

Chemical Demilitarization Program

The Chemical Demilitarization Program is an Army-managed program responsible for the destruction of the U.S. stockpile of lethal chemical agents and munitions, and non-stockpile chemical warfare materiel. This program is required to comply with the Chemical Weapons Convention (CWC), which is a major arms control and nonproliferation treaty that requires destruction of stockpile unitary chemical weapons by April 29, 2007. OSD placed the Chemical Demilitarization Program on oversight in December 1994. Since then, DOT&E has provided oversight of the stockpile, non-stockpile, and alternate technologies projects within the Chemical Demilitarization Program.

The Chemical Stockpile Disposal Project is responsible for the development of chemical agent disposal facilities collocated with the nine chemical depots. The disposal facilities are government owned and contractor operated. Each site's prime contractor conducts all developmental and operational testing under oversight of the Program Office and the U.S. Army Materiel Systems Analysis Activity. Five disposal facilities are employing the baseline chemical weapons disassembly and incineration process.

The Army has selected chemical neutralization of agents, followed by post-treatment of the neutralized products for the disposal facilities at the two bulk agent storage sites in Aberdeen, Maryland, and Newport, Indiana. The Alternative Technology and Approaches Project is responsible for conducting testing at these two sites. At the direction of Congress, the Assembled Chemical Weapons Assessment Program was established in 1996 to evaluate alternative technologies for the Pueblo and Blue Grass disposal facilities. In 2003, the Army awarded contracts to implement chemical neutralization of agents followed by post-treatment of the neutralized products as an alternative technology for the Pueblo and Blue Grass disposal facilities. Due to the events of September 11, 2001, accelerated destruction is being implemented at the two bulk storage sites, and is being considered for the Pueblo and Blue Grass sites, to reduce the risk of continuing agent storage.

The Johnston Atoll disposal facility completed chemical agent operations in November 2000, and completion of the closure process, including demolition of the facility, is expected in November 2003. The Tooele disposal facility is currently the only fully operational facility. The Aberdeen and Anniston disposal facilities began limited agent operations in April and August 2003, respectively. The Umatilla, Pine Bluff, and Newport disposal facilities are scheduled to begin limited agent operations in 2004. The Pueblo and Blue Grass disposal facilities are in the design phase, and no testing is anticipated for 2004. As of July 13, 2003, the disposal facilities had successfully destroyed approximately 26 percent of the total U.S. chemical weapons stockpile (originally 31,496 agent tons). The Army has met the first two Milestones of the CWC (1 percent and 20 percent destruction, respectively). However, current Army plans for full destruction will not be complete until April 2012 and a request for a five-year extension to the CWC 100 percent destruction Milestone will be required.

The Non-Stockpile Chemical Materiel Project is responsible for the destruction of non-stockpile chemical warfare materiel, including the components of binary chemical weapons, miscellaneous chemical warfare materiel, recovered chemical weapons, former production facilities, and buried chemical warfare materiel. The Non-Stockpile Chemical Materiel Project has developed, tested, and fielded several mobile systems: the Explosive Destruction System (EDS), Phase 1, Unit 1 (EDS-1/1); the Rapid Response System; the Mobile Munitions Assessment System; and the Portable Raman System. Two additional variants of EDS and two other mobile systems are in or have recently completed testing: EDS, Phase 1, Units 2 and 3 (EDS-1/2,3); EDS, Phase 2 (EDS-2); Single Chemical Agent Identification Set Access Neutralization System (SCANS); and Large Items Transportable Accessing and Neutralization System (LITANS). The Pine Bluff Arsenal Ton Container Decontamination Facility is a fixed, non-stockpile facility in testing at Pine Bluff Arsenal, Arkansas. Three other fixed, non-stockpile facilities are in development: the Munitions Assessment and Processing System at Aberdeen Proving Ground, Maryland; and the Pine Bluff Non-Stockpile Facility and Pine Bluff Binary Destruction Facility, both at Pine Bluff Arsenal, Arkansas.



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TEST & EVALUATION ACTIVITY

The test and evaluation program for each stockpile incineration disposal facility consists of developmental test (DT), combined DT/operational test (OT), and OT phases. The DT phase consists of subsystem component testing. The DT/OT phase employs surrogate agents in all test events, culminating in trial burns of the furnaces and end-to-end operations of the facility. The OT phase consists of agent trial burns and initial operations with agent. The OT is tailored to a specific agent/munition campaign. The OT will support a decision whether to proceed to fully operational status for that specific agent/munition campaign. After completion of the campaign, the facility will revert to OT status for the next planned agent/munition campaign. This process will be repeated until destruction of all agent/munition configurations in the site's stockpile is complete.

For the two bulk agent storage sites implementing accelerated destruction, there is only a DT phase that culminates in end-to-end testing of the facility with surrogate agent, and an OT phase that consists of initial operations with agent. In implementing accelerated destruction at the Aberdeen and Newport sites, the program office has replaced the approved Test and Evaluation Master Plans for those sites with Test Concept Plans (TCPs). The TCPs are still subject to DOT&E approval. DOT&E has reviewed a draft of the TCP for the Newport site and approved the TCP for the Aberdeen site in 2003.

