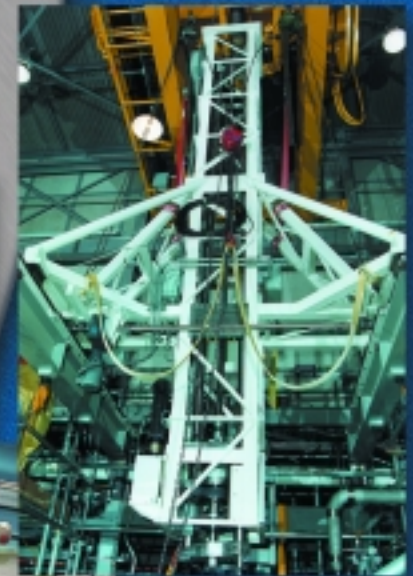


# Fluor Hanford

## CLEANUP PROGRESS REPORT

JANUARY – MARCH 2000

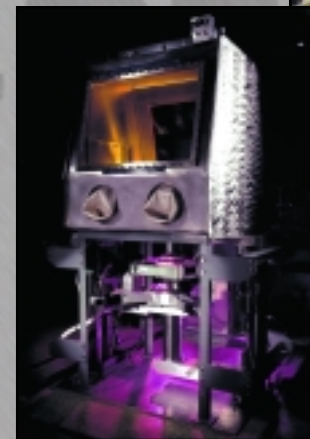


# CONTENTS

Highlights .....	2
Hanford Site Map .....	3
Nuclear Material Stabilization.....	4
River Corridor.....	7
Spent Nuclear Fuel.....	10
Waste Management & Analytical Services.....	13
Fast Flux Test Facility.....	16
Site Services .....	17
HAMMER.....	19
Environment, Safety & Health .....	21
Economic Transition .....	23
Other Hanford Cleanup .....	25
For More Information .....	26

Prime Contractor:  
**Fluor Hanford, Inc., A Fluor Global Services Company**

- Contributing Subcontractors:
- DynCorp Tri-Cities Services, Inc.
  - Numatec Hanford Corporation
  - Protection Technology Hanford
  - Waste Management Federal Services of Hanford, Inc.
  - Westinghouse Safety Management Solutions LLC



CONTENTS

## 2<sup>ND</sup> QUARTER FISCAL YEAR 2000 HIGHLIGHTS



Ron Hanson,  
Fluor Hanford President  
and Chief Executive Officer

We've come a very long way in one short year. That's because all Fluor employees and our team of subcontractors are committed to the progress of Hanford cleanup. I'm pleased that our client, the Department of Energy (DOE), has publicly recognized our efforts.

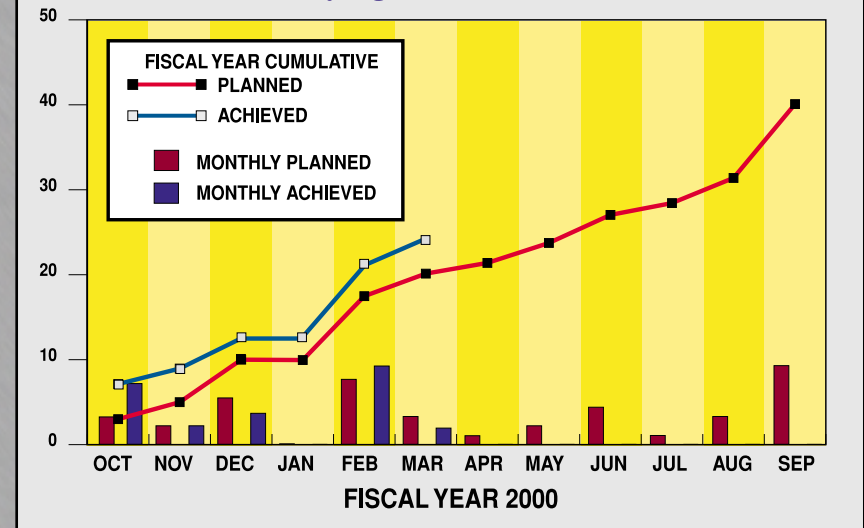
According to DOE's Richland Operations Office Manager, Keith Klein, "Fluor has embraced Hanford's

outcomes – restoring the river corridor, transitioning the central plateau for long-term waste treatment and storage, and putting Hanford's assets to work for the future. The company and its employees are working hard to help us achieve our vision for the future."

