

# **EFCOG Best Practice, Achieving the First Record of Decision on a Canyon in the Complex**

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the  
U.S. Department of Energy under Contract DE-AC06-96RL13200

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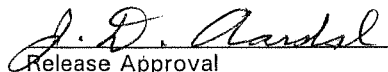
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# EFCOG Best Practice #55

**Facility:** Hanford Site, Richland, Washington

**Best Practice Title:** Achieving the First Record of Decision on a Canyon in the Complex

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**Brief Description of Best Practice:**

One of the most challenging precursors to performing environmental cleanup is reaching a decision on a cleanup alternative that is agreeable to the U.S. Department of Energy (DOE), regulatory agencies, and stakeholders, who represent a multiplicity of interests. Furthermore, the difficulty in achieving a decision is directly related to the complexity of the cleanup effort itself. Challenges include physical aspects such as obtaining the quantity and quality of characterization data required to provide a basis for decision-making. They also include, however, organizational aspects such as maintaining commitment and consistency in thought over the length of time needed to perform evaluations and reach a decision, while budgets fluctuate, leadership changes, and priorities evolve. Activities leading to the issuance of a cleanup decision for Hanford's U Plant exemplify the complexity of reaching cleanup decisions for the many substantial structures still to be addressed across the DOE complex. The difficulties associated with reaching a decision for U Plant were significantly reduced as a result of implementing this Best Practice.

The U Plant "Canyon" is an 800-plus-foot long concrete structure constructed, as were four other canyon facilities at Hanford, to chemically separate plutonium from fuel rods irradiated in Hanford's production reactors. An examination of the way the Record of Decision (ROD)<sup>a</sup> on the U Plant Canyon was achieved provides a Best Practice methodology for achieving decisions on other substantial structures:

- Create, sustain, and empower an interagency project team committed to resolving challenges.
- Establish an Agreement-in-Principle (AIP) among DOE and applicable environmental regulatory agencies to define the cleanup problem and the framework under which it will be solved.
- Divide major initiatives into meaningful but achievable subtasks and focus on completing one of the easier subtasks first to create success to build upon.
- Provide regular opportunities for DOE and regulatory agencies to interact jointly with stakeholders.
- Plan and coordinate with regulatory agencies and stakeholders to identify and resolve potential issues at the outset.
- Conduct independent validation of project scope, schedule, budget, risks, and associated road blocks early in the project.

In 1995, a Canyon Disposition Initiative (CDI) team was formed comprising members from DOE, the U.S. Environmental Protection Agency (EPA), and the State of Washington Department of Ecology (i.e., the "Tri-Parties") as well as from major site contractors. The CDI team developed a plan, including a range of alternatives for dispositioning the five canyons at Hanford, reviewed it with stakeholders, and cemented it in an AIP signed by the Tri-Parties the following year. The AIP established that the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Remedial Investigation/Feasibility Study process

would be followed, on a case-by-case basis, to evaluate potential cleanup remedies and identify a preferred alternative for the final end state for the five canyons. The U Plant Canyon was chosen as the pilot for the proof of concept, due to its relatively low radiological loading and more limited number of regulatory issues that needed to be addressed.

In conjunction with the public interactions required under the CERCLA process, from 1996 through 2005, the CDI team implementing the AIP primarily gained stakeholder perspective through frequent presentations and updates to the Hanford Advisory Board (HAB). The HAB is an independent, non-partisan, and broadly representative body advising the Tri-Parties on selected major policy issues related to the cleanup of the Hanford Site. In 1997 a draft Phase I feasibility study was prepared for the U Plant, and based on that study, the HAB provided a letter to the Tri-Parties framing its concerns regarding the CDI. This issues letter provided an important guidepost to the Tri-Parties through the years as players changed. Additionally, the DOE interacted directly with affected Indian nations as designee of the Federal government. Lastly, in 2001 and 2005, the Tri-Parties supported the Hanford communities in providing informational local television broadcasts covering the CDI and the overall vision for closure of the U Plant area. Team input, stakeholder reviews, and independent validation early in the project allowed identification of the most difficult issues and prompt initiation of issue resolution actions (such as specific characterization and studies) to be accomplished on a schedule to support the decision-making process.

The U Plant final ROD was issued in the fall of 2005 as the first final ROD for the remediation of a DOE canyon facility and the first ROD calling for leaving waste in place on the Hanford Central Plateau under an engineered evapotranspiration barrier. The ROD was recognized by the EPA as one of three RODs of the Year for Fiscal Year 2005. Numerous complex regulatory and technical issues were resolved to reach a final remedial decision that will protect the environment and minimize risk to the workers during cleanup. The selected "close-in-place" remedy for U Plant involves the removal of some long-lived radionuclides from the facility and disposal to an out-of-state geologic repository, consolidation of contaminated equipment into below-grade cells, filling the equipment and cells with grout, collapsing the structure above the canyon deck, installing an engineered soil barrier, and conducting long-term monitoring. The remedy is sufficiently robust that the ROD documents the regulatory agencies' approval of waivers and variances from various environmental requirements for the disposal of the variety of hazardous wastes that are currently within the canyon.

