided with the system and note down the time to get fully charge.	Battery charger provided must recharge a fully discharged battery within 5 hrs (maximum).	
		(xii) 12-24V DC Charger to be provided with the equipment capable of charging rechargeable batteries.	Check the battery charger operation on AC mains power supply by varying it from 100 to 240 volts. Also check the charger operation on DC source from 12 V to 24 V	The battery charger provided must have the facility to charge the battery from 100 to 240 volt AC mains supply and from DC 12 V to 24 V.	
		(xiii) The system should have minimum 32 GB internal data storage facility.	Check the system for the facility of external memory card and inbuilt memory system for data storage..	The system must have minimum 32 GB internal data storage facility.	
13.	Transportation	A ruggedized transportation box and rain/splash proof canvas carrying case should be provided which accommodates the system with all accessories	• Check the transportation box and canvas carrying case for accommodation of system with all accessories. • Check the National/International accredited lab certificate/report in	• The transportation box and canvas carrying case must accommodate the system with all accessories comfortably. • The firm must provide the National/	

		comfortably. Ruggedized transportation should be complied with IP 65.	respect of ruggedness of transportation box. • Physically check the canvas carrying case for rain/splash proofing.	International Accredited lab certificate/report in respect of the transportation box. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab. • Canvas carrying case must be rain/splash proof.	
14.	EMI & EMC	The system must confirm to lay down EMI and EMC specifications.	Check the National/International accredited lab certificate/report in respect of the same.	The firm must provide the National/ International Accredited lab certificate/report in respect of EMI & EMC specifications. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab.	
15.	Environmental Specification:	i) Operational temp: -20°C to +55°C ii) Storage temp : -30°C to +55°C	Check the National/International accredited lab certificate/report in respect of the same.	The firm must provide the National/ International Accredited lab certificate/report in respect of the same. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab.	
16.	System Ruggedness	The system (GPR) must conform to MIL standard 810H or better. For system- IP65 For search head-IP65 Drop test- 3m within box	Check the National/International accredited lab certificate/report in respect of the same.	The firm must provide the National/ International Accredited lab certificate/report in respect of the same. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab.	
17.	Warranty	03 Years	OEM will submit a undertaking certificate in this regard.	Warranty of the equipment must be as per the requirements mentioned in the QRs.	
18.	Shelf life	10 Years	OEM will submit a undertaking certificate in this regard.	Shelf life of the equipment must be as per the requirements mentioned in the QRs.	
19.	02 sets of additional rechargeable batteries with charger be provided by the firm.		OEM will submit a undertaking certificate in this regard.	--	
20.	User Manual and Operation Instructions	Detailed instructions technical literature with schematic diagram, maintenance manual and Inspection standards be	Not to be evaluated at the time of physical evaluation.	--	

		provided with the equipment.			
21.	Miscellaneous				
(a)	Cleaning kit be provided with each of the equipment.		Not applicable at the time of technical/physical evaluation	Not applicable at the time of technical/physical evaluation	
(b)	Supplier to submit undertaking to provide spare parts for next 10 yrs minimum from the date of supply.		Not applicable at the time of technical/physical evaluation	Not applicable at the time of technical/physical evaluation	
(c)	Technical manual/operational manual including repair manual of GPR		Not applicable at the time of technical/physical evaluation	Not applicable at the time of technical/physical evaluation	
(d)	Repair & maintenance training should be arranged for at least 05 persons for 05 days. The training should be conducted at field location for 03 days.		Not applicable at the time of technical/physical evaluation	Not applicable at the time of technical/physical evaluation	
(e)	Illustrated Spare Parts List (ISPL), photograph and CAT parts number be provided.		Not applicable at the time of technical/physical evaluation	Not applicable at the time of technical/physical evaluation	

तकनीकी विशेषज्ञों के उप समूह द्वारा यह निश्चित किया गया है कि उक्त गुणात्मक 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 भेजने का श्रम करें:–

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

24/04/2023

(दिगेन्द्र सिंह पँवार)
उप कमांडेण्ट (आधुनिकीकरण)