
Plutonium Pit Re-use

While DOE was spending hundreds of millions of dollars on pit production and support for future production, the pit reuse and requalification program for existing pits languished—even though it was a “must re-establish” technology on par with pit manufacturing, “vital in supplementing surveillance data and as input to the Stockpile Stewardship weapon modeling activities.”#

A pit re-use project occurred at Pantex in the early 1990's when Rocky Flats was shut down. This project allowed DOE to proceed to complete the W-89 weapon program by re-using W68 pits and converting them to fire-resistant pits by cladding them with vanadium. Heralded then as an innovative approach that avoided messy pit fabrication, the latest plan for pit re-use went unfunded in fiscal year 2000.#

The pit reuse project was renamed the *Special Nuclear Material Component Requalification Facility*. Its primary purpose is to “provide the Pantex Plant with Pit Recertification/Requalification capabilities as required for the W76 program and W80 future work,” but it is also intended to provide similar capabilities for Canned Subassemblies and other weapon components. Not until the FY2003 bill did the Pantex reuse project get funded for the first \$3 million of an estimated \$11 million dollar construction project.#

The funding and project startup are timely for Pantex pit production supporters, since the project will provide the plant with its first real plutonium pit mission that involves more than handling intact pits. Pit re-use at Pantex was always described as non-intrusive during the Environmental Impact Statement process. After Pantex was selected for the pit re-use mission, the mission was renamed “pit requalification” and changed from non-intrusive to intrusive because it included pit tube replacement and refurbishment:

“SNM Requalification at PANTEX for FY 98 has been as continuation of the original effort and has included an increase in scope to address pre-screening, tube replacement and reacceptance...tube replacement is a capability that was utilized at Rocky Flats. A similar capability is being supported as a part of the Pit Rebuild program at LANL”#

One of the sticking points regarding pit re-use involves pit tubes. Plutonium pit tubes are designed to carry the booster tritium gas from the tritium reservoir to the hollow core of the pit at the time of detonation.

Pit tube replacement was being advocated by Los Alamos prior to the funding cutoff for this program. Because pit tubes are bent to very specific configurations and there is no record of the number of times they have been bent, Los Alamos wanted to replace all pit tubes. However, a LLNL report discussing the stainless steel used in W87 pits reported that the tube would need to be bent at least ten times to pose a great risk of failing (Figure 2-1).#