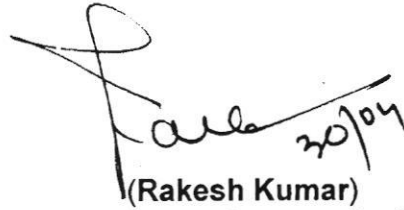


Government of India  
Ministry of Home Affairs  
**Directorate General National Security Guard**  
(Provisioning Branch/Ord Section)  
Mehram Nagar, Palam, New Delhi – 110 037  
Fax No. 011-25663258/25671639

No. P/604/18(389)/Liquid Expl Detector/Prov (Ord)/NSG/2050 Dated, the 20<sup>th</sup> Apr 2019

**QUALITATIVE REQUIREMENTS (QRs) AND TRIAL DIRECTIVES (TDs)**  
**OF LIQUID EXPLOSIVE DETECTOR.**

1. The QRs and TDs in respect of **Liquid Explosive Detector** 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.

  
(Rakesh Kumar)

Group Commander (Proc)

**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 LIQUID EXPLOSIVE DETECTOR

Ser No	Specification
1.	The Liquid Explosive Detector should detect the presence of hazardous liquids or gels and distinguish them from benign liquids.
2.	Shall detect the following threats:- (a) Diesel. (b) Acetone. (c) Petrol. (d) Isopropyl alcohol (IPA). (e) H <sub>2</sub> O <sub>2</sub> (Hydrogen peroxide). (f) Methyl Ethyl Ketone Peroxide (MEKP*). (g) Nitrobenzene. (h) Methanol. (j) Ethanol. (k) Jet Propellant 8 (JP8*). (l) Methyl Ethyl Ketone (MEK). (m) Nitric Acid*. (n) Sulphuric Acid (H <sub>2</sub> SO <sub>4</sub> *). (o) Hydrazine*. (p) Trichloroethylene. (q) Other similar chemicals can be added.
3.	Should detect the presence of hazardous liquids or gels regardless of container shape & size.
4.	Should detect without the need to open the bottle or liquid container (transparent or light colored plastic/ glass), also without the need to remove the label (if any) on the container.
5.	Should be able to detect explosive in the container of thickness ≤7mm and are made up of:- (a) Clear (Transparent) glass or plastic. (b) Colored glass or plastic. (c) Translucent glass or plastic. (d) PET bottle. (e) Patterned or embossed glass or plastic.
6.	Should operate in conditions between -20°C to +55°C or better.
7.	Should be able to perform an analysis on containers with minimum liquid of 10 ml.
8.	Detection Time - Detection time should be ≤ 01 Minute.
9.	(a) The result of analysis to be displayed on a screen and should be simple and easy to understand and should display name of the chemical/ liquid on the screen after the detection. (b) Should have visual display of min 3.5" high resolution screen (touch/ buttons control panel) for all light conditions.
10.	Should have a false alarm rate of less than 5% under all operating conditions.
11.	Should have proximity sensor in case of laser based technology.

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DRAFT QRs OF LIQUID EXPLOSIVE DETECTOR (Contd...)

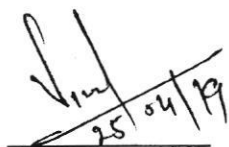
Ser No	Specification
12.	Should have no radioactive material used inside the detector.
13.	The tech being employed by the equipment should not ignite the liquid explosive, gun powder, detonating cord and similar kind of other explosives.
14.	Equipment should not require any calibration or sample preparation.
15.	Should not use any consumable items.
16.	Should be one-piece hand held design & one-man portable which can be carried on body through holster/ body worn strap for long operations.
17.	Should not weigh more than 2 Kg with batteries when operationally ready (without holster/ body worn strap).
18.	The detector should have rugged carrying case with min IP 67 rating or better with its all set & accessories inside and hand carried by one person.
19.	Should have battery charger of CE standard 2015 or better.
20.	The detector should have min IP 65 rating.
21.	Should have min 5 hrs of operation time with one set of rechargeable batteries. The rechargeable set of batteries used should be commercial available. OEM to provide one spare set of rechargeable batteries.
22.	The system should be operationally ready in less than 90 seconds after pressing the start button.
23.	There should be no warm up time and calibration required between two consecutive test/ detection.
24.	The system should save the detection information on the device log event, which can be downloaded & transferred to a laptop.
25.	The user should have an option to upgrade the database.
26.	System should come with a user manual & quick reference document specifying the shelf life and operational life of the equipment.

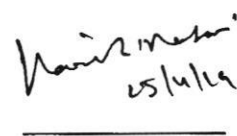
  
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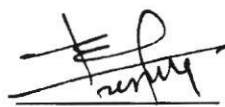
  
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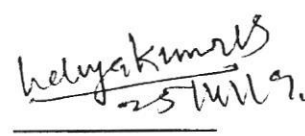
  
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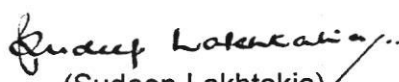
  
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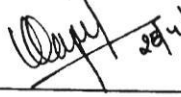
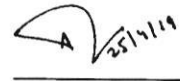
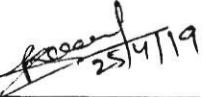
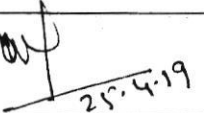

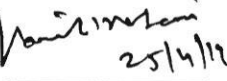

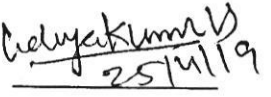

  
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(Sudeep Lakhtakia)  
DG, NSG

**DRAFT TRIAL DIRECTIVES FOR LIQUID EXPLOSIVE DETECTOR**

Ser No	Specification	Trial Directives
1.	The Liquid Explosive Detector should detect the presence of hazardous liquids or gels and distinguish them from benign liquids.	A series of benign liquids in transparent and translucent glass or plastic container are tested to ensure that the system does not give a false alarm on a benign item & to demonstrate system capability with different container materials.  To be physically checked by the BOO.
2.	Shall detect the following threats:- (a) Diesel. (b) Acetone. (c) Petrol. (d) Isopropyl alcohol (IPA). (e) H <sub>2</sub> O <sub>2</sub> (Hydrogen peroxide). (f) Methyl Ethyl Ketone Peroxide (MEKP*). (g) Nitrobenzene. (h) Methanol. (i) Ethanol. (k) Jet Propellant 8 (JP8*). (l) Methyl Ethyl Ketone (MEK). (m) Nitric Acid*. (n) Sulphuric Acid (H <sub>2</sub> SO <sub>4</sub> *). (o) Hydrazine*. (p) Trichloroethylene. (q) Other similar chemicals can be added.	(a) For any of the THREAT samples, the system must return a positive result. When the threats are substituted into benign item containers, the containers shall have been cleaned thoroughly with a mild detergent and dried to ensure no moisture, detergent & other contaminants remain within the bottle. (b) *MEKP, JP8, NITRIC ACID, H <sub>2</sub> SO <sub>4</sub> , Hydrazine and other chemicals which are sensitive in nature are required to be carefully tested. (c) BOO will present few samples of threat chemicals which are not mentioned in the QR's & will give info of the chemicals to the OEM & the OEM will have to add the new list (If not present) to the database of the detector during the trials. (d) Firm to provide certificate from a national/ international accredited lab certifying the detection of the chemicals as mentioned at Para 2. (e) Chemicals required will be provided by the user organization.

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DRAFT TRIAL DIRECTIVES FOR LIQUID EXPLOSIVE DETECTOR (Contd...)

Ser No	Specification	Trial Directives
3.	Should detect the presence of hazardous liquids or gels regardless of container shape & size.	To be physically checked by the BOO.
4.	Should detect without the need to open the bottle or liquid container (transparent or light colored plastic/ glass), also without the need to remove the label (if any) on the container.	To be physically checked by the BOO.
5.	Should be able to detect explosive in the container of thickness $\leq 7$ mm and are made up of:- (a) Clear (Transparent) glass or plastic. (b) Colored glass or plastic. (c) Translucent glass or plastic. (d) PET bottle. (e) Patterned or embossed glass or plastic.	To be physically checked by the BOO.
6.	Should operate in conditions between $-20^{\circ}\text{C}$ to $+55^{\circ}\text{C}$ or better.	Firm to provide a certificate from National/ International accredited lab.
7.	Should be able to perform an analysis on containers with minimum liquid of 10 ml.	(a) Tests will be performed on 10 ml liquid which will be in the clear glass vials. (b) To be physically checked by BOO.

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**DRAFT TRIAL DIRECTIVES FOR LIQUID EXPLOSIVE DETECTOR (Contd...)**

Ser No	Specification	Trial Directives
8.	Detection Time - Detection time should be $\leq$ 01 Minute.	To be physically checked by the BOO.
9.	(a) The result of analysis to be displayed on a screen and should be simple and easy to understand and should display name of the chemical/liquid on the screen after the detection. (b) Should have visual display of min 3.5" high resolution screen (touch/buttons control panel) for all light conditions.	To be physically checked by the BOO.
10.	Should have a false alarm rate of less than 5% under all operating conditions.	(a) To be physically checked by the BOO. (b) Firm to provide certificate from a National/ International accredited lab.
11.	Should have proximity sensor in case of laser based technology.	BOO will check for proximity sensor by operating the equipment close to the target & when it is moved back more than three meters from the target the laser should stop.
12.	Should have no radioactive material used inside the detector.	Firm to provide a certificate from a National/ International accredited lab.
13.	The tech being employed by the equipment should not ignite the liquid explosive, gun powder, detonating cord and similar kind of other explosives.	(a) BOO will check on various samples. (b) Firm to provide a certificate from a National/ International accredited lab.
14.	Equipment should not require any calibration or sample preparation.	To be physically checked by the BOO.

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DRAFT TRIAL DIRECTIVES FOR LIQUID EXPLOSIVE DETECTOR (Contd...)

Ser No	Specification	Trial Directives
15.	Should not use any consumable items.	To be physically checked by the BOO and OEM to provide certificate
16.	Should be one-piece hand held design & one-man portable which can be carried on body through holster/ body worn strap for long operations.	To be physically checked by the BOO.
17.	Should not weigh more than 2 Kg with batteries when operationally ready (without holster/ body worn strap).	To be physically checked by the BOO.
18.	The detector should have rugged carrying case with min IP 67 rating or better with its all set & accessories inside and hand carried by one person.	To be physically checked by the BOO and Firm to provide certificate for IP rating through National/ International accredited lab.
19.	Should have battery charger of CE standard 2015 or better.	Firm to provide a certificate from a National/ International accredited lab.
20.	The detector should have min IP 65 rating.	Firm to provide a certificate from a National/ International accredited lab.
21.	Should have min 5 hrs of operation time with one set of rechargeable batteries. The rechargeable set of batteries used should be commercial available. Firm to provide one spare set of rechargeable batteries.	To be physically checked by the BOO.
22.	The system should be operationally ready in less than 90 seconds after pressing the start button.	To be physically checked by the BOO.
23.	There should be no warm up time and calibration required between two consecutive test/ detection.	To be physically checked by the BOO.

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DRAFT TRIAL DIRECTIVES FOR LIQUID EXPLOSIVE DETECTOR (Contd...)

Ser No	Specification	Trial Directives
24.	The system should save the detection information on the device log event, which can be downloaded & transferred to a laptop.	To be physically checked by the BOO.
25.	The user should have an option to upgrade the database.	To be physically checked by the BOO.
26.	System should come with a user manual & quick reference document specifying the shelf life and operational life of the equipment.	To be physically checked by the BOO.

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