Government of India
Ministry of Home Affairs
Directorate General National Security Guard
(Provisioning Branch/Ord Section)
Mehram Nagar, Palam, New Delhi – 110 037
Fax No. 011-25663258/25671639

No. P/604/17(389)/DSMD/NSG/1354 **Dated, the 23 Feb 2018**

QUALITATIVE REQUIREMENTS (QRs) AND TRIAL DIRECTIVES (TDS) OF DEEP SEARCH MINE/METAL DETECTOR (DSMD)

1. The QRs and TDs in respect of **Deep Search Mine/Metal Detector (DSMD)** as per Annex-I and Annex-II respectively have been approved by the competent authority are forwarded herewith.

2. For your information and further necessary action please.

(**Kuldeep Singh**)
Group Commander (Prov)

Distribution:-

1. JS (PM), MHA, Jaisalmer House, New Delhi - for information please.
2. IG/ Director (R&D), BPR&D, 4th Floor, Block No 11, CGO Complex, New Delhi.
3. DIG (Prov), CRPF, CGO Complex, New Delhi.
4. DIG (Prov), CISF, CGO Complex, New Delhi.
5. DIG (Prov), ITBP, CGO Complex, New
6. DIG (Prov), SSB, R.K. Puram, New Delhi.
7. DIG (Prov), BSF, CGO Complex, New Delhi
8. DIG (Prov), Assam Rifles (Through LOAR)
9. Ops (WE), HQ NSG

DRAFT QRs OF DEEP SEARCH MINE/ METAL DETECTOR

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S/No	Parameter	Specification
1.	**Physical characteristic**	**i)** The detector and its accessories should be comfortable for handling. **ii)** Light weight and made of non-corrosive (exceptionally corrosion protected) material, aluminium, carbon fiber, glass fiber etc. **iii)** Material should have proven reliability and durability. **iv)** Complete equipment should be Water Proof (IP-67 Standard). It should be a single composite unit including the control unit and extension shaft with all cable and connectors inside and no connector or cable should be visible outside except headphone connector to avoid any mishandling. **v)** Easy to transport.
2.	**Weight and Dimensions**	**i)** Complete operational unit with batteries & Search head **3.5 kgs** (Maximum). **ii)** Bag pack weight of the equipment with search head **5kgs** (Maximum). **iii)** Total weight of the equipment including all accessories and ruggedised carrying case **12 kgs** (Maximum). **iv)** Packed length of the equipment should be maximum **700 mm**. **v)** Operating Length - (Measured from the rear end of armrest to edge of coil, coil being placed parallel to the shaft). The minimum operating length should be between **700 to 900 mm** and the maximum operating length should be in between **1500 to 1750 mm**.
3.	**Search Head**	The search head should be in any shape i.e. Circular or oval. **i)** The circular search coil should have diameter between 20 cm to 26 cm and oval search coil should have dimensions dimensions between 20 cm to 30 cm. **ii)** Extendable rods with clamps to extend the length of detector. **iii)** Ruggedised/replacable protective cover for the search head should be provided.

S No	Parameter	Specification
4.	Detection Sensitivity	**i)** The size and shape of the objects with which the tests will be conducted are as under :- **a.** 0.15 gm metal - 1 inch x 1 inch tin foil **b.** 50 mm nail - Thickness 03 mm and dia of head 06 mm. **c.** Salty water - 03 gm iodized common salt in 1 ltrs of water. **ii)** The sensitivity of the detector must meet the following specifications: **In free Air :** (a) 0.15 gm metal 27 cm; (b) 50 mm nail vertical 33 cm; (c) 50 mm nail horizontal 25 cm; **Under Ground** (a) 0.15 gm metal 20 cm; (b) 50 mm nail vertical 28 cm; (c) 50 mm nail horizontal 18 cm; **In clear water** (a) 0.15 gm metal 20 cm; (b) 50 mm nail vertical 28 cm; (c) 50 mm nail horizontal 19 cm; **In salty water** (a) 0.15 gm metal 20 cm; (b) 50 mm nail vertical 28 cm; (c) 50 mm nail horizontal 19 cm; **iii)** Detector must be capable of pinpointing detected metal to ± 10 cm range and will be checked in free air, underground, clear water and salty water. The distance will be taken from the center of the search head to the center of the object. **iv)** Detection tone should be distinct from the working tone. The equipment should be free from radio and static interference and the equipment should have the radio frequency interference elimination feature and this feature should be independent of Sensitivity button. **v)** Ground compensation feature should be in the equipment for manual ground compensation by the user if required for any particular soil and this feature should be independent of Sensitivity button. **vi)** The equipment should have Audio Threshold feature to enable the user to increase or decrease audible response from the target for a better detection of target.

S No	Parameter	Specification
5.	**Detection Capability**	**i)** Very easy and effective searching of large areas. **ii)** Should detect all ferrous and nonferrous metals. There should be different audio tone / pitch to differentiate between ferrous and nonferrous metals. **iii)** Must be capable of detecting buried metals in all types of soil including laterite. **iv)** It should work in all-weather condition from arid to pouring rain. **v)** Usage time should be minimum 12 hours on rechargeable batteries. **vi)** Operating temperature: -20° to +55° C. **vii)** The equipment should be able to differentially detect two detonators placed at a distance of one ft apart.
6.	**Control panel and display unit**	**i)** The integrated unit should have LED display bright enough to be visible in sunlight. **ii)** Visual LED indication must be observable in normal operation of detector with the option to switch off the LED (to work under discrete mode). **ii)** Display should show signal strength / intensity of metal. **iii)** It should have visual as well as audio signal for metal detection. **iv)** The control unit should have low battery indication and also audio alert to enable the user to replace the batteries. **v)** The Control Unit should have adequate buttons for volume control, sensitivity control, radio frequency interference elimination button etc. **vii)** It should have inbuilt speaker as well as provision for headphones.
7.	**Source of Power**	**i)** When equipment is switched on, battery level status should be displayed/indicated through LED/Audio beeps. **ii)** The equipment should function properly with commercially available rechargeable as well as alkaline batteries. **iii)** Two sets of rechargeable batteries with battery charger to be provided with each equipment. **iv)** The battery usage time should be minimum 12 hours with both type of batteries mentioned above.

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S No	Parameter	Specification
8.	**Transportation and Storage and Transit**	**i)** The detector together with its accessories must come in a lightweight, durable, compact soft carrying case, preferably water resistant. **ii)** A ruggedized carrying case should also be provided for safe transportation.
9.	**Operational life**	Minimum eight years.
10.	**Warranty**	**i)** Warranty of the equipment should be 2 years (24 months). **ii)** Supplier and manufacturer should give undertaking for supplying spares parts and service for 8 years including warranty period.

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R.S. Chauhan
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Sudeep Lakhtakia

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DG, NSG

TRIAL DIRECTIVE FOR DEEP SEARCH MINE/ METAL DETECTOR

S No	Parameter	Specification	Trial Directives
1.	**Physical characteristic**	**i)** The detector and its accessories should be comfortable for handling. **ii)** Light weight and made of non-corrosive (exceptionally corrosion protected) material, aluminium, carbon fiber, glass fiber etc. **iii)** Material should have proven reliability and durability. **iv)** Complete equipment should be Water Proof (IP-67 Standard). It should be a single composite unit including the control unit and extension shaft with all cable and connectors inside and no connector or cable should be visible outside except headphone connector to avoid any mishandling. **v)** Easy to transport.	For S. No. (ii) the firm to provide OEM certificate specifying the composition of the material used. For S. No. (iv) the firm to provide IP-67 certificate from national/international accredited lab and also, *during the Technical Evaluation, the complete equipment shall be immersed under one meter of water in switched on condition and kept submerged for 15 minutes to assess the IP-67 capability.* S. No. (i), (iii) & (v) to be physically checked by the BOOs.
2.	**Weight and Dimensions**	**i)** Complete operational unit with batteries & Search head **3.5 kgs** (Maximum). **ii)** Bag pack weight of the equipment with search head **5kgs** (Maximum). **iii)** Total weight of the equipment including all accessories and ruggedised carrying case **12 kgs** (Maximum). **iv)** Packed length of the equipment should be maximum **700 mm**. **v)** Operating Length - (Measured from the rear end of armrest to edge of coil, coil being placed parallel to the shaft). The minimum operating length should be between **700 to 900 mm** and the maximum operating length should be in between **1500 to 1750 mm**.	To be physically checked by the BOOs (respective dimensions be measured physically).

S No	Parameter	Specification	Trial Directives
3.	**Search Head**	The search head should be in any shape i.e. Circular or oval. **i)** The circular search coil should have diameter between 20 cm to 26 cm and oval search coil should have dimensions dimensions between 20 cm to 30 cm. **ii)** Extendable rods with clamps to extend the length of detector. **iii)** Ruggedised/ replacable protective cover for the search head should be provided.	To be physically checked by the BOOs.

