

United States Government

Department of Energy

memorandum

DATE: February 13, 1997

REPLY TO

EH-53 (R. Sastry, 301-903-4664)

ATTN OF:

SUBJECT: Chemical Safety Concerns / Search of Occurrence Reporting and Processing System (ORPS)

TO: Distribution

Significant Occurrences

January, 1997**Class 1:**

None

Class 2:Fernald - overpressurized drum, worker exposed to ammonia**Additional:**

At Y-12, there were two related discoveries of improperly stored chemicals affecting the operating basis. At Savannah River, there were two events involving additions of acid instead of water as per procedures.

These occurrences are further described below with additional information, including Occurrence Report (OR) numbers, provided in the [Attachment](#).

A search of ORPS for occurrences having chemical safety relevance conducted for the month of January 1997 produced 34 reports representing potential chemical safety concerns. These occurrences are listed in the [Attachment](#). There was one "Emergency", four occurrences categorized as "Unusual" and the remainder were identified as "Off-normal". The Office of Environmental Management (EM) was Cognizant Secretarial Office (CSO) for 18 occurrences; Defense Programs (DP) reported 12; Energy Research (ER) had two; and Fossil Energy (FE) and Nuclear Energy (NE) one each. The CSO designation may change after the distribution of this monthly memorandum, and this change will be reflected in Quarterly and Annual Reviews.

In order to determine which chemical safety occurrences represent more important (significant) Levels of Concern, a classification scheme has been developed. The definitions of these Classes are as follows:

Class 1 Occurrences characterized by an injury or exposure requiring hospital treatment, or confirmed, severe environmental effect; also occurrences that had the potential to cause these effects with all safety barriers down, except, for example, that no one was nearby to be injured or exposed, or

escaped in time, or the climatic conditions were favorable;

Class 2 Occurrences characterized by minor injury (first aid) or exposure, or minor environmental damage; also occurrences that were near misses (where one additional safety barrier remained to prevent consequences) to those in Class 1;

Class 3 Potential precursors to the occurrences in Class 1 or 2;

Class 4 Minor occurrences such as leaks, spills, or releases, which may be significant in their frequency of occurrence though not in their consequences.

There was one Class 2 occurrence reported during January. There were ten Class 3 occurrences. Among the Class 3 occurrences, in addition to those noted previously, was the collapse of a covering at a containerized waste storage area at Y-12. There were several occurrences involving explosives procedures and handling: three at Pantex and two at Livermore. There were also three occurrences at Savannah River regarding the loss of tank purge ventilation at the In Tank Precipitation Facility.

Summary of Class 2 Occurrence:

Worker Exposed to Ammonia (EM): (OH-FN-FDF-FEMP-1997-0003) On January 8, 1997, at Fernald, as a worker was loosening locking ring bolts on a waste drum containing incinerator cinders, the lid blew off, striking the ceiling 14 feet above. Immediately after the event, the employee was not exactly sure of what occurred and was disoriented. (Since the intent of this part of the work was not to remove the drum lid, the Radiation Work Permit (RWP) required full Anti-Contamination clothing, but no respiratory protection.) The employee complained of having a headache, was taken to an off-site medical facility for treatment and evaluation, and was diagnosed with ammonia fume exposure. Readings at the scene of the occurrence indicated an ammonia concentration of 15 - 25 ppm at the top of the drum. Ammonia has an 8-hour Time Weighted Average (TWA) limit of 25 ppm and a Short Term Exposure Limit (STEL) of 35 ppm. According to [Operating Experience Weekly Summary \(OEWS\) 97-03](#), investigators determined that although the drum was bulging, the worker did not use a lid-restraining device. **OEWS 97-03** contains a discussion of similar occurrences, their causes, and corrective actions.

There were also two related Class 3 occurrences (taking place at Oak Ridge Y-12 this month; both involved the discovery of improperly stored chemicals that impacted the facility Basis for Interim Operations (BIO). On January 17, personnel discovered two containers in which lithium metal was not submerged in mineral oil nor inerted (ORO--LMES-Y12SITE-1997-0003). On January 23, when checking the status of other chemicals as follow-up to the previous occurrence, more improperly stored chemicals (lithium hydride not in a compressed state) were discovered (ORO--LMES-Y12SITE-1997-0004). Managers at DOE facilities are urged to periodically review the storage status of hazardous chemicals. In particular, as regards the storage and handling of so-called active, reactive or alkali metals, the National Research Council's publication **Prudent Practices in the Laboratory: Handling and Disposal of Chemicals** states that "these [active metals] require special storage, handling, and disposal procedures. **Prudent Practices** contains helpful detailed information in Section 5G., Working with Highly Reactive or Explosive Chemicals, and also contains Laboratory Chemical safety Summaries for potassium and sodium.

Additional information regarding these occurrences and others will be discussed in an upcoming Quarterly Review. As occurrence reports are finalized, lessons learned will be communicated.

[Signature of]

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[Attachment](#)

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