

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 1, 1999

TO: G.W. Cunningham, Technical Director
FROM: Paul F. Gubanc and David T. Moyle, Oak Ridge Site Representatives
SUBJ: Activity Report for Week Ending October 1, 1999

A. Resumption of Y-12 Enriched Uranium Operations (EUO) Reduction Process: DOE line management issued its final report on metal reduction readiness on September 24. The forwarding letter to LMES states that all DOE line management and LMES readiness assessment (RA) prestart findings must be closed and corrective actions for post-start items must be approved prior to the start of the independent DOE RA (now scheduled to begin October 18). The biggest concern continues to be the use of non-code stamped vessels in an application which is known to exceed rated temperatures for the material type. We have provided EUO management with excerpts from the AEC Reactor Handbook (1961) which attests to explosions and molten metal burn through which have occurred in the past in reactor vessels. Furthermore, the reference stresses the need to carefully inspect reactor vessels for any cracks or flaws. We understand that LMES now intends to do volumetric inspection of welds on the current reactor vessels intended for use (circa 1989). It alludes us, however, why LMES does not just fabricate new vessels to existing design specifications (recognizing that the vessel will not be code stamped) thus increasing confidence in material pedigree, weld integrity, and the absence of flaws or scaling. This could be accomplished relatively quickly and in a non-contaminated environment. (2-A)

B. Hydrogen Fluoride Supply System (HFSS) - Tube weld replacement is underway for the HFSS. After encountering problems again with hastelloy welds, efforts were shifted to stainless steel welding on the reduction fluid bed subsystem. Over one hundred welds have been completed this week, without any problems. While pressure testing the welds, however, leaks were discovered in some isolation valves. Out of the first 20 valves tested, approximately half failed to hold pressure and will have to be replaced. It is suspected that valve seats may have been damaged either by over-tightening or particulate matter in plant nitrogen system. As a result of this discovery, formal engineering test and inspection will be performed on all valves prior to reinstallation

LMES has yet to identify a single coordinator for corrective actions stemming from the LMES review of the HFSS construction project. We again suggested to senior LMES management the need for such a person. Next week, a L-M electronics and missiles company will visit Y-12 to review its quality programs. (2-A)

C. Perchlorate Hazard: Perchloric Acid (HClO_4) was commonly used in the 1940's through the 1960's as a reagent for performing uranium assays. Perchloric acid, if allowed to dehydrate or react with organic matter, can become a shock-sensitive explosive and fire hazard. Ventilation ducts are particularly susceptible to collecting such perchlorate deposits. On Monday, we met with the ORNL perchlorate experts who informed us that in the mid-1990's, they were involved in extensive cleanout campaigns at ORNL and K-25 but not at Y-12. At our suggestion, DOE has pursued this topic with Y-12 and has identified the analytical lab (Bldg 9995) and the development labs as the most likely to have used perchloric acid. A walkdown of Bldg 9995 on Thursday confirmed that its perchloric acid hoods are equipped with washdown systems to preclude the buildup of deposits though the lab currently is storing a significant excess amount of perchloric acid. DOE is still examining the development labs. (1-C)

cc: Board Members