

Performance Area: Campaigns – Enhanced Surveillance**FY 2001 Overall Performance Summary:****Performance Measures**

- Meet established campaign milestones as defined in Implementation Plan, with a focus on the W80 and W87 refurbishment, and Pit and Canned Subassembly (CSA) aging assessments
- Support ongoing Enhanced Surveillance Campaign (ESC) tasks and accelerate implementation of Fabry Perot for TATB and Electrical Safety

Overall Performance Rating: Outstanding
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Criteria 1: Quality of science:
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Rating: Outstanding 94.00%

Independent review panels selected by the ESC Steering Committee gave LLNL tasks high marks in every MTE for their scientific and technical approach and results. LLNL has shown innovation in the design of their Pu accelerated aging experiments and the design of a laser shock diagnostic. Modeling efforts for pits and CSAs have contributed to a greater degree of understanding of aging behavior and have helped to explain experimental results.

LLNL has made excellent progress in meeting ESC milestones and deliverables in FY 2001. They are teaming with LANL on a project that projects the behavior of plutonium alloys far into the future using accelerated aging. LLNL has completed the fabrication of the alloys and is in the process of characterizing them in the non-aged condition. LLNL has also made advances in modeling plutonium aging behavior. LLNL has made excellent progress in understanding the complex behavior of the set of components and materials that make up the canned subassemblies (CSAs) or the components of nuclear weapon secondaries

Criteria 2: Relevance to national needs and agency mission

Rating: Outstanding 93.00%

The lifetime assessment work at LLNL has contributed directly to decision-making on the W87 and the W80 Life Extension Programs (LEPs). The understanding gained this year from aging work on pits, CSAs, and High Explosives (HE) has continued to support the annual assessment of the stockpile. The development and deployment of high-resolution x-ray tomography is a major accomplishment that provides the complex with an advanced non-destructive technique to evaluate pits. The progress on old pit examinations and accelerated aging alloy preparation is contributing to the understanding of pit lifetimes which is critical to future decisions regarding a Modern Pit Facility.

LLNL has made excellent progress in the development of a high-resolution x-ray tomography for pit examinations. They achieved an 8-10 mil resolution in a prototype operating facility for pits and have started the process of installing such a system at Pantex. LLNL has also demonstrated 2 mil resolution in the lab and plans to install this improved capability at Pantex as a “drop in” to

Lab Profile Rpt 2001 Laboratory Open Board

FINAL DRAFT

National Security

Strategic Goal: Maintaining the Nuclear Deterrent

Program Area: Stockpile Assessments and Certification

R&D Activity: Enhanced Surveillance

DOE Programs

Program: Defense Programs
Office: Nuclear Weapons Stockpile - Stockpile Assessments and Certification

DOE Laboratory Performers

Principal Laboratories: LANL, SNL, LLNL
Contributing Laboratories: None
Participating Laboratories: None

Strategic Goals and Objectives

The Enhanced Surveillance Campaign will provide a validated basis to determine if or when components must be replaced. The goals of this Campaign are to: provide documented component lifetime assessments; have predictive tools in place to identify aging defects prior to any impact to safety, reliability, or performance; develop tools to identify all birth defects in new materials prior to introduction into the stockpile; and meet defined Stockpile Life Extension Program (SLEP) and certification-driven surveillance requirements.

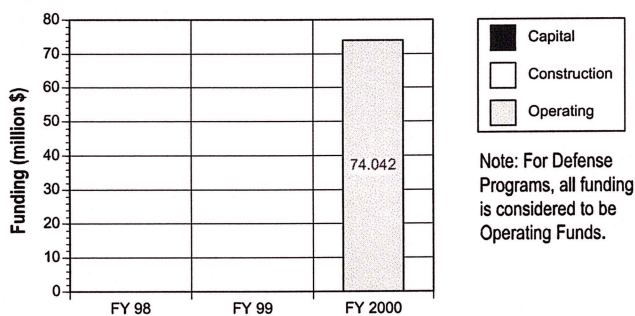
R&D Activities

B&R: DP0808

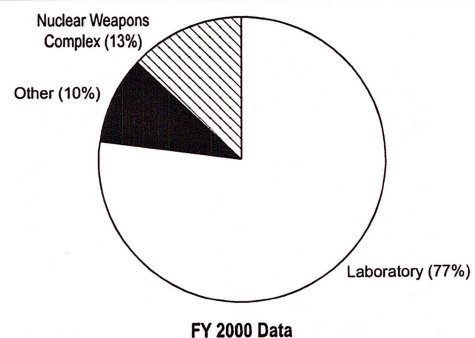
- Conduct vulnerability tests on oldest pits available. *→ pits*
- Benchmark canned subassembly corrosion models with simulated aging tests. *→ CSA*
- Complete experiments to confirm HE aging mechanisms and benchmark model. *→ HE*
- Predict performance of highest risk nonnuclear energetic components. *→ Special*

?? - no HE?

Funding History



Laboratory-Academia-Industry Participation



Fiscal Year 2000 Funding Profile

