The Search for Knowledge: Meeting DOE-EM's High Priority D&D Needs

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Introduction

In an effort to capture previous work performed by the decontamination and decommissioning (D&D) community and to facilitate the transfer of knowledge and lessons learned, the Applied Research Center performed a series of research studies and data mining activities during fiscal year 2009 for DOE-EM. The need for these studies was identified at the 2008 D&D Needs Prioritization Workshop and were recommended by the panel of D&D experts in attendance.

ARC researchers (including DOE Fellows) performed a literature, database, and Internet search for appropriate information, including papers, reports, databases and presentations. Specific sources of information included:

➢ DOE Information Bridge, Office of Scientific and Technical Information (OSTI) (http://www.osti.gov/bridge/)
➢ Gateway to Environmental Technology (GET) (www.dandd.org)
➢ D&D Knowledge Management Information Tool (D&D KM-IT) (www.dndkm.org)
➢ Hanford ALARA Weekly reports from 2005 to 2009
➢ Contact with Hanford ALARA Center of Technology
➢ Contact with Oak Ridge National Laboratory
➢ Technology vendor websites and literature
➢ Waste Management Symposium Proceedings – last 10 years
➢ X-Change Conference Proceedings
➢ Contact with former DDFA associates, including NETL and INEEL
➢ DDFA Technology Summaries and Annual Reports

Research Studies and Data Mining Activities:

1. Large Area Dry Decontamination Technologies

The total area of contaminated concrete within the DOE complex has been estimated to be approximately 18,000 acres. FIU performed a study to identify large area (>93 m² or >1000 ft²) dry decontamination technologies capable of decontaminating horizontal and/or vertical surfaces. Special emphasis was given to technologies that can cover large areas with a single pass.
A total of 21 vendors and 27 technologies were identified.
Technologies that best satisfy the study's criteria include the following:

➢ Blastrac shot blasting (blast patterns up to 122 cm or 48" width)
➢ Pentek MOOSE (cutting width of 46 cm or 18")
➢ Novatek concrete grinder (61 cm or 24" cutting width)
➢ Marcrist concrete shaver (25 cm or 10" drum)

Blastrac 2-20D Walk Behind Shot Blaster

2. Review of Previous D&D Work (D&D Focus Area)

In 1994, the DOE Office of Science and Technology (OST) established and staffed a program referred to first as the Decontamination and Decommissioning Focus Area and later as the Deactivation and Decommissioning Focus Area (DDFA). The objective of the DDFA was to identify and promote deployment of improved D&D technologies for the cleanup of DOE sites.
The objective of this study was to locate and make available the large body of knowledge that was accumulated during the existence of the DDFA from 1995 to 2002. Special emphasis was placed on:

➢ Large-Scale Demonstration and Deployment Projects (LSDDP)

➢ Accelerated Site Technology Deployment (ASTD)

MIP-DC system developed and assembled at FIU in Miami.

A total of 201 Innovative Technology Summary Reports were compiled in addition to 70 X-Change Conference papers, 120 technology fact sheets and 4 ASTD cost and performance reports.

3. Improved PPE for D&D Activities

A large number of contaminated facilities at DOE sites are currently or will eventually undergo D&D, requiring the use of protective clothing.
This study was conducted to provide the D&D community with relevant information on existing technologies available for PPE. A total of 35 vendors and 96 technologies were identified. These technologies were categorized as:

a) Body Protection
b) Eye Protection
c) Foot Protection
d) Hand Protection
e) Head Protection
f) Hearing Protection
g) Heat and Cold Protection
h) Respiratory Protection

Kleen Guard A70

4. Non-Intrusive Tools For Utilities Identification in Soils and Concrete

The objective of this study was to identify the current technologies available on the market for utilities identification, including magnetic, electromagnetic, and ground penetrating radar (GPR) technologies. Utilities can be defined as pipes, cables, and electric, natural gas, telephone, fuel, water and sewer lines. As a result of this study, a total of 12 vendors and 61 technologies were identified.

