

GPS/GIS BASED MINEFIELD RECORDING SYSTEM (GBMRS)

1. Introduction. GPS/GIS Based Minefield Recording System is required to record locations of mines which are laid manually, so as to be able to safely retrieve the mines, when required to do so.

2. Brief of the Project. The equipment is envisaged to provide user friendly and simple hand held devices to record details of mines and minefields, laid by soldiers. The equipment should enable safe laying as well as retrieval of mines, duly catering for shifting of mines after they have been laid.

3. Broad Qualitative Requirements.
 - (a) Military grade specifications for ruggedness.
 - (b) Hand held devices to enable safe use by soldiers while laying or retrieving mines at night.
 - (c) Equipment should ensure that no/ minimum change is required to extant mine laying drills and procedures.
 - (d) Equipment including software should be secure to ensure no loss of data, integrity or interference occurs.
 - (e) Capable of being used in temperature range of -25⁰ C to +45⁰ C and upto an altitude of 15,000 feet above mean sea level.
 - (f) The system should be capable of locating mines which may have shifted after laying.

4. Tentative Quantity. 3680 Sets.

5. Tentative Timelines for Development/ Production. One year.

6. Any Other Information. Nil.



**QUESTIONNAIRE FOR PROCUREMENT
OF GPS / GIS BASED MINEFIELD RECORDING SYSTEM FOR INDIAN ARMY**

1. The Ministry of Defence, Government of India, intends to procure GPS/GIS Based Minefield Recording System for the Indian Army.
2. There is a requirement of inducting an accurate minefield recording system in Indian Army for accurate recording of minefields. It should be able to record location of various mines laid along with the design of minefield. It should be possible to pre-feed a minefield design in the system and carry out minelaying according to the design.
3. The request for information (RFI) consist of two parts indicated below:-
 - (a) **Part -I** - Operational Requirements.
 - (b) **Part -II** - Important Technical Parameters.

PART -I

4. **Operational Requirements.** GPS/ GIS Based Minefield Recording System must be capable of operating in varying terrain & temperature conditions as obtained in Indian sub-continent. It should be possible to accurately record the location of mines laid. It should also be possible to feed a desired minefield design in the system and carry out minelaying according to the pre-fed design.

PART-II

5. **Important Technical Parameters.**

- (a) GPS/ GIS Based Minefield Recording System should have capability to plot and record the coordinates of any desired point on ground, at which the equipment is taken.
- (b) It should have capability to record the following details of a mine laid on ground:-
 - (i) Location, both in terms of Latitude-Longitude.
 - (ii) User customizable library of symbols for different type of mines.
 - (iii) Extent of trip wires on one or both sides of the mines in enemy direction including diagrammatic plot of trip wires.
 - (iv) Details of minefield to include layout of multiple strips, density, location of Start Strip Marker (SSM), Turning Point (TP), End Strip Marker (ESM), Gaps, Lanes and Perimeter Fencing.
 - (v) Anchorage provided to a mine.
 - (vi) Self Neutralisation (SN) period/ Self Destruction (SD) period.
 - (vii) Date and time at which a mine is laid/ recorded.
 - (viii) Details of person, mine laying party and unit laying the mine field.

(ix) Memo/ notes pertaining to a mine/ minefield.

(c) It should be capable of displaying a diagrammatic plot of the data recorded, on a hand held screen, which could be zoomed as required for enlargement with scroll facility

(d) It should have facility to indicate the bearing of the direction of move and North on the screen.

(e) Questionnaire for vendors is attached as per **Appendix B**.

6. **Procedure for Response**. The procedure for response is attached as **Appendices A and B**.

Appendix A

(Refer to Para 6 of Comb Engrs Directorate letter No 71525/ GPS & GIS/ CE-5(A) dt ____ Nov 2018)

REQUEST FOR INFORMATION : PROCEDURE FOR RESPONSE

GPS/ GIS BASED MINEFIELD RECORDING SYSTEM

Request for information for GPS/ GIS Based Minefield Recording System.