Yes, we are working very hard. The following pages describe our achievements since January 1, many of which position us to accelerate cleanup and further reduce the financial burden on the American taxpayer. We're on our way to quadrupling the rate of plutonium stabilization. We're testing our equipment and training our operators so that we safely begin removing spent fuel from the riverside K Basins this November. We should soon receive the go-ahead to begin shipping transuranic waste offsite to New Mexico. We may be able to shave decades off some portions of the cleanup timetable.

This is very real cleanup progress. It will make our vision for Hanford a reality.

Tri-Party Agreement Milestones



We were credited with completing two more milestones as of last October. Our regulators extended three other milestones beyond fiscal 2000. Fluor Hanford now is expected to achieve 40 enforceable cleanup milestones this year, rather than the 42 shown in our last Progress Report. As the chart shows, we're ahead of plan for the first half of the fiscal year.



HIGHLIGHTS

# HANFORD FACILITIES FEATURED IN THIS REPORT



## 100 K Area

- K Basins
- Cold Vacuum Drying (CVD) Facility

## 200 East Area

- Canister Storage Building (CSB)

## 200 West Area

- 222-S Labs
- Central Waste Complex
- Mixed Low-Level Waste Trench
- Plutonium Finishing Plant (PFP)
- T Plant
- Waste Receiving and Processing (WRAP) Facility
- Waste Sampling and Characterization Facility (WSCF)

## 300 Area

- 309 Building (former Plutonium Recycle Test Reactor)
- 310 Treated Effluent Disposal Facility (TEDF)
- 324 Building
- 327 Building
- 340 (Liquid Effluent) Facility *[closed]*
- Waste Acid Treatment System (WATS) *[closed]*

## 400 Area

- Fast Flux Test Facility (FFTF)

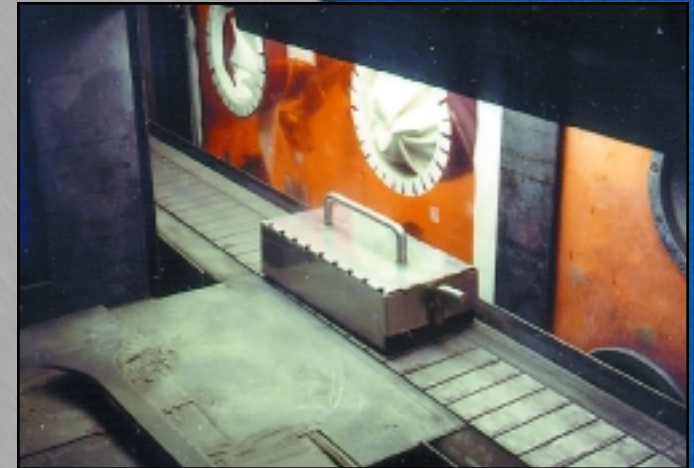
# NUCLEAR MATERIAL STABILIZATION

## Expectation:

Safely stabilize special nuclear materials at the Plutonium Finishing Plant and then deactivate the facility to reduce risk to workers and the environment while decreasing cost to taxpayers.

## Status:

- Fluor Hanford contracted with Westinghouse Safety Management Solutions (WSMS) to bring in a core leadership team with significant relevant plutonium operations experience. A 30-day transition between B&W Hanford and WSMS was completed February 1.
- Thermal stabilization of plutonium-bearing materials is progressing at a rate double last year's, with more than 200 items stabilized this fiscal year. More than 8 percent of the inventory has been stabilized to date. Three new furnaces recently brought on line should double the throughput rate again.

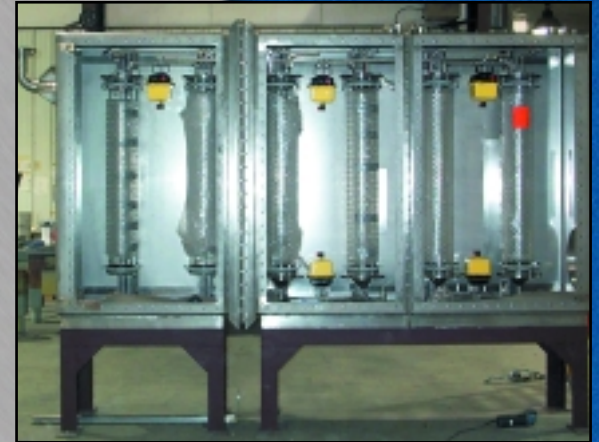


*Inside gloveboxes at the Plutonium Finishing Plant, workers place plutonium-bearing materials in containers called boats. This boat, on a conveyor, is approaching a small oven, called a muffle furnace, where high temperatures will dry the moist, chemically reactive materials in the boat to a stable powder.*

# NUCLEAR MATERIAL STABILIZATION

## What's Next:

- The added muffle furnaces, plus restart of cementation of plutonium residues and the start of magnesium hydroxide precipitation processing of plutonium solutions this summer, will quadruple the overall rate of stabilization at the Plutonium Finishing Plant this year.
- Studies have confirmed that the use of muffle furnaces will be an efficient, cost-effective and safe method for stabilizing plutonium polycubes. That effort will be initiated in the first quarter of fiscal 2001.



