Tech Fact Sheet

Oak Ridge Institute for Science and Education ***Tennessee***
Pacific Northwest National Laboratory ***Washington***

D&D and Risk Assessment Tools

Challenge

The Department of Energy has numerous facilities which require deactivation and decommissioning (D&D). While carrying out the D&D of these facilities various health, safety and environmental requirements must be met. The challenge addressed in this study is to develop tools to assist the D&D workforce to be in compliance with the requirements, to efficiently and effectively manage risk from health and safety concerns, to promote safety in D&D activities, and to provide computer-based models to people doing the work. The Pacific Northwest National Laboratory (PNNL) and the Oak Ridge Institute for Science and Education (ORISE) each undertook a portion of the work.

Tech Solution

ORISE and PNNL both developed tools to assist in the risk assessment and planning of D&D activities. PNNL developed a Risk D&D tool, a rapid prototype computer-based model, to evaluate alternatives in the sequencing of D&D work. The tool utilizes the Pertmaster© software as a platform for a custom risk register that integrates the evaluation of health and safety risk and project risk. The software utilizes a macro to evaluate optional D&D approaches. Pertmaster© is widely used in industry to assess project schedule and cost risks; however, in this setting, the goal is to augment the project risk characterization with safety and health risk, allowing analysis, comparison, reduction and documentation of the risks associated with optional D&D work sequences or approaches. A typical output of the evaluation of several alternatives is shown to the right (Fig.1).

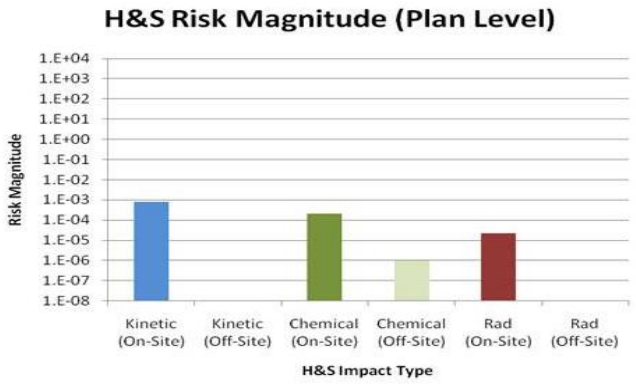

Figure 1: Risk D&D's evaluation of several D&D work sequence alternatives.

ORISE developed: 1) a "Job Hazard Analysis Tool (JHA)" – a computerized checklist for hazard identification and categorization, particularly for industrial hygiene and health physics approval and 2) an electronic "Detector Selection Tool" for recommended radiological instrument for final status surveys to confirm the completion of radiological decontamination. The JHA tool is software which leads the user through a categorized hazard listing, assists in hazard selection, and creates a JHA complete with mitigation controls. A flowchart of the JHA process is shown to the right, superimposed on a typical input screen (Fig.2). The "Detector Selection Tool" compares radionuclides of concern and survey media to detector capabilities. With input data on radionuclides of concern, the tool recommends radiation detectors that have the necessary detection capabilities.

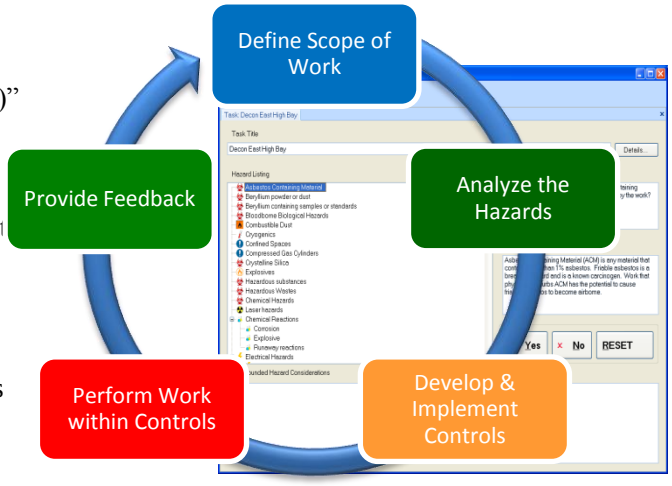

Figure 2: Flowchart of JHA process with an example of an input screen

Site Project & Identifier	Tech Stage: Demonstration
Oak Ridge Institute for Science and Education and Pacific Northwest National Laboratory – D&D Risk Assessment Tools	Tools have been received from the developers and are in a test and evaluation status.

Tech Accomplishments
The PNNL and ORISE software products are available for the testing and evaluation of alternative work sequences for D&D; supporting health, safety and environmental evaluations at D&D sites; and determining radiation detection possibilities for particular radiological survey needs.

The Risk D&D software uses commercially available schedule and cost risk assessment software to evaluate D&D activities from both safety & health and project risk points of view, supporting identification of a risk-optimal sequencing of D&D work.

The JHA software utilizes questions and answers to computerize typical health and safety hazard assessments relating to D&D work.

The Detector Selection Tool provides a computerized identification of possible radiation detectors, based on the input of the radiation type, radionuclide, and the media.

Impact
The products have the potential to enhance D&D planning, work sequencing, safety and radiation protection. This will potentially help identify best practices and avoid health, safety and radiological problems. In turn, this will promote the successful completion of D&D projects.

Impact and Features

- The Risk D&D tool facilitates the evaluation of multi-attribute risks in the assessment of possible D&D sequences
- The JHA tool provides analysis of job hazards in the conduct of D&D work
- A Detector Selection tool provides suggestions on radiation detection instruments for final status surveys to demonstrate completion of D&D
- The tools have the potential to promote more efficient and safer conduct of D&D activities

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Technology Name	• Risk D&D • Job Hazard Analysis Tool • Detector Selection Tool
Federal End User Information	W. Alexander Williams DOE EM-44 301-903-8149
Tech User Information	TBD
Web Links	TBD
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Challenge Category	Tech Solution Category
• Deactivation & Decommissioning • Health and Safety • Work Sequencing • Job Hazard Analysis • Radiation Detector Selection	• Information Tools • Risk and Safety Evaluation