1. The Indian Army is planning to procure GPS/ GIS Based Minefield Recording System for Army. With the view to identify probable vendors who can undertake the said project, OEMs/ Vendors are requested to forward information on the product which they can offer. The parameters/ broad specifications of the item are mentioned in the questionnaire attached as per **Appendix B**. In addition the vendors are required to furnish details as per Performa at **Annexure to Appendix A**.
2. Apart from the information as per the Appendices the vendors may also forward technical details/product brochures/literature etc pertaining to the item in question.
3. The required information/ details may please be forwarded at the following address by _____ :-

**Comb Engrs - 5(A),
 Combat Engrs Directorate,
 E-in-C Branch,
 Room No 91, Kashmir House,
 Integrated HQ of MoD (Army)
 Rajaji Marg, New Delhi-110011
 Fax : 011-23019675
 E mail : ce5-einc-army@nic.in**

5

Annexure

(Refer to Para 1 of Appendix A of Comb Engrs Directorate letter No 71525/ GPS & GIS/ CE-5(A) dt ____ Nov 2018)

PERFORMA FOR REPLY TO RFI TO BE FOLLOWED
(INDIAN VENDORS)

1. **Name of the Vendor/Company/Firm.**

(Company profile, in brief, to be attached)

2. **Type (Tick the Relevant Category).**

- (a) Original Equipment Manufacturer (OEM) Yes / No
- (b) Authorised Vendor of foreign Firm Yes/No
(attach details, if yes)
- (c) Other (give specific details)

3. **Contact Details.**

Postal Address

City: _____ State : _____

Pin Code: _____ Tele: _____

Fax: _____ URL/Website: _____

4. **Local Branch/Liaison Office in Delhi (if any).**

Name and Address : _____

Pin Code : _____ Tele: _____ Fax : _____

5. **Financial Details.**

- (a) Category of Industry (Large/medium/small Scale) : _____
- (b) Annual turnover: _____ (in INR).
- (c) Number of employees in firm : _____
- (d) Details of manufacturing infrastructure: _____

(g) Status (in service /design & development stage)

(h) Production capacity per annum: _____

(j) Countries/agencies where equipment supplied earlier (give details of quantity supplied).

(k) Estimated price of the equipment _____

10. Alternatives for meeting the objectives of the equipment set forth in the RFI.

11. Any other relevant information: _____

12. **Declaration.** It is certified that the above information is true and any changes will be intimated within five (05) working days of occurrence.

(Authorised Signatory)

Appendix B

(Refer to Para 5(e) of Comb Engrs
Directorate letter No 71525/ GPS &
GIS/ CE-5(A) dt ____ Nov 2018)

**QUESTIONNAIRE : GPS AND GIS BASED
MINEFIELD RECORDING SYSTEM**

<u>S No</u>	<u>Specifications/ Parameters</u>	<u>Reply</u>
1.	Will your firm be able to supply a Minefield Recording System, in accordance with MAKE II procedure of Defence Procurement Procedure 2016 (as amended from time to time), capable of accurately recording and storing location of mines laid as well as facilitating their safe retrieval at a later date?	
2.	What are the components of the system? Give brief physical (weight, dimensions etc) and technical details of all components and working of the system.	
3.	(a) Is the complete system designed for easy carriage by one person? If not, how many persons are required for carriage of the complete system? (b) Are all components of the system man-portable or hand-held?	
4.	(a) Does the system being offered have required harness and straps for comfortably operating the eqpt. (b) Will your firm be providing a carrying case for safe carriage of the equipment.	
5.	Will your system be able to detect mines which are displaced after laying? If yes, how?	
6.	Is the system offered capable of identifying the type of mine being detected?	
7.	What is the maximum range and depth underground (dry sand) at which mines would be detected and identified by detector?	
8.	Can the mines be detected by the system being offered in all types of terrain (plains, desert, semi-desert and High Altitude Area) and weather conditions (including wet conditions) as obtained in area of operations	
9.	Is there any limit for maximum displacement of mine that can be detected by the system? If yes, please specify the displacement.	
10.	(a) Does the system have a rugged tablet PC with a coloured display screen of a minimum size of 10 inch, for day and night viewing of diagrammatic layout of complete minefield? (b) What is the kind of display (LCD/LED/ any other)?	
11.	(a) Can the plot be zoomed as required for enlargement with scroll facility? (b) What is the kind of zoom facility (optical/digital/electronic)?	
12.	What is the maximum accuracy (in cm) that can be achieved in recording of location of mines? (a) What is the power source incorporated in the system? (b) Is it possible to operate the system by using Commercially Off The Shelf (COTS) battery.	
13.	What is the duration for which the system can be used continuously without the need for recharging or replacement of power source?	
14.	What will be the size and weight of handheld device using which location of	