*This filtrate glovebox is being installed for a magnesium hydroxide process technology that will start stabilizing plutonium liquids this summer. Two more gloveboxes are in fabrication at Idaho Falls.*

Fluor Hanford

# NUCLEAR MATERIAL STABILIZATION

## What's Next: (continued)

- Two final packaging units, referred to as bagless transfer systems, will be installed at the Plutonium Finishing Plant to package the inventory of stabilized materials. Startup of the first system, now being installed, is scheduled for the fourth quarter of fiscal 2000. Having two systems will increase operating efficiency and help accelerate the Project's completion.



*An efficient method for final packaging of stabilized materials in canisters, or "bagless" transfer, is being imported to Hanford from DOE's Savannah River Site. This is the first of two bagless transfer system gloveboxes to be installed.*



# RIVER CORRIDOR

## Expectation:

Safely deactivate contaminated facilities, including several near the Columbia River, to reduce risk to workers and the environment while decreasing cost to taxpayers.

## 324 Building Cleanout:

- Technicians removed the final two-story equipment rack from the wall inside B Cell, the largest, most contaminated cell in the facility. All of the 17-foot rack has been cut into smaller pieces with a plasma arc torch using remote manipulators.
- Remnants of the large racks from B Cell are being packaged in grout containers. This quarter, two containers were packaged, loaded into a 56,000-ton cask assembly, and moved to compliant storage in the 200 Area. The shipment demonstrated that the 324 Building team has successfully resolved some difficult waste characterization, packaging and shipping issues. Two of the 17 shipments scheduled for the first campaign are complete. These shipments support removal of waste and equipment from B Cell by November, an important Tri-Party Agreement milestone.
- We worked with our regulators to resequence some of the cleanout work; they approved the new, more efficient schedule in January.



*Technicians use a 30-ton crane at the 324 Building to lower a grout container cask onto a truck for shipment to the low-level waste burial grounds in the 200 Area. The container is filled with remnants of a two-story-tall rack from B Cell, the largest and most contaminated cell in the facility.*



RIVER CORRIDOR



# RIVER CORRIDOR

## 327 Building Deactivation:

- Thanks to aggressive cost cutting, we are on track with a “stretch” initiative to move legacy waste to safe storage, even though the work was not specifically funded this year.
- About 30 percent of the approximately 370 sample cans of radioactive materials stored in the building’s under-floor carousel have been retrieved and removed.
- Reclassification of certain low-level waste from the facility from Category 3 to Category 1 will cut disposal costs 75 percent.



*Hot cells line a corridor in the 327 Building. Three of the facility’s eight hot cells are now clean.*

## Other Project Achievements:

- As part of the National Facility Deactivation Initiative, we provided deactivation expertise to the Savannah River Site and helped the Idaho National Engineering and Environmental Laboratory install planning and estimating software, called POWERtool, developed at Hanford for decontamination and decommissioning projects.
- Our closedown of the Waste Acid Treatment System, once used to treat and store waste acid from nuclear fuel fabrication, was named Project of the Year by the local Project Management Institute chapter. The innovative effort is considered a model for similar Resource Conservation and Recovery Act closures.

# RIVER CORRIDOR

## 310/340 Facilities:

- The 310 Treated Effluent Disposal Facility and the much older and currently closed 340 Facility are where all process wastes from the 300 Area flow for treatment. Planning has been done to enable accelerated closure of the 340 Facility if funding is made available. The first critical deactivation task would be to remove the residual heels in two storage tanks, significantly reducing the facility's maintenance and surveillance costs. (See also Page 17, Site Services.)



*From inside the modern control room, an operator monitors treatment of wastewater at the 310 Treated Effluent Disposal Facility.*

## What's Next:

- Develop a 300-Area Accelerated Closure Project Plan, including schedules and cost estimates.
- A contract for an off-the-shelf robotic arm that will be used to complete deactivation of B Cell was awarded to Cybernetix, a recognized expert in the manufacture of remote-controlled components. The robotic system is expected to accelerate the cleanout and shutdown of the 324 Building.

