

Joint Chemical Agent Detector (JCAD)

Executive Summary

- Developmental and Operational Testing (DT/OT) results and an Operational Assessment (OA) supported a Milestone C low-rate initial production (LRIP) decision for Joint Chemical Agent Detector (JCAD) Increment 1 in June 2007.
- The Service operational test agencies (OTAs) conducted the JCAD Multi-Service Operational Test and Evaluation (MOT&E) in July-August 2007. The Service OTAs are reducing data. Additional DT/OT of JCAD Increment 1 against chemical warfare agents in the presence of interferents must be completed before the OTAs will complete their JCAD system evaluation.
- The Joint Program Executive Officer for Chemical and Biological Defense (JPEO (CBD)) scheduled the JCAD full-rate production decision for 60,000 Increment 1 detectors for March 2008.
- JCAD Increment 2 downselection testing among three vendors is scheduled to begin January 2008.

System

- JCAD is a hand-held device that automatically detects, identifies, and alerts warfighters of the presence of nerve, blister, and blood chemical agents, and some toxic industrial chemicals, including chlorine.
- JCAD Increment 1 is a non-developmental item modified from a commercially available device. It will operate as a stand-alone detector. It will be carried by personnel and placed onto various platforms, including ground vehicles, fixed site installations, and collective protection shelters. It supplements or replaces existing fielded chemical agent vapor detectors.
- JCAD Increment 2 is a commercially available device designed to detect lower levels of chemical agents and will have a networking capability.
- The total quantity of Increment 1 systems is 60,000 detectors, with 6,000 low-rate initial production. The planned Joint Acquisition Objective for JCAD is 145,150 detectors.
- The JCAD will be issued to:
 - Army squads
 - Marine platoons

Activity

- The JPEO (CBD) rebaselined the JCAD program in 2003 to acquire a non-developmental item. The Single Acquisition Management Plan was approved in September 2005 and updated for the Milestone C low-rate initial production decision in June 2007.



- Air Force aircraft, base reconnaissance, and ground-service personnel
- Navy shore installations, and riverine or land-based units

Mission

- Units use JCAD to provide hazard level indication of chemical warfare agent and toxic industrial chemical vapors to alert personnel to take personal protection measures including masking, and unit force protection measures.
- JCAD will be employed in a wide variety of tasks including:
 - Personal chemical vapor detector
 - Monitor in and around a vehicle or shelter's interior and exterior, or aircraft interior
 - Survey instrument for cargo surveillance
 - Survey instrument for effectiveness of decontamination of personnel and equipment
 - Fixed installation monitor or array of monitors to provide remote alarming

- The Joint Project Manager (JPM) with the Service OTAs conducted a comprehensive DT/OT program for the non-developmental JCAD Increment 1 in FY06 and FY07. They conducted the DT/OT events to provide data for decision by the JPEO(CBD) to determine readiness to start MOT&E.

DOD PROGRAMS

Additional DT/OT is scheduled in FY08 to determine JCAD's capability to discriminate, detect, and identify chemical agents in the presence of several potential interferents.

- The four Service OTAs conducted the JCAD Increment 1 OA in FY06. From the OA results, the JPM modified the non-developmental item to add a toxic industrial chemicals detection capability and increased sampling rate for use in a new mode for survey operations.
- The Service OTAs conducted the JCAD Increment 1 MOT in July-August 2007 at Dugway Proving Ground, Utah, and McGuire Air Force Base, New Jersey. The Service OTAs are reducing data and completing the JCAD system evaluation. DOT&E will evaluate in November 2007.
- Developmental testing did not determine if calibration is required to maintain over time the detection and identification capabilities of JCAD within specifications. The JPM is developing a test plan to assess JCAD long term calibration and replacement requirements.
- The JPM is addressing all shortcomings identified in DT/OT, the OA, and the MOT.
- The JPM is planning laboratory testing of JCAD Increment 2 commercial devices.

Assessment

- JCAD detected eight chemical agents greater than 90 percent of the time and another agent 88 percent of the time.

However, detection response times for very low levels of agent contamination need to improve.

- In developmental testing, JCAD displayed acceptable performance in a wide variety of extreme environmental conditions, with the exception of:
 - Salt Fog Testing
 - Full Immersion Testing
 - Low Temperature Operations
- JCAD is easy to operate, troubleshoot, and maintain. JCAD is lightweight and its small size makes it more portable than currently fielded chemical warfare agent point detectors.
- Surveillance testing may be required to determine calibration and replacement requirements in order to ensure users have confidence that JCADs maintain performance after fielding and use.

Recommendations

- Status of Previous Recommendations. The JPM accepted DOT&E's previous recommendations.
- FY07 Recommendations. The JPM should conduct testing to develop an appropriate surveillance, inspection, and calibration program for fielded JCADs.