

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

March 22, 1990

NRC INFORMATION NOTICE NO. 90-20: PERSONNEL INJURIES RESULTING FROM IMPROPER
OPERATION OF RADWASTE INCINERATORS

Addressees:

All U.S. Nuclear Regulatory Commission licensees who process or incinerate radioactive waste.

Purpose:

This information notice is intended to inform recipients of recent industrial accidents involving the operation of radioactive waste incinerators. It is expected that licensees will review this information, distribute the notice to responsible safety staff and equipment operators, and consider actions, as appropriate, to preclude similar accidents from occurring at their facilities. However, suggestions contained in this notice do not constitute new NRC requirements, and no written response is required.

Description of Circumstances:

Two uranium fuel fabrication facilities have reported personnel injuries, resulting in the accidental amputation of fingers, involving the operation of radioactive waste incinerators. A description of each of the accidents is provided in Attachment 1, and were reported to the Occupational Safety and Health Administration (OSHA) by NRC. In summary, the accidents apparently involved:

- o Unauthorized removal of a safety shield
- o Failure to follow proper procedures
- o Operator error
- o Component failure
- o Poor safety design
- o Inadequate sorting of waste products

The accidents did not directly involve radiation safety hazards. However, any serious personnel injury in the vicinity of radioactive material has the potential to escalate to a situation which could result in a radiation hazard.

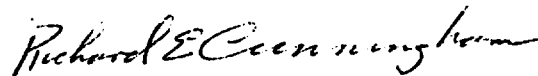
Discussion:

Serious personnel injuries can occur when personnel ignore or circumvent safety systems and equipment. To help prevent such injury, it is important

that personnel strictly adhere to procedures and operating parameters. It is also important that maintenance and safety inspectors routinely observe the operation of equipment and be alert to unauthorized modifications, unsafe operating conditions and practices, and equipment malfunctions.

When unsafe conditions and practices are noted, it is imperative that unsafe operations be halted, corrective action taken to resolve the problem, and employees advised of the conditions and corrective actions. Merely correcting an unsafe practice and condition without also advising the affected workforce does not advance the safety goal of eliminating accidents.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the appropriate regional office.



Richard E. Cunningham, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical Contacts: Cynthia Perny, Region II
(404) 331-5559

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Attachments:

1. Description of Events
2. List of Recently Issued NMSS Information Notices
3. List of Recently Issued NRC Information Notices

DESCRIPTION OF EVENTS

Note: The following descriptions are based on reports from licensee personnel. They are for informational purposes to illustrate the importance of following proper safety procedures. The Nuclear Regulatory Commission makes no representation as to the accuracy of the specific details of the reports. The licensees also reported these events to OSHA field offices.

Advanced Nuclear Fuels Corporation, Richland, WA.

On September 29, 1989, an employee was filling a drum with ash from a uranium-contaminated waste incinerator. The employee lowered the drum to check the ash level, but could not get the lift to raise the drum back up. The worker placed his right hand on the lip of the drum and then reached around the drum to jiggle the rear limit switch (this switch tells the controller that the drum is in the proper location). As the worker reached around the drum, the lift activated and lifted the drum to the cooling chamber discharge port gasket lip. This crushed and severed the tip of the right middle finger above the first joint.

The worker reacted by reaching behind him to activate the emergency-off control. This did not lower the drum. The worker then pulled the emergency off control again, which turned the system on again, and hit the down control to release the lift. The lift still did not lower the drum. At this point, the worker began moving his trapped hand and was able to free it. Immediately after the hand was freed, the lift activated and the drum was lowered. Further amputation was required at a hospital, due to the extent of damage to the finger. No radioactive contamination was found in or around the wound.

The licensee's investigation identified the cause of the accident as the failure of the upper limit switch which controls raising of the scissors lift. The switch failed in the upper or closed position. The controller believed that the drum was in the up position when, in fact, the worker had lowered it to look inside the drum. When the worker reached inside the hood to jiggle the rear limit switch, the upper limit switch activated (opened) and the lift actuated, lifting the drum.

Follow-up actions by the licensee included:

- o Fabrication of a position guide to center drums under the cooling chamber discharge port
- o Installation of proximity switches on the access doors of the cooling chamber discharge port hood, to disable the lifting sequence when the doors are opened
- o Installation of a second emergency stop button on the hood (new location)

- o Installation of handles on the drums, to eliminate the need for personnel to place their hands on the drum lip
- o Engineering review of replacement of upper limit switch with a hydraulic pressure control system
- o Engineering review of lift with lift vendor, to determine if the speed of the scissors lift could be decreased

General Electric Co., Wilmington, N.C.

