Cleanup Progress Report

July – September 2001

Fluor Hanford

Contents

DOE Richland Operations Office
RL
River • Plateau • Future

Fluor Hanford

Project Hanford Management Contractor:
Fluor Hanford, Inc.

Principal Subcontractors:
- **Day & Zimmerman Protection Technology Hanford**
- **Duratek Federal Services of Hanford, Inc.**
- **Numatec Hanford Corporation**

Technology Management:
- **Pacific Northwest National Laboratory**

Hanford Environmental Restoration Contractor:
- **Bechtel Hanford, Inc.**

4th Quarter Fiscal Year 2001 Highlights

- ✔ **Completed cleanout of mixed waste and equipment from B Cell, the largest and most contaminated of the eight cells in the 324 Building. The achievement represents a major reduction in public risk.**

- ✔ **Demolished a second 300-Area water tower and a mixed-waste storage structure as part of the accelerated "skyline reduction" initiative, and completed all of the year's planned uranium disposition activities.**

- ✔ **Shipped 12 more loads of spent nuclear fuel out of the K-West Basin, enabling the Project to exceed a fiscal-year goal of 25 shipments. The year-end total of 27 loads took about 4 million curies of radioactivity away from the Columbia River shore.**

- ✔ **Repackaged the remaining inventory of plutonium metals and successfully implemented a more efficient chemistry to stabilize plutonium solutions.**

- ✔ **Made three more shipments of transuranic waste to New Mexico, for a year-end total of seven shipments – two more than planned.**

This report describes these and many other achievements over the past three months, as well as the continued assistance of the Pacific Northwest National Laboratory in the use of technology for efficient, safe cleanup, and notes the ongoing environmental remediation by Site colleague, Bechtel Hanford. Indeed, this quarter culminated a fiscal year of strong and significant progress in Hanford cleanup.

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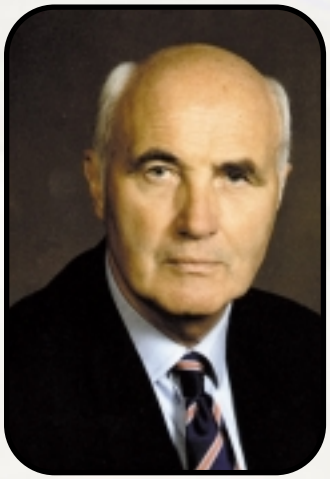
4th Quarter Fiscal Year 2001 Highlights
(Continued)

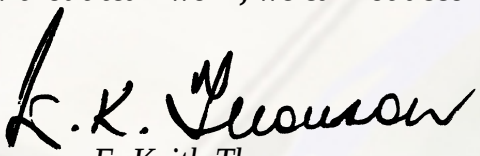


Despite the complex hazards of cleanup activities, safe-hour records continue to be set and extended by many of our Project organizations, as noted on Page 30. In addition, the Fast Flux Test Facility team received the Voluntary Protection Program Gold Star, becoming the fifth organization at Hanford to achieve this prestigious status in the national safety program.

While we take pride in our successes, we constantly strive to refine our processes, practices and project management. In that spirit, we brought a new vice president on board at the end of August to lead a team whose mission is to champion a single, shared vision: doing the mission safely. All aspects of nuclear and criticality safety and regulatory compliance, quality assurance, operations readiness, requirements management, corrective action, lessons learned and independent assessment are integrated in this new Safety & Mission Assurance organization.

As of October 1, we also completed the transition of infrastructure services to Fluor Hanford management, a move designed to provide a more cost-effective structure for our Department of Energy client. As part of that restructuring and following the centralized model of our Project Operations Center, we have established a consolidated Project Maintenance Center to better integrate maintenance practices and procedures, materials, procurement, spare parts and resources across all Fluor Hanford Projects.

