

## PFP Nuclear Material Stabilization Project team on a roll

The Nuclear Material Stabilization Project at the Plutonium Finishing Plant has come a long way since starting up the thermal stabilization process in January 1999. Using two muffle furnaces inside a glovebox, project staff members began heating plutonium residues and oxides to drive off water and volatile chemicals to convert the materials into a stable form for long-term storage.

Subsequently, project staff members also designed, installed and brought on line the rest of the processes needed to stabilize and package all of the PFP plutonium forms including metals, solutions, oxides, alloys, residues and polycubes.

In fiscal year 2000, the Nuclear Material Stabilization Project team met the Department of Energy Richland Operations Office Manager Keith Klein's challenge to quadruple the plutonium stabilized in 1999. This year, according to George Jackson, Fluor Hanford vice president for the Nuclear Material Stabilization Project, the project has already quadrupled the 2000 amount.

### Solutions stabilization

Since the start-up of solutions stabilization in October 2000, the team has made steady progress on stabilizing PFP's inventory of over 4,200 liters of plutonium-bearing solutions. The team has processed about 22 percent of the total volume of the solutions that contained over 50 percent of the plutonium. The project has purposely chosen the best-integrated safety approach by processing solutions with the lowest volume but highest plutonium content, thus mitigating the highest risk first.

Moisture measurement is a vital part of ensuring the integrity of the plutonium storage container by making sure that



Allen Ostby performs routine surveillance on the W460 glovebox.

there will not be a buildup of pressure within the container that could potentially cause container failure.

Klein commended PFP staff members for their work in discovering the analytical bias in DOE-approved methods of moisture measurement. "Specifically, I commend Scott Barney, Thurman Cooper, Rich Szempruch and Ted Venetz of the Plutonium Finishing Plant staff," Klein said. "Their timely detection of this problem will save DOE and its contractors thousands of hours and millions of dollars by avoiding flawed moisture measurement in packaging plutonium."

Through a recent acceleration initiative, PFP has gained DOE and Defense Nuclear Facilities Safety Board approval to directly

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dispose of some of the low purity plutonium solutions. Implementation of the direct discard process has accelerated stabilization of the entire solutions inventory by over two months. It also reduces unnecessary processing, radiation risk and costs. Solutions stabilization at PFP is now on schedule to be completed in July 2002.

### Metals stabilization

In September, the PFP staff completed stabilizing and repackaging the inventory of plutonium metals and the small amount of corrosion products from disintegrated metals, attaining a key goal set by the DNFSB. A significant efficiency was realized through metals brushing, which left a stable metal that was repackaged into the new storage containers. Only the powdered oxides brushed off the metal and the corrosion products required thermal stabilization before packaging.

### Alloys

Disposition of the material group identified as alloys proved to be quite challenging. The greatly varied alloy group was divided into two groups: residues that could be disposed of directly and those materials requiring stabilization and packaging for long-term storage. The residues team repackaged 31 alloy residue items for shipment to the Waste Isolation Pilot Plant, and the thermal stabilization team completed brushing and packaging of 11 alloy items into the new stainless steel canisters. The remaining alloy items will be stabilized and packaged after an adequate moisture measurement technique is developed and approved.

### 3013 Plutonium storage canisters

Start-up operation of the outer can welder on April 10 made Hanford the first DOE site to fully comply with the new DOE national standard for safe, long-term storage of plutonium by completing the welding of the inner and outer canisters with the stainless steel "convenience" can inside. PFP continues to set the pace for the complex with both the variety of materials packaged and the speed at which they are being produced.

### Residues

The residues team began repackaging Hanford plutonium ash in early April and shipped the first batch of the packaged ash to the Central Waste Complex on May 17. The team took a break from residues repackaging to package the alloys for shipment to the WIPP. The team is now recovering schedule in the repackaging of Hanford ash to be completed in January 2002.

### W460

The Material Packaging team recently completed an Operational Readiness Review to allow hot start-up of the new processing system by the end of November. The Nuclear Material Stabilization Project will more than double the stabilization and packaging capabilities when the W460 Project is brought on line. This system will have four large furnaces and processes to package and weld material into both the inner and the outer canister all in the same location.

### New technology in the vault

Fluor Hanford, Pacific Northwest National Laboratory and DOE teamed to develop and apply an innovative PNNL technology to remotely monitor the new canisters. PNNL's radio-frequency tag is linked with a pressure monitor developed by Vista Engineering Technologies, a local firm. The integrated system will provide continuous monitoring of pressure, temperature and safeguards information for each canister. Cost savings and avoidances are projected to exceed \$10 million.

### Safety

Despite accelerated schedules and many technical challenges, the PFP team has achieved more than 2.3 million hours and 700 days without a lost-workday accident case. However, there is an increased focus on the incidence of Occupational Safety and Health Administration recordable incidents. Management and staff take these incidents very seriously. ♦