S No	Parameter	Specification	Trial Directives
4.	**Detection Sensitivity**	**i)** The size and shape of the objects with which the tests will be conducted are as under :- **a.** 0.15 gm metal - 1 inch x 1 inch tin foil. **b.** 50 mm nail - Thickness 03 mm and dia of head 06 mm. **c.** Salty water - 03 gm iodized common salt in 1 ltrs of water. **ii)** The sensitivity of the detector must meet the following specifications: **In free Air :** (a) 0.15 gm metal 27 cm; (b) 50 mm nail vertical 33 cm; (c) 50 mm nail horizontal 25 cm; **Under Ground** (a) 0.15 gm metal 20 cm; (b) 50 mm nail vertical 28 cm; (c) 50 mm nail horizontal 18 cm; **In clear water** (a) 0.15 gm metal 20 cm; (b) 50 mm nail vertical 28 cm; (c) 50 mm nail horizontal 19 cm; **In salty water** (a) 0.15 gm metal 20 cm; (b) 50 mm nail vertical 28 cm; (c) 50 mm nail horizontal 19 cm; **iii)** Detector must be capable of pinpointing detected metal to ± 10 cm range and will be checked in free air, underground, clear water and salty water. The distance will be taken from the center of the search head to the center of the object. **iv)** Detection tone should be distinct from the working tone.	Collect or arrange the test objects of mentioned shape & size, clear water and salty water. Also arrange a non metallic measuring tape or supporting object like thread or straight wooden stick for measurement of depth during detection. Operate the detector and check the detection of different test objects in free air. Note down the detection distance of all the test objects. Operate the detector and check the detection of different test objects underground. Note down the detection distance of all the test objects. Operate the detector and check the detection of different test objects in clear water. Note down the detection distance of all the test objects. Operate the detector and check the detection of different test objects in salty water. Note down the detection distance of all the test objects. Pinpointing capability of ± 10cm to be tested in horizontal plane while carrying out trials to ascertain compliance of QRs. Check the detection tone by operating the

		The equipment should be free from radio and static interference and the equipment should have the radio frequency interference elimination feature and this feature should be independent of Sensitivity button. **v)** Ground compensation feature should be in the equipment for manual ground compensation by the user if required for any particular soil and this feature should be independent of Sensitivity button. **vi)** The equipment should have Audio Threshold feature to enable the user to increase or decrease audible response from the target for a better detection of target.	detector in detection mode. The detector should not be affected or disturbed by the use of radio set or any other static interference like generator or motor etc. For S No. v & vi OEM certificate to be provided.

S No	Parameter	Specification	Trial Directives
5.	**Detection Capability**	**i)** Very easy and effective searching of large areas. **ii)** Should detect all ferrous and nonferrous metals. There should be different audio tone / pitch to differentiate between ferrous and nonferrous metals. **iii)** Must be capable of detecting buried metals in all types of soil including laterite. **iv)** It should work in all-weather condition from arid to pouring rain. **v)** Usage time should be minimum 12 hours on rechargeable batteries. **vi)** Operating temperature: -20° to +55° C. **vii)** The equipment should be able to differentially detect two detonators placed at a distance of one ft apart.	BOOs to operate the detector and check the detection for ferrous (iron & tin etc.) and non ferrous (copper & Aluminium etc.) metals. To simulate the rain condition, shower can be used and buried objects can be detected under the shower. The firm will provide the national or international accredited lab test report for operating temperature. Operate the detector and detect two detonators placed at a distance of one ft apart.
6.	**Control panel and display unit**	**i)** The integrated unit should have LED display bright enough to be visible in sunlight. **ii)** Visual LED indication must be observable in normal operation of detector with the option to switch off the LED (to work under discrete mode). **iii)** Display should show signal strength / intensity of metal. **iv)** It should have visual as well as audio signal for metal detection. **v)** The control unit should have low battery indication and also audio alert to enable the user to replace the batteries. **vi)** The Control Unit should have adequate buttons for volume control, sensitivity control, radio frequency interference elimination button etc. **vii)** It should have inbuilt speaker as well as provision for headphones.	To be physically checked by the BOOs.

S No	Parameter	Specification	Trial Directives
7.	**Source of Power**	**i)** When equipment is switched on, battery level status should be displayed/indicated through LED/Audio beeps. **ii)** The equipment should function properly with commercially available rechargeable as well as alkaline batteries. **iii)** Two sets of rechargeable batteries with battery charger to be provided with each equipment. **iv)** The battery usage time should be minimum 12 hours with both type of batteries mentioned above.	To be physically checked by the BOOs.
8.	**Transportation and Storage and Transit**	**i)** The detector together with its accessories must come in a lightweight, durable, compact soft carrying case, preferably water resistant. **ii)** A ruggedized carrying case should also be provided for safe transportation.	The BOOs to physically check and conduct a drop test for ser No ii (a drop from 6 ft height with the equipment and all its accessories inside). The equipment should function properly after the drop test and the ruggedized carrying case should withstand the drop.
9.	**Operational life**	Minimum eight years.	OEM to give undertaking.
10.	**Warranty**	**i)** Warranty of the equipment should be 2 years (24 months). **ii)** Supplier and manufacturer should give undertaking for supplying spares parts and service for 8 years including warranty period.	To be incorporated in tender documents.

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