

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

July 8, 1991

NRC INFORMATION NOTICE NO. 91-44: IMPROPER CONTROL OF CHEMICALS
IN NUCLEAR FUEL FABRICATION

Addressees:

All nuclear fuel facilities.

Purpose:

This information notice is intended to inform licensees who use chemicals in nuclear fuel production activities of improper handling practices that resulted in the inadvertent introduction of the wrong chemicals into production operations. This notice also serves to remind licensees of the importance of establishing a procedure to adequately identify, store, and handle incoming shipments of chemicals and other production-related materials. Recipients should review this information and consider actions, as appropriate, to prevent a similar occurrence at their facilities. However, suggestions contained in this information notice do not constitute any new Nuclear Regulatory Commission (NRC) requirements, and no specific action or written response is required.

Description of Circumstances:

The following cases illustrate improper handling of chemicals used at nuclear fuel facilities:

Case 1: A truck delivering nitric acid to a nuclear fuel facility pumped the acid into a hydrochloric acid storage tank outside the main processing building. The tank overflowed and the excess acid flowed into the containment dike. The acid fumes entered the main processing building which is maintained at a negative pressure. When the source of the acid fumes could not be located immediately, the licensee promptly evacuated the building by manually activating the criticality alarm. Nine members of the facility's response team involved in searching for the source of the acid fumes were subsequently sent to the local hospital due to upper respiratory tract and eye irritations from the acid fumes, but were later released without treatment. During the course of a preliminary investigation of this incident, it was determined that the driver of the tanker truck containing nitric acid told a licensee representative that he was delivering hydrochloric acid. Consequently, he was directed to discharge the contents into the hydrochloric acid storage tank. There was no indication that shipping papers were reviewed before making the discharge, nor indication that a confirming laboