

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 30, 2004

MEMORANDUM FOR: J. Kent Fortenberry, Technical Director
FROM: C. H. Keilers, Jr.
SUBJECT: Los Alamos Report for Week Ending January 30, 2004

Quality Assurance (QA): In November 2002, the Secretary of Energy provided the Board a Quality Assurance Improvement Plan. The plan includes an action to validate and verify that QA programs are effectively implemented for vital safety systems (action 3.3). As an initial step, A NNSA-LANL team has completed a thorough independent assessment of the design, procurement, and operation of the new TA-18 in-core temperature monitoring system (ITMS). The team identified both lab-wide and TA-18 specific issues, as well as opportunities to improve these types of assessments. Their assessment continues next week on construction and fabrication and on software quality assurance.

Critical Experiments Facility (TA-18): In July 2002, NNSA approved a new TA-18 safety basis, which included developing and installing the new ITMS in each of the five critical assemblies. ITMS is intended to shutdown an assembly before partial core or sample vaporization. This postulated accident scenario is new for TA-18 and has low probability but high off-site consequences (i.e., 1000 Rem range). The ITMS is the Safety Class engineered control to prevent the accident. The systems have been installed in two assemblies, Planet and Sheba, but have not yet been through readiness assessments (RAs). As of last November, the RAs and a response to a Board letter (7/9/03) were the last remaining steps before ITMS are declared operational. Interim administrative controls are in place now.

As of this week, four independent sets of reviewers have raised issues on the ITMS – either (a) that a temperature based scram will be difficult to verify with confidence that it will work when needed, or (b) the temperature scram systems designed and installed in Planet and Sheba have not been adequately reviewed and do not meet the pedigree expected for Safety Class systems. The four reviews are:

Board letter (7/9/03) - A Board letter and staff report raised both these issues last year. Among many observations, the staff suggested that it might be better to pursue a nuclear instrument (NI) based scram as the Safety Class defense, given the challenges. NNSA has not responded to the Board's letter.

NNSA-LANL QA review - The review discussed above identifies significant design and procurement issues, particularly the need for LANL to charter an independent design review – not done to date. The team found, that while TA-18 has good QA processes, they failed sometimes to follow those processes.

LANL Reactor Safety Committee (RSC) - The last 3 RSC annual reports have stated that the RSC is skeptical as to the real benefit that will accrue from the ITMS. In FY 01, the RSC emphasized that the existing NI based scram systems must be maintained to existing requirements. Last November, the RSC reported that TA-18 had identified a possible need to redefine "burst mode" as greater than \$0.80 reactivity since the automatic temperature scram systems are not fast enough. It is unclear how such a redefinition would resolve slow temperature-scram response time and thereby improve nuclear safety.

NNSA Albuquerque Service Center - Last December, the NNSA Site Office chartered a Service Center review of the ITMS, which was completed this week. The review's scope was to determine whether the ITMS design, installation, and testing incorporated appropriate standards and requirements for its Safety Class function, and whether line management has a process to verify and document that the design was correctly developed, components properly purchased, and installation properly tested – for Safety Class. This was also a thorough review. The team concluded that the ITMS only met 1 of 17 criteria that were used to assess the system. LANL has not addressed all requirements expected for Safety Class systems.