



Technical Inquiry 2019-4378

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Overview

A member of Unmanned Aerial Technologies requested information regarding sensors capable of detecting CBRN threats in open water.

Findings

HDIAC identified several CBRN sensors capable of threat detection in open water environments. Table 1 lists relevant technologies, their sensing capabilities, and salient details concerning operational usage in naval contexts. For images of relevant technologies, see Table 2.

Sensor	Company Information	Sensor Type	Size and Weight	Details
Ship Ballast CBRN Water Monitor [1]	Technical Associates	Biological/ Chemical/ Radiation	Approx. size of home dishwasher: >50 kg	Contains 20 sensors detecting full spectrum of CBRN threats. Fully automated, detects agents in 2-15 minutes. Ideally suited for agent detection in open water.
Ship Ballast CBRN Solar Powered Water Monitor – Portable [1]	Technical Associates	Biological/ Chemical/ Radiation	Approx. size of carry-on luggage suitcase: 5-25 kg	Contains 20 sensors detecting full spectrum of CBRN threats. Fully automated, detects agents in 2-15 minutes. Portable, adaptable to multiple open water sensing environments.
IPDS-LR Shipboard Chemical Detection System [1]	Bruker Detection System	Chemical	Approx. size of carry-on luggage suitcase 5-25 kg	Specifically designed for chemical detection of chemical warfare agent vapors onboard US Navy surface ships. Fully automated, instantaneous detection.
Second Sight [1]	Bertin Technologies	Chemical	Approx. size of carry-on luggage suitcase 25-50 kg	Real-time gas cloud detector. Can be mounted on ships for standoff agent vapor detection at sea. Fully automated, instantaneous detection.
C-FLAPS Biological Detection System [1]	Dycor Technologies Ltd.	Biological	Approx. size of carry-on luggage suitcase 25-50 kg	Designed for use as an anomalous bioaerosol point detector—deployable on a ship or fixed site (e.g. buoy). Fully automated, 2 minutes or less for detection.
Rapid Plus Standoff Chemical Detector [1]	Bruker Detection Corporation	Chemical	Approx. size of carry-on luggage suitcase: 25-50 kg	Deployable on ships to perform chemical agent standoff detection. Fully automated, instantaneous detection.
Lightweight Chemical Detector 3.2e [1]	Smiths Detection	Chemical	Approx. size of soda can: <1 kg	Designed for use on fixed (e.g., buoys) and mobile (e.g., ships) platforms to perform chemical warfare agent or toxic industrial chemical detection. Fully automated, instantaneous detection.
GID-3 [1]	Smiths Detection	Chemical	Approx. size of a toaster: 5-25 kg	Designed for use on fixed (e.g., buoys) and mobile (e.g., ships) platforms to perform chemical warfare agent or toxic industrial chemical detection. Fully automated, instantaneous detection.

Table 1: CBRN sensors for use in open water

 <p>Ship Ballast CBRN Water Monitor [1]</p>	 <p>Ship Ballast CBRN Solar Powered Water Monitor – Portable [1]</p>	 <p>IPDS-LR Shipboard Chemical Detection System [1]</p>
 <p>Second Sight [1]</p>	 <p>C-FLAPS Biological Detection System [1]</p>	 <p>Rapid Plus Standoff Chemical Detector [1]</p>
 <p>Lightweight Chemical Detector 3.2e [1]</p>	 <p>GID-3 [1]</p>	

Table 2: CBRN sensor images

Conclusion

Technical Associates’ Ship Ballast CBRN Water Monitors and Bruker Detection System’s IPDS-LR are specifically designed for agent detection in open water environments. However, the additional sensors identified in this report can be modified to use in open water as a part of a ship or buoy network dedicated to agent detection.

A more comprehensive analysis of CBRN sensors suitable for deployment in open water is available through an HDIAC Core Analysis Task. Such a task would assess state of the art naval/open water CBRN sensors and address principle size, weight, and power and sensor networking constraints associated with mobile and buoy-fixed sensors achieving high accuracy detection at standoff ranges.

We request your feedback on this Inquiry: <https://www.hdiac.org/new-inquiry-assessment-form/>

References

1. Caples, M. (2017, October). Global CBRN Detector Market Survey (ECBC-TR-1483). Edgewood Chemical and Biological Center (ECBC), Aberdeen Proving Ground, Maryland. Retrieved from <https://apps.dtic.mil/docs/citations/AD1040693>