

D&D Knowledge Management Information Tool – 2010 (10452)

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ABSTRACT

Deactivation and decommissioning (D&D) work is a high priority activity across the Department of Energy (DOE) complex. Subject matter specialists (SMS) associated with the different ALARA (As-Low-As-Reasonably-Achievable) Centers, DOE sites, Energy Facility Contractors Group (EFCOG) and the D&D community have gained extensive knowledge and experience over the years in the cleanup of the legacy waste from the Manhattan Project. To prevent the D&D knowledge and expertise from being lost over time from the evolving and aging workforce, DOE and the Applied Research Center (ARC) at Florida International University (FIU) proposed to capture and maintain this valuable information in a universally available and easily usable system.

INTRODUCTION

The D&D Knowledge Management Information Tool (KM-IT) is a web-based tool custom-built for the D&D user community by the Applied Research Center (ARC) at Florida International University (FIU) in collaboration with the Department of Energy, the Energy Facility Contractors Group (EFCOG), and the ALARA Centers at the Hanford and Savannah River Sites.

D&D KM-IT will serve as a centralized repository and will provide a common interface for all D&D related activities. The main purpose of this process is to improve efficiency by reducing the need to rediscover the knowledge and to promote reuse of the existing knowledge. D&D KM-IT is a community driven system. It will facilitate the sharing of knowledge within the D&D community by gathering, analyzing, storing and displaying D&D related information.

D&D KM-IT has the ability to define, store, categorize, index and link digital information corresponding to D&D problem areas. The system has the ability to allow users to search for and subscribe to relevant content and presents the content with sufficient flexibility to render it meaningful and applicable across multiple contexts of use.

Too frequently, people in one part of the D&D community “reinvent the wheel” or fail to solve problems quickly or in an optimum fashion because, while the knowledge they need may exist elsewhere, it is not known or accessible to them. This knowledge management tool will help to enhance collaboration and knowledge sharing while building upon the D&D knowledge base within the EM’s D&D community. As the generational cycle of the D&D cleanup progresses into the future the knowledge pool and its best practices for D&D applications will expand.

D&D KM-IT will promote knowledge innovation where new knowledge will be created and converted into valuable goods and services. This tool will provide an environment where creativity and learning will flourish and knowledge will be encapsulated in a form that can be applied.

D&D KM-IT will get the right content to the right people at the right time and in the right form. It will use the World Wide Web as the primary source for content in addition to information entered by the subject matter specialists and the D&D community.

In this paper, FIU ARC will present the various new modules added to D&D KM-IT in fiscal year 2009-2010 that are designed to capture information from the D&D community and build the knowledge base for future use.

MATERIALS AND METHODS

The requirement from DOE Headquarters was to develop a repository and a dynamic system that will make excellent use of the knowledge that exists within the D&D community by allowing D&D project managers around the DOE complex to share innovative ideas, lessons learned, past experiences, and practices.

D&D KM-IT is being developed and deployed in multiple phases, providing solutions to the D&D problems, sharing best practices, yellow pages, customized web searching, technology solutions, etc. It will evolve as a centralized high-end knowledge repository where D&D scientists and engineers can search for information related to their field of expertise.

Underlying system and information technologies will provide shared conceptualization to describe people, process and content. They will provide a semantic framework from which information can be harvested, modeled, published, retrieved, used and shared. The next generation of information technologies will be used to create, manage and extract value from their knowledge assets and to integrate these technologies to create a complete approach to the knowledge life cycle.

As there was no off-the-shelf computer application or integrated solution available for building the D&D knowledge base, ARC is building an approach that will service the DOE complex with a, high performance, n-tier web-based system for capturing the information from the DOE sites/facilities, ALARA centers, EFCOG and the D&D community as a whole as shown in Fig 1.

This system is being built using Microsoft.net framework, SQL server 2005, and SQL server reporting services. Visual Studio 2005, Dream Weaver and Photoshop were also used as development tools to construct the system.

RESULTS AND DISCUSSION

D&D KM-IT can be accessed from the web at www.dndkm.org. The system home page, shown in Figure 1, provides the interface to connect to the various components of D&D KM-IT.

D&D KM-IT
Knowledge Management Information Tool

HOME | COLLABORATORS | CONTACT US | Welcome Guest | Login

Powered by the Global D&D Community

Hotline | Technology | Web Crawler | Mobile System
Lessons Learned | Best Practices | Video Picture Library | ALARA Reports
Yellow Pages | Vendors | Collaboration Tools | Training

About D&D KM-IT
The D&D KM-IT is a web-based knowledge management information tool custom built for the D&D user community. This system is being developed by Florida International University - Applied Research Center (FIU-ARC) in collaboration with the Department of Energy (DOE EM20), EFCOG, and the ALARA Centers at Hanford and Savannah River.

