

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 7, 2006

**MEMORANDUM FOR:** J. K. Fortenberry, Technical Director  
**FROM:** Michael J. Merritt, DNFSB Site Representative  
**SUBJECT:** Lawrence Livermore National Laboratory (LLNL)  
Report for Week Ending July 7, 2006

**Teflon Components in Nuclear Environments:** On June 30, 2006, LLNL provided the Livermore Site Office (LSO) with a closeout letter related to the use of Teflon components in nuclear environments. This long standing concern involves the use of Teflon as a sealing surface in applications where degradation could occur due to exposure to alpha particle radiation. The primary concern is the potential for the release of contamination due to the degradation of components with Teflon seals. LSO initially directed LLNL to conduct reviews of the use of Teflon in nuclear facilities in June 2004. In its most recent letter, LLNL documented the completion of the LLNL Teflon Implementation Plan.

In order to close out this issue, LLNL presented a proposal to rescind a commitment to implement a facility-wide Teflon inspection program that was originally part of the Teflon Implementation Plan. LLNL now believes that the facility-wide inspection is no longer necessary or cost-effective. This belief is based on assertions that LLNL has:

- conducted assessments in each nuclear facility and identified all existing vulnerable components and either replaced them, protected them, or entered the components into a component inspection and replacement program;
- learned as a result of the inspections that all Teflon components of concern are associated with gloveboxes and that visual inspection of the components with surface alpha contamination less than  $1 \times 10^9$  dpm/100 cm<sup>2</sup> revealed no degradation when exposed to the radioactive environment for 13 to 30 years;
- established additional requirements in the LLNL Environment, Safety and Health (ES&H) Manual specifically to deal with components in harsh radiological environments including the identification of components required to be in an inspection and replacement program; and
- strengthened programs including the Superblock Teflon component evaluation as part of the workstation startup requirements (see weekly report dated November 4, 2005).

LLNL has also established design criteria to eliminate or minimize the introduction of new Teflon components into harsh environments. The use of the design criteria combined with the identification of components of concern and new programs for inspection and replacement were provided to LSO as justification of resolution of the Teflon issue. Given the current practices and programs, LLNL considers the workers, the public, and the environment adequately protected without the time-consuming, facility-wide inspection program.