

United States Government

Department of Energy

memorandum

DATE: May 8, 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

April, 1997**Class 1:**

None

Class 2:Rocky Flats - employees became ill when exposed to capacitor dielectric fluidLBNL - refrigeration failure caused potentially explosive situation**Additional:**

There were two occurrences at Savannah River related to concerns about hydrogen releases involving potential inadequacies in safety analysis. At Hanford, a modification project began before application of isolation valve lockouts/tagouts.

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 April 1997 produced 29 reports representing potential chemical safety concerns. These occurrences are listed in the [Attachment](#). There were three occurrences categorized as "Unusual" with the remainder identified as "Off-normal". The Office of Environmental Management (EM) was Cognizant Secretarial Office (CSO) for 18 occurrences; Defense Programs (DP) reported eight; and Energy Research (ER) had three. 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 April. There were seven Class 3 occurrences. Among the Class 3 occurrences, in addition to those noted previously, were two at Savannah River: a hydrogen concern due to inadequate purging duration and a concern about overdue refresher training of waste management personnel. There were suspected tampering incidents at Fernald involving gasoline releases. There were also several occurrences involving shipping and/or labelling of chemicals.

Summaries of Class 2 Occurrences:

Refrigeration Failure causes Chemical to Become Unstable (ER): (SAN--LBL-AFRD-1997-0002) On April 9, at Lawrence Berkeley National Laboratory, the Berkeley Lab Fire Department responded to a report of a chemical (Cellulose Nitrate) that had been exposed to a temperature of approximately 58 degrees Celsius (136 F). A refrigeration malfunction produced abnormally high temperatures in a cold room. Stored containers of Cellulose Nitrate were deemed potentially unstable, resulting in a precautionary evacuation of staff and removal of the containers by a responding explosives disposal unit. Three containers of Cellulose Nitrate were stored, each with different concentrations in solution with 30% by weight Isopropyl Alcohol. Cellulose Nitrate may become shock sensitive if the Isopropyl Alcohol is reduced by 5% or greater. The containers were placed in the cold room. The MSDS specified that the chemical be stored in a cool, dry place. Between April 2 and April 9, both of the compressors for this cold room failed. Heat produced by the compressor motors progressively elevated the room temperature to approximately 58 C. The cold room is equipped with an overtemperature alarm, which sounded and was silenced and not reported. On April 9, an employee noticed that the digital temperature readout for the cold room indicated 58 C, and informed a co-worker. The co-worker opened the cold room door and felt hot air escaping. A third employee with knowledge of the Cellulose Nitrate was notified and recognized the potential for an unstable solution and explosion. The third employee contacted the Berkeley Lab Fire Department. Firefighters responded, consulted the MSDS and confirmed the unstable potential of the solutions. The mezzanine level of the building was then ordered evacuated. Phone contact with CHEMTREC and CHEMTROL further confirmed the explosive potential of the material. The FD Incident Commander requested the support of the University of California Berkeley Police Department (UCPD) Bomb Squad. The Bomb Squad arrived and ordered further evacuations of the building's main level and all levels of an adjacent building. The containers of Cellulose Nitrate were then successfully removed by the Bomb Squad, transported off-site, and safely neutralized.

Employees Exposed to Capacitor Dielectric (EM): (RFO--KHL-NONPUOPS1-1997-0006) On March 31, 1997, at Rocky Flats, after draining DIELEKTROL II from capacitors, three subcontractor personnel complained of feeling nauseous after smelling a "sweet, sickening odor". Two of the employees reportedly became physically ill, but did not report to the Occupational Health Department. One of the employees reported to Occupational Health the following day. [Ed. Note: Dielektrol II comprises a blend of Di(2-EthylHexyl)Phthalate [DEHP] and Trichlorobenzene. According to MSDS

information, exposure to DEHP vapors could cause the symptoms exhibited.] Subcontractor management failed to notify Building Facility Management of this illness/occurrence until April 1. Facility Management restricted access to the area and initiated a Management Investigation. A Health and Safety review was also requested. All similar work of this type was suspended pending the outcome of the fact finding process.

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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Office of Field Support

[Attachment](#)

Note to Distribution:

This report is distributed via e-mail either as a WordPerfect or a text file. Please contact **John Usher** Voice: 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://dewey.ti.s.eh.doe.gov/web/chem_safety/. This report is accessible using the **Chemical Occurrences** link via the homepage.

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