To access all of the features of the D&D KM-IT System [Register](#)

Latest News
Hanford ALARA Workshop postponed until mid-2010
D&D KM-IT Vision Document coming soon!!!!
Lessons Learned will be made live by the end of May 2009.

D&D Focus Areas

Characterization: Solutions that address the challenges and problems to assist in the accurate location, classification and/or quantification of radiological contamination of DOE facilities.

Decontamination: Solutions that address the need to improve the decontamination of DOE facilities including process equipment and ductwork.

Dismantlement and Material Disposition: Solutions that address the challenges and problems to dismantle and reduce contaminated facilities' process equipment, support equipment, and ventilation ducts.

Worker Safety: Solutions that address the need to improve the protection of the health and safety of workers having to deactivate and decommission radiologically contaminated DOE facilities

Feedback

D&D KM-IT is in its development phase with features and enhancements being integrated and incorporated on a continuous basis. Please keep visiting us to see more exciting and valuable D&D information. Your feedback and input are important for the current and future development of this system, please [send your feedback](#)

D&D KM-IT is developed by Florida International University Applied Research Center (FIU-ARC) in collaboration with Department of Energy (DOE EM20), EFCOG, and the ALARA Centers at Hanford and Savannah River.

Design and Development by Applied Research Center at Florida International University with funding provided by U.S. Department of Energy - Environmental Management

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Figure 1 D&D KM-IT website home page

D&D knowledge management is the overall strategy, approach or philosophy followed to build the D&D KM-IT which is the information tool integrating knowledge management in the D&D area. Following are the new components or modules of D&D KM-IT that were successfully developed and deployed in fiscal year 2009-2010.

- **Technology Information Management**
- **Lessons Learned**
- **Best Practices**

Technology Information Management

The main objective for the D&D KM-IT Technology Information Management module is to maintain and enhance the technology information repository for D&D applications. The technology management component of D&D KM-IT will provide the D&D community with easy access to up-to-date information on technologies used in the deactivation and decommissioning of facilities. It will also facilitate collaboration on technology development, improvement, and deployment by providing a vehicle for information and experience exchange between developers, manufacturers, vendors, and users of technologies. This system will provide a comprehensive, easily accessible source of information on D&D technologies.

The Technology Information Management module will provide information on D&D technologies, demonstrations and vendors. The system will provide problem holders with up-to-date, reliable information on technologies in the following areas:

- Characterization
- Decontamination
- Dismantlement
- Worker Health & Safety

The D&D KM-IT Technology Information Management module will contain basic and advanced search features which allows users to search through published technologies, demonstration and vendor information. Extensive data mining work will be performed at FIU by DOE Fellows and will be published in the Technology Information Management module of D&D KM-IT after careful review by the experts.

Pictures, documents and videos can be added to the technology as they are entered. If the technology is demonstrated, then the relevant information regarding the demonstration can also be entered along with the supporting documents, pictures, videos, etc. Some features of the Technology Information Management module can be accessed through wireless devices like PDAs or cell phones. This will be made available through the mobile application module of D&D KM-IT.

Users can search for technology, demonstration and vendor information using the basic search feature of the wireless application. A full text search feature will allow the system to search through technology and demonstration documents based on the search criteria and display results based on the matching keywords. The search process will help the user or the vendor to search through the whole KM-IT Technology Information Management module. It is designed and developed in an efficient way to help users or vendors get complete information about the technology, demonstrations and all related information. The various subsystems of this module are as follows:

- Technology Management
- Demonstration Management
- Vendor Management
- Technology Search

The home page of the Technology Information Management module is shown in Figure 2.



Figure 2 D&D Technology Information Management home page

Technology Management

The technology module manages the D&D technology related information entered into the module repository. Technology information consists of technology name, description, benefits and limitations. It also records the source from where the technology information was obtained. Technologies are categorized based on the D&D category and sub-category or application category and sub-category. This helps in the advanced search process where the search can be narrowed to a specific technology category/sub-category or an application category/sub-category. Pictures, documents and videos can be

attached to the technology information to provide complete information about the specific technology. The technology fact sheet provides the interface for complete technology related information. It displays the technology name, category, sub-category, reference number, model number, date when the technology was entered and updated, description benefits, limitations, vendor information and a link to the vendor website, a list of demonstrations with a link to the demonstration fact sheet, and a list of all videos, pictures and documents attached.

