



Cleanup Progress Report

October – December 2001

Prepared By

Fluor Hanford

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Technology management provided for Fluor Hanford by the Pacific Northwest National Laboratory, which is operated by Battelle.

This report includes material submitted by DOE's Environmental Restoration Contractor Bechtel Hanford, Inc.

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1ST QUARTER FISCAL YEAR 2002 HIGHLIGHTS

- Safely moved another 12 loads of spent fuel, or about 1.8 million curies of radioactivity, away from the Columbia River at the K Basins. The loads were dried and transported to central Hanford and placed in dry, interim storage.
- Improved processing times at the Cold Vacuum Drying Facility and Canister Storage Building to well below the Spent Nuclear Fuel Project's targeted cycle times.
- Started up a second complete stabilizing and packaging system at the Plutonium Finishing Plant, more than doubling the Plant's capability.
- Substantially increased the rate of plutonium solutions stabilization, on schedule for July completion.
- Enhanced 300-Area cleanup by completing pipe-trench cleanout in the 324 Building and removing bulk wastes from a third cell at the 327 Building.
- Completed the first phase of characterization of process cells at the 224-T Building to determine cleanup steps for this 200-Area facility.
- Marked a processing milestone of two billion liters of wastewater treated in the 300 Area since the Treated Effluent Disposal Facility started up in 1994.
- Completed retrieval of uncovered transuranic-waste drums.
- Cleaned out the first of eight cells that will be used to store sludge from the K Basins at T Plant, in central Hanford.

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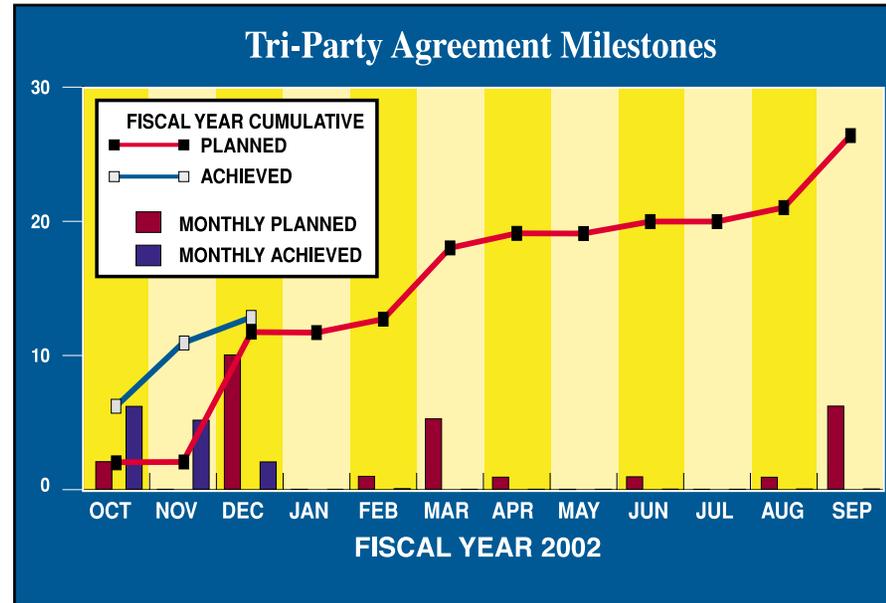
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Two of the milestones “achieved” as of October 2001 were actually scheduled for completion that month, but one was scheduled for a December completion and two were not scheduled for completion until next September. However, the required activities to meet all five of these Tri-Party Agreement (TPA) cleanup commitments

were successfully completed prior to the start of the 2002 fiscal year.

Fluor Hanford’s River Corridor Project met one waste-removal obligation 30 months ahead of its September 2002 commitment. The interim milestone involved removal and shipment of certain “special-case” wastes from the 300 Area to the 200 Area for storage. The Waste Management Project achieved a waste-treatment and disposal target two years early, back in September 2000. That was when the team completed the treatment or direct disposal of more than 1,644 cubic meters of mixed low-level waste.

The three other early cleanup achievements, met during July and September, are credited to the Bechtel Hanford-led Environmental Restoration Contract team. Bechtel Hanford was responsible for the 12 TPA milestones obligated for the quarter – and successfully met 11. The 12th will be deemed complete when a public-comment period on remedial actions in the 100 Area ends in April.

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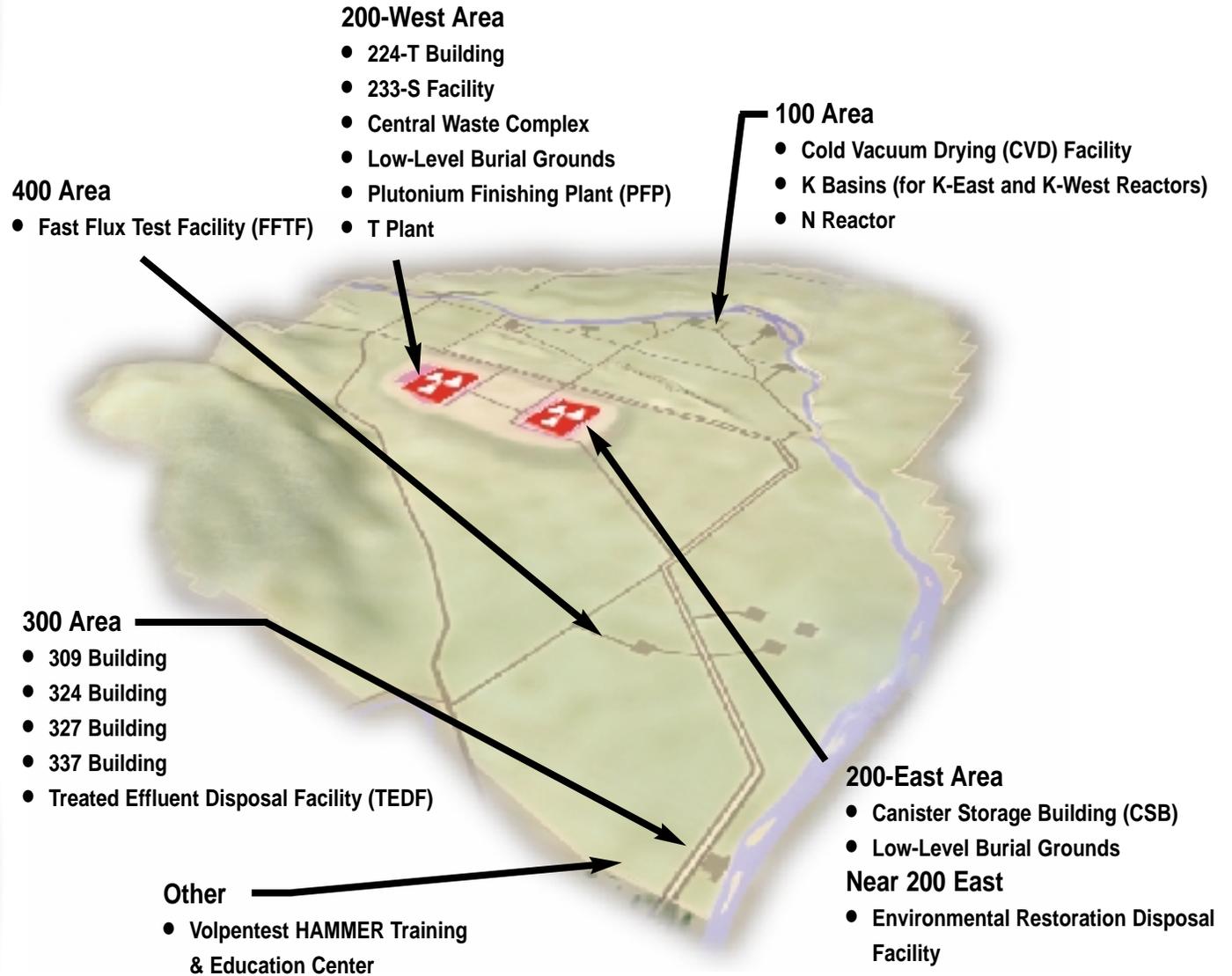
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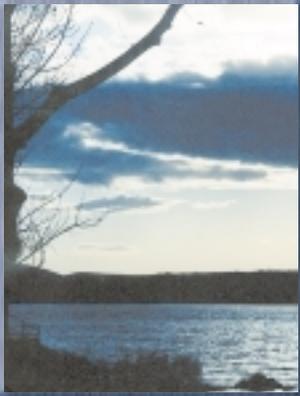
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Hanford Facilities Featured in This Report



RESTORE THE RIVER CORRIDOR



Nuclear Energy Legacies

Cleanup of legacy sodium systems in the 337 Building continued, with three large test vessels successfully isolated from the sodium-system piping. The task of removing the small-diameter sodium piping for offsite disposal will continue through the summer. Meanwhile, roof repairs continued at the 309 Building to ensure an adequate weather barrier pending the facility's future deactivation. The 337 and 309 projects are both advancing cleanup of the 300 Area, which is adjacent to the Columbia River just north of the City of Richland.



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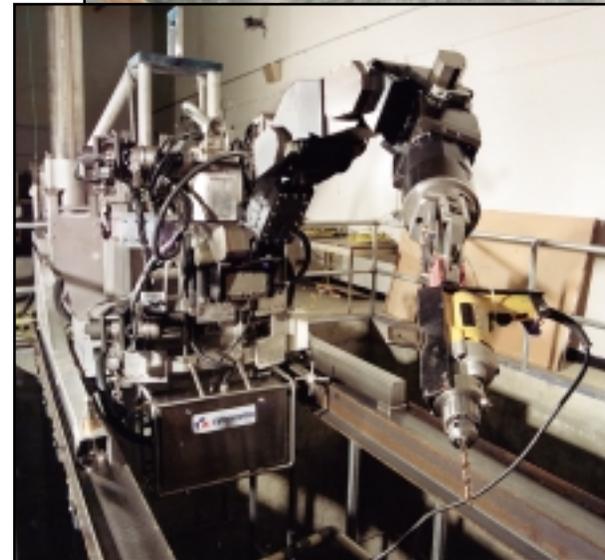
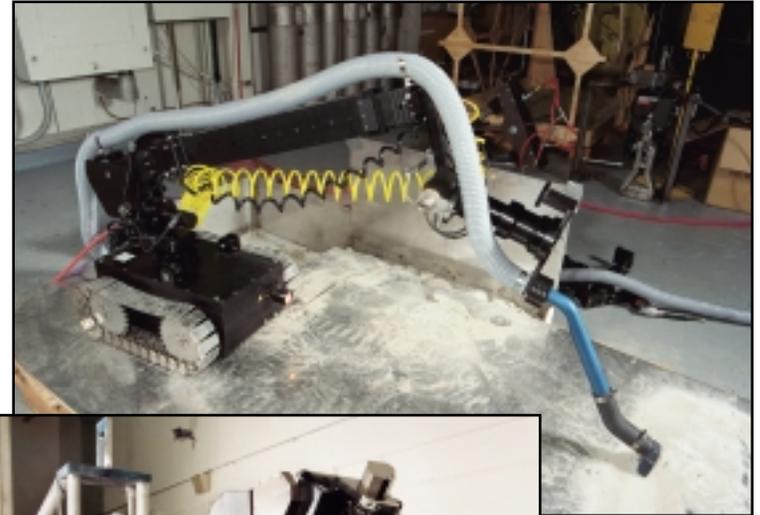
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River Corridor Project

With the help of robots, workers removed the residue in the 324 Building pipe trench and replaced the trench cover blocks, completing yet another key element of cleanup at the facility. A versatile robotic crawler (top) and a dexterous, heavy-duty robot arm (bottom), both shown in mockup settings used for training, were used in the pipe-trench cleanout. The robots allow cleanup work to be performed safely in highly radioactive areas where manned entry is not practical.



Major refurbishment of a 30-ton crane is also now complete. Reliable performance of the crane is important to effective cleanup at the 324 Building, located in the 300 Area.

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River Corridor Project

At the I Cell in the 327 Building, Project workers removed bulk waste, such as the items seen here through the thick, yellow, leaded glass of the cell window. They also removed the cell's glove bag and prepared for the final wipe-down of the cell. I Cell will be the third of 10 cells to be cleaned out at this 300-Area facility.



Workers successfully completed robotic hazardous sampling in the remaining five process cells at the 224-T Building needed to complete the first phase of characterization activities for determining appropriate cleanup steps. The facility is located in the 200 Area and the process cells were used in the 1940s and '50s to concentrate plutonium solutions.

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River Corridor Project

The next step following demolition last summer of 303-K, a former radioactive- and mixed-waste facility, is removal of the concrete slab on which the building sat. The Environmental Protection Agency recently approved a revised Notice of Construction for the slab removal so that aspect of the project can proceed. Taking down 303-K is part of the accelerated “skyline reduction” initiative under way in the 300 Area.



December 7, 2001, marked a very different cleanup success at Hanford: on that day, the 300-Area Treated Effluent Disposal Facility achieved a processing milestone of two billion liters of wastewater treated since the Facility’s startup in 1994.

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Spent Nuclear Fuel Project

Workers safely removed another 12 loads of spent nuclear fuel from the K-West Basin this quarter, moving more than 55 tons of irradiated uranium and about 1.8 million curies of radioactivity away from the Columbia River shoreline.

In the K-West Basin, an overhead monorail and manually operated hoists are used to place each two-barrel canister of spent fuel inside a box-like device for the process of decapping, or removing the cap from each barrel. The enclosure helps keep sludge or loose material, released when the caps are removed, from drifting into the surrounding water. After a flushing process, the enclosure is opened and the canister lifted out and moved, still underwater, to a processing table in another portion of the Basin.



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Spent Nuclear Fuel Project

These photos show spent-fuel assemblies from an opened canister (visible at lower right in the left photo) emptied out onto an underwater process table. A remote-operated device, called a Konan Arm, picks up each piece (left and center photos). Loose particles are washed off, and then the Konan arm places the cleaned spent fuel assembly in a specially fabricated basket (right photo). Filled baskets are placed inside a multi-canister overpack (MCO), which is fitted with an outer cask for transport to the Cold Vacuum Drying Facility.



This quarter, workers at the Cold Vacuum Drying Facility, where the MCOs containing baskets of spent fuel from the K-West Basin are vacuum-dried, further reduced the average process time for each MCO to less than 80 hours, well below their target of 90 hours.

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Spent Nuclear Fuel Project

The 12 loads of spent fuel removed from the K-West Basin this quarter were dried, then transported and placed in interim storage in steel tubes beneath the Canister Storage Building (CSB) in Hanford's central plateau. The average cycle time at the CSB between the arrival of a loaded MCO and shipment of an empty MCO back to the K-West Basin is below the target of 18 hours.



Several managers and regulators from DOE's Rocky Flats (Colorado) site recently visited Hanford to learn about cleanup operations, including the Spent Nuclear Fuel Project. The visitors saw the CSB's massive MCO-handling equipment (top photo). In the bottom photo, Jerry Bazinet, of Numatec Hanford, describes the impact absorbers used in the storage tubes at the CSB. Mike Schlender

(kneeling), DOE-Richland's deputy manager for Site Transition, and Doug Sherwood (behind Schlender), the Environmental Protection Agency's Hanford manager, accompanied the tour group.

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Environmental Restoration Along the River

In November, the Bechtel Hanford-led Environmental Restoration Contract team began cleaning up the most radioactively contaminated liquid-waste site to date in Hanford's Columbia-River corridor. For 18 years, N Reactor discharged nearly 2.5 million gallons of highly contaminated cooling water daily into nearby cribs and trenches to dissipate the liquids through layers of silt, gravel and rock. Cleanup operations are now under way at the far end of the 1,600-foot-long zig-zag-shaped N-1 trench, opposite N Reactor (see inset). Eventually the 36,125-square-foot crib next to the reactor will be demolished and removed. By project completion next July, the team will have placed an estimated 125,000 tons of contaminated soil, rock, concrete and steel from this crib and trench into the Environmental Restoration Disposal Facility on Hanford's central plateau.

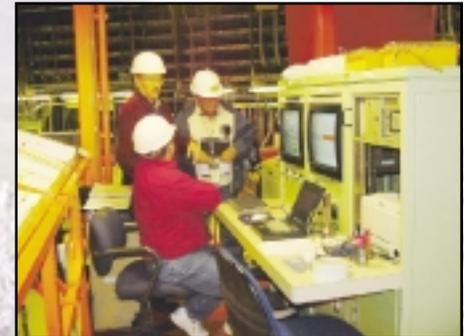




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Fast Flux Test Facility (FFTF)

The Secretary of Energy announced in December that the Department would proceed with deactivation of the FFTF. Meanwhile, FFTF staff continued repairs and upgrades to fuel-handling systems that will be needed to remove stored fuel assemblies for deactivation. One component of those systems is the Closed Loop Ex-vessel Machine (CLEM), the large orange machine inside the FFTF dome. Running tests on the CLEM from the control room are test director John Logan (seated), operator Dale Shephard (left) and electrician Juan Tedpahogo.



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Nuclear Material Stabilization

Nuclear chemical operator Rick Wilson inserts the first can of plutonium oxide in a new glove-box, part of a second complete stabilizing and packaging system started up November 29.

Looking on are Bob McQuinn, Plutonium Finishing Plant (PFP) director, and DOE facility representative Joe Waring. The system, which includes the first installation in the DOE Complex of a new instrument to measure moisture in the stabilized

plutonium, is the second of two systems Fluor Hanford is now operating at the PFP to prepare four tons of plutonium for safe, long-term storage. The second system will more than double the Plant's stabilizing and packaging capability, and eliminates the need to move plutonium materials between PFP's two process buildings, saving time and worker radiation exposure.



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Nuclear Material Stabilization

Regulators approved disposal of certain residue waste, known as sand, slag and crucible, through a process called pipe-and-go, in which a can of the repackaged material is placed in a pipe that is then placed in a 55-gallon drum overpack container, as shown below, for ultimate shipment to the Waste Isolation Pilot Plant in New Mexico. As a result, in November PFP workers removed the last of these materials from one processing glovebox. This clears the way for the installation of new instruments that will allow the glovebox to be used to stabilize less-than-pure plutonium oxides, and represents yet another step forward in completing the cleanup mission at PFP.



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Nuclear Material Stabilization

The rate of stabilizing plutonium solutions at PFP substantially increased during the past quarter, thanks in part to the success of a more efficient oxalic-acid precipitation process developed with the assistance of the Pacific Northwest National Laboratory. More than 300 liters have already been stabilized with the new chemical process, which will potentially be used for about 60% of the solutions stored at PFP. In addition, since late September, workers have packaged about 930 liters of solutions that did not require additional stabilization because they contain low concentrations of plutonium. Through December, the PFP team has stabilized 65%, by plutonium weight, and 46%, by volume, of PFP's inventory of plutonium-bearing solutions. Solutions stabilization is on schedule for completion this July.



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Waste Management

Project workers completed the retrieval of uncovered drums of transuranic (TRU) waste this quarter. They assayed and relocated 504 drums during the period; a total of 769 drums have been relocated since the start of uncovered TRU drum retrieval in 1999.

Meanwhile, preparations proceeded for the retrieval of covered, or buried, drums. The National Environmental Policy Act environmental assessment public review ended in mid-December. A plan of action is being prepared for the appropriate readiness activities that will take place once safety-analysis documentation is approved.



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Waste Management Spent Nuclear Fuel Project Support

T-Plant workers completed cleanout of the first of eight cells that are needed to receive and store sludge from the K Basins. Before (left) and after (right) photos of the cell's interior are shown.



In addition, an auxiliary, 10-ton slave crane at the Plant is being inspected to determine parts needed to repair it. When operable, the crane will be used to help the Project meet its schedule for fuel movement and cell cleanout at T Plant.

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Waste Management Nuclear Material Stabilization Support

The Waste Management team supports the Nuclear Material Stabilization Project by accepting waste shipments from PFP into the Central Waste Complex for interim storage pending future processing or offsite shipment. This quarter, shipments of Hanford ash and 106 pipe-overpack containers, like the one shown, were accepted for storage at the Central Waste Complex.



Other Waste Management

Hanford has long been the repository for defueled naval reactor compartments from the US Navy's nuclear fleet. While this activity is not considered part of the cleanup scope covered by the Tri-Party Agreement, it represents another aspect of nuclear-waste disposal at Hanford. During the past quarter, the 100th naval reactor compartment arrived at Hanford. The Waste Management team safely completed its disposal in a huge trench in central Hanford with the other, previously received units.



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Environmental Restoration on the Plateau

The 233-S Plutonium Concentration Facility is the first plutonium production facility to undergo decontamination and decommissioning at Hanford. The Bechtel-led Environmental Restoration Contract (ERC) team is ahead of schedule on this project. They removed three more vessels from the highly contaminated process hood this



quarter, bringing the total to 12 removed – eight more than originally planned. The ERC team's productivity is a direct result of their focus on safety and planning. Workers, dressed in two layers of protective clothing, have made more than 10,000 entries into the facility. The team has performed difficult tasks in cramped quarters while maintaining an excellent safety record since the project began four years ago.



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Asset Transition

With the help of commercial buyers to remove equipment for their own reuse, Fluor Hanford cost-effectively completed the cleanup of a former concrete geotechnical test facility north of the 300 Area. The Tri-Cities Asset Reinvestment Company (TARC) transferred the government equipment used at the facility to private industry. They sold much of it to Applied Geotechnical Engineering and Construction (AGEC), a local firm that had previously leased the facility to conduct concrete testing for Hanford-Site projects. The equipment transfer enabled AGEC to expand and offer its services to other DOE sites. Other local firms, including Central Pre-Mix Concrete and Rockman Products, also benefited from the excess equipment, such as the concrete holding tank shown being loaded for removal from the Site.



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Asset Transition

Earlier this year, 10 semi-truck loads of manufacturing and electronic equipment were hauled from a former machine shop and engineering test facility in the 300 Area that is being prepared for potential commercial reuse. TARC helped disperse the equipment for commercial, public and private use. This quarter, the locally headquartered Neil F. Lampson crane company bought, lifted and moved offsite for its own use a construction office located just outside the shop building. TARC also transferred a large outdoor storage box for reuse by another local firm, Nelson Transport.



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Asset Transition

Another 300-Area asset-transition effort involved a 22,500-gallon tank from the 324 Building. The tank is enabling A & B Asphalt of nearby Benton City to add a second product line. A & B's co-owner, Don Thacker, says the DOE/TARC asset-transfer program "is a big help to local businesses." All the recent equipment transfers have been cost-effective for the government because the new owners have agreed to remove the assets from Hanford property at their own expense.



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Volpentest HAMMER Training & Education Center

For five days in October, 100 Chemical/Biological Incident Response Force (CBIRF) Marines trained with the Hanford Fire Department at HAMMER. The CBIRF augments civil first-response efforts. The Marines practiced a variety of rescue techniques at HAMMER props, including rappelling from the six-story training tower (at right) and search-and-rescue in the confined-space prop (below). A simulated chlorine-car derailment by “terrorists” at the railcar/truck burn-pad prop also involved a Weapons of Mass Destruction Civil Support Team of the Washington Army National Guard. More than 40 people role-played as “victims” in a townhouse (HAMMER’s burn building) and high-rise (the training tower) during the exercise. The CBIRF commander later said the Hanford Fire Department is “better prepared than most first-response units” with which he has worked.



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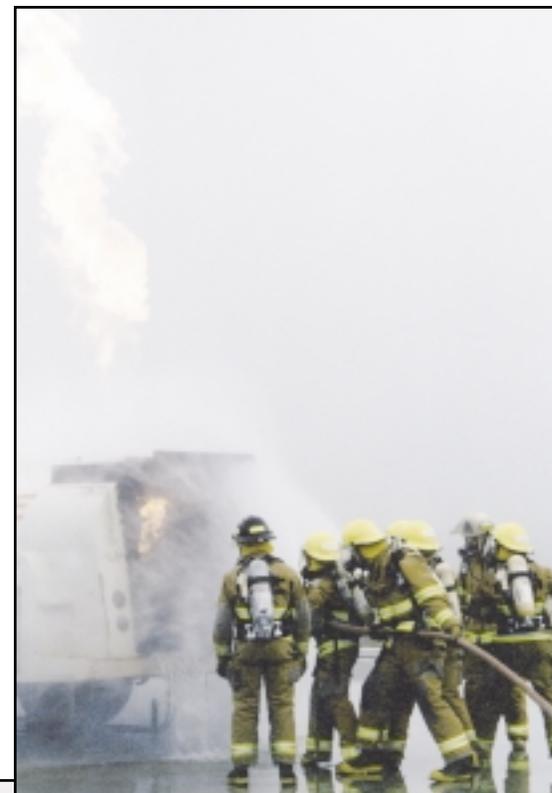
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Volpentest HAMMER Training & Education Center

The Hanford Fire Department conducted a six-week recruit school at HAMMER this quarter. The training prepared the recruits for employment with the Fire Department by ensuring their proficiency with firefighter skills defined by the National Fire Protection Association. One of the tools used to select the recruits was a physical-ability test held at HAMMER last May. State funding was used to purchase equipment for the grueling, eight-station test course, constructed in accordance with the International Association of Fire Fighters and International Association of Fire Chiefs Joint Labor-Management Fitness and Wellness Task Force.



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Volpentest HAMMER Training & Education Center

An OSHA Training Institute scaffold-users course at HAMMER trained trainers from Hanford and around the country, shown below reviewing types of scaffolding. At right, Vern Olson explains a two-point motorized scaffolding system to the trainers. The trainers included representatives from the Pipe Fitters, Insulators, Cement Masons and Plasterers' unions, as well as members of the Job Corps. Based on the OSHA training, Hanford instructors are incorporating new techniques into their training programs and developing new scaffold and aerial-lift training. Skills acquired will also be useful for training Hanford's vitrification-plant construction workers.



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Site Operations Support On Spent Fuel Basket Fabrication

This quarter, Fluor Hanford Site Operations workers fabricated 180 spent-fuel baskets, including their 1,000th basket, to support fuel removal from the K Basins. At right, Rex Ozment, fabrication-shop production lead for the project, inspects a steel spent-fuel basket. Next to it is a copper basket designed to hold spent-fuel scraps. The team is fabricating four different models of baskets, each weighing from 230 to 625 pounds.



At left, machinist Philip J. Olson deburs a nearly complete spent-fuel storage-basket base plate. This step follows several earlier fabrication operations, including the one he's performing at right.



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Site Operations Support For Asset Transition

Workers remove a flat-roller pallet-handling system as part of an effort to vacate space in a former DOE procurement and warehousing facility in north Richland. Completing the task will provide the local port authority, current owner of the facility, more than 54,000 square feet of office space and 52,400 square feet of warehouse space to meet economic development needs in the community. Port officials have already leased several portions of the facility.



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Safety Performance

This quarter, three Fluor Hanford organizations reached million-hour thresholds for work performed without any injuries involving a lost away workday: the Waste Management Project (three million hours), the Fast Flux Test Facility team (two million), and Fluor Hanford Site Operations (one million).

In addition, Fluor Hanford's River Corridor Project team became the sixth Hanford organization to earn "Star" status in the Department of Energy's Voluntary Protection Program (VPP), an OSHA-based program that recognizes and promotes exemplary workplace safety and health efforts.

A very strong safety performance notwithstanding, Fluor Hanford continues to strive for the goal of a totally injury-free workplace. To help meet that goal, management recently reiterated its expectations at all-manager meetings and is planning a "safety summit" involving Project safety and operations personnel and labor. Additional safety training for managers and work groups is being developed. Also, Integrated Safety Management System (ISMS) and VPP tools and practices are being reinforced throughout the workforce, especially through Employee Zero-Accident Councils.



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Barriers to Contamination

Workers place a bio-barrier on a recurring radioactive contamination area. Prior to the barrier installation, this particular area had been a source of migrating contamination caused by ants and deep-rooted vegetation. Monitoring data show a continued decrease in animal and vegetation radioactive contamination incidents across the Site. The downward trend began in 1999, following inception of a formal biological-control program, reversing a trend that had been increasing in the six previous years.



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Lifesaving Leadership

In a pioneering step for Hanford – and possibly the first non-medical installation in eastern Washington – six automated external defibrillators (AEDs) have been placed in strategic locations around the Plutonium Finishing Plant (PFP). Mike Esparza, Pat Jenkins and Mike Luckman are shown training on the AED with “patient” and PFP co-worker Dave Messinger. Jerry Stevenson (right), a nuclear chemical operator at PFP and a paramedic, was instrumental in initiating the pilot program. PFP’s remote location in central Hanford potentially places workers too far from emergency services in the case of sudden cardiac arrest, where help within the first four minutes is critical. AEDs are becoming more widely available throughout the country at airports, stadiums and other busy public places for use by trained, non-medical people to save lives.



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What's Next in Restoring the River Corridor?

- **Remove, dry and place in storage in central Hanford about 30 more loads of spent nuclear fuel from the K Basins near the Columbia River by April.**
- **Increase from two-shift to around-the-clock operations, seven days a week, at the K-West Basin.**
- **Begin operating canister-cleaning equipment in the K-West Basin.**
- **Receive equipment and prepare a mock-up facility to test equipment and train operators for the removal and shipment of six DOE-owned, commercial spent-fuel assemblies from the 324 Building to the 200 Area.**
- **Ship pipe-trench waste from the 324 Building to the low-level waste burial grounds in central Hanford.**
- **Ship three flat railcars to the low-level waste burial grounds for disposal.**
- **Transfer and ship the last of five pieces of heavy equipment to an offsite, Nuclear Regulatory Commission-licensed company for reuse.**
- **Continue to remove piping from the 337 Building sodium test systems for shipment offsite. Perform a remote, visual inspection of the Composite Reactor Component Test Activity vessel to verify residual sodium volume prior to preparing contracts for cleanup.**

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What's Next in Transitioning the Plateau?

- Complete the repackaging of Hanford ash and begin stabilizing plutonium polycubes at the Plutonium Finishing Plant.
- Start accepting and storing at the Canister Storage Building the Shippingport spent nuclear fuel that is now stored at T Plant.
- Complete readiness preparations for covered-drum transuranic waste retrieval.
- Continue repairs and upgrades to fuel-handling systems and equipment needed to remove stored fuel assemblies for deactivation of the Fast Flux Test Facility.

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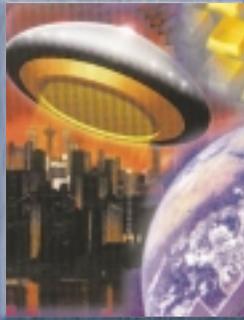
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What's Next in Preparing for the Future?

- Through the Tri-Cities Asset Reinvestment Company, Fluor Hanford's asset-transition team will help transfer to the private sector no-longer-needed government assets from a drill yard in 200 East and equipment from a former 300-Area photography lab.
- Fluor Hanford is assisting Richland Specialty Extrusions, a subsidiary of Kaiser Aluminum, in its move from a leased facility in the 300 Area to its new manufacturing facility in north Richland at the former DOE 1167 Building, which the county port authority now owns and, with the adjacent 1163 Building, has converted to a manufacturing mall.
- Fluor Hanford Site Operations staff are working with DOE to plan a water-system upgrade for the 100 and 200 Areas. The proposed effort would use private funding instead of government funding. The project includes replacing old, inefficient pumps and installing instrumentation to monitor and control the water system from a central location.

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