

# PIT MANUFACTURING

## RELYING ON 60 YEARS OF EXPERIENCE

In the 1940s, the Laboratory produced the first core of a nuclear weapon, more commonly known as a "pit." In the years that followed, Los Alamos transferred its expertise in pit design to facilities such as Mound (Miamisburg, Ohio) and Rocky Flats (Denver, Colorado). As the world climate changed, the United States began to shut down such facilities. In June 1989, the only remaining pit production facility, Rocky Flats, closed its doors, thus ending pit production for the next 14 years.

In 1996, the United States government wanted to upgrade many of the processes used to maintain the stockpile, so it once again turned to the Laboratory, asking its specialists to reestablish a pit manufacturing capability and still comply with strict new environmental regulations and specifications. To meet this goal, more than 700 employees in numerous divisions worked long hours, often coming in on weekends and holidays. Their efforts paid off in 2003, when the Laboratory produced the first Qual-1 pit, so called because it was built using documented processes guided by quality assurance principles.

The Department of Energy selected the Laboratory for its expertise in pit design and because it possesses the nation's only full-capability plutonium facility. When certified, these pits will be used in W88 warheads carried aboard Trident II D5 ballistic missiles. These missiles represent the cornerstone of America's nuclear deterrent and thus play a crucial role in maintaining our national security.

These three panels describe the major functional areas required to manufacture pits. In short, nuclear and nonnuclear precision components are constructed and then inspected for quality. These parts are then carefully assembled into a pit, which is subsequently evaluated.



The Actinide Sciences Team conducts world-class work. Operations monitored here provide the feed metal stock for a pit.



Both preventative and corrective maintenance programs are deployed in pit manufacturing. Workers are calibrating oxygen monitors.



Investment continues to ensure technology robustness. A worker from the Process and Engineering Team checks the resistance of an end-process gauge.



The Assembly Team puts together nuclear and nonnuclear components that have been machined and thoroughly inspected.



Workers from the Nuclear Machining Team manufacture components and cut samples for analysis.



This worker performs laser gas sampling. The results of this operation are used as one of several checks for the effectiveness of the overall pit-building process.

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