On October, 4, 1989, an employee was attempting to clear a blockage in a uranium-contaminated waste incinerator ash discharge chute, when the horizontal discharge slide activated and severed two fingers on her left hand below the nail. The employee had removed a plexiglass cover from the front of the discharge chute and reached up the chute to dislodge banding material. At the same time, the employee's right hand was on the hydraulic control lever for the horizontal discharge slide. The slide is a metal plate that closes the chute opening prior to the discharge chamber being filled.

The employee had activated the hydraulic start button for the discharge station pump. The employee then removed the plexiglass cover and with her right hand pushed the discharge control lever. When the employee reached up the chute with her left hand to dislodge some blockage, her right hand slid off the slide control lever, enabling the slide to close and sever her fingers.

Slight contamination was detected on the finger ends. Based on follow-up bioassay information, no internal exposure to uranium is believed to have occurred.

Follow-up actions by the licensee have included:

- o Conversion of the hydraulic ash discharge slide system to a manual system
- o Retraining for incinerator operators
- o Revision of procedural instructions on ash clean-out
- o Installation of a new plexiglass cover for discharge enclosure
- o Provision of special tools for clearing choke-ups
- o Review and analysis of waste going to the incinerator. Reemphasizing to waste-sorting personnel the importance of separating combustibles from non-combustibles.

LIST OF RECENTLY ISSUED
NMSS INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issuance | Issued to |
|------------------------|--|------------------|--|
| 90-16 | Compliance with New Decommissioning Rule | 03/07/90 | All materials licensees |
| 90-15 | Reciprocity: Notification of Agreement State Radiation Control Directors before Beginning Work in Agreement States | 03/07/90 | All holders of NRC materials licenses which authorize use of radioactive material at temporary job sites |
| 90-14 | Accidental Disposal of Radioactive Materials | 03/06/90 | All NRC Byproduct Materials Licensees |
| 90-09 | Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees | 02/05/90 | All holders of NRC materials licenses |
| 90-01* | Importance of Proper Response to Self-Identified Violations by Licensees | 01/12/90 | All holders of NRC materials licenses |
| 89-85 | EPA's Interim Final Rule on Medical Waste Tracking and Management | 12/15/89 | All medical, academic, industrial, waste broker, and waste disposal site licensees |
| 89-82 | Recent Safety-Related Incidents at Large Irradiators | 12/07/89 | All U.S. NRC licensees authorized to possess and use sealed sources at large irradiators |

*Correct Number for 90-01 should be 90010145.

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issuance | Issued to |
|------------------------|--|------------------|---|
| 90-19 | Potential Loss of Effective Volume for Containment Recirculation Spray at PWR Facilities | 3/14/90 | All holders of OLs or CPs for PWRs. |
| 90-18 | Potential Problems with Crosby Safety Relief Valves Used on Diesel Generator Air Start Receiver Tanks | 3/9/90 | All holders of OLs or CPs for nuclear power reactors. |
| 90-17 | Weight and Center of Gravity Discrepancies for Copes-Vulcan Valves | 3/8/90 | All holders of OLs or CPs for nuclear power reactors. |
| 89-59, Supp. 2 | Suppliers of Potentially Misrepresented Fasteners | 3/7/90 | All holders of OLs or CPs for nuclear power reactors. |
| 90-16 | Compliance with New Decommissioning Rule | 3/7/90 | All materials licensees. |
| 90-15 | Reciprocity: Notification of Agreement State Radiation Control Directors Before Beginning Work in Agreement States | 3/7/90 | All holders of NRC materials licenses which authorize use of radioactive material at temporary job sites. |
| 90-14 | Accidental Disposal of Radioactive Materials | 3/6/90 | All U.S. NRC byproduct material licensees. |
| 90-13 | Importance of Review and Analysis of Safeguards Event Logs | 3/5/90 | All holders of OLs or CPs for nuclear power reactors. |
| 90-12 | Monitoring or Interruption of Plant Communications | 2/28/90 | All holders of OLs or CPs for nuclear power reactors. |
| 90-11 | Maintenance Deficiency Associated with Solenoid-Operated Valves | 2/28/90 | All holders of OLs or CPs for nuclear power reactors. |

OL = Operating License
 CP = Construction Permit