# SPENT NUCLEAR FUEL

## Expectation:

Protect the Columbia River by safely moving more than 2,100 metric tons of deteriorating spent nuclear fuel from aging wet storage near the river to safe, dry, interim storage in the center of Hanford.

## Construction and Testing:

- Initiated operational tests of K West Basin fuel retrieval and water treatment systems as part of a phased approach to enhance worker proficiency and our ability to start removing spent fuel in November.
- Installed the last components of the cask loadout system, a Tri-Party Agreement milestone. This completes all major construction activities in the K West Basin required for fuel movement. Initiated startup testing of the loadout system components.



*Craft workers position the final item for the K West cask loadout system, a gantry, on its support structure. The loading system operates under water to shuttle and lift spent fuel baskets and place them in overpacks and casks for transport.*

SPENT NUCLEAR FUEL



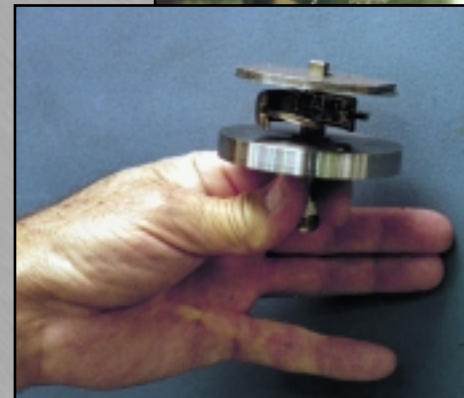
# SPENT NUCLEAR FUEL

## Construction and Testing: (continued)

- Initiated integrated testing at the Cold Vacuum Drying Facility. Using a multi-canister overpack and a shipping cask, these tests will assure that the installed process equipment will meet performance criteria for safely drying fuel.
- Completed final welding on all 220 storage tubes in the Canister Storage Building vault.

## Planning and Technical Issues:

- Resolved the last remaining technical issue, assuring we have a safe, solid foundation for the Project's path forward.
- We've proposed a strategy to expedite completion of sludge removal from the K Basins by one year without increasing overall Project costs.



*The uniqueness of the Spent Nuclear Fuel Project posed a number of technical issues that had to be resolved prior to fuel movement. Some innovative solutions resulted, such as this magnetic pressure gauge that will sit just inside the shield plug at the top of the multi-canister overpacks to detect any pressure buildup.*

# SPENT NUCLEAR FUEL

## What's Next:

- Secure DOE's approval of the Project's final safety documentation.
- Complete acceptance testing at the K West Basin, Cold Vacuum Drying Facility and Canister Storage Building in preparation for November fuel movement; transition from construction to operation of the facilities.
- Receive the first production batches of fuel baskets and overpacks, due June 1.
- Continue K East integrated water treatment system design.



*A purge-and-vent cart (left) will be used to vent, purge and refill storage tubes with helium in the Canister Storage Building, and sampling equipment (above) will allow workers to monitor the air inside the overpacks. Each circle on the floor is a cover for a 40-foot storage tube below.*

# WASTE MANAGEMENT & ANALYTICAL SERVICES

## Expectation:

Safely treat, store and dispose of solid wastes and liquid effluents; store cesium and strontium capsules; provide waste generator, environmental and waste minimization services; and manage and integrate analytical services, optimizing use of onsite and offsite laboratories.

## Transuranic (TRU) Waste:

- DOE's Carlsbad Area Office audited Hanford's ability to meet requirements to ship TRU waste to the New Mexico repository.
- In general, the auditors found our program adequate and its implementation satisfactory and effective. The Environmental Protection Agency is expected to recommend qualification for our TRU Project.
- Hanford's first shipment is planned for later this spring.
- In the meantime, we continue to prepare TRU waste for shipment at the Waste Receiving and Processing Facility. We performed non-destructive examinations of 339 drums, non-destructive assays of 273 drums, visual examinations of 25 drums and radiography of 25 boxes, and processed 29 drums through the low-level waste repackaging/compaction glovebox.



