



Release date: October 2, 2000

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HANFORD'S PLUTONIUM FINISHING PLANT STARTS UP NEW AUTOMATED PACKAGING SYSTEM

Four Plutonium Handling Processes Now Underway at Hanford

A new system to package plutonium began September 30 at the Plutonium Finishing Plant (PFP), located in the Central Plateau of the U.S. Department of Energy's (DOE) Hanford Site. Operation of the Bagless Transfer System started after successful completion of a readiness review and authorization by DOE's Richland Operations Office (RL).

"This automated, state-of-the-art system is the first step in packaging Hanford plutonium in compliance with DOE's new requirements," said George Jackson, Fluor Hanford, Inc.'s Vice President for the Nuclear Material Stabilization Project.

The system is used to seal plutonium into the inner container of a new two-container package made of heavy, welded stainless steel. A second automated process for the outer package is under construction for startup in March 2001.

Bagless Transfer is the fourth plutonium handling process underway at Hanford and the third major process startup this month at the Plutonium Finishing Plant:

- January 15, 1999 - Thermal stabilization began converting chemically reactive plutonium-bearing powders and scraps into a safer form by heating the materials in small furnaces (three additional furnaces added March 2000, making a total of five)
- September 11, 2000 - PFP workers began repackaging of plutonium residues not requiring additional stabilization into a package called "pipe-and-go" for eventual shipment to the Waste Isolation Pilot Plant in New Mexico
- September 20, 2000 - The new Magnesium Hydroxide Precipitation Process began stabilizing plutonium nitrate solutions

Hanford PFP Starts...

PFP has 4 metric tons of plutonium within nearly 18 metric tons of bulk plutonium-bearing material. With startup of the Bagless Transfer System, all the processes are in place to stabilize and package PFP's plutonium in all its forms including oxides, solutions, metals, residues and polycubes.

Hanford applied some of the lessons learned at DOE's Savannah River Site, where the Bagless Transfer System was developed. Before work began on the new system, PFP engineers, scientists, operators, and radiation control personnel visited Savannah River to ensure they developed the best design for the Hanford process.

The system is called "bagless transfer" because it eliminates the practice of "bagging out" radioactive items from the glove box used at DOE sites. In the past, operators would reach into the glovebox through the glove port and slide the radioactive item into a plastic sleeve connected to the glove port.

This provided a seal in front and behind the material leaving the outside of the bag clean. The bag containing the radioactive item was then sealed inside containers for storage. When it was discovered that the chemistry of the plastic could degrade the container's seal over time, the nuclear industry looked for a way to safely move items out of the glovebox without plastic.

Using the new system, a stainless steel container is pushed into the glovebox through a series of rubber wipers - called a sphincter port - from underneath. This port creates a seal as the steel container is pushed through, leaving the lower half of the container outside the glovebox. Plutonium materials are put in the container, and a hollow steel plug is placed about halfway down the can. The outside of the can is welded at the plug, creating a seal. Cutter wheels divide the container and plug into two pieces - a sealed can and a remnant.

"We're fortunate we can put to use a design that has already been highly successful at the Savannah River Site," said Bob McQuinn, PFP Director. "It's economical and it gives us a high level of confidence in proceeding with the packaging of PFP materials."

"Startup of the 'Bagless Transfer System' is a key achievement in preparing PFP's large plutonium inventory for long-term storage," said Larry Romine, DOE-RL Director of the Materials Disposition Division. "This new automated system will accelerate our packaging capabilities while reducing radiation exposure to our workers."

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Historical Note: The U.S. Department of Energy's Richland Operations Office manages the Hanford Site in southeastern Washington State. Hanford was established during World War II as part of the top secret Manhattan Project to produce plutonium for nuclear weapons. Weapons material production was halted in the late 1980s. The Hanford Site is now engaged in the world's largest cleanup effort to deal with the legacy of radioactive and hazardous wastes that resulted from the plutonium production era. The U.S. Environmental Protection Agency and the Washington Department of Ecology regulate Hanford's cleanup program under a long-term compliance contract called the Tri-Party Agreement. This agreement sets the framework and timelines on the cleanup work so that

Hanford meets environmental standards. Hanford cleanup is focused on three outcomes: restoring the Columbia River Corridor for other uses, transitioning the Central Plateau to long term waste treatment and storage, and preparing for the future.

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