

Joint Biological Tactical Detection System

The Joint Biological Tactical Detection System (JBTDS) must overcome major challenges to meet the operational effectiveness requirement to detect and identify biological warfare agents in the air. JBTDS requires improvements to detector and identifier reliability, battery power indicator accuracy, and the transit load configuration to meet operational suitability requirements. The IOT&E planned to support the final operational effectiveness and suitability assessment is scheduled for 4QFY23.



System Description

The Services intend for JBTDS to detect biological warfare agents in the air, by utilizing either a trigger when a biological warfare agent is detected, or through on-demand collection initiated by the operator. The system consists of an integrated man-portable biological warfare agent detector and sample collector, base station, meteorological station, GPS, sample extraction kit, and a handheld biological warfare agent identifier with consumable cartridges. The detector and sample collector can be connected to the base station using a Service-provided, closed, or restricted local area wired or wireless network to enable remote monitoring and reporting.

Program

The JBTDS is a joint Service Acquisition Category II program. DOT&E approved a revision to the Milestone B Test and Evaluation Master Plan in November 2020. The Milestone C low-rate initial production decision is scheduled for 4QFY22. The IOT&E is planned for 4QFY23.

Major Contractors

Chemring Sensors and Electronic Systems – Charlotte, North Carolina. Biomeme – Philadelphia, Pennsylvania.

Test Adequacy

In FY21, the Army conducted JBTDS test events to assess the readiness for low-rate initial production. These included detection limits tests for 6 of 10 agents, identification limit tests for 7 of 10 agents, environmental and military standards compliance tests, false alarm rejection and reliability tests, the first of two operational assessments to support Service biological surveillance and site exploitation missions, and an Adversarial

Assessment. These tests, conducted in accordance with the DOT&E-approved test plans, were adequate to characterize the intended aspects of system performance and identify areas for additional development.

Performance

Effectiveness

The JBTDS program will need to address identified performance shortfalls to mitigate its risk to meeting operational effectiveness requirements. During the operational assessment, military personnel were able to employ JBTDS to detect simulated biological threats and trigger the automatic collection of a sample for analysis. Operators were able to manually trigger the collection of an air sample and employ the sample collection/extraction kit to transfer the sample to the identifier for analysis in the field. Poor performance of identifier cartridge lots significantly affected the capability to support force protection decisions. In certain environments, the detector false alarm rate did not meet the requirement, which could lead to lost confidence in the system.

Suitability

The JBTDS program will need to successfully address identified shortfalls to mitigate the risk to meeting operational suitability requirements. During the operational assessment, the JBTDS detector

collector demonstrated improved reliability while the identifier demonstrated poor reliability. The Army test unit expressed concern over their current JBTDS load configuration due to the time required to pack and load the systems for transport and due to its transport and storage footprint. The identifier requires improvements to accurately detect and indicate remaining battery life during operation, which, if not addressed, will continue to drive the need for more frequent battery changes and additional spare batteries. One of the test units noted that the packaging associated with system consumables generates burdensome waste that needs to be collected, stored, and properly disposed.

Survivability

Data analysis is ongoing precluding a survivability assessment of JBTDS in a cyber-contested environment at this time.

Recommendations

The contractors should:

1. Improve the performance of the identifier cartridges to accurately identify biological warfare agents and enable appropriate force protection decisions.
2. Reduce the system false alarm rate to meet operational requirements.

JBTDS base station and handheld biological warfare agent identifier with consumable cartridges



3. Improve system reliability to meet operational requirements.
4. Fix the battery life indicator for system components to accurately estimate the remaining battery life.
5. Modify system consumable packaging to minimize waste.