

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 7, 2000

**TO:** G.W. Cunningham, Technical Director  
**FROM:** Paul F. Gubanc and David T. Moyle, Oak Ridge Site Representatives  
**SUBJ:** Activity Report for Week Ending January 7, 2000

Staff member Helfrich visited Y-12 this week to review the handling of transuranic contaminants.

A. Nuclear Criticality Safety (NCS) at Y-12: On December 27, LMES submitted to DOE their corrective action response to the fissile material stop work order issued by DOE for Building 9212 on December 14. Walkdowns of fissile material storage areas are expected to continue through January though some results are as follows:

1. As of Friday, EUO management has still not completed its critique of the December 14 event. This delay is partially due to LMES using a root cause analysis tool which gives useless results.
2. On January 4, a DOE representative noted an EUO worker relocating a fissile material dolly in violation of the currently imposed "stop work." EUO management has strongly reiterated the fissile material handling restrictions to the EUO staff and is evaluating other personnel actions.
3. The criticality deficiencies identified in the nuclear facilities to date have been largely administrative in nature. Key safety contingencies such as mass and geometry limits have not been violated. While the walkdowns have identified some ambiguities requiring resolution, the level of sensitivity has become so high that some of the "deficiencies" requiring resolution are absurdly trivial (e.g., use of upper case versus lower case lettering on postings). (2-A)

B. ORNL Building 3019: ORNL continues to develop their recovery plans in response to the DOE Peer Review of the U-233 program completed in December 1999. Key observations include:

1. ORNL's "plan for a plan" was issued on January 3 to DOE. ORNL expects that it will issue its revised Phase-1 U-233 inspection plan by the end of February.
2. Development of test plans and instructions, and relocation of the U-233 inspection chamber to a non-rad area is expected to support testing restart in early February.
3. DOE and ORNL continue to debate the relative merits of SAR implementation (including a revised Fire Hazards Analysis) before or during the Phase-1 inspection. A delta analysis is probably required to judge the difficulty and benefits of this transition from BIO to SAR. (3-A)

C. Chemical Safety: On November 26, 1999 we reported that LMES would investigate the hazards of long term storage of dibutyl carbitol (DBC) exposed to air which could result in explosive peroxide formation. To date, of eight DBC samples taken, two have 11-28 ppm peroxide. A sample of fresh DBC from a previously opened drum will be analyzed soon. Per one technical reference: 3-30 ppm peroxide is not a threat but warrants addition of inhibitor, 30-80 ppm may pose a threat and is recommended for disposal, and >80 ppm should be considered potentially shock sensitive. LMES seems content that the current DBC in storage is safe, but we still have these concerns:

1. Sampling to date does not include DBC in process vessels which may have higher exposure to oxygen than safe bottles. Also, no DBC in building 9206 has been sampled.
2. To date there is no formal sampling plan or path forward for analysis and results.
3. It would be prudent to implement requirements to periodically monitor peroxide content of DBC (Some sources recommend between 3 and 12 month sampling intervals).
4. LMES indicated that the DBC currently in storage will eventually be discarded to the incinerator which will eliminate the hazard, but there is no clear time frame for this to occur. (1-C)

cc: Board Members