Demonstration Management

D&D technologies are demonstrated to evaluate certain parameters of the technology. Technology demonstrations performed with specific objectives are captured through the demonstration management module. Demonstration information captured during the process includes the demonstration name, date, site location, objective, results and contact person information like name, email and phone. Once the demonstration information is captured, additional documents, videos and pictures can be attached to the demonstration information. The user can access all the demonstration information through the demonstration fact sheet which provides the demonstration objective, date, site/location, results and contact person information and with pictures, videos and documents in a single screen.

Vendor Management:

Vendor management captures all the vendor related information like vendor name, address, phone, fax, email, website and comments. Vendor fact sheets show all of the vendor information and any technologies associated with the vendor. Vendor information and associated technology will be monitored and maintained by FIU. DOE Fellows will work on D&D data mining activities and publish vendor and technology information to D&D KM-IT.

Technology Search

The technology search feature is designed to search the Technology database based on search selection criteria. It is divided into technology search and application search categories. The technology category includes characterization, decontamination, dismantlement and worker health & safety. These categories are further divided into sub-categories. Similarly, the application category and subcategory are created based on the application of the technology. The user can select the technology-based search or the application-based search. He/she can narrow down the search results based on the category and subcategory combination. The user can add a search string to refine the search process. Thus, the advanced search process allows granular control over the search and provides results specific to the user's needs.

D&D KM-IT
Knowledge Management Information Tool

HOME | COLLABORATORS | CONTACT US | Welcome Guest | Login

Technology Home | Search | Links | Help | Technology | Vendor | Technology Approval

Advanced Search

Technology Category Group: Characterization
 Application Category Category: Sampling & Analysis Equipments
 Vendor Subcategory: All Subcategory

Search String: Demonstrated 5 results Search

8 Records found

Advance Search Results

Alpha Sentry CAM System
 The spectroscopic algorithm (which uses a stripping method instead of ROIs) is extremely effective at subtracting out the radon daughter interference from the transuranic region of interest. This phys [...more](#)
 Source : Catalogs
 Category : Characterization > Sampling & Analysis Equipments > Analysis Equipment [Similar Pages](#)
 Vendor : [Canberra Industries, Inc.](#)

Beta Fiber-Optic-Sensor for Detecting Strontium-90 and Uranium-238 in Soil
 The BetaScint(TM) sensor is designed to measure beta emissions from Sr-90 and U-238 in soils. The sensor is 150x35x8cm; it can measure contamination of the soil surface or of a soil sample spread over [...more](#)
 Source : Laboratory for Energy-Related Health Research
 Category : Characterization > Sampling & Analysis Equipments > Analysis Equipment [Similar Pages](#)
 Vendor : [BetaScint, Inc.](#) Demonstrated

Compact Subsurface Soil Investigation System
 The uniqueness of the soil sampling equipment is the compactness of the Geoprobe Model 540. The Geoprobe Model 540 is capable of sampling in congested areas. The equipment fits in places that standar [...more](#)
 Source : Hanford C-Reactor
 Category : Characterization > Sampling & Analysis Equipments > Analysis Equipment [Similar Pages](#)
 Vendor : [Geoprobe Systems](#) Demonstrated

ISOCS for Free Release
 The Canberra ISOCS system is designed with the following materials: 55% efficiency germanium detector with a portable liquid nitrogen cryostat (a 5-day Big mac [dewar] Battery – or AC-powered In [...more](#)
 Source : Idaho National Engineering And Environmental Lab
 Category : Characterization > Sampling & Analysis Equipments > Analysis Equipment [Similar Pages](#)
 Vendor : [Canberra Industries, Inc.](#) Demonstrated

Lead Paint Analyzer
 The Niton 700 series analyzer uses X-ray fluorescence (XRF) spectrum analysis to identify and quantify elements in metal and then compares the readings to a built-in library to determine the alloy. Th [...more](#)
 Source : Idaho National Engineering And Environmental Lab
 Category : Characterization > Sampling & Analysis Equipments > Analysis Equipment [Similar Pages](#)
 Vendor : [NITON Corporation](#) Demonstrated

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Figure 3 Technology search

Lessons Learned

The lessons learned module enables the members of the D&D user community to understand and benefit from the past experiences gained while working on a specific project. The lessons learned module provides a repository of documents published by the D&D community. This will allow the users to share their experiences with the D&D community. This should help the D&D community to avoid difficulties that were faced previously. Registered users will be able to upload their documents or files which will be published on D&D KM-IT after careful review. This provides an opportunity for users to learn from each project phase, regarding the targets to be established and for the project to be assessed. Figure 4 shows an example of the lessons learned module search.

