

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 21, 2000

TO: J. Kent Fortenberry, Technical Director
FROM: Paul F. Gubanc and David T. Moyle, Oak Ridge Site Representatives
SUBJ: Activity Report for Week Ending April 21, 2000

A. Y-12 Pump J-107 Explosion: On August 5, 1998, the 400 horsepower J-107 "brine" (i.e., 20-24% methanol in water) pump in Y-12 Building 9767-13 exploded due to operating for approximately two hours with both the inlet and outlet valves shut. LMES subsequently conducted an investigation and issued a report in August 1998. A major contributor to the accident was determined to be the delinquent implementation of formal conduct of operations (i.e., since 1994) in the Y-12 utilities organization due to a severe lack of resources (e.g., inadequate or no procedures, lack of face-to-face turnover, long-standing equipment deficiencies, questionable operator training/competence).

DOE and LMES iterated over an acceptable corrective action plan (CAP) until May 1999. On April 19, Mr. Gubanc reviewed the status of the corrective actions and found:

- The physical damage has been cleaned up but no replacement/repairs were identified in the CAP due to the brine system having excess pumping capacity for current production needs. Of the 12 brine pumps, four are out of service and only two are routinely operated. The other six are considered "ready to operate" but receive no periodic operational testing.
- With few exceptions, the corrective actions have NOT been accomplished due to budget cuts and in some instances the problems have been exacerbated:
 - S** The approved CAP identified hiring 4 shift advisors and 12 additional operators; Utilities has acquired only one advisor and *lost* 20 operators since the CAP was approved with no reduction in assigned workload. Face-to-face shift turnover at the job site is still not conducted; a turnover checklist is utilized.
 - S** In 1995, all Utilities operating procedures were canceled without replacement. Today, five years later, only 29 of the 56 required procedures are issued.
 - S** As of today, only 30% of the systems requiring drawing reconstitution and labeling have been addressed. Subcontractors supporting this effort were terminated in September 1999.
 - S** Utilities management has established an updated and comprehensive qualification card for all new operators but is limited in its ability to backfit this training on incumbent operators.
 - S** A safety-related design modification to the brine pumps has been created but is not funded for installation. In fact, no utility infrastructure upgrades are currently budgeted for FY2001.

The conclusions we draw from this and other examples such as Bldg 9206 deactivation, Bldg 9201-5 NaK explosion, Bldg 9212 E-Wing, radiological waste accumulation, emergency management, chemical safety, criticality safety, and authorization basis updates are as follows:

1. Y-12 continues to use up the equity in its physical plant. While some reductions can be accommodated due to excess capacity, this is a trend which cannot be continued indefinitely.
2. Except for production supporting areas such as EUO, continued safe operations at Y-12 depend increasingly on experienced staff "working around" deficient or non-existent hardware, drawings, labeling, procedures, etc. Downsizing continues to encourage the departure of experienced staff.
3. Lack of effective follow through on corrective actions continues to be problematic at Y-12; often stemming from an ineffective coupling between commitment tracking, risk-awareness and budgeting authority. (1-A)

cc: Board Members