*TRUPACT II casks like these used for worker training and public education will be used to safely transport Hanford's transuranic waste to the Waste Isolation Pilot Plant in New Mexico.*

# WASTE MANAGEMENT & ANALYTICAL SERVICES

## Waste Treatment and Disposal:

- Shipped another 134 boxes totaling 525 cubic meters toward our fiscal 2000 target of sending 1,160 cubic meters of mixed low-level waste to a local firm for treatment. This represents an effective storage volume reduction in Hanford's Central Waste Complex of 1,150 cubic meters, nearly twice the amount shipped out, due to waste over-packing and storage requirements.
- Disposed of 1,650 cubic meters of low-level waste from Hanford and offsite generators in the 200 Area low-level burial grounds.



*Mixed low-level waste is being treated at the local Allied Technology Group facility. ATG has already returned 25 treated containers for disposal in Hanford's mixed low-level waste trench.*

## Analytical Services:

- The Waste Sampling and Characterization Facility and 222-S Laboratories continue to provide reliable, quality analytical services. These analyses support a wide variety of cleanup projects across the Site, including the Office of River Protection (underground waste tanks).

# WASTE MANAGEMENT & ANALYTICAL SERVICES

## What's Next:

- Complete certification and begin shipping TRU waste from Hanford.
- Complete a project management plan for remote-handled TRU waste to meet a June 2000 Tri-Party Agreement milestone.
- Accelerate readiness to receive spent-fuel sludges from the K Basins at T Plant, including cleaning off the canyon deck and completing seismic analyses and planning documents.



*Storage of K Basin sludges at T Plant will support the Spent Nuclear Fuel Project and protect the Columbia River.*

# Fluor Hanford

WASTE MANAGEMENT & ANALYTICAL SERVICES





# FAST FLUX TEST FACILITY

## Expectation:

Maintain the Fast Flux Test Facility (FFTF) in a safe and compliant condition. Prevent facility degradation and optimize the ability to respond cost effectively to a DOE mission decision. Continue deactivation of related legacy facilities in the 300 Area.

## Status:

- The FFTF team achieved 1,001 days (1.3 million hours) without a lost workday accident. On January 27, an employee underwent surgery for carpal tunnel syndrome, and the Project began rebuilding its safety record.
- Finished cleaning the residual sodium from the last of the tanks previously moved from the 200-Area Containment Systems Test Facility (which was located in T Plant) to the 337 Building in the 300 Area. The caustic sodium hydroxide resulting from this cleaning work is used by the 300 Area Treated Effluent Disposal Facility in its normal operations, so minimal waste was generated.
- The aboveground ion exchange column for the 309 Building (former Plutonium Recycle Test Reactor) wastewater discharge system was removed and packaged for shipment to the low-level waste burial grounds in central Hanford.



*Workers prepare an ion exchange column in the 300 Area for removal and shipment for burial in central Hanford. The column once supported wastewater discharges from the Plutonium Recycle Test Reactor.*

## SITE SERVICES

### Expectation:

Provide site services ensuring that the infrastructure, safeguards and security, emergency services, engineering laboratories and corrective action management functions are properly aligned to support Hanford projects.

### Reducing the Site Mortgage and Cleanup Costs:

- Developed an innovative approach for the demolition of the 200-Area steam plants. Issued a request for proposals under a contract using underutilized Site assets as consideration for demolition services, which could avoid demolition costs of up to \$8 million. Work could begin by September, accelerating the demolition of the steam plants by at least 7 years.
- Engineering lab staffers are teaming with River Corridor Project personnel to identify methods and equipment for tank heel cleanout at the closed 340 liquid effluent facility. When the two tanks are successfully cleaned out, the facility's current annual maintenance and surveillance costs of \$1.5 million would drop to about \$100,000. (See Page 9, River Corridor.)



*In addition to reducing Site maintenance and cleanup costs, an innovative approach to demolishing the 200-Area steam plants would change Hanford's skyline dramatically, as shown by this current photo of the 200 East steam plant (top) and a computer-altered image without it.*

SITE SERVICES



## SITE SERVICES

### Reducing the Site Mortgage and Cleanup Costs: (continued)

- Developed a proposal to decontaminate and make available 10 pieces of heavy equipment which were destined for burial as low-level waste at a cost of more than \$900,000. Money generated from the sale of the equipment will be used to clean and free up more items.



*A Washington State trooper admires a patrol-car video camera. Protection Technology Hanford donated the camera. DynCorp Tri-Cities Services has also contributed to the Fluor Hanford-initiated community drive to video-equip law-enforcement vehicles in the Tri-Cities following the murder of a trooper this past October.*

### Support for Privatized Waste Treatment Plant:

- Provided raw and potable water, construction power and access roads to the site of the future tank waste vitrification facility.
- Currently assessing readiness in eight infrastructure areas: water, electrical, sewer, transportation, office space, safeguards and security, fire department services and emergency preparedness.

