

FLUOR HANFORD PROJECT-FOCUSED PROGRESS AT HANFORD

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ABSTRACT

Fluor Hanford is making significant progress in accelerating cleanup at the Hanford site. This progress consistently aligns with a new strategic vision established by the U.S. Department of Energy's Richland Operations Office (RL). This vision includes restoring the Columbia River Corridor by moving spent nuclear fuel out of the K Basins, drying it in the Cold Vacuum Drying Facility, and then placing it in an interim state at the Canister Storage Building. In addition, efforts continue to safely decontaminate facilities once used for Hanford's radiological research and fuel fabrication. A second aspect of RL's vision includes transitioning the central plateau. This includes safely stabilizing the plutonium inventory at the Plutonium Finishing Plant (PFP) and retrieving, repackaging, storing and preparing for off-site disposal of thousands of tons of radioactive and hazardous and transuranic (TRU) waste as well as on-site management of some of the nation's most complex wastes. The final aspect of this vision is to re-deploy Hanford's assets for local communities to benefit.

INTRODUCTION

Fluor Hanford, a Fluor Global Services company, manages cleanup and economic transition of the 560-square-mile Hanford site located in southeast Washington State under contract to the U.S. Department of Energy (DOE). As FY 2000 approached, the DOE's Richland Operations Office announced a new strategic vision for the site:

- Restore the Columbia River corridor,
- Transition the site's central plateau for long-term waste management, and
- Put Hanford's assets to work for the future of the Tri-Cities and neighboring communities.

Fluor Hanford is making significant strides to make DOE's vision a reality. As a result, Fluor Hanford has developed and implemented a new commercial-based business model that is aligned with the vision. The model is a flexible, project-focused organization. Specific advantages of this new model include:

- Significant reduction in indirect costs (cut \$98 million since FY 1996),
- Flatter organization in which layers of management have been eliminated,
- Doubled worker to management ratio from 5.5:1 to 11:1,
- Consolidated eight individual corporate business systems into one,
- Increased project focus and efficiencies,
- 200 employees have been reassigned from their previous integrator role to the field where cleanup is taking place,
- Joining together the employees of our subcontractor team, allowing us to capitalize on each individual's skill, regardless of contractor affiliation, and
- Increased focus on accelerated cleanup (e.g., 300 Area Accelerated Closure), to free up money for other important cleanup work.

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In addition, streamlining Fluor Hanford operations allows the Hanford site to take fuller advantage of Fluor's commercial project-management expertise.

The significant progress achieved by Fluor Hanford is heightened by consistently strong safety performance through sustained emphasis on worker safety and implementation of the Integrated Environment, Safety and Health Management System (ISMS). Since 1996, Fluor Hanford has reduced the lost workday accidents by more than a factor of three and the Occupational Safety and Health Act (OSHA) recordable rate by a factor of two, and is one of the top three DOE Contractors in safety performance.

RESTORING THE COLUMBIA RIVER CORRIDOR

The Spent Nuclear Fuel project is one of the nation's highest environmental cleanup priorities. Nearly 80 percent of the DOE's inventory of spent nuclear fuel is stored underwater at Hanford in two 4.94-million-liter (1.3-million-gallon) pools. The pools, known as the K Basins, are less than a quarter-mile from the Columbia River. The K Basins are aging and the fuel is corroding, so the fuel must be moved to safe interim storage to minimize risk to the Columbia River until a permanent national repository is established.

The project's goal is to move the more than 2,070 metric tons (2,300 tons--7,200 canisters) of corroding spent fuel from the K Basins and dry it in the new Cold Vacuum Drying Facility. It will then be placed in a safe and stable interim state in the newly constructed Canister Storage Building at Hanford's 200 Area Plateau, thus eliminating a threat to the Columbia River.

Fuel movement in the Spent Nuclear Fuel Project will begin by November 2000, or earlier, and continue uninterrupted until all fuel and sludges are removed. Significant progress has been made in preparation for the fuel movement, including:

- Successfully completed ISMS verification,
- Completed construction of the Canister Storage Building, Cold Vacuum Drying Facility, and installation of the Integrated Water Treatment System and Fuel Retrieval System in K West Basin,
- A Phased Startup Initiative is underway that will accelerate early fuel movement,
- Began K West Basin system "cold testing" in January 2000,
- "Hot testing" will begin in May 2000, and
- Fabrication is underway on 2,170 baskets and 400 canister overpacks to hold the fuel during removal, drying, and storage.

In addition, an innovative "breakthrough initiative" is being evaluated to remove and store radioactive sludge left in the basins after fuel is removed. Closure of the entire Spent Fuel project will be within the decade, allowing vital cleanup funds to be shifted to priority projects.

