

TA-55/Plutonium Facility (PF-4)

Facility

Building 4 at the LANL Plutonium Facility (PF-4) is located at TA-55.

- The building is the only full-service plutonium fabrication facility in the United States, with capability to fabricate both metal and ceramic products, and to recycle and purify large quantities of plutonium for future work.
- There are several utility feeds into the building including two electrical service feeds, with generator back-up, industrial gases, and a large filtered, dry air ventilation system.
- The facility has been upgraded to withstand large seismic events and can be “entombed” to ensure that natural disaster events or major radiological events do not cause the release of radioactive material.
- The building shell consists of a heavily reinforced concrete.

Programmatic Tenants

There are several major programs represented in PF-4

- **Plutonium Sustainment and Surveillance.** These programs support defense programs for weapons work. Sustainment supports both the pit and the heat source missions for weapons, while surveillance programs for these two product lines ensure that the stockpile is aging well. These programs are supported heavily by the chemical and materials characterization areas within PF-4, CMR, and RLUOB.
- **Plutonium Science Campaigns.** Several organizations utilize the facility for studying the physical, mechanical, and chemical properties of plutonium and its alloys and compounds. Work in this area also supports the subcritical experimental



program in testing at the Nevada National Security Site.

- **Nonproliferation.** There is a small, but growing mission to support the fabrication of plutonium sources used for the calibration and testing on radioactivity monitoring.
- **MR&R (Material Recycle and Recovery).** This program takes residue materials from previous processing and places them in usable forms. They utilize both aqueous and pyrochemical processing remove impurities. Four main processing areas are encompassed. Chloride processing allows for the recycle of materials that have chloride residues. Nitrate processing allows for the recycle of materials that have nitrate residues. Pyrochemical processing allows for the removal of trace impurities and radioactive decay products from the material.
- **ARIES.** This program takes surplus pits and converts the plutonium from a weaponized form into oxide form. This material can then be processed into mixed oxide fuels or sent for disposal as high-level radioactive waste.
- **Heat Sources.** The ^{238}Pu heat sources mission supports both defense and space applications. The two main product lines are general heat sources, which are required to ensure that moving parts do not get too cold in deep space missions, and thermal batteries, which power the electronics for these missions. A good example of the use of ^{238}Pu thermal batteries is the NASA Voyager missions where batteries fabricated in the 1970s are still powering instrumentation in the far reaches of our Solar System.

04/04/2018

Status

The line item project is nearing completion of construction.



Strategy

Fixed Price Design followed by Fixed Price Construction by Yearout Industrial, cost reimbursable construction support by WNNNM.

Key Information/Milestones
(under revision 2/2017)

LLW CD-4 w/Contractor MR	10/2017
LLW CD-4 w/DOE Contingency	5/2018

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