The screenshot displays the 'D&D KM-IT Knowledge Management Information Tool' interface. At the top, there are navigation buttons for 'HOME', 'COLLABORATORS', and 'CONTACT US', along with a 'Welcome Guest' message and a 'Login' button. The main heading is 'SEARCH LESSONS LEARNED DOCUMENTS', with an 'Upload Lessons Learned' button to the right. Below this is a search form with a 'Category' dropdown menu (set to 'All') and a 'Search String' input field. A dropdown menu is open below the search string, listing categories: 'All', 'Characterization', 'Decontamination', 'Dismantlement', 'Material Disposition', and 'Worker Safety'. The search results are presented in a table with columns for 'Category', 'Source', and 'Description'. Each row includes a 'View' link.

Category	Source	Description	View	
Decontamination	Information Bridge	LESSONS LEARNED AND BEST PRACTICES PROGRAM MANUAL	Lessons Learned and Best Practices Program within Lawrence Berkeley National Laboratory (LBNL) to ensure ongoing improvement of safety and reliability, prevent the recurrence of significant adverse events/trends, and determine implementation strategies that will help LBNL successfully meet the missions and goals set forth by the Department of Energy (DOE).	View
Dismantlement	FIU-ARC HIKER	LESSONS LEARNED WITH THE DISMANTLING OF THE KARLSRUHE REPROCESSING PLANT WAK	The WAK plant was closed down on June 30, 1991, after 20 years of hot operation. The dismantling of the plant started in 1994 with the decommissioning of obsolete systems and will be finished in 2009 with a green meadow. The dismantling activities are carried out by hands-on techniques, remote techniques, or a mixture of both, depending on radiological conditions. 5,500 tons of contaminated solid waste, 3,200 m3 of liquid waste, 130 canisters of HLW glass, and 75,000 tons of rubble will	View
Decontamination	ARC-FIU HIKER	PRELIMINARY LESSONS LEARNED FROM THE GUNITE AND ASSOCIATED	Make equipment as rugged as possible to avoid mechanical problems. - Consider personnel exposure consequences when designing systems and determining maintenance and procedures. - Maximize visibility with view ports and contamination covers, cameras, and lighting. - Design equipment interfaces.	View
Dismantlement	FIU-ARC HIKER	San Onofre Unit 1 Lessons Learned	450 Mw Westinghouse PWR w/3 Primary Loops • Commercial Operation 1968, Shutdown 1992 • Coastal Location, between Los Angeles & San Diego, CA • Shares physical site with SONGS 2 & 3 Units • Co-owned by SCE (80%) and SOG&E (20%) • SONGS 3 Fuel located in SFP, at SONGS 2 & 3 and at Morris, IL • On Federal land/Lease requires removal of structures	View
Dismantlement	FIU-ARC HIKER	Technology Application and Lessons Learned from ORNL Fuel Facility D&D	Reduce / stabilize loose surface • Reduces worker exposure potential • Reduces PPE requirements • Reduces possibility of release in downtown ORNL Low Contamination areas reduced to Faxed CAs • High Contamination areas reduced to Low CAs • Hot Cells downgraded from High CA, supplied breathing air required to standard negative pressure respirators	View

At the bottom of the page, there are logos for Florida International University (FIU) and Hanford Alara Center. Text on the right indicates 'Design and Development by Applied Research Center at Florida International University with funding provided by U.S. Department of Energy - Environmental Management'. A copyright notice at the bottom center reads 'Copyright 2009 D&DMMET. Disclaimer.'

Figure 4 Lessons Learned

Best Practices

Within knowledge management, best practices have become a key component in deciding the important steps to start a project and develop it in the right way. Straight talk, good advice, and real-life experience can all be tips for a successful D&D project. Best practices will provide the repository of D&D best practices documents that the user community has uploaded to the D&D KM-IT system. The search will return the links to the best practice documents from the above sites based on the search string entered by the user. This can provide helpful information to the D&D community, both new and experienced professionals in the field. D&D community can upload best practices documents which will get published after approval.

CONCLUSION

D&D KM-IT will provide single point access to all D&D related activities through its knowledge base. It is envisioned to be a community driven system. D&D KM-IT will make D&D knowledge available to the people who need it at the time they need it and in a readily usable format. It will use the World Wide Web as the primary source for content in addition to information collected from subject matter specialists and the D&D community. It will bring information in real time through web based custom search processes and its dynamic knowledge repository.

Future developments include a custom web search engine and D&D information access through mobile devices. The goal is to develop a high-end sophisticated and secured system that will serve as a single large knowledge base for all the D&D activities. The system will consolidate a large amount of information available on the web and present it to users in the simplest way possible.