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Hanford Decommissioning Update: September 2007

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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Richland, Washington

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Fluor Hanford

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Michele Gerber, Fluor Hanford

Triple Victories at Hanford's K Basins

Fluor Hanford's K Basins Closure (KBC) Project tallied three major accomplishments at the U.S. Department of Energy's (DOE's) Hanford Site in southeastern Washington State this past summer. The Project finished emptying the aging K East Basin of both sludge and the last pieces of scrap spent nuclear fuel. It also completed vacuuming the bulk of the sludge in the K West Basin into underwater containers. The 54-year-old concrete basins once held more than four million pounds of spent nuclear fuel and sit less than 400 yards from the Columbia River. Each basin holds more than a million gallons of radioactive water.

In 2004, Fluor finished removing all the spent nuclear fuel from the K Basins. Nearly 5o cubic meters of sludge remained -- a combination of dirt, sand, small pieces of corroded uranium fuel and fuel cladding, corrosion products from racks and canisters, ion-exchange resin beads, polychlorinated biphenyls, and fission products that had formed during the decades that the spent nuclear fuel was stored underwater.

Capturing the sludge into underwater containers in the K East Basin took more than two years, and vacuuming the much smaller volume of sludge into containers in the K West Basin required seven months. Workers stood on grating above the basin water and vacuumed the sludge through long, heavy hoses. The work was complicated by murky water and contaminated solid waste (debris). Pumping was paused several times to safely remove and package debris that totaled more than 370 tons.

In October 2006, Fluor Hanford workers began pumping the sludge captured in the K East Basin containers out through a specially designed pipeline to underwater containers in the K West Basin, about a half mile away. They used a heavy but flexible, double-walled "hose-in-hose" system. Pumping work progressed slowly at first, but ramped up in spring 2007 and was completed on May 31.

Just a week before sludge transfers finished, the KBC Project removed the last few small pieces of irradiated fuel (about 19 pounds) found as the last remnants of sludge were vacuumed up. The fuel was loaded into a cask that sat underwater. The cask was hoisted out of the water, decontaminated, and transported to the K West Basin, where it is now being stored underwater until it can be dried and taken to storage in central Hanford.

Removing the sludge and fuel from the K East Basin eliminated the final major radioactive sources there, and made the Columbia River and the adjacent environment safer for everyone who lives downstream.

Fluor's priority at the K East Basin quickly turned to final preparations for demolishing the structure. Final activities to sort debris are progressing, along with plans to de-water the basin and turn it to rubble in the next two years. At the K West Basin, after the bulk sludge was removed July 3, workers began preparing to load out the last of the "found" nuclear fuel and to complete final pass sludge collection this coming year.

241-Z Plutonium Liquid Waste Treatment Facility Demolished

Fluor's Central Plateau Deactivation and Decommissioning (CP D&D) Project, along with workers from the Plutonium Finishing Plant (PFP) Closure Project achieved another major success in June when they finished demolishing the 241-Z Liquid Waste Treatment Facility at PFP. They also completed removing rubble and stabilizing the site, declaring victory on June 1. Demolishing the facility met a milestone in the Tri-Party Agreement (TPA), Hanford's cleanup pact, four years and four months early! In addition Fluor demolished two small structures ancillary to the 241-Z Facility.

Demolishing the sheet-metal 241-Z facility, removing rubble and stabilizing the site took exactly six weeks from start to finish. The task generated about 480 cubic yards of low-level debris. The concrete slab floor of the facility was sealed, covered with a robust polyurea membrane, and then overlaid with two-to-three inches of gravel.

Fluor began planning for cleaning out the 241-Z Facility five years ago, and started physical remediation work on five highly contaminated vaults and tanks under the facility in late 2005. The 241-Z Facility was part of the original PFP construction during 1947-49; however the above-ground portion of the building was erected in the early 1980s.