### What's Next:

- Deliver first shipment of 60 fuel baskets June 1 to the Spent Nuclear Fuel Project. The baskets will hold spent fuel from the K Basins during drying and interim storage at Hanford.

SITE SERVICES



# VOLPENTEST HAMMER TRAINING AND EDUCATION CENTER

## Expectation:

Host, broker and provide training to the Hanford workforce with hands-on use of realistic props and settings to save lives, reduce injuries and increase worker productivity, and serve as a catalyst for regional training.

## Hanford Support:

- Delivered 488 classes this quarter for a total of 7,793 student days. This included 451 classes for Hanford workers.
- Began Web-based emergency preparedness training that saves money and time by allowing workers to complete certain requalification courses at their workstations via personal computers.
- Presented seven Pilot/Escort Vehicle Operator classes for Site workers, at a \$4,000 saving, after state legislation took effect that stopped all movement of loads requiring pilot cars until operators received training.



*Worker at left wears personal protective equipment routinely used at the Plutonium Finishing Plant. But mock-up testing at HAMMER for a motor replacement job in a waste tank pit proved the garb was too stiff and bulky for entrance through the pit's two-foot-square opening and restricted the worker's visibility. A new, more effective design (shown above) was adopted for the job.*

HAMMER



# VOLPENTEST HAMMER TRAINING AND EDUCATION CENTER

## Hanford Support: (continued)

- Helped Society for Fire Protection Engineers find cost-effective training solutions, enabling the organization to stage its introductory design course, normally only offered in major cities, for Hanford workers.

## Federal Agency Support and Regional Training:

- Distributed 1,500 CDs containing radiological transportation emergency response training to eight DOE regions.
- Held five OSHA Training Institute courses for 150 national compliance officers.
- HAMMER's "cultural test bed" prop was used by a Bonneville Power Administration global positioning system class and a Confederated Tribes of the Umatilla Indian Reservation class on inadvertent discovery of human remains.
- Partnered with the state's Criminal Justice Training Commission to conduct a statewide Basic Corrections Officer Academy at HAMMER, the first held in southeastern Washington.



*Workers in a 40-hour trench rescue class learn proper shoring and stabilization techniques as they attempt to rescue individuals trapped by a simulated cave-in.*

HAMMER



# ENVIRONMENT, SAFETY AND HEALTH

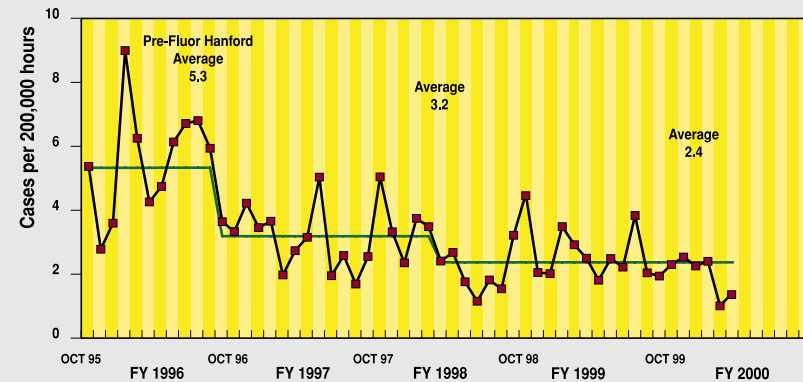
## Expectation:

Achieve safe, compliant, quality performance by implementing an Integrated Environment, Safety and Health Management System (ISMS).

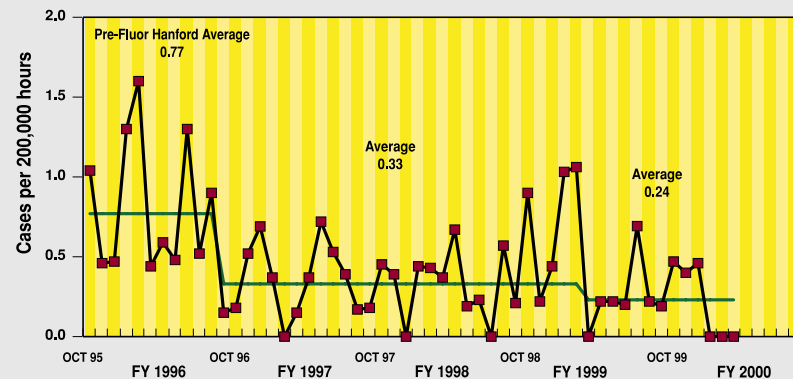
## Status:

- Developed an accelerated ISMS implementation strategy that could lead the full Fluor Project Hanford Team to completion by July, two months ahead of the national deadline. The strategy reflects our restructured organization and addresses remaining verification criteria with a single system description.
- The last of three workshops for employees focused on final implementation and maintaining, sustaining and continually improving our ISMS.

