Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD)

JSLSCAD is intended to be a passive detector of chemical agent vapors at ranges up to 5 km (10 km objective). It is intended to provide real-time detection of specific types of chemical warfare threats to U.S. forces at both fixed sites and while on the move.

This system will be installed in fixed locations for protection of facilities and installations such as air bases. The mobile configurations of Block I JSLSCAD will be used on platforms such as ground vehicles and ships. Aircraft configurations will be included in JSLSCAD Block II. The JSLSCAD will have visual and audible indicators to display the chemical agent class (nerve, blister, and blood), and to indicate the azimuth and elevation (but not distance) of the detection. Detection and warning information may be entered automatically into Service command, control communications, computers and intelligence (C^4I) systems, or the information may be reviewed and distributed manually. JSLSCAD is to be interoperable with the Joint Warning and Reporting network when it becomes available.

JSLSCAD consists of four major components: scanner module, sensor electronics module, operator display unit, and power adapter. There are two configurations of the scanner module. The aerial applications scanner covers a 60-degree forward-looking cone, and the ground mobile/fixed site/shipboard configurations scan 360-degrees in azimuth and +50 to –10-degrees in elevation. The JSLSCAD Block I is intended to be integrated into the Joint Service Light Nuclear, Biological, and Chemical (NBC) Reconnaissance System (JSLNBCRS) and the Stryker-NBC Reconnaissance Vehicle, and will be employed aboard Navy landing ship docks or equivalent aviation capable amphibious ships. JSLSCAD Block II is intended to be carried on Army and Navy helicopters, and outboard on selected Air Force C-130 aircraft. Present plans call for the JSLSCAD to be carried as an unmanned aerial vehicle payload, but the unmanned aerial vehicle to be used has not been selected.

The current operational requirements document was approved in June 1997, and is now being revised. JSLSCAD achieved Milestone II on September 17, 1996. The Test and Evaluation Master Plan for JSLSCAD was approved in 1997, before the system came under DOT&E oversight in January 2000. A revised Test and Evaluation Master Plan dated September 30, 2002, is in Service coordination.

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TEST & EVALUATION ACTIVITIES

JSLSCAD's engineering development tests were completed in April 2001.

Production qualification test/developmental test (PQT/DT) began in February 2002 at Dugway Proving Ground. The February PQT/DT events were in the chamber, using three nerve agents and one blister agent, and were intended to prove system performance and to correlate the system's chamber performance with open-air releases of chemical simulants. Problems encountered during the developmental testing resulted in the contractor revising the processing algorithm and retraining the system's neural network. High false alarm performance has caused early termination of some developmental tests. PQT/DT began anew in the test chamber at Dugway in July 2002 with the revised algorithm.

TEST & EVALUATION ASSESSMENT

The revised algorithm used in the renewed tests appears able to process most of the signals it has received from the same agents where it failed in February. There remain questions, however, about JSLSCAD's performance in terms of its ability both to detect adequately agent vapor levels other than that for which its neural network was trained or its ability to detect and identify weapons grade agent in varying strengths. Completion of PQT/DT events should answer many of these questions, but lack of weapons grade agent from various potential threats may leave some questions not completely answered.

Test limitations in the Initial Operational Test and Evaluation (IOT&E) will include the use of simulants instead of actual agents. Although the chosen simulants approximate spectral or physical characteristics of agents, they do not match them. Current testing is intended to support the ability to correlate concentration levels of real chemical vapors to concentration levels of simulant vapors. Even if a good correlation could be determined, the details of the algorithm in the JSLSCAD must be changed to allow it to detect a simulant vapor, and hence there could be low confidence that the system will be operationally effective on the battlefield. Other limitations include simulation of agent delivery by explosive, line, and stack release devices instead of actual weapons, and a restricted C^4I network warning capability instead of a full theater or joint task force C^4I system. Achieving ideal delivery conditions during tests is difficult due to the vagaries of weather, and the desired effects of the atmospheric mixing layer dictate that releases are best made during pre-dawn hours. The test site at Dugway, an isolated, desert location that does not represent military bases, cities, or many types of battlefields where JSLSCAD likely will be deployed, is a limitation. A Navy test is planned to be done at sea and the Air Force plans to test the system at Eglin Air Force Base.

The IOT&E budget for Block I (fixed site, ground mobile, and shipboard) is not fully funded; $8.303 Million is required, of which $2 Million is unfunded. Block II tests (the airborne and networked version) are unfunded. The program office has requested $2 Million for the test in 2003.