# Three tons of residues repackaged at PFP

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**PFP nuclear chemical operators handle residues inside a vented "tent" structure.**

This month, Fluor Hanford personnel at the Department of Energy's Plutonium Finishing Plant passed the 3-ton mark in repackaging the large collection of plutonium-bearing leftovers known as residues.

Residues are a diverse collection of scrap items dispositioned as wastes. The residues include Rocky Flats ash; Hanford ash; mixed oxide scrap; sand slag and crucible, or SS&C, that remains from the process of making plutonium metal "buttons"; at least two types of plutonium alloys scrap; and other miscellaneous plutonium-bearing scrap items from decades of weapons production at PFP. PFP employees have been repacking the residues for permanent disposal at the Waste Isolation Pilot Plant in Carlsbad, New Mexico.

The collection of residues is the largest part of the legacy plutonium-bearing materials at PFP. Of the approximately 18 metric tons of plutonium-bearing materials left at PFP when plutonium production ended in 1989, nearly 6 tons have been designated as residues.

In original agreements with DOE and the Defense Nuclear Facilities Safety Board, only about 4 metric tons of the materials were designated as residues. However, over the ensuing years, about two metric tons of additional material have been designated residues.

"We're extremely proud of the residues team because they've been willing and able to absorb so much extra feed to repackage," said Kent Smith, Fluor Hanford's PFP deputy director. "If additional materials hadn't been moved into the residues category, this team would just about be crossing the finish line [90 percent complete] six to eight months ahead of schedule. By taking on extra tasks, the residues team has provided us a great opportunity to stabilize and repackage all the material at PFP ahead of the May 2004 deadline."

## Residues packaging

Unlike some other forms of plutonium leftovers at PFP, residues already exist in stable forms and do not have to be stabilized. Residues, which generally contain lesser amounts of plutonium by volume, simply need to be repackaged into sturdy containers to meet WIPP standards for disposal. PFP thermally treats plutonium-bearing materials such as solutions and polycubes, not suitable for long-term storage, to convert them to stable forms.

Repackaging residues involves sorting, processing and transferring certain plutonium- bearing solids and dense powders into new billet cans, which are 2.7-liter slip-lid cans. The work is done inside a glovebox in the main PFP processing facility, the 234-5 Building, long known to Hanford workers as "Dash 5." The billet cans are placed inside vented and filtered plastic bags, measured to determine plutonium content, and then placed inside special 55-gallon drums known as pipe overpack containers, or POCs.

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## Three tons of residues repackaged at PFP, cont.

The stainless-steel-lined POCs hold one to four billet cans and have secondary HEPA (high-efficiency particulate air) filtration. The POCs are destined for disposal as transuranic waste at the Waste Isolation Pilot Plant. Shipments to WIPP are expected to begin in 2004.

The packaging of residues has increased dramatically over the past three years. Teams led by Brian Skeels, Fluor Hanford Residues Stabilization manager, began repackaging in fiscal year 2000, and packaged nearly a ton in FY 2001 and about 1.7 tons in FY 2002. Thus far in FY 2003, they have repackaged more than three-quarters of a ton.

In late March, residues teams completed repackaging a large category of MOX scraps and began working on another set of materials known as “Group 2 Alloys.” They also completed measuring and transferring the large SS&C residues group to Hanford’s Central Waste Complex to await shipment for permanent disposal off site.

## Other PFP progress

The Residues Sub-Project is one of three major sub-projects focused on stabilization at PFP. The Thermal Stabilization Sub-Project under Rob Cantwell finished stabilizing plutonium-laced cubes of polystyrene, known as polycubes, in February, and is expected to begin washing and stabilizing oxides this spring.

Stabilizing and canning of plutonium metals and oxides, managed by Rob Gregory, was partly finished in September 2001 with completion of plutonium metals. That team is working to complete canning plutonium oxides by early 2004. The metals and oxides are being placed into new stainless-steel “3013” cans — those meeting the stringent new specifications of DOE’s Standard 3013.

In addition, planning is under way to accelerate deactivation of the 61 structures in the PFP compound. Tasks include environmental documentation and fieldwork to clean out plutonium that has been “held up” in old equipment, and size-reducing and removing old equipment. ■