Current milestones in Hanford's Tri-Party Agreement call for the PFP complex to be razed to "clean slab-on-grade" status by 2016. Currently, Fluor Hanford has removed contaminated equipment from 90 gloveboxes and hoods in the main PFP building. Fluor also built and deployed a robot under the concrete "cap" of a historical "crib" or ground waste disposal site near PFP. This crib received some of the wastes transferred through the 241-Z Facility. The robot is relaying photos that are helping to define cleanup plans for equipment in the crib.

To view a video about 241-Z Facility cleanout, go to www.hanford.gov then click on Videos on the left side of the screen, and then click on "241-Z Cleanout Work Evolution."

Cumbersome Cleanout of 212-N Building Nearly Complete

Fluor Hanford's CP D&D Project worked through the summer to clean out the 212-N Storage Building in north central Hanford, first reported in the Spring *DD&R Newsletter*. The World War II 212-N Building was storing 15 large crates of contaminated equipment from the 1970s, as well as the insulating material that encased it.

The crates were tightly packed into the 212-N Building. They covered and rested on both sides of rail track that traverses part of the structure, and also lay on a mezzanine that could no longer be accessed by crane. The facility also contained large quantities of rockwool insulation that had been blown in as a fire retardant around the crates. Steel walls and part-wall partitions served as forms to hold the rockwool around the crates. Equipment and piping in the crates bearing small quantities of mixed oxide (plutonium and uranium) materials from a fabrication mission required that the 212-N Building be maintained under a nuclear Hazard Category 3 level.

Removing the crates and surrounding packing materials, overpacking or re-packaging them, and transporting them to safe interim storage in a Hanford facility built to deal with mixed and transuranic (TRU) wastes would allow the 212-N Building to be downgraded it to a "radiological" facility, and would "shrink the footprint" of nuclear facilities to an area closer to Hanford's central core. TRU waste contains more than 100 nanocuries per gram of alpha-emitting TRU isotopes with half-lives greater than 20 years. Transuranic isotopes are those

higher than uranium on the Periodic Table of the Elements. A nanocurie is a unit of radioactivity one-billionth of a curie.

The work proved to be more extensive than anticipated. Many of the wood crates were decaying from water that leaked through the roof. Fluor Hanford riggers, carpenters, nuclear chemical operators and radiological control personnel implemented creative approaches to handle the disintegrating crates. In addition, the crates were tightly packed, some were leaning against each other, and much of the mineral (rockwool) insulation was also soaked. In addition, scorpions, rattlesnakes and black widow spiders had made their homes in the old building, providing a further hazard to workers.

However, by September 2007, Fluor Hanford crews had succeeded in removing all of the insulation and crates, overpacked some crates, completely repackaged others, completed non-destructive analysis and preparation for shipment, and shipped them to their new home Hanford's Central Waste Complex. Department of Energy verification of the new status of the 212-N Facility as a radiological facility is expected in early October.

Other D&D News at Fluor Hanford

In addition, Fluor Hanford retrieved approximately 8,000 drum-equivalents of buried solid waste suspected of being TRU, and made approximately 50 shipments of TRU waste from the Hanford Site to DOE's Waste Isolation Pilot Plant.