DOT&E monitors the test activity and independently analyzes test data for all stockpile facilities and non-stockpile systems. The test activity and test data support decisions on whether to proceed to the next test phase and determine readiness of either a stockpile facility to begin fully operational status or of a non-stockpile system to be operationally fielded at the conclusion of OT. Test activity for stockpile facilities and non-stockpile systems is summarized in the table below.

Chemical Demilitarization Test and Evaluation Activity

Facility/System	Technology	FY03 Activity	Agent Tested	Planned FY04 Activity
Anniston	Incineration	DT/OT; OT ^a	Surrogate/Sarin ^b	OT
Umatilla	Incineration	DT/OT	Surrogate	DT/OT; OT
Pine Bluff	Incineration	DT; DT/OT	Surrogate	DT/OT; OT
Aberdeen	Neutralization	DT; OT	Surrogate, Mustard	OT
Newport	Neutralization	DT	Surrogate	DT; OT
EDS-1/2,3	Neutralization	FOT&E ^c	Mustard, Sarin, Phosgene	FOT&E (Lewisite, VX)
EDS-2	Neutralization	DT/OT	Mustard, Sarin, Phosgene	DT/OT
SCANS	Neutralization	DT/OT; Follow-on DT	Mustard, Lewisite	DT/OT
LITANS	Neutralization	DT	None	DT; OT
PBA TCDF	Neutralization	OT	Potential trace agent (Lewisite observed)	OT

^a Start of the OT phase was delayed for over six months due to the need to address safety concerns.

^b Sarin filled M-55 rockets are the munitions being tested.

^c An Operational In-Process Review conditional fielding decision for EDS-1/2,3 was made in October 2002.

TEST & EVALUATION ASSESSMENT

Army testing of stockpile and non-stockpile systems in the Chemical Demilitarization Program has been adequate to ensure the safe and efficient disposal of the inventory of chemical warfare materiel. The implementation of accelerated destruction at the bulk storage sites increases the amount of manual handling of agent materiel and places increased emphasis on maintaining program schedules, thereby increasing the risk of safe operation of these facilities. To date, results at the bulk storage sites have not provided a clear indication that the intended schedule and cost benefits of the accelerated destruction process will be realized. Emphasis on maintaining the program schedule at the Aberdeen facility led to a hastily conducted final DT prior to the

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start of OT. The numerous problems and subsequent delays that are occurring during the OT can, in part, be attributed to the haste with which the final DT was conducted. For the Tooele facility, unexpected events that have occurred during operations and maintenance have led to lengthy delays and greatly increased program costs, illustrating the need for robust event-driven testing to minimize the possibility of such occurrences for these facilities when they become fully operational. DOT&E will continue to monitor the safety issue closely during testing of these facilities.

Operational testing of EDS-1/2,3 at Aberdeen and the remediation site at Spring Valley was adequate for DOT&E to determine that the system is operationally effective and suitable. All munitions were safely and successfully destroyed by the EDS-1/2,3 during testing. DOT&E participated in the Operational Readiness In-Process Review in November 2003, which supported the Program Manager's decision to declare EDS-1/2,3 fully operational for use with mustard, sarin, and phosgene. The EDS-2 DT/OT at Porton Down, United Kingdom, and Aberdeen is currently going well. The DT/OT testing is being conducted similarly to a dedicated OT in that operational crews and procedures are being employed with a production representative system. Therefore, a dedicated OT phase is not anticipated for EDS-2, and an Operational Readiness In-Process Review that will support a Program Manager's fielding decision is planned for 2004. At DOT&E's direction, all EDS variants now have a defined vessel vacuum "go/no go" criterion as part of their operating procedures that is based on past test data. This will reduce the risk of inadvertent agent release from the EDS vessel that could result if detonation occurs without a proper vessel seal.

The original test plan for the SCANS DT/OT was for a configuration that included a sampling port that would not be part of the production configuration. At DOT&E's request, additional production representative SCANS items were included in the DT/OT to ensure an adequate test plan. Results of the SCANS DT/OT indicated a need for an engineering design change in the system. The Army determined that the break pin assembly was susceptible to cracking during operation, potentially leading to a system leak. The assembly was redesigned and additional DT was conducted to confirm the effectiveness of the new design. DOT&E determined that the system is operationally effective and suitable based on SCANS testing. DOT&E actively participated in a Conditional Operations In-Process Review that supported a Program Manager's decision to field in September 2003.

The LITANS system began DT in 2003, and OT is planned to begin in January 2004 at Porton Down. The Pine Bluff Ton Container Decontamination Facility began OT in September 2003. Several treated ton containers contained residual lewisite agent contamination during the test. Therefore, the Army suspended the OT and the system is being redesigned.

The U.S. Army Materiel Systems Analysis Activity is providing effective independent oversight of the testing of both stockpile and non-stockpile programs.