#### **Why the Best Practice was used:**

The U Plant is one of five canyons at Hanford that were similarly constructed as concrete monoliths to chemically process irradiated fuel, and consequently contain significant amounts of residual radioactive material. As of the early 1990s, planning for their cleanup consisted basically of deactivating the facilities, followed by many years of surveillance and maintenance before they would be decontaminated, demolished, and disposed of in a traditional manner. This approach was characterized by significant projected cost and carried with it a fair amount of industrial and radiological safety risk. This Best Practice was used to reach a better decision for the U Plant as a pilot project for the remaining four canyons through the CDI.

### **What are the benefits of the Best Practice:**

Benefits of implementing this Best Practice are improved safety, reduced cost, and increased confidence among regulatory agencies and stakeholders that innovative solutions can be achieved together. The Best Practice also establishes a team that can effectively promote obtaining waivers and exemptions from governing regulations where the intent of those regulations is otherwise met with an innovative approach. Precedent has been set for the close-in-place disposal of canyons and other substantial structures across the DOE complex.

### **What problems/issues were associated with the Best Practice:**

Over the nine years between establishing the AIP and issuing the ROD, nearly all the major players changed. With those changes in personnel, there were at times pushes to change the scope outlined in the AIP. While reassessment of a project can be good, it many times serves as an unwarranted distraction that can prolong the decision-making process, increase the cost, and even put the outcome in jeopardy. Future deployment of this Best Practice would benefit from including in the AIP provisions for 1) existing players to indoctrinate new players with the content of the AIP and history of the project as it has progressed and 2) formally evaluating proposed changes in scope, which is an essential practice for good project management.

Additional lessons learned and best practices regarding the U Plant Canyon (i.e., 221-U Facility) ROD are provided in the following noteworthy sources:

- DOE Office of Inspector General Report DOE/IG-0672<sup>b</sup>, "Department of Energy Efforts to Dispose of Hanford's Chemical Separation Facilities," February 2005.

The CDI concept held that significant cost avoidances might be realized by using the canyon buildings for permanent disposal of low-level waste instead of demolishing the buildings and disposing of the resulting waste in another location. Thus, early CDI concepts involved disposal of Hanford Site wastes both inside and outside of the canyon structure, followed by the installation of a surface barrier to provide long-term containment for the concrete structure and waste fill. To ensure that the use of canyons are maximized in the future, management committed to identify waste disposal possibilities in current and near-term feasibility studies and modify the approved U Plant Canyon ROD if an appropriate waste stream is identified.

- D&D-35827<sup>c</sup>, "Project Experience Report, Canyon Disposition Initiative (221-U Facility)," January 2008.

This report provides a summary of Lessons Learned associated with the CDI for the U Plant Canyon. The report provides recommendations for the U Plant Canyon and future projects, as well as opportunities for improvement for future projects throughout the DOE Complex.

### **How the success of the Best Practice was measured:**

The success of this Best Practice was measured in achieving the first ROD on a canyon structure in the complex. Projected net present worth costs of the full removal alternative and the chosen close-in-place alternative are \$84 million and \$67 million, respectively. The close-in-place alternative also realizes an improvement in worker safety in that a lesser degree of heavy demolition activities involving radiological hazards is required. Additionally, the close-in-place alternative

provides greater long-term protection of the environment than the full removal alternative.

**Description of process experience using the Best Practice:**

Use of this Best Practice buoyed the effort to achieve a ROD on the U Plant Canyon through changes in budgets, leadership, and priorities. At times funding constraints slowed progress, and the momentum generated by CDI was essential to bridging those gaps to achieve the goal of a ROD over the long run.

This Best Practice embodies Integrated Safety Management System Core Function 1: "Define Scope of Work." Clear definition of the task to be performed and the goal to be achieved is essential to safely and successfully completing a specific work task in the field, and even more so for completing long-term projects in the regulatory arena. For complex situations, independent validation of task definition, including early identification of major challenges to achieving the goal, further improves the probability of success.

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<sup>a</sup> U Plant ROD

<http://www.efcog.org/bp/p/doc/cdiROD.pdf>

<sup>b</sup> DOE/IG-0672

<http://www.efcog.org/bp/p/doc/ig-0672.pdf>

<sup>c</sup> D&D-35827

<http://www.efcog.org/bp/p/doc/cdiPER.pdf>