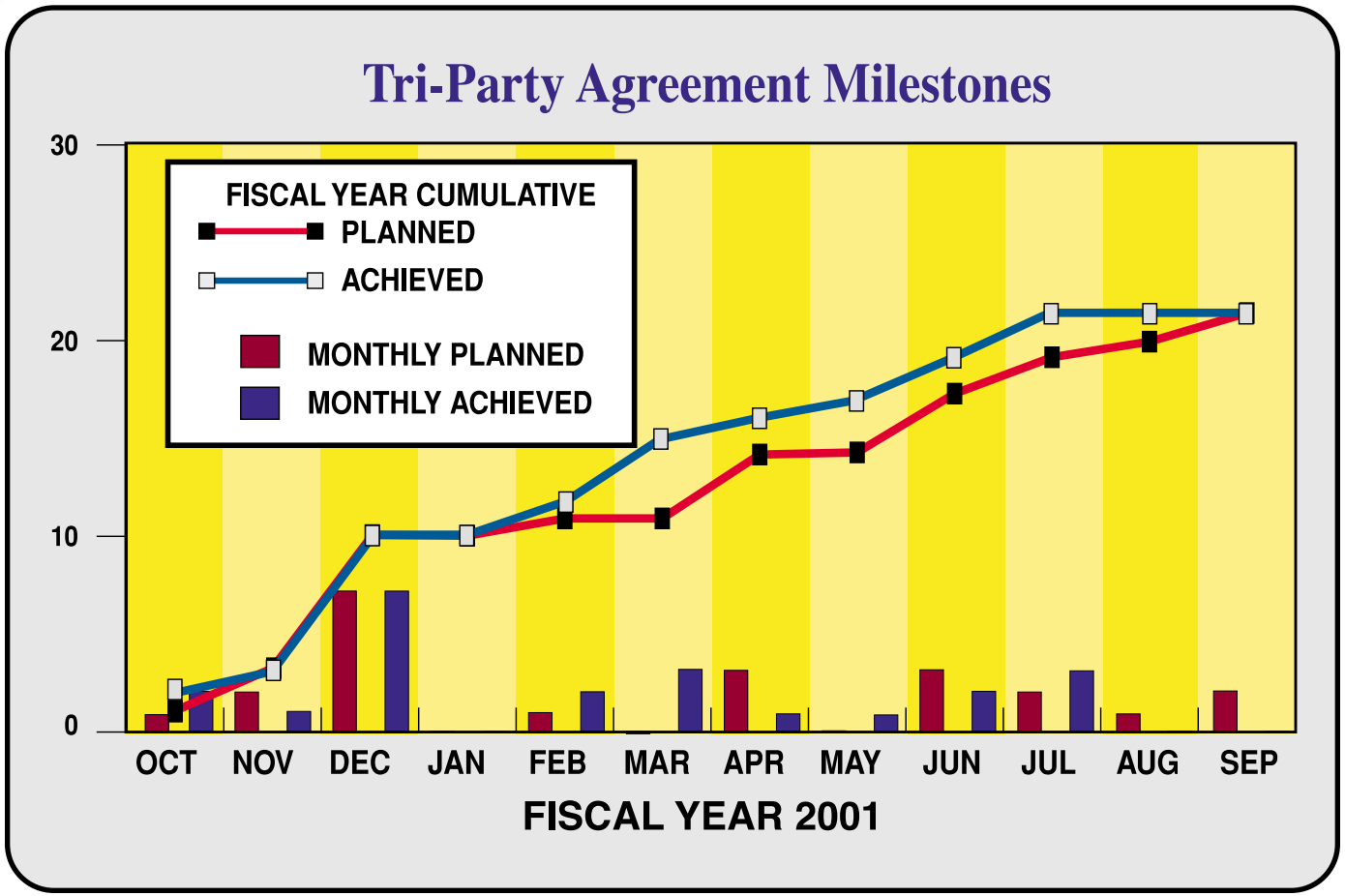
Four key values will continue to underscore our work at Hanford: safety, integrity, teamwork and excellence. We simply won't do work that isn't safe, excellent and based on integrity. And without teamwork, we cannot accomplish effective cleanup.



E. Keith Thomson
President and Chief Executive Officer
Fluor Hanford

Highlights

By the end of July, the Fluor Project Hanford team and DOE-Richland's Environmental Restoration team led by Bechtel Hanford had already completed all the milestones for the fiscal year for which they are directly responsible, as spelled out in the Tri-Party Agreement that governs Hanford cleanup.



Restore the River Corridor

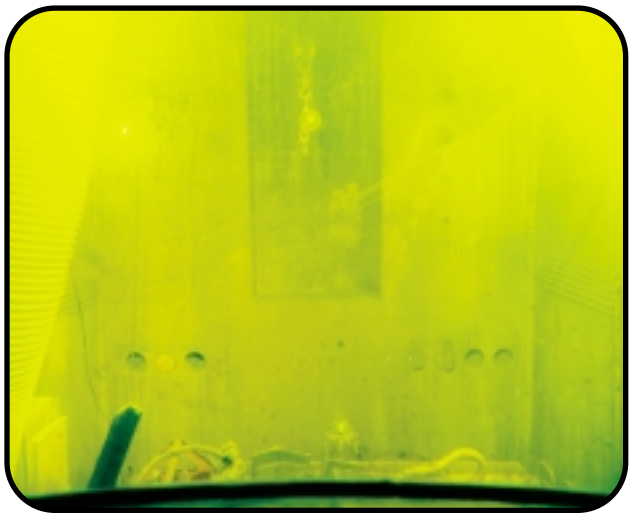
Nuclear Energy Legacies

Cleanup of sodium systems in the 337 Building continued with removal of trace heat controls, insulation and thermocouples. Sodium system pipe-cutting plans were developed. In addition, workers met an August 20 DOE milestone to complete stabilization of the fuel transfer pit at the 309 Building, and removed two drums of radioactive mixed waste from the building. The 337 and 309 projects both are advancing the cleanup of the 300 Area, located adjacent to the Columbia River just north of the City of Richland.

River Corridor Project

Before and after photos of the interior of the 324 Building's B Cell are shown. The cleanout of B Cell and shipment of the mixed waste and equipment to the 200-Area burial grounds *(see Page 20)* completed the workscope to meet a key Tri-Party Agreement milestone for 300-Area cleanup. Project workers also completed tasks required by a DOE milestone for removing a vault treatment system in the Building's D Cell.

At the 327 Building, a minimal operations staff continued to make effective progress in the cleanup of several cells.



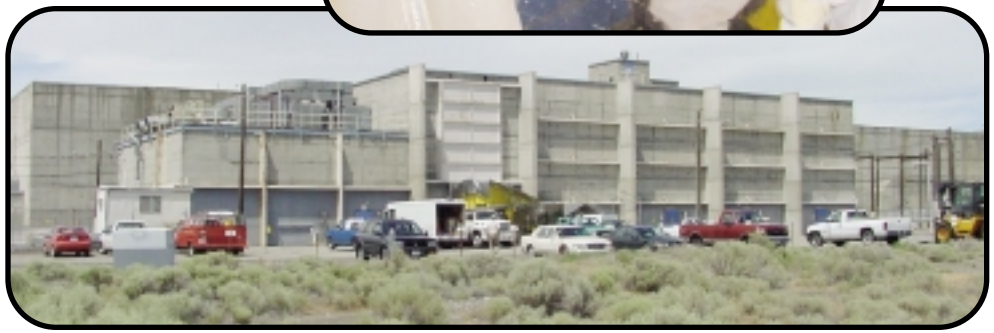
River Corridor Project

The Accelerated Deactivation team demolished a second water tower in the 300 Area. Small amounts of uranium contamination between layers of paint on both towers precluded recycling the cut-up steel, so workers shipped about a dozen trailer loads of tower parts to central Hanford for disposal.

In another successful project for the 300 Area's accelerated "skyline reduction" initiative, Fluor Hanford subcontracted Environmental Restoration Contractor Bechtel Hanford to demolish 303-K, a former radioactive and mixed-waste storage facility.

River Corridor Project

For the first time since the 1980s, workers entered two of the process cells at the 224-T Building (bottom photo), used from 1945 to the mid-50s to concentrate plutonium solutions. At top, lead nuclear chemical operator Dale Sumsion dons a "cool suit" to help deal with high temperatures in the containment tent during warm weather. In the middle photo, with protective, anti-contamination clothing and gear on top of their cool suits, Sumsion watches carpenter Gary Harting cut the lock on a cell door. They and their coworkers completed the first phase of characterization activities to determine appropriate cleanup steps. They borrowed successful ideas and lessons learned from the earlier deactivations of B Plant and the Plutonium-Uranium Extraction (PUREX) Facility to perform the work safely.



River Corridor Project

The first of four tall-well railcars rolls past the 300 Area on a lowboy trailer, on its way to Duratek in Memphis, Tennessee. The 150,000-pound specialty cars (two are shown at lower right) were used to transport fuel from the reactors near the Columbia River to the processing plants in the 200 Area. Instead of burying them as mixed waste, the cars are being recycled, which leaves no mixed waste. This is saving taxpayers at least $100,000 per car. In the background is one of the water towers that has since been taken down in another river corridor cleanup effort *(see Page 7)*.

River Corridor Project

As part of the Project's task to dispose of no-longer-needed heavy equipment, Fluor Hanford released two welder trailers, an earth auger and drill, and a line-and-auger truck for potential commercial reuse.

In addition, the River Corridor team deferred disposition costs of more than $1 million by sending uranium dioxide crystals to the Oak Ridge National Laboratory and transferring thorium to the Pacific Northwest National Laboratory. Both Labs can use the materials in research programs, avoiding disposal costs for Hanford. Transfer of this material completed all uranium disposition activities planned for fiscal 2001.

Spent Nuclear Fuel Project

The Project team exceeded the year's goal to get 116 tons of irradiated uranium out of the K-West Basin, dry it and place it in interim storage in central Hanford. The total of 27 loads shipped to date to the central plateau has successfully and safely moved more than 4 million curies of radioactivity away from the Columbia River shoreline.

Spent Nuclear Fuel Project

Fluor Hanford nuclear chemical operators Robert Crow (left) and Raul Ramirez test new process equipment to accelerate work in the K-West Basin. Two new processing tables and additional fuel- and basket-handling equipment have been in use since August 1 and enabled workers to load and remove 12 containers of spent nuclear fuel during this quarter.

Spent Nuclear Fuel Project

To date, the Project has received more than 130 multi-canister overpacks (MCOs) from its offsite vendor, like this empty one being delivered to the Canister Storage Building from the Project warehouse to be fitted with an outer transport cask. In addition, the onsite Spent Nuclear Fuel Basket Project team has fabricated more than 900 baskets. Each MCO holds six or seven baskets containing a total of nearly 300 spent fuel assemblies from the K Basins.

The Spent Nuclear Fuel team successfully completed a standard startup review in preparation for transporting dried Shippingport (PA) spent nuclear fuel, now stored at T Plant, to the Canister Storage Building, shown here.

Spent Nuclear Fuel Project

Dan Truman (left), leader of the DOE National Spent Nuclear Fuel Program audit team, reviews quality assurance records with Fluor Hanford's Ron Ruth. The Project received an excellent rating in the July 2001 audit. Rigorous quality performance is required to meet the prescriptive standards of the Office of Civilian Radioactive Waste Management because Hanford's dried spent fuel will ultimately go to a geologic repository for commercial nuclear power plant spent fuel.

Collaborative efforts between Fluor Hanford and the Pacific Northwest National Laboratory (PNNL) are expected to save at least $1 million in maintenance costs over the remaining five-year life of the Spent Nuclear Fuel (SNF) Project. Using risk analyses to evaluate 1,535 regular preventive maintenance tasks covering more than 5,000 equipment components, PNNL researchers and SNF engineers determined that 22 percent of the tasks could be performed less frequently or eliminated with no adverse impacts to safety or schedule.

Environmental Restoration Along the River

Workers demolish the second of two valve houses that formerly released cooling water from N Reactor into adjacent cribs and trenches. The Bechtel Hanford-led Environmental Restoration Contract team has removed 125,000 tons of radioactively and chemically contaminated soil and debris from the N Reactor area to date. Innovative work techniques have resulted in zero skin contaminations and zero lost time. Altogether, nearly 3.2 million tons of contaminated material have been removed from the reactor areas in the river corridor and safely disposed in the Environmental Restoration Disposal Facility in central Hanford.

TRANSITION THE PLATEAU

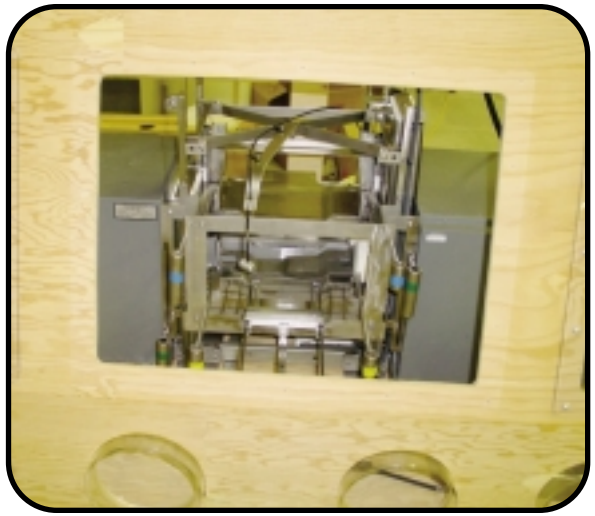
Fast Flux Test Facility (FFTF)

A team commissioned by the Secretary of Energy to review the decision to permanently shut down the FFTF provided its report on July 27. The Secretary subsequently initiated a 60-day review of a commercial proposal. A final decision on FFTF's future was expected as this issue went to press. Meanwhile, FFTF staff continued repairs and upgrades to fuel handling systems that would be needed to remove stored fuel assemblies for deactivation.

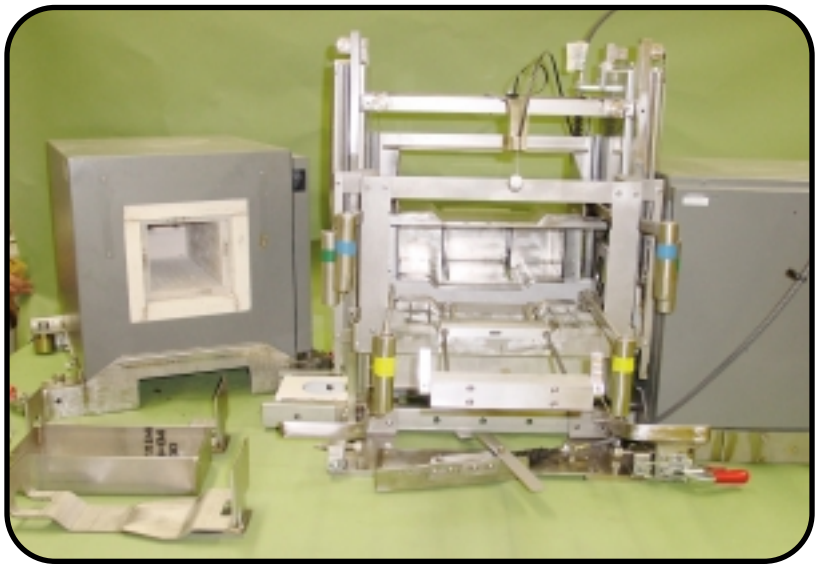
Nuclear Material Stabilization

The Plutonium Finishing Plant (PFP) team successfully switched to a more efficient oxalic acid precipitation process to stabilize plutonium solutions to supplant the magnesium hydroxide precipitation in use since last September. The change in chemistry reduces the volume of precipitate generated and lessens moisture reabsorption, which slowed the stabilization process. This, along with approval to directly discard low-plutonium concentrate solutions that can be packaged for disposal without further treatment, will speed the rate of solutions stabilization. Direct-discard processing began September 26.

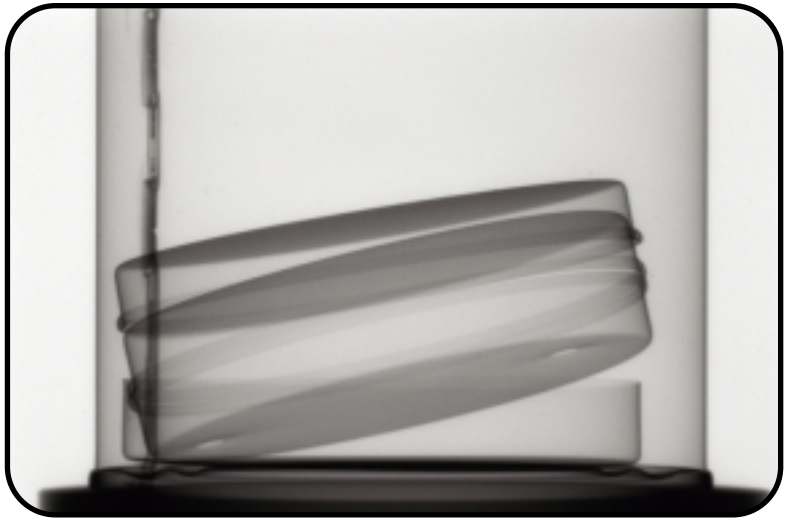
Nuclear Material Stabilization



The Pacific Northwest National Laboratory, in support of PFP, developed and functionally tested a new stabilization furnace design called a "hot box." This design could prove to be important in future stabilization plans at PFP. The hot box allows continuous operation of the furnaces, which operate at 1,000 degrees Celsius. The device is a mechanical loading/unloading system (center, lower photo) positioned between two furnaces (to the right and left of the hot box). Special heating and cooling chambers enable workers to load and unload material in the furnaces while safeguarding themselves from the very high heat. Currently, the furnaces must be cooled down for several hours before material can be inserted or retrieved. The top photo shows the complete glovebox mockup – with furnaces coupled to both sides of the hot box – used for testing and evaluation. The technology is readily transferable to any DOE site that needs new furnace and glovebox capability.



Nuclear Material Stabilization



Workers completed repackaging of the remaining plutonium metals inventory to new long-term storage standards, attaining a key goal set by the Defense Nuclear Facilities Safety Board. Digital radiography is being used to periodically monitor the contents of the new triple-container canisters for safe storage of plutonium. This "X-ray" shows metal items in a canister.

Final packaging was also completed for a group of plutonium metal alloys that did not require thermal stabilization.

Waste Management

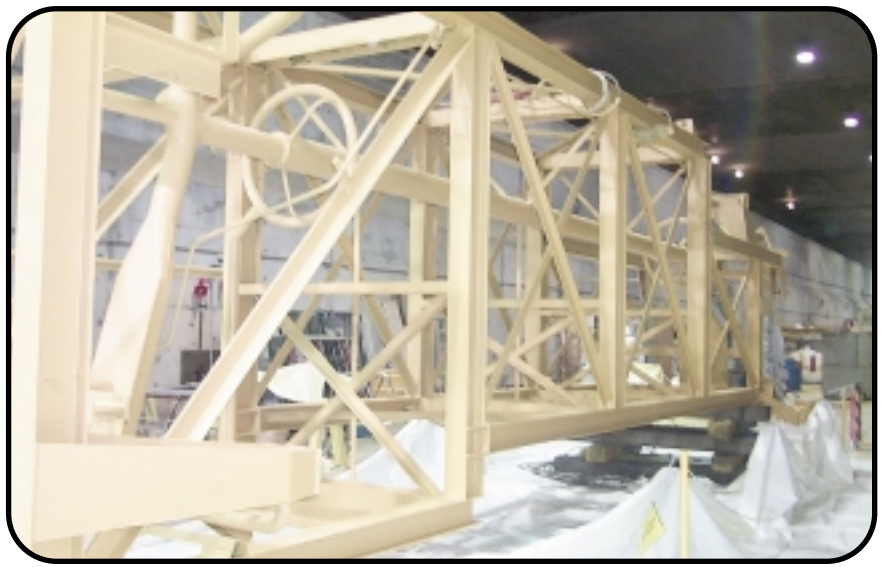
This quarter, three more shipments of transuranic waste left Hanford's Waste Receiving & Processing Facility (seen behind the cask transporter) for disposal at the Waste Isolation Pilot Plant in New Mexico. A total of seven shipments were made this year – two more than planned – removing nearly 60 cubic meters of Hanford's waste legacy. Transuranic waste is the kind of radioactively contaminated clothing, rags and debris depicted in these "see-through" drums.

Waste Management
River Corridor Project Support

Helping the River Corridor Project successfully complete cleanout of the 324 Building B Cell *(see Page 6)* remote-handled mixed transuranic and remote-handled low-level waste and equipment involved shipping 21 containers from the 300 Area to the low-level waste burial grounds in the 200 Area. The low-level waste was disposed of in the burial grounds while the transuranic waste is in interim storage while awaiting processing.

Waste Management
Spent Nuclear Fuel Project Support

Accelerated cleanout of the T-Plant canyon on the central plateau will make room for receipt, starting next fall, of sludge from the K Basins near the Columbia River. Ten deck sections have been cleared and major pieces of stored equipment removed, including two long towers, shown here prior to removal from the canyon. The towers had once been part of the now-deactivated Plutonium-Uranium Extraction (PUREX) Facility.



Waste Reduction Technologies

The National Energy Technology Laboratory funded a demonstration of emerging robotic technologies potentially applicable at Hanford to efficiently reduce large, complex steel shapes such as the PUREX towers. In a collaborative effort with DOE's Office of Science and Technology, Fluor Hanford and the Pacific Northwest National Laboratory jointly hosted a demonstration of a size-reduction technology at Hanford's Volpentest HAMMER Training & Education Center.

PREPARE FOR THE FUTURE

The Future

Economic Transition

Joseph Hankins of NW Tire Recycling tests baling equipment the company will use to recycle old tires into bales for a variety of uses. Fluor Hanford assisted the firm with start-up funds and development of business and marketing plans.

Fluor Hanford successfully met its 1996 commitment to DOE and the community to assist in the creation of 3,000 new jobs – 2,888 through the Fluor Hanford team; 137 through the CH2M Hill Hanford Group (tank farms) – by the end of fiscal 2001.

The Future

Economic Transition

A large compressor is loaded for a move to a company in northern Idaho. The compressor and a large well-drilling rig, units no longer needed at Hanford, were bought by the firm for exploratory drilling for natural gas in Wyoming. To date, the Tri-Cities Asset Reinvestment Company has disbursed more than $4 million worth of excess government equipment to help diversify the local and regional economy.

The Future

Volpentest HAMMER Training & Education Center

The continuous rise in cumulative student days, now totaling more than 135,000 over four years of operation, makes HAMMER one of the largest hands-on training centers in the nation. National Institute of Environmental Health Sciences programs, which are geared to hands-on, craft-specific training, have especially flourished at HAMMER because of its prop-oriented facilities.

As a result, HAMMER continues to expand its Hazardous Waste Operations & Emergency Response Regulations (HAZWOPER) curricula. One HAZWOPER refresher class has been converted from a classroom program to an almost totally hands-on format in which students can apply techniques learned during training to realistic settings. Here, a HAZWOPER student practices sealing a leak at HAMMER's above-ground pipeline prop.

This year, HAMMER presented more than 40,000 student days of training, including about 5,000 student days devoted to HAZWOPER training.

Volpentest HAMMER Training & Education Center

Representatives from the Center to Protect Workers' Rights (CPWR) visited HAMMER to film an emergency response digital video disc (DVD) for use in HAZWOPER training classes at Hanford and nationwide. Hanford worker-instructors participated in the filming at the liquid petroleum gas burn pad. CPWR plans to return to HAMMER to shoot footage for additional training DVDs in the future.

The Future

Volpentest HAMMER Training & Education Center

In late September, 37 health physics technician (HPT) trainees started work at Hanford, thanks to an HPT Fundamental Academics opportunity. The trainees were selected based on results of a screening process conducted during a job fair held at a HAMMER last spring and subsequently successfully passed their final exams following classes this summer at HAMMER. Their current on-the-job training will run until January 2002. The program is important to Hanford because it fills a need created by an industry-wide shortage of HPTs.

The Idaho National Engineering and Environmental Laboratory recently agreed to provide HAMMER with a full-scale model of a shipping cask used to transport highly radioactive spent fuel from nuclear power plants. The model has never contained radioactive material and has cut-aways to show the cask's construction. HAMMER will use the model to enhance transportation training for Hanford workers and emergency-response scenarios.

Support & Services

Infrastructure Cleanup

In July, workers for Fluor Hanford subcontractor DynCorp Tri-Cities Services and DOE's Environmental Restoration Contractor, Bechtel Hanford, completed a four-month project to excavate, demolish and remove a 54-year-old bunker that stored diesel fuel for the powerhouse that supplied steam to the entire 300 Area until 1998. Removal of the 209-foot-long, 26-foot-wide, 12-foot-deep reinforced concrete structure eliminates a source of soil contamination in the 300 Area, just north of Richland. After the 450,000-gallon bunker was excavated (far right photo), an additional 2,000 cubic yards of fuel-contaminated soil was removed for remediation.

ES&H

Continued Safe Performance

The Fluor Hanford team continues to post a strong safety performance since setting a Site-record 11 million hours-plus without a lost away workday injury early this fiscal year. This quarter, Waste Sampling and Characterization Facility (WSCF) employee Joel VanSant (pictured at work in a WSCF lab) and his co-workers achieved 500,000 hours worked with no one missing a day because of a job-related injury. The record began the day the doors opened at WSCF October 1, 1993. Meanwhile, the Spent Nuclear Fuel Project is still building on a 3-million-hour mark set in late June, while the Nuclear Material Stabilization Project surpassed 2 million hours in July. Fluor Hanford subcontractor Lockheed Martin Services, Inc. exceeded 4 million safe hours in July.

Also this quarter, Bechtel Hanford subcontractor Duratek marked five years without a lost-time accident in operations at the Environmental Restoration Disposal Facility, where 3.2 million tons of contaminated soil and debris have been permanently disposed.

ES&H

Voluntary Protection Program Awards

This quarter, Site subcontractor Fluor Federal Services and the Fast Flux Test Facility (shown) became the fourth and fifth Hanford organizations to earn "Star" status in the national Voluntary Protection Program (VPP). Hanford's earlier DOE-VPP Gold Star winners are the Pacific Northwest National Laboratory and Fluor Hanford subcontractors Day & Zimmerman Protection Technology Hanford and DynCorp Tri-Cities Services. In addition, Fluor Hanford millwright Jack Griffith became the first employee at a DOE site to receive an individual achievement award – for safety and health knowledge and activities by a worker who is not a safety or health professional – at the recent Voluntary Protection Programs Participants' Association annual conference.

ES&H

Environmental Compliance

T Plant nuclear chemical operator Laura Johnson and environmental compliance officer Brett Barnes review contents of a drum containing bulbs for recycling. Protection of people and the environment is at the heart of Hanford cleanup, and environmental compliance officers like Barnes ensure that Site facilities meet permit conditions, regulations and requirements. They also interface with regulatory agencies to develop compliant paths forward on cleanup. One example of this was the incorporation of environmental requirements into the retrofit of T Plant for K-Basin sludge storage.

Environmental scientist Steve Szendre leads the discussion at one of a series of environmental compliance workshops that Fluor Hanford is sponsoring and presenting for DOE and contractor personnel across the Site. The sessions provide a forum to discuss current compliance topics, enhancing environmental communications.

Restore the River Corridor

Begin pipe trench cleanout in the 324 Building's radioactive process cells with the help of a new robotic work platform.

Complete cleanup tasks in I Cell at the 327 Building.

Ship two more tall-well railcars to Tennessee for recycling.

Complete the remaining characterization activities at the 224-T Building process cells to determine the appropriate cleanup steps.

Remove another 15 loads of spent nuclear fuel (about 70 tons of irradiated uranium containing more than 2 million curies of radioactivity) from the K-West Basin, then dry it and place it in interim dry storage on the central plateau.

Finish installation, test and begin operating canister-cleaning equipment in the K-West Basin.

Cut and remove small-diameter sodium piping in the 337 Building for offsite disposal. Verify the volume of sodium remaining to be dispositioned in a reactor-component test vessel that was a prototype for the FFTF, representing one third of the reactor vessel and core.

Perform roof repairs and minor system shutdowns to place the 309 Building in a low-cost maintenance and surveillance condition until deactivated under the 300 Area Accelerated Cleanup Plan.

Transition the Central Plateau

Start up a second complete plutonium stabilization and packaging system at the Plutonium Finishing Plant.

Begin moving the Shippingport spent nuclear fuel now stored at T Plant to dry, interim storage at the Canister Storage Building. This is part of an accelerated effort to make room at T Plant by October 2002 for sludge from the K Basins.

Complete readiness preparations to begin retrieving buried drums of transuranic and other wastes in early 2002. Retrieval of uncovered drums from 200-Area trenches will continue; there are about 600 such drums left to retrieve.

Implement the Secretary's decision on FFTF, when issued.

Prepare for the Future

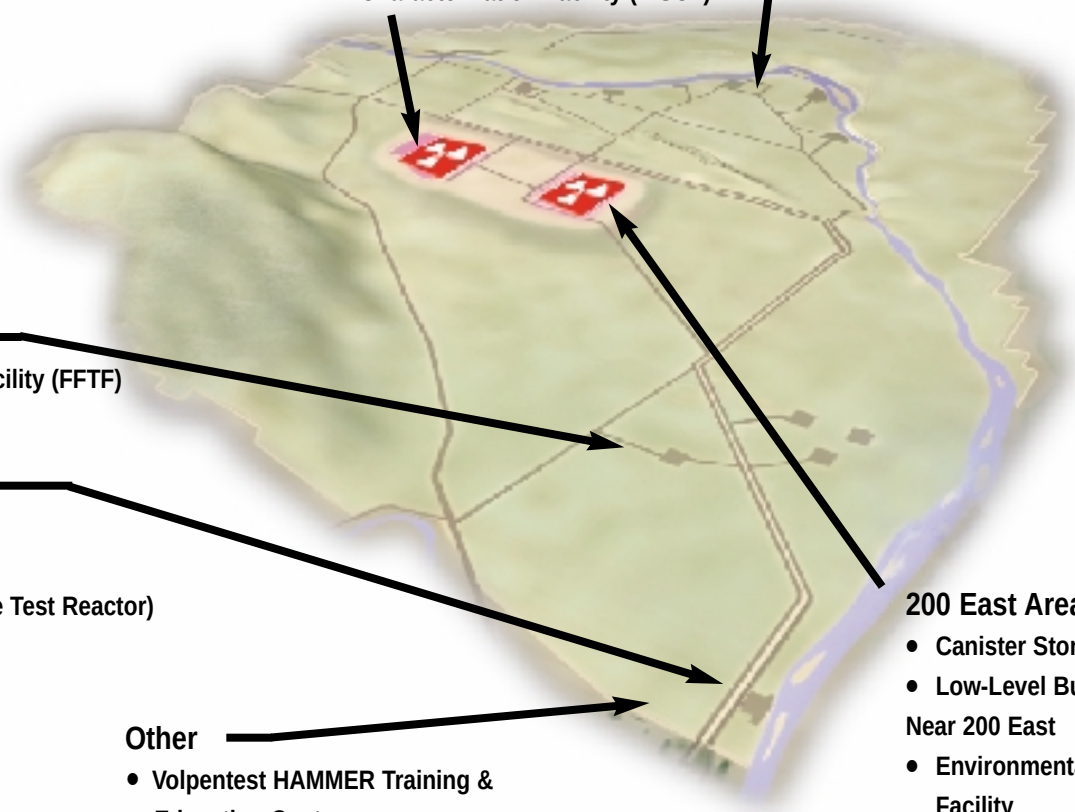
Fluor Hanford will be assisting Richland Specialty Extrusions, or RSE, a subsidiary of Kaiser Aluminum, in its move from the 300 Area to its new manufacturing plant in the former DOE 1167 Building in north Richland. RSE has been leasing a 300-Area facility, where it operates a 4,000-ton extrusion press no longer needed by Hanford and which it will move to the new facility. RSE's intent to expand its operations and assure a long-term presence in the Tri-Cities exemplifies a vision for the future of the Hanford Site in which private business operates side-by-side with federal operations.

Hanford Site Map

Hanford Facilities Featured in This Report

200 West Area
- 224-T Building
- Low-Level Burial Grounds
- Plutonium Finishing Plant (PFP)
- T Plant
- Waste Receiving & Processing (WRAP) Facility
- Waste Sampling & Characterization Facility (WSCF)

100 Area
- Cold Vacuum Drying (CVD) Facility
- K Basins (for K East and K West Reactors)
- N Reactor



400 Area
- Fast Flux Test Facility (FFTF)

300 Area
- 303-K Facility
- 309 Building (Plutonium Recycle Test Reactor)
- 324 Building
- 327 Building
- 337 Building

Other
- Volpentest HAMMER Training & Education Center

200 East Area
- Canister Storage Building (CSB)
- Low-Level Burial Grounds

Near 200 East
- Environmental Restoration Disposal Facility

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http://www.hanford.gov

Hanford's 300 Area and the Columbia River

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