

# Deploying New Tritium D&D Technologies in the US--Recent Experience and Plans

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## I. Introduction

The US Department of Energy (DOE) Office of Environmental Management (EM) sponsors projects called Large-Scale Demonstration and Deployment Projects (LSDDP). These projects seek to identify and deploy technologies that will allow decontamination and decommissioning (D&D) of surplus facilities more quickly, at less cost and with reduced risk to personnel and the environment. Such a project was started centered on the Tritium Systems Test Assembly (TSTA) at Los Alamos National Laboratory (LANL) in 2001. TSTA is a tritium contaminated facility that is being shutdown. This LANL LSDDP is also performing deployments at other LANL facilities and at Mound, Princeton Plasma Physics Laboratory, Lawrence Livermore National Laboratory, the Savannah River Site and Lawrence Berkeley National Laboratory. The project encourages international participation and representative from the Joint European Torus are working with the project.

## II. Areas of Interest

The LSDDP project is interested in a broad range of D&D technologies. These include:

- Waste handling and disposal—water oils and solids
- Tritium characterization—surface and bulk
- Dismantlement and demolition
- Personal protective equipment
- Gas detritiation
- Tritium air monitoring
- Decontamination of equipment and materials
- Surface stabilization (fixatives)
- Long-term surveillance and maintenance

## III. Approach

The LSDDP employs a logical approach for the efficient deployment of technologies. The process begins by the identification of un-met needs at D&D facilities. A survey of field-ready technologies is made. Where technologies are found that match with un-met needs, a potential deployment is considered. This deployment is evaluated with respect to benefit, feasibility, and appropriateness. If approved, the deployment proceeds by the identification of a deployment engineering, the development of a test plan and acquisition of the technology. Then the technology is deploy, data is collected and a report written.

## IV. Deployment Status

The LSDDP team has been formed and has completed an initial evaluation of facilities needs and available technologies. The results are summarized in Table 1. This shows that one or more technology that meet the LSDDP criteria has been identified in most of the categories of interest. The table lists each technology name and its application. The table also lists the major facilities where there is a potential deployment of the technologies. As shown, there is a large number of potential deployments.

## V. Conclusions

The deployment of innovative technologies under an LSDDP format can be successfully executed as demonstrated by the progress made. The use of this thoughtfully develop LSDDP format, matching needs with technologies, combined with the knowledge and expertise acquired during the demonstration of these technologies, is leading to a large number of D&D technology deployments at multiple sites. It is expected that this will result in significant reductions in risk, cost, and schedule associated with D&D projects.



**Table 1 Summary of LSDDP Technologies and Potential Deployment Facilities**

Category	Technology Name	Application	LANL	SRS	PPPL	LLNL	Mound
<b>Characterization</b>							
	Lumi-Scint	Portable Scintillation counting	✓	✓	✓		✓
	TMS-2000	Direct reading surface tritium monitor	✓				
	Hammer Drill	Concrete Characterization		✓		✓	✓
<b>Air Monitoring</b>							
	Rad Elec, Inc.-Electret	Passive air and surface tritium measurement	✓	✓	✓	✓	
<b>Gas Detritiation</b>							
	LLNL Tritium Clean-up "Cart"	Gaseous process effluent detritiation	✓	✓			
	Portable Tritiated Water Removal Unit	Rapid glovebox decontamination		✓	✓		
	DBATS	Glovebox decontamination	✓			✓	
<b>Decontamination</b>							
	Environmental Alternatives	Surface decontamination System	✓		✓		✓
	Ozone decon	Surface decontamination			✓		
	Bartlit Strip Coat TLC	Strippable coating	✓		✓		
<b>Surface Stabilization</b>							
	EKOR, PAG						✓
<b>Dismantlement and Removal</b>							
	Burndy Hydraulic Crimper	Tubing crimper	✓			✓	✓
	Evolution 180 Circular Saw	Metal demolition	✓				✓
	Adamant 2739 Circular Saw	Metal and wood demolition					
<b>Waste Handling and Disposal (water, oils, solids)</b>							
	Waterworks Crystals Superabsorbent Polymer	Water solidification					
	NOCHAR Petrobond®	Oil solidification	✓	✓			
	SAMMS	Heavy metal stabilization from liquids		✓			
	WIC® (Waste Isolation Composite)	solidifying high activity tritium					
	Vial Crusher		✓			✓	
<b>Other</b>							
	Race Scan	Wireless communication	✓	✓			✓