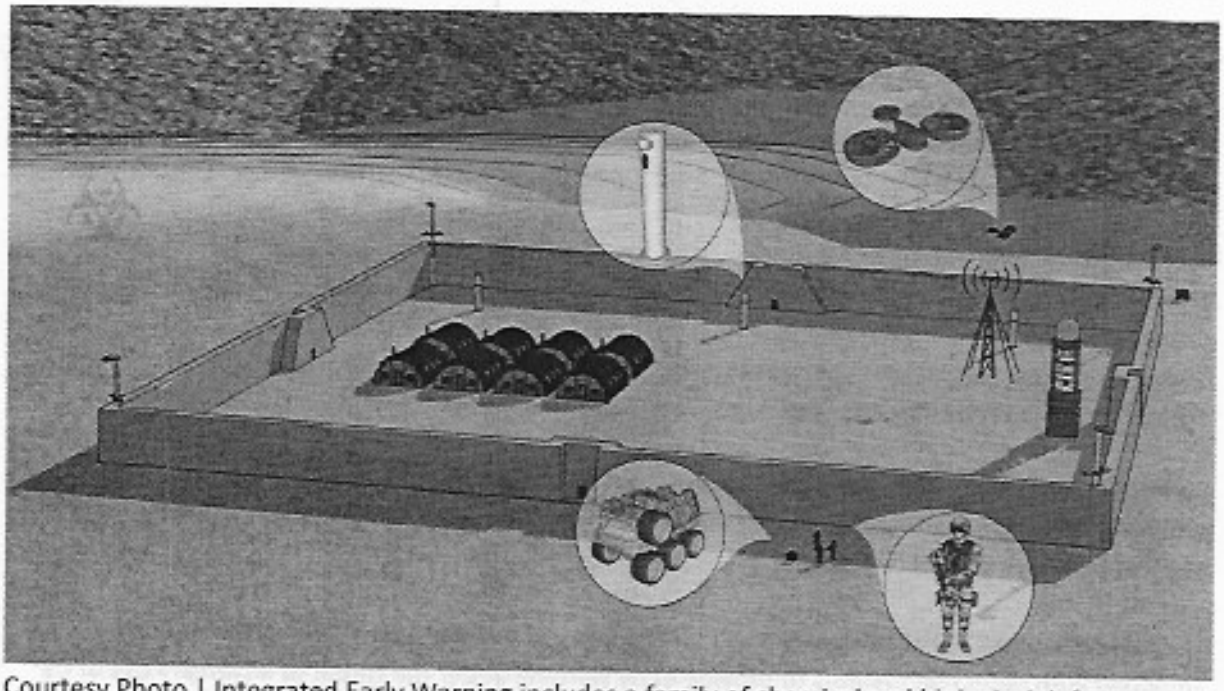
Perceptive Dragon Gives Early Warning



Courtesy Photo | Integrated Early Warning includes a family of chemical and biological defense systems..... read more read more

FORT BELVOIR, VA, UNITED STATES

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Courtesy Story

Defense Threat Reduction Agency's Chemical and Biological Technologies Department

Predicting the future in a world of uncertainties is a formidable task, however, with evolving technologies, it may become easier. Everyday technology, such as our smart phone or GPS, synthesize multiple traffic patterns and distances to optimize routes for reduced travel time. Similarly, in a combat environment several factors affect a commander's ability to achieve a mission success, which can be aided with advanced warning and decision-based tools.

The Defense Threat Reduction Agency's Chemical and Biological Technologies Department is conducting a series of demonstration events as part of the Integrated Early Warning (IEW) Advanced Technology Demonstration program This technology will provide an innovative capability that gives commanders advanced warning, allowing more time to make informed decisions. The capabilities will be advanced through demonstrations and test events through fiscal year 2021. Researchers recently conducted the Perceptive Dragon demonstration to assess current Department of Defense capabilities.

Conducted at Dugway Proving Ground (DPG) in Utah, scientists and engineers tested sensing and decision support capabilities to demonstrate an integrated chemical and biological (CB) detection and warning system. The system incorporates both dedicated CB point and standoff detection systems and force protection sensors on a common, service-oriented, interoperable 'publish and subscribe' information architecture. This architecture features integrated decision logic algorithms that improve situational understanding within the Joint Warning and Reporting Network, command

and control environments.
Focusing on the software framework over the current CB alerting process, the demonstration integrated the framework with force protection systems that identify triggering events such as hostile activity or an incoming mortar, artillery or rocket. The framework also implemented cross-cue functionality to autonomously slew surveillance assets, capture contextual information and correlate sensor alerts to improve the rate of informed decision-making.

In addition, researchers demonstrated network-level detection in which a sensor data analytics algorithm integrated multiple sources of information to understand an attack is occurring and to project the source.
CB sensor data analytics and the cross-cueing of assets, such as unmanned aerial vehicles, further enabled early detection and is a critical component.

Additionally, Perceptive Dragon aimed to demonstrate the mitigation of spurious detection events, provision of sample management, contamination visualization applications, and integration of intelligence feeds and force protection decisions.

The demonstration also incorporated a simulated passive defense scenario in which forces were equipped with detection systems to provide early warning under the threat of adversary use of CB agents such as improvised explosive dissemination devices or point and line dispersion devices.

At the conclusion of the test event, the IEW software framework successfully: integrated fixed site sensors, light detection and ranging, and unmanned platforms; demonstrated advanced tasking (cross cueing) algorithms between fixed sensor networks and autonomous unmanned platforms; and demonstrated an ability to provide below threshold sensor alarms by virtue of networked sensor data analytics.

Ultimately, Perceptive Dragon demonstrated six to 12 minutes of earlier warning, leveraging the fixed site and unmanned sensor platforms using networked sensor data analytics. The demonstration also provided an opportunity to shape the immediate path forward with respect to further technology development and integration.

On the battlefield, the amount of information and how quickly it can be accessed can be the difference between successfully accomplishing the mission or defeat. Perceptive Dragon highlighted current IEW capabilities while laying the framework for further development. Advancing these technologies may save warfighters' lives and ensure their ability to conduct successful military operations in a chemical or biological environment.

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