Contaminated facilities near the Columbia River are being safely decontaminated and waste is being consolidated in the 200 Area, reducing risk to workers and the environment. For nearly 50 years, the 300 Area just north of Richland, Washington, was the center of Hanford's radiological research and fuel fabrication. That activity resulted in highly contaminated facilities and a large inventory of radioactive materials. One of the most urgent Hanford cleanup priorities is to safely

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clean contaminated buildings and ship radioactive and hazardous waste out of the 300 Area to approved storage - away from Richland and the Columbia River. Current focus is on deactivation of the 324 and 327 Buildings – highly radioactive facilities that contain heavily shielded enclosures (hot cells) once used to examine and test reactor fuel elements and other irradiated materials. Since deactivation began in 1996, major progress has been made and significant quantities of radioactive material have been moved out of the 324 and 327 Buildings including:

- Three of eight “hot cells” are now clean, and legacy waste from the facility has been moved to regulated storage facilities in the Central Plateau,
- The last of 12 two-story, highly contaminated equipment racks were remotely cut up and removed from the 324 Building’s B-Cell,
- 150,000 curies of spent fuel or waste products have been sent to the 200 Area Storage Facility,
- 8 million curies of waste were vitrified into safe glass logs and sent to the 200 Area Storage Facility,
- 400,000 curies of cesium were sent to the Waste Encapsulation Storage Facility (WESF), and
- 236 waste containers were sent to the 200 Area Storage Facility

An alternative, resourceful strategy is being developed to expedite cleanup of Hanford’s 300 Area. This plan is expected to accelerate cleanup by decades, allow remediation of large parcels of land at one time, and free up money for other cleanup work.

TRANSITIONING THE CENTRAL PLATEAU

The Nuclear Material Stabilization Project is an important piece of the 200 Area conversion effort. The project’s goal is to safely stabilize the plutonium inventory at the Plutonium Finishing Plant (PFP), and deactivate and dismantle associated contaminated buildings. Significant progress made in nuclear material stabilization includes:

- Restarted the prototype vertical calciner to stabilize plutonium solution. The calciner heats plutonium nitrate solutions, converting them to a more stable oxide powder.
- Completed design for Magnesium Hydroxide Precipitation (MgOH) process, which chemically separates plutonium from solutions. This process, which eliminates a step in stabilization, was adopted from Rocky Flats in a cooperative effort between Fluor Hanford and Pacific Northwest National Laboratory (PNNL).
- Shipped 11 kg (24.3 pounds) of highly enriched uranium to Oak Ridge National Laboratory in Tennessee.
- Processed 150 oxide and sludge items - 40 more than targeted.
- Installed three additional muffle furnaces to increase plutonium stabilization capacity.
- Installation of bagless transfer system underway.
- Cementation process will restart in April 2000.
- New plutonium solution process to be operational by July 2000.
- A joint Fluor Hanford-PNNL effort to disposition polycubes is underway, a unique Hanford technical challenge.

In addition, we have placed a contract with Westinghouse Safety Management Solutions effective in February 2000, which will significantly accelerate stabilization.

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The Nuclear Materials Project is dealing with the “worst first.” This translates:

- To acceleration of plutonium polycubes stabilization by more than two years, and
- Deactivation of PFP is being moved up to 2010: 15 - 20 years early – and \$1 billion under budget.

Hanford's legacy from decades of defense production includes large volumes of waste that must be managed. The Waste Management Project is retrieving, repackaging, storing, and preparing for offsite disposal of thousands of tons of radioactive and hazardous waste. Significant progress in waste management includes:

- Efficiencies which resulted in a savings of \$45 million since 1996,
- Began onsite mixed low-level waste disposal (the first in a DOE complex) more than 17 months early, and
- Reduced the number of contamination areas at the Waste Encapsulation and Storage Facility by successfully removing 34 cubic meters (1,200 cubic feet) of low-level waste, and 1.98 cubic meters (70 cubic feet) of mixed waste.

In addition, Hanford is making final preparations to begin shipping transuranic (TRU) wastes to the federal repository in New Mexico. Hanford could be one of the first DOE sites to do so in compliance with the new Resource Conservation and Recovery Act (RCRA) Part B Permit requirement of the New Mexico Ecology Department. Significant accomplishments in preparation include:

- Began TRU waste retrieval from the low-level burial grounds 14 months early,
- Accelerated retrieval of Hanford's buried TRU waste drums by 24 months, minimizing the risk of container failure and avoiding added characterization costs,
- Received high marks in the initial certification assessment of the TRU Waste Program. Final certification is expected in the spring upon completion of a joint DOE-Environmental Protection Agency (EPA) audit.

The Waste Management Project will continue to develop creative and cost saving methods of waste treatment and storage. Existing Hanford facilities are undergoing rigorous evaluations to determine if they have a future in waste treatment or storage.

FORMER HANFORD ASSETS ARE BEING REDEPLOYED FOR LOCAL COMMUNITIES TO BENEFIT

In support of the vision of putting Hanford's assets to work, Fluor Hanford strongly supports economic diversification, stabilization and growth of the Tri-Cities and the region. As a result of Fluor Hanford's efforts:

- More than 1,500 jobs have been created – 40 percent over goal since October 1996.
- Asset conversion efforts helped re-distribute nearly \$30 million worth of Hanford equipment to the local community in 1999.
- The Fluor Hanford Team has contributed more than \$3 million to the community since 1996.
- 25 percent of the total local United Way budget is provided by Fluor Hanford and its employees.
- \$1.8 million has been invested in local businesses by Columbia Basin Ventures.

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In addition, the Fluor Corporation recently relocated a strategic business operation to the Tri-Cities, specifically to seek other contracts outside of Hanford and expand the Fluor Federal Services business. Fluor continues to demonstrate outstanding corporate citizenship in the region. Specific examples include:

- A 100,000 square foot, \$4.3 million Fluor-financed, industrial building is being constructed to attract new business to the Tri-Cities.
- Fluor Global Services is partnering with the Tri-City Industrial Development Council to attract new business.
- More than \$110,000 has been contributed by the Fluor Foundation for local scholarships since 1996.
- The Fluor Team has donated \$65,000 to local universities for scholarships since 1996.

The family wage jobs Fluor has created today provide incentive for families to lay roots in the region for generations to come.