

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 10, 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 February 10, 2006

Plutonium Facility Criticality Safety Audit: In early December 2005, an annual criticality safety audit of Plutonium Facility operations was conducted. The purpose of the audit was to verify that applicable safety plans, standards, DOE orders and good practices were being followed, and to confirm the adequacy of the criticality safety program implementation. The audit team consisted of nationally recognized experts from other DOE sites and LLNL criticality safety engineers that are independent of the Nuclear Materials Technology Program (NMTP) that manages the Plutonium Facility. The principal audit criteria for assessing the criticality safety program were DOE Order 420.1A, *Facility Safety*; LLNL Environment Safety and Health Manual, Document 20.6 *Criticality Safety*; ANSI/ANS-8.19 *Administrative Practices for Nuclear Criticality Safety*; and DOE-STD-1158-2002, *Self-Assessment Standard for DOE Contractor Criticality Safety Programs*. The classification categories¹ for audit results are findings, concerns, observations, or noteworthy practices.

The audit team's draft report concluded that there were no primary or secondary findings and that, in general, the NMTP criticality safety program was effective. The draft report identified two concerns, three observations and two noteworthy practices. One of the concerns involves the management and use of the Controlled Materials Accountability Tracking System (COMATS). The interface between COMATS, which is primarily a Material Control and Accountability (MC&A) system, and the implementation of facility safety requirements is complex and controversial. Facility management has been working with Materials Management to try and utilize COMATS more effectively.

As a practical matter, the Fissile Material Handlers (FMHs) are responsible for meeting the MC&A requirements and the facility safety requirements. The Facility Safety Plan requires FMHs to ensure that nuclear material movements comply with Standard Criticality Control Conditions (SCCC). In order to ensure compliance with the SCCC for a workstation, the FMH uses data (primarily the fissile mass) from COMATS. In fact, COMATS approves or disapproves the movement based on workstation mass limits and other parameters. COMATS also provides safety data relative to plutonium administrative limits for all laboratory rooms.

The responsibility for meeting the criticality safety requirements relies heavily on the FMH's expertise and independent verification. However, the FMH relies on COMATS (data and programming) as an operator aid. Since safety requirements have not been fully integrated into COMATS, the FMH duties are complicated by additional systems (sometimes manual) to perform similar functions. A new system, the Criticality Special Support System (CSSS), is being developed to assist FMHs in ensuring compliance with the criticality safety requirements, however, CSSS will still utilize COMATS data.

LLNL as an institution should strive to integrate and streamline the implementation process for these important MC&A and safety requirements. Improving the capabilities of COMATS for the FMH-users could simplify the implementation of safety requirements. Reducing the complexity of implementing the requirements for the FMHs would likely enhance safety in the facility.

¹ *Finding* - a statement of fact documenting a deviation from an applicable requirement or procedure (includes primary and secondary findings with primary involving issues that are essential to criticality safety); *Concern* - an issue that is not a violation of a requirement or procedure, but in the judgment of the audit team indicates a potential problem; *Observation* - an issue that is not a violation of a requirement or procedure, but should be brought to facility managements attention to enhance criticality safety; and *Noteworthy Practice* - a practice that improves or enhances criticality safety.