<u>S No</u>	<u>Specifications/ Parameters</u>	<u>Reply</u>
15.	Is the system capable of operation (recording location and retrieval of mines) both by day and night and in rains?	
16.	What is its maximum and minimum operating and storage temperature?	
17.	Is it possible to upgrade the software used in the equipment? If yes, then how?	
18.	(a) What is the Indigenous Content in the system being offered?	
	(b) Is the design of the system indigenous?	
19.	(a) Is the system being offered based on indigenous software?	
	(b) Specify the source of software	
20.	(a) Are all components of the system manufactured indigenously?	
	(b) If OEM is a foreign firm, please specify OEM and its country.	
21.	(a) How is data transferred from the equipment to any other database or storage device?	
	(b) Will your firm be able to offer a provision of data transfer by CD?	
22.	(a) Is it possible to provide password protection to data recorded by the system?	
	(b) Is the system capable of encryption of data stored in the system?	
23.	(a) Does the equipment have capability of backing up data?	
	(b) What all redundancies are provided for the same?	
24.	What are the protection measures incorporated in the system against loss/ corruption of stored data?	
25.	(a) Is the system protected against embedded malware?	
	(b) If yes how is it certified / tested?	
26.	Does the equipment have facility to record following details of mines laid on ground?	
	(a) Location, in terms of Latitude-Longitude?	
	(b) User customizable library of symbols for different type of mines.	
	(c) Extent of trip wires on one or both sides of the mines in enemy direction including diagrammatic plot of trip wires.	
	(d) Details of minefield to include layout of multiple strips, density, location of Start Strip Marker (SSM), Turning Point (TP), End Strip Marker (ESM), Gaps, Lanes and Perimeter Fencing.	
	(e) Anchorage provided to a mine.	
	(f) Self Neutralisation (SN) period/ Self Destruction (SD) period.	
	(g) Date and time at which a mine is laid/ recorded.	
	(h) Details of person, mine laying party and unit laying the mine field.	
	(j) Memo/ notes pertaining to a mine/ minefield.	
	(k) Alignment of perimeter fence.	
27.	(a) What are the various environmental & corrosion standards that the system being offered is compliant to?	
	(b) Please specify the relevant IS codes.	
28.	On which technology and frequency band, is the equipment based?	
29.	(a) Does it support multiple constellations (GPS/GLONASS/IRNSS)? If yes, please specify the constellations.	
	(b) Is it compatible with IRNSS?	

