

United States Government

Department of Energy

memorandum

DATE: September 15, 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

August, 1997**Class 1:**

None

Class 2:INEEL - Employees exposed to NOx from valve boxOak Ridge, Y-12 - Near miss from explosion at reaction vessel washing station**Additional:**

There was a fire in an oven at Los Alamos potentially involving residual wax stripper. Acid sprayed at Savannah River when pressure build-up forced out a plug.

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 August 1997 produced 35 reports representing potential chemical safety concerns. These occurrences are listed in the [Attachment](#). There were four occurrences categorized as "Unusual" with the remainder identified as "Off-normal"; one occurrence was "Cancelled". The Office of Environmental Management (EM) was Cognizant Secretarial Office (CSO) for 20 occurrences; Defense Programs (DP) reported seven; Energy Research (ER) had four; Fossil Energy (FE) two; and Nuclear Energy (NE) and Nonproliferation and National Security (NN) 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 were two Class 2 occurrences reported during August. There were 14 Class 3 occurrences. Among the Class 3 occurrences, in addition to those noted previously, was the unplanned shutdown of the computerized, site-wide MSDS system at Hanford. Also at Hanford, an undocumented (in authorization basis) settling tank was discovered during a chemical vulnerability assessment. At Savannah River, a drum of hydroxylamine nitrate (HAN) was discovered in area from which all HAN was believed removed. At the K-25 Plant at Oak Ridge, three abandoned cylinders of sulfur dioxide were discovered leading to a USQ.

Summaries of Class 2 Occurrences:

Employees Exposed to NO_x (EM) (ID--LITC-WASTEMNGT-1997-0020) On August 25, at the Chemical Processing Plant at the INEEL, workers preparing to conduct a remote video inspection in a valve box reported a strong smell of nitrogen oxides (NO_x). The workers were sent to the facility dispensary, but showed no immediate symptoms of excessive NO_x exposure. Surveys subsequently performed indicated a potential exposure of 5 to 15 ppm, which is above the ceiling limit of 5 ppm. "The best estimate was that the Immediately Dangerous to Life and Health (IDLH) level was not reached." [Ed. Note: For Nitrogen Dioxide, IDLH = 20 ppm.]

The work package prepared to conduct the inspection utilized measurements of the NO_x levels made about three weeks previously, which showed negligible levels outside of the valve box and up to 12 ppm midway into the box. No personal protective equipment (PPE) or Safe Work Permit (SWP) for NO_x exposure were specified in the work package, and pre-job monitoring of the levels was not performed. An SWP was approved for a fall hazard, and the work was covered by a Radiation Work Permit. A caution tag on the lock for the valve box specified that an SWP was required to open the lid due to the potential for NO_x.

Near Miss to Serious Injuries from Washing Station Explosion (DP): (ORO--LMES-Y12SITE-1997-0034) On August 7, at Y-12, two workers were conducting a reactor [chemical reaction vessel] lid washing operation when a wire-reinforced rubber gasket breached explosively due to excessive internal pressure. Workers also observed a brief burst of flames, following which material inside the washing station ignited and briefly burned. Neither worker was injured, but each was initially stunned by the loud report and later complained of tinnitus (sensation of ringing ears). The lid is one component of a reaction vessel for hydriding lithium metal. The workers had placed the lid on the washing station apparatus to cleanse the accumulation of reaction by-products from the interior lid surface. There were no injuries to personnel beyond that previously described. The operation was temporarily halted, and an investigation was immediately begun.

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](#)

Note to Distribution:

This report is distributed via e-mail either as a WordPerfect or a text file. Please contact **John Usher** (516-344-2096, Fax: 516-344-3957, E-mail: usher@bnl.gov) at Brookhaven National Laboratory to be placed on e-mail distribution. If you want to receive hardcopy, please contact John Usher who will make every effort to accommodate you.

The DOE Chemical Safety Program homepage is now available. The Internet address for this site is http://tis-hq.eh.doe.gov/web/chem_safety/. This report is accessible using the Chemical Occurrences link via the homepage.

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