United States Government **Department of Energy**

memorandum

DATE: August 12, 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

July, 1996

Class 1:

None

Class 2:

Kansas City Plant - chlorine exposure due to mixing of incompatible chemicals

INEL - employee exposures during nitric acid spill

Additional:

At Sandia, a titanium fire occurred when a hazard analysis was not updated. At Rocky Flats, a potentially shock sensitive chemical was discovered. At Hanford, fuming nitric acid reacted with combustibles in a waste container. At Los Alamos, explosives area entry requirements were violated for the third time in two months. At Y-12, kathene leaks/corrosion threatened building structural integrity similarly to an earlier situation investigated at Rocky Flats.

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 July 1996 produced 28 reports representing potential chemical safety concerns including one concern "discovered" in May but not reported until July. These occurrences are listed in the Attachment. Three occurrences were categorized as "Unusual" with the remainder identified as "Off-normal." The Office of Environmental Management (EM) was Cognizant Secretarial Office (CSO) for 16 occurrences, Defense Programs (DP) reported seven, Energy Research (ER) had four, and Civilian Radioactive Waste Management (RW) one. 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 July. There were 13 Class 3 occurrences. Among the Class 3 occurrences, in addition to those noted previously, were a gas release at the RMI Decommissioning Project when a cylinder valve was inadvertently opened, the discovery of an inoperable (unplugged) hydrogen monitor in a furnace room at Sandia, and an acid battery system failure at ANL due to increased pressure. Multiple occurrences were reported at Savannah River (WVIT) involving safety grade nitrogen purge gas, and at Hanford involving loss of stack sampling and evacuations of a fume hood room.

Summaries of Class 2 Occurrences:

Exposure to Chlorine Gas Generated in Reaction (EM): (ALO-KC-AS-KCP-1996-0002) On July 26, at the Kansas City Plant, a worker was mixing small quantities of waste chemicals in a 55 gallon stainless steel drum prior to treatment at the Industrial Wastewater Pretreatment Facility. An unexpected reaction created chlorine gas to which the worker became exposed. The building was immediately evacuated of four workers. As a precaution, the one worker initially exposed to the chlorine gas was evaluated by an AlliedSignal physician. AlliedSignal's on duty physician could not find any adverse affects from the exposure, but referred the associate to his primary health care provider for further evaluation. The associate returned to work the next day with no evidence of injury.

Exposures due to Nitric Acid Spill (EM): (ID--LITC-WASTEMNGT-1996-0012) On July 30, at the INEL, a maintenance fitter was attempting to repair a valve which had leaked externally during the last transfer of 13 Molar nitric acid through the line/valve. There was some confusion as to whether the line had been flushed with water and then blown down with air. It was decided to work the job as is. Per the approved safe work permit (SWP), the fitter was wearing the required personal protection equipment (PPE) including an air supplied respirator. A mechanic was assigned to be the backup man to the fitter. The mechanic was not in the immediate area where the valve was being removed and did not don the PPE required by the SWP. As the valve was removed, nitric acid solution drained from the line into a catch pan which drained to a 5 gallon container. The mechanic noticed the 5 gallon container was filling up and requested help from operations personnel to replace the full container. Before the containers could be swapped, about one quart of nitric acid solution overflowed. The mechanic left the area upon detecting acid fumes. Industrial safety personnel monitored the area approximately 20 minutes after the spill. Nitrous oxides (NOx) levels of approximately 50 parts per million (PPM) were detected in the spill area. Although the exact exposure to the mechanic is not known, it is assumed that the employee was overexposed due to the levels measured after the incident. The OSHA ceiling limit for NOx is 5 ppm (Note: NO2 IDLH - 20 ppm). The mechanic and fitter were sent to medical for evaluation. Minor nose/throat irritation was experienced by the mechanic. The fitter experienced no discomfort; both were released back to work. The mechanic was requested to avoid working in hazardous environments until

re-evaluated the following week.

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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

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