ACCELERATED CLOSURE OF THE HANFORD SITE

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ABSTRACT

Cleanup of the Hanford Site is currently planned to take until 2046 and another approximately $50B. In the summer of 1999, Fluor Hanford initiated an "Accelerated Closure Team" to evaluate opportunities to reduce this long schedule and high cost for the parts of the Hanford Site, which they manage. To-date, this breakthrough team has developed two approaches, which will move > 50 million curies away from the Columbia River sooner than planned and at a significantly reduced cost. The approaches successfully applied so far are presently being applied to other opportunities at Hanford.

BACKGROUND

Under the management of three prime contractors, cleanup of the Hanford Site is proceeding rapidly with progress being made in several major areas. Hanford contractors are deactivating and decommissioning (D&D) reactors, moving spent nuclear fuels away from the Columbia River and into dry storage in the center of the site, cleaning out uranium and plutonium-contaminated facilities, and preparing to vitrify High Level Waste. Although significant progress is being made, the baseline schedule for completion of the cleanup effort is 2046, and projected costs are in excess of $50 billion dollars.

In the summer of 1999, Fluor Hanford initiated the concept of a dedicated Accelerated Closure Team (ACT) for the purpose of accelerating cleanup of the specific areas of the Hanford Site using lessons learned and technologies from other U.S. Department of Energy (DOE) Sites. The team leaned heavily on principles used at Fernald, which is the other site that Fluor manages. In the first year of operation, this team has had startling success in several areas.

Work Description

The first area evaluated, known as the 300 Area, is located just North of the City of Richland Washington along the Columbia River (Figure 1). This section of the Hanford Site was dedicated since the 1940's to research and development activities and fuel fabrication.

Fig. 1. 300 Area, North of the City of Richland

The baseline plan for cleaning up this area was to stabilize the most risky facilities in the next several years. Because of budget constraints and competing site priorities, it was determined that stabilized facilities would remain in that standby condition until the late 2030's.

Using the section by section approach implemented at Fernald, plutonium facility cleanup experience from Rocky Flats and Idaho National Engineering Environmental Laboratory, and the support of Pacific Northwest National Laboratory, a new plan was prepared. This plan shortened the schedule by more than 30 years, reducing the cost by over $1 billion. The result of implementing this accelerated plan will be an area ready for release for future uses by the year 2010.

The Accelerated Closure Team has moved on to other areas of the Hanford Site with similar successes. The most notable example is the identification of a method to remove the spent

nuclear fuel and highly reactive sludge from the K Basins, also along the Columbia River, much more quickly (Figure 2). Much of the fuel has degraded over the years producing 50 cubic meters of 'sludge.'

Fig. 2. Spent Fuel in K Basins

This material was originally thought to be high-level waste and would have required extensive treatment prior to placing into Hanford's high level waste underground storage tanks.

Further evaluation of the material led to the determination that it was remote handle (RH) transuranic (TRU) waste and could be merged with the other RH TRU waste onsite avoiding a $100M cost for treatment and reducing the schedule by one year.

Summary

Fluor Hanford continues to evaluate new management approaches and technologies for ways in which to accelerate cleanup of the Hanford Site. These accelerated closure evaluations have led to a series of lessons learned that will be applied to the next series of projects being evaluated for acceleration. These lessons learned include: implementing a "dedicated team" of innovative thinkers that form the core of each project evaluation, early involvement of the client and the regulators, involvement of the Site's technology staff, and use of experts from other DOE Sites where applicable.

Several other breakthrough initiatives are in the works in the following areas:

Remote-Handled Transuranic Waste – The current Hanford Site baseline and life-cycle waste forecast predicts that nearly 1,900 cubic meters of remote-handled transuranic (RH-TRU) waste will be generated by waste management and environmental restoration activities at Hanford. These 1,900 cubic meters, comprised of both transuranic and mixed transuranic waste, represent approximately 40 percent of the total estimated inventory of RH-TRU to be disposed of at the Waste Isolation Pilot Plant.

River Corridor Clean up – In 1996, attention was focused on the portion of the Columbia River that flows through the Hanford Site when the Department of Interior issued a Record of Decision (ROD) based on the *Final Hanford Reach of the Columbia River Comprehensive River Conservation study and Environmental Impact Statement*. The ROD recommended that the Hanford Reach portion of the Columbia River be designated a "recreational river" as defined by the National Wild and Scenic River Act of 1968 and that a National Wildlife Refuge be established on the Wahluke Slope of the Hanford Site. The management of the Hanford Reach and the National Wildlife Refuge was determined in June 2000 when President Clinton proclaimed the Hanford Reach a National Monument and designated the U.S. Department of Interior Fish and Wildlife Service (FWS) to manage the Monument. Since some of the Hanford Site along the shoreline of the Columbia River included in the boundaries of the Monument continue to be the responsibility of the U.S. Department of Energy (DOE) and have not yet been cleaned up to be made available for alternative use, cooperation between DOE and FWS will be required.

Consistent with this on-going interest in prioritizing cleaning up of the Hanford Site along the Columbia River, the DOE Richland Operations Office (RL) has established a long-rang vision for the Hanford Site that includes a major focus on "Restoring the River Corridor." In August, 2000, RL unveiled a plan to accelerate the cleanup of the River Corridor, *"Hanford 2012 – Accelerating Cleanup and Shrinking the Site."* This plan outlines an approach to *accelerate* cleanup along the river and shrink the Hanford Site from 560 square miles to 75 square miles by 2012. In a report to Congress in November 2000, DOE descried the plan as a phased approach "to reduce risk to the Columbia River, accelerate visible cleanup progress, and reduce costs." In

submitting the report to Congress, DOE described their follow-on plan to make Hanford land along the river corridor available for alternative use. As the clean up of distinct areas of the river corridor are complete, DOE will petition the EPA to remove those areas from the Superfund National Priorities List (NPL). After being removed from the NPL, these areas will become available for other uses as determined in consultation with the FWS, tribal nations and stakeholders.

Plutonium Finishing Plant – The Plutonium Finishing Plant (PFP) was constructed from 1947 to early 1949, with hot operations commencing July 5, 1949. During it's production and operation from 1949 to the mid 1980's a significant portion of the Pu produced by the United States was processed at PFP.

After production ceased at PFP, an extensive and diverse in inventory of Pu-bearing materials remained. The DOE and the Defense Nuclear Facility Safety Board (DNFSB) have established a series of milestones to reduce the risk to the worker, the public, and the environment.

The material remaining at PFP must be stabilized and repackaged before deactivation and dismantling the facility can be completed.