### OSHA Reported Injury/Illness Rate



### Lost Workday Injury/Illness Rate

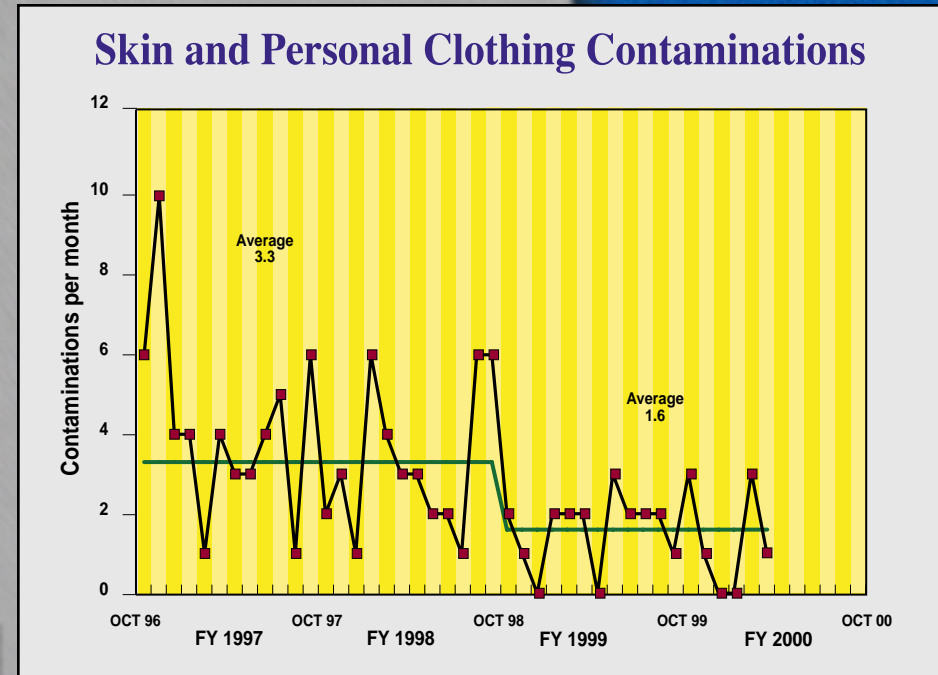


*Consolidation of the Projects under Fluor Hanford and actions taken at the end of fiscal 1999 to look at sources of injury appear to be having a positive effect, with the OSHA recordable case rate and overall injury rate declining.*

# ENVIRONMENT, SAFETY AND HEALTH

## What's Next:

- The second annual Hanford ALARA (As Low As Reasonably Achievable) Workshop in April will again be sponsored by Fluor Hanford Radiation Protection. The three-day event features formal presentations, panel discussions, a Site tour focused on practical radiological safety methods and tools, and an opportunity to network with professionals and vendors from the national and international nuclear community.
- Fluor Hanford will sponsor the annual Safety Expo in May. This three-day show is open to the public and typically many school children and family members of Hanford workers attend.



*The overall rate of skin and personal clothing contaminations continues to decline.*

# ECONOMIC TRANSITION

## Expectation:

Focus economic diversification efforts on the Tri-Cities and workers affected by Hanford job declines.

## Status:

- Construction on the Fluor multipurpose industrial building in Pasco continues. Footers are complete, steel beams were delivered, and the split-faced brick walls are going up. Fluor-developed materials are ready for use in a targeted marketing campaign by the Tri-City Industrial Development Council (TRIDEC).
- Fluor Global Services personnel, in support of TRIDEC, inventoried existing and potential Tri-Cities locations for business and industrial parks suitable for targeted industries.