RD1000™ Ground Penetrating Radar (GPR)

Results

The results of these studies, including each technical report and the compiled documents on applicable technologies, will be made available to the general D&D community through the FIU/DOE D&D Knowledge Management Information Tool (KM-IT) located on the web at www.dndkm.org. The technologies will be searchable by technology name, technology category, vendor name, and keyword. Additional information on technology demonstrations will also be available.
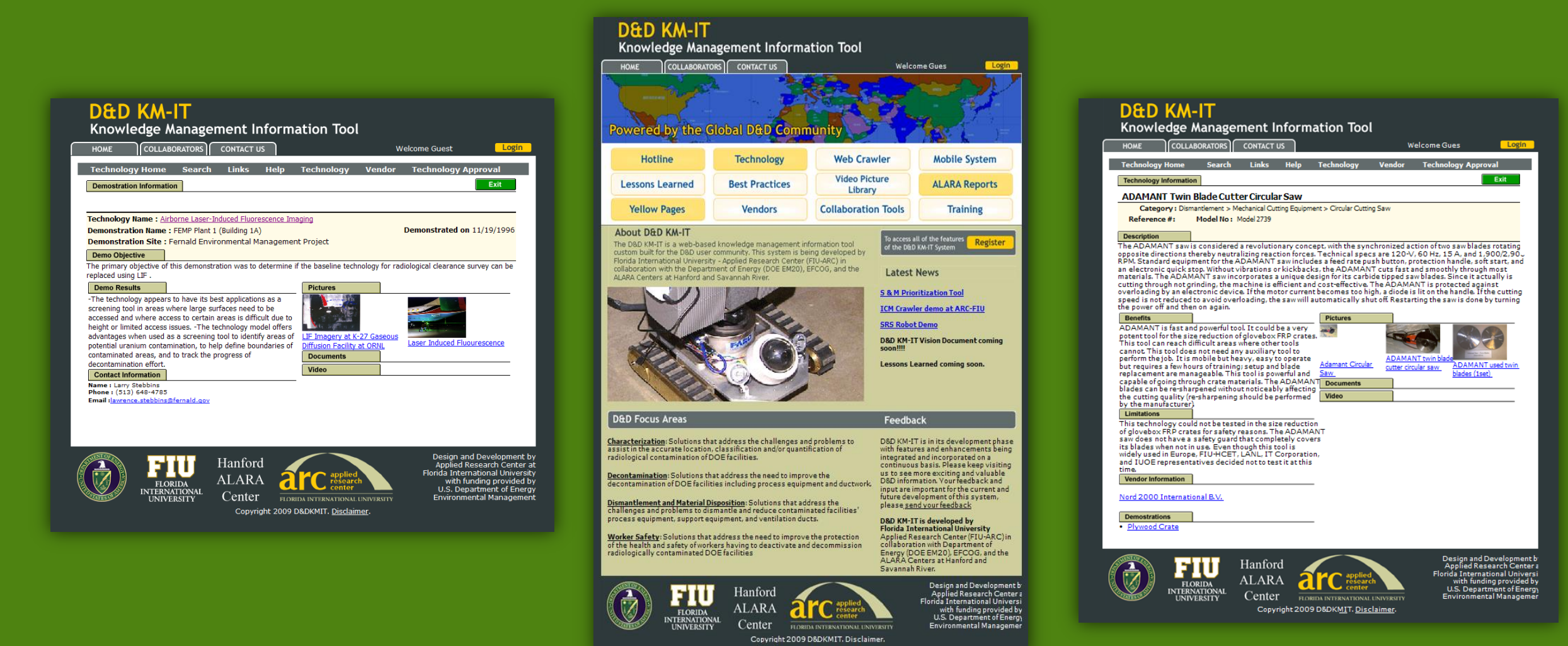
Conclusions

DOE faces a challenging task in decontaminating and decommissioning their excess facilities. Identifying the most efficient and cost effective D&D technologies will be a major factor in their success. FIU is supporting DOE-EM's mission by identifying and making available a large and broad repository of technology information. The studies shown here reflect the need to continuously invest in research to facilitate the safe and efficient clean-up of all DOE excess facilities.