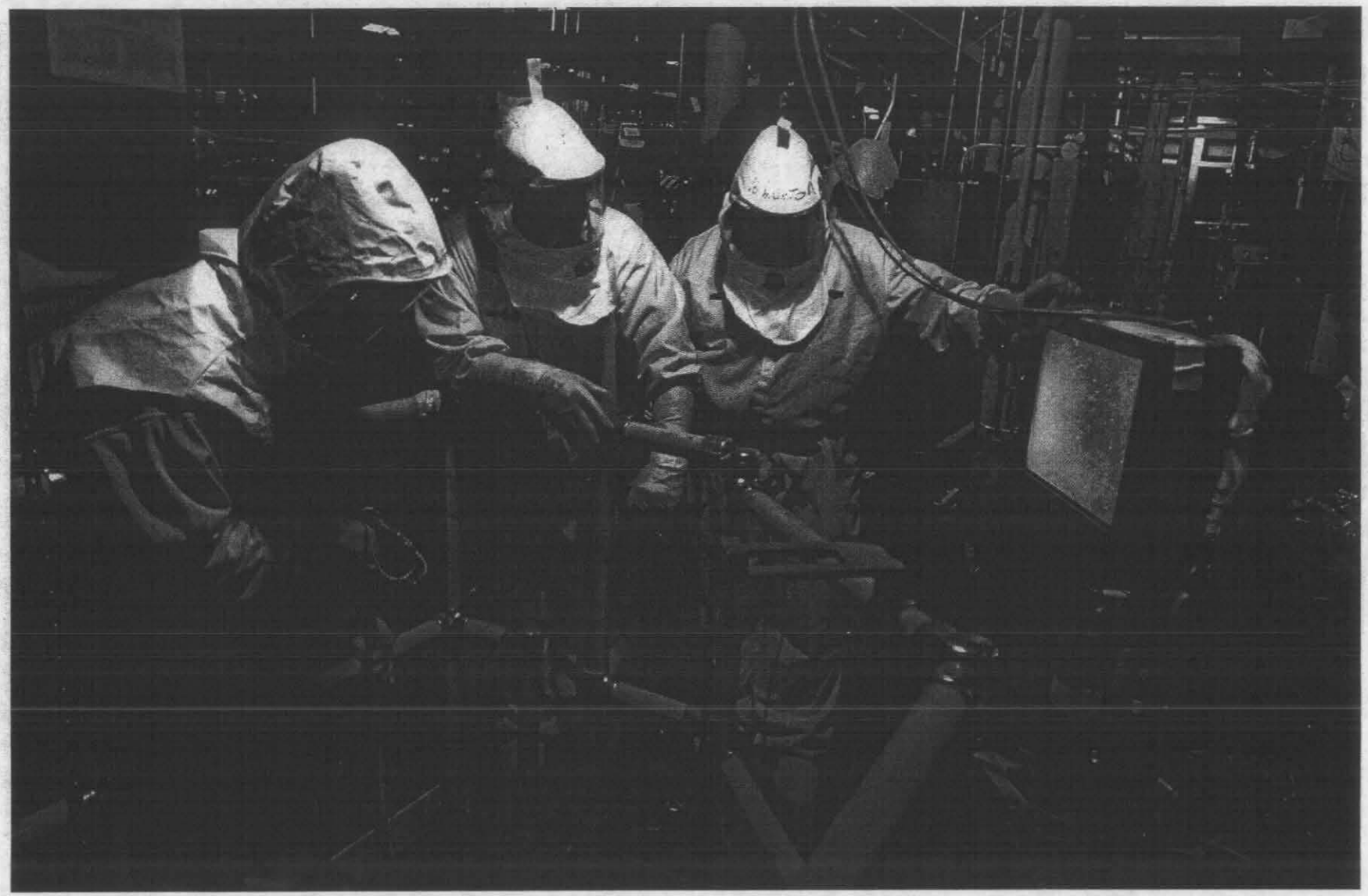
Fluor workers at the Fast Flux Test Facility continued to deactivate systems as part of facility shutdown. They removed combustibles, drained liquids, isolated water and sewer systems, and deactivated support systems. They also removed an additional transformer that contained polychlorinated biphenyls (PCBs), and made preparations to ship remaining fuel to the Idaho National Laboratory for final disposition.

Fluor Hanford also completed another round of injections of a band of ten wells in the Site's 100-N Area with a chemical compound designed to trap strontium 90 before it travels from contaminated soil into the Columbia River. The Soil and Groundwater Remediation Project also decommissioned more than 30 older wells, drilled approximately 25 new wells and two major new boreholes, initiated a treatability test in the BC Cribs and Trenches in central Hanford, and delivered three large work plans required under the Comprehensive Environmental Response, Compensation and Liability Act.

Photos & Captions:

KW Sludge Pumping 041df.6.07: Workers check a monitor displaying underwater conditions while pumping sludge in the K West basin into underwater containers, June 2007.

241.Z.demo.May 7-211.dfa: Fluor Hanford workers demolish the 241-Z Liquid Waste Treatment Facility, May 2007.

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