United States Government **Department of Energy**

memorandum

DATE: May 14, 1996

REPLY TO ATTN OF: EH-53 (R. Sastry, 301-903-4664)

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

TO: Distribution

Significant Occurrences

April, 1996

Class 1:

None

Class 2:

Hanford - employee receives facial burns when inadvertently mixing nitric acid and ethanol

Savannah River - workers splashed with sodium hydroxide when removing chemical transfer lines

Additional:

At Savannah River, it was discovered that an inventory of purge gas, as specified by the FSAR, was inadequate. At Fernald, there was evidence of deliberate tampering with a breathing air compressor. At Rocky Flats, there was a release of phosphorous pentoxide when a storage bottle was discovered to be cracked.

These occurrences are further described below with additional information, including Occurrence Report (OR) numbers, provided in Table 1.

A search of ORPS for occurrences having chemical safety relevance conducted for the month of April 1996 produced 23 reports representing potential chemical safety concerns. These occurrences are listed in Table 1. Seven occurrences were categorized as "Unusual" with the remainder identified as "Off-normal." The Office of Environmental Management (EM) was Cognizant Secretarial Office (CSO) for 11 occurrences. Defense Programs (DP) reported seven, Nuclear Energy (NE) had four, and Energy Research (ER) one. Three of the NE occurrences took place at the Portsmouth Gaseous Diffusion Plant. In recent months there has been some confusion as to whether or not Paducah and Portsmouth are required to report to ORPS and are reporting consistently. There is also a question as to whether NE or the Office of Uranium Enrichment (UE) is the CSO responsible for these facilities. The information presented in this report is based entirely on ORPS and the designated CSO is taken directly from the occurrence report. This 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 April. There were 12 Class 3 occurrences. Among the Class 3 occurrences, in addition to those noted previously, was the discovery of an explosive device in a room no longer used for explosives work at Sandia. Also at Sandia, confined space entry requirements were violated leading to a potentially oxygen deficient atmosphere. A worker was splashed by magnesium diuranate at Fernald. An unauthorized treatment was applied to reactive peroxides at Rocky Flats.

Summaries of Class 1 and 2 Occurrences:

Employee Receives Facial Burns when Acid/Ethanol React (EM): (RL--WHC-ANALLAB-1996-0016) On April 3, 1996, at Hanford, a chemical technologist was transferring concentrated nitric acid into a small squeeze bottle located inside a fume hood. There were two squeeze bottles in the fume hood: an unlabeled bottle containing a small amount of concentrated nitric acid and a bottle labeled "ethanol." It was the intent of the technologist to top off the acid squeeze bottle. Instead, the technologist placed the ethanol squeeze bottle near the arm port and while holding the nitric acid container outside the fume hood, proceeded with pouring the concentrated nitric acid into the squeeze bottle containing the ethanol. The chemical reaction caused the mixture to be expelled from the container, through the arm port and onto the technologist's face. Personnel in the immediate area rendered assistance and requested an ambulance respond to the laboratory. The technologist was transported by ambulance to Kadlec Medical Center for treatment and evaluation. A critique was conducted on 4/4/96. Areas of concern which were identified included the current methods of storage/handling of incompatible chemicals, labeling of containers, proper protocol for handling caustics and acids, and wearing the appropriate protective equipment for the work being performed. To address these issues, five laboratory procedures were modified

Workers Splashed by Sodium Hydroxide while Removing Transfer Lines (EM): (SR--WSRC-FCAN-1996-0006) On April 23, at Savannah River, while removing an isolated, caustic transfer line, two to three gallons of 50% sodium hydroxide solution drained into the containment basin and splashed onto two workers. Workers were unaware of the potential for holdup of caustic in the line. The workers reported to Medical. Medical personnel directed them to wash with warm water and return to Medical the morning of 04/24/96. A critique meeting was held 04/24/96. OEWS 96-18 states that "this event resulted from poor communication between Operations and the construction organization, the industrial hygienists, and the work planners regarding the status of the transfer line."

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]

Rama Sastry
Office of Field Support

Attachment: Table 1

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