

Common Analytical Laboratory System - Field Confirmatory - Analytical Capability Set (CALs-FC-ACS)

Executive Summary

- The Common Analytical Laboratory System – Field Confirmatory – Analytical Capability Set (CALs-FC-ACS) consists of commercial and government off-the-shelf equipment to provide analysis of environmental samples to identify the presence of chemical and biological threats.
- The Army Test and Evaluation Command (ATEC) conducted a user demonstration and combined developmental/operational testing during FY17.
- The CALs-FC-ACS analytical instruments have the capability to identify some of the required chemical and biological threats in environmental samples to support operational decision-making.
- The most capable chemical analysis instrument was not able to reliably operate in cold and hot humid conditions during chemical chamber testing.

System

- The CALs-FC-ACS is one of three variants of CALs. The CALs-FC-ACS is composed of commercial and government off-the-shelf equipment to provide analysis of environmental samples (e.g., air, soil, water) to identify chemical and biological hazards.
- The CALs-FC-ACS is composed of a biological subsystem, a man-portable chemical subsystem, laboratory support equipment, analytical workflows, an instrument control computer with information management software, external disc data storage, a printer, and protective cases for transit.
- The biological subsystem consists of the Next Generation Diagnostic System FilmArray 2.0, Mesoscale Defense PR2-1800, and the Defense Biological Product Assurance



DBPAO - Defense Biological Product Assurance Office
 NGDS - Next Generation Diagnostic System

Office Hand Held Assay. The chemical subsystem consists of the Inficon HAPSITE ER, Thermo Scientific TruDefender FTX, and the Thermo Scientific FirstDefender RMX spectrometer; laboratory sample preparation equipment; two class III gloveboxes; an uninterruptible power supply; and power distribution unit.

Mission

Commanders use Army, Navy, Air Force, and National Guard Bureau's Civil Support Team field analytic units equipped with the CALs-FC-ACS to analyze environmental samples, identify chemical and biological hazards, and report the results to support force protection and health surveillance decisions.

Major Contractor

Battelle Memorial Institute – Columbus, Ohio

Activity

- ATEC's West Desert Test Center conducted a combined developmental/operational test of the ACS man-portable chemical subsystem agent from July 11 to October 2, 2017, at Dugway Proving Ground, Utah. DOT&E approved several deviations to the test plan due to the inability of some of the equipment to function in certain environmental conditions. This test event was conducted to support the Full-Rate Production decision planned for FY19.
- The Army Research Laboratory, Survivability/Lethality Analysis Directorate conducted a cybersecurity Cooperative

Vulnerability and Penetration Assessment of the CALs-FC-ACS from October 3-7, 2016, in conjunction with the operational assessment at the Edgewood Chemical and Biological Center, Maryland.

- ATEC conducted a user demonstration of the CALs-FC-ACS from October 13-17, 2016, at the Edgewood Chemical and Biological Center. The test was conducted in accordance with the DOT&E-approved test plan.

Assessment

- The CALS-FC-ACS has the capability to identify some of the required chemical warfare agents, precursor chemicals and breakdown products in environmental samples at operationally representative concentrations.
- During the combined developmental/operational test of the man-portable subsystem, the most capable of the chemical analysis instruments experienced numerous failures in cold and hot humid conditions during chemical chamber testing.
- Cybersecurity testing identified numerous, significant cybersecurity vulnerabilities in the CALS-FC-ACS commercial off-the-shelf instruments.
- During the user demonstration, units were able to employ the system to accurately identify chemical targets in 77 percent and biological targets in 85 percent of environmental samples that the systems had the capability to identify.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY17 Recommendations. The Program Office should:
 1. Identify the capabilities and limitations of the analytical instruments in user training materials.
 2. Conduct additional developmental testing to characterize the environmental conditions in which the analytical instruments are able to properly function to inform tactics, techniques, and procedures.
 3. Address the cybersecurity vulnerabilities to ensure the integrity of the analytical results.