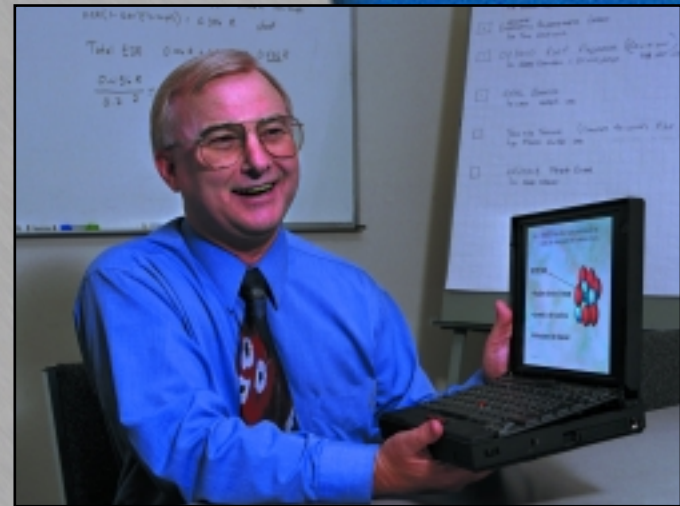
*Construction is ahead of schedule on Fluor's 100,000-plus square-foot industrial building, designed to help attract new businesses to the Tri-Cities.*



# ECONOMIC TRANSITION

## Status: (continued)

- Fluor Hanford underwrote an economic development workshop for more than 45 local economic development professionals. The workshop featured nationally recognized experts Bob Leak and Bob Goforth, who were associated with development of the acclaimed Research Triangle Park in North Carolina.
- The donation, sale, transfer or lease of underutilized and excess equipment from the Hanford Site continues to help local companies expand their businesses. Among those assisted this quarter were EXITECH Columbia Corporation, a local firm providing training to Hanford and private-sector clients, and Lockheed Martin Services, Inc. (LMSI). EXITECH received audiovisual and other training equipment, while LMSI is leasing underused photography equipment.



*EXITECH can spend precious resources on expanding its base of clients or other critical needs, thanks to the donation of excess audiovisual and computer equipment it can use to deliver training for Hanford workers and private-sector customers.*

## OTHER SIGNIFICANT HANFORD CLEANUP

- A daily average of 3,000 tons, or 150 truckloads, of contaminated soil is removed from major sites along the Columbia River and safely disposed in the Environmental Restoration Disposal Facility in central Hanford. More than 2.1 million tons have been disposed to date.
- Decontamination and decommissioning work continues at the 233-S Plutonium Concentration Facility in the 200 West Area and has begun on the 224-B Plutonium Concentration Facility in 200 East.
- Reactor interim safe storage (cocooning) of C Reactor is complete and in process on the DR and F reactors. Engineering for the cocooning of D and H reactors is under way.
- Five pump-and-treat systems processed 300 million gallons of contaminated groundwater this quarter.



*East of DR Reactor, 66-inch effluent water lines that lead to retention basins and on to the river are being removed. More than half of the reactor's footprint has been removed as part of the Reactor Interim Safe Storage Project.*

*Contaminated soil is removed from near the river north of the 300 Area.*

## FOR MORE INFORMATION....



- **U.S. Department of Energy**  
Office of External Affairs  
P.O. Box 550, MS A7-75  
Richland, WA 99352  
(509) 376-5742

## Fluor Hanford

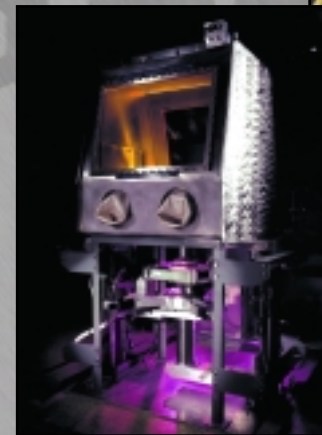
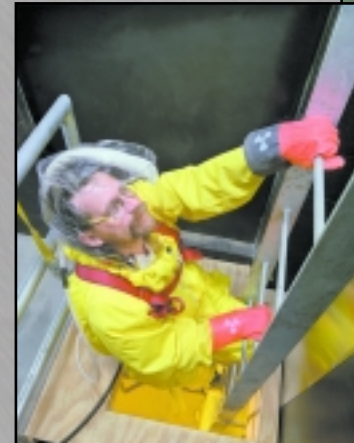
- **Fluor Hanford, Inc.**  
Office of Communications & Media Relations  
P.O. Box 1000, MS B3-30  
Richland, WA 99352  
(509) 376-5101

OR

- Visit the Hanford Homepage at:  
<http://www.hanford.gov>

RL-F98-009 04/00

You can also access this report and previous editions at  
<http://www.hanford.gov/doe/progress/progress.htm>



INFORMATION