<u>S No</u>	<u>Specifications/ Parameters</u>	<u>Reply</u>
	accuracy and capability as for other constellations.	
	(d) If not, specify the accuracy possible with IRNSS.	
30.	(a) Is it feasible to pre-feed design of minefield (in terms of Start point, bearing and inter-spacing of different mines and other details as given at Para 26) and lay mines according to it?	
	(b) Will the system indicate with sound/ blinking light or both, the proximity to a designated point/mine when reached within a desired distance? If yes, at what distance?	
31.	(a) Is the system capable of indicating the actual direction of move viz-a-viz the intended path by displaying both as lines, when the equipment is being moved?	
	(b) Is deviation from the intended path indicated by a cautionary beep? If yes, at what minimum deviation will the equipment give a cautionary beep?	
32.	Is the system capable of indicating location and identification of mines which have been displaced from their original recorded location?	
33.	(a) Is the system capable of displaying all the mines in the vicinity of individual during recovery?	
	(b) What is the maximum effective radius within which the system is capable of displaying location of mines by the system.	
34.	(a) Does the system take input in form of digitised maps of Indian Army (including Defence Series Maps) and superimpose all records on the map, when required?	
	(b) If yes, what is the manner of loading the maps into the system?	
	(c) Is it possible to load satellite imagery including Google Earth into the system and superimpose it on the digital maps by geo referencing?	
35.	Can a buffer zone (showing alignment of a field lane or gap) be created where no mines (not even trip wires of fragmentation mines) should be allowed?	
36.	Is it possible to display number of mines of each type laid and the frontage of minefield achieved?	
37.	Does the system indicate distinctly, all mines which have exceeded their Self Neutralisation period/ Self Destruction period, for ease of recovery?	
38.	(a) Is it possible to connect the system offered by your firm to a mobile based on GSM and CDMA?	
	(b) If yes how will security of record of locations of mines be ensured?	
39.	Does your system indicate day wise progress of recovery of mines if recovery is done over a period of more than one day?	
40.	How much time is required to set up the system on a virgin land to enable commencement of recording/ retrieval?	
41.	Does the system comply with the following EMI/EMC standards? (a) 461E (b) 464C	
42.	(a) Is the system safe to be operated in the vicinity of mines which get actuated by sensing electro-magnetic signatures?	
	(b) Which accredited laboratory (Indian/ international) has certified your equipment?	
43.	(a) What is the expected service life and shelf life of the equipment?	

<u>S No</u>	<u>Specifications/ Parameters</u>	<u>Reply</u>
44.	Will your firm be able to provide maintenance support (including repair facility, Special Maintenance Tools, Special Test Equipments and Engineering Support Package) for the service life of the system being offered?	
45.	Will you be providing AMC for repair and calibration cover for Special Maintenance Tools and Special Test Equipment?	
46.	Does the system have BITE (Built in Test Equipment) facility and internal diagnostics?	
47.	Please provide the rough indicative cost (inclusive of taxes) of one complete set of equipment which can be employed for laying a minefield by a team of approximately 35 personnel over an area of approximately one square kilometre for budgetary purpose.	
48.	(a) What is your annual production capacity?	
	(b) Is it likely to increase?	
	(c) What is the recommended 'Delivery Schedule' for approximately 3000 sets?	
49.	Do you have Industrial licenses for the production of the Equipment? If not, have you applied for the same and by when (date), it is likely to be granted ?	
50.	What is the likely time period required to field the prototype for Trials, post intimation by this office (including time for clearance, transportation etc).	
51.	How much time is required to deliver the equipment/ platform with the stipulated indigenous content, post trials/ contract for operational use?	
52.	Is the OEM / Vendor willing to participate in trials as per DPP-2016 in India on 'NCNC' basis?	
53.	(a) How will you assist in carrying out training for User, Maintenance personnel and QA personnel?	
	(b) What are the various training aids that your firm will be able to provide (Charts, models, cut models, CBT, any other)?	
	(c) What is the recommended Training period for each type?	
54.	Will you provide soft copies of the 'User Handbook' and other manuals including technical manual along with CBT for training?	
55.	(a) Is your firm registered with Ministry of Micro, Small and Medium Enterprise?	
	(b) If yes, please provide your firm's UAN No?	
56.	Any other relevant information in terms of specifications/terms of reference, you would like to share.	
57.	(a) Does the system have adequate features to prevent detection of these mines by inimical elements?	
	(b) If yes, what are these?	
58.	(a) Will the detection technique allow detection of every unique mine or only different type of mine?	
	(b) How will this be achieved?	