

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 23, 2012

MEMORANDUM FOR: Timothy Dwyer, Technical Director
FROM: Jonathan Plaue, DNFSB Site Representative
SUBJECT: LLNL Activity Report for Week Ending March 23, 2012

The Site Representative was out of the office on Thursday and Friday.

Safety Basis: Last week, laboratory contractor personnel briefed Livermore Site Office (LSO) personnel on the pilot of the expert unreviewed safety question determination (USQD) process (see weekly report dated June 17, 2011). The contractor reported that the expert USQD process was performed for 65 USQDs, which represented 32 percent of site total for the examined time period. The contractor further reported that each of these evaluations met all administrative requirements of the institutional process.

Plutonium Facility: Contractor program and facility personnel continued to prepare the work permit in support of an upcoming classified experiment involving nuclear material and high explosives. The approved safety basis assessed the worker consequences for this experiment as low and therefore the only credited controls are Specific Administrative Controls used to establish initial conditions (see weekly report dated January 20, 2012). The work permit will authorize conduct of the experiment using a surrogate (non-radioactive) material and actual explosives. However, most hazards and controls for the work permit were developed assuming the use of radioactive materials in order to develop worker familiarity with the actual operation and to permit high fidelity demonstrations for the upcoming readiness assessments.

At the activity level, notable proposed controls include: (1) use of an experimental chamber tested and qualified to institutional requirements, (2) conduct of the experiment using a continuous-use procedure, (3) procedural direction, including independent verification, to ensure appropriate valve configurations on the chamber, (4) required respiratory protection and anti-contamination clothing during execution and initial recovery from the explosive event, and (5) required high explosives handler qualifications for personnel involved with certain procedural steps.

Explosives Safety: The *DOE Explosives Safety Manual* exempts exploding bridgewire (EBW) type detonators from the category defined as low energy electroexplosive devices. As a result, the *LLNL Environment, Safety and Health Manual* does not require additional analysis or controls (e.g., protection from electrostatic discharge) to prevent an inadvertent detonation for operations involving EBW detonators. In contrast to these directives, laboratory experts have determined through testing that EBW detonators are not inherently safe by design from electrostatic discharge hazards and may be vulnerable to this insult in rare configurations of furniture or workers using tooling. Based on these results, the laboratory experts require additional analysis and controls for nuclear explosive operations involving EBW detonators at the Pantex Plant. In the Site Representative's opinion, the explosives expert community ought to examine whether the technical basis for electrostatic discharge concerns with EBW detonators is sufficient to warrant additional review and controls, if necessary, for other nuclear operations (i.e., non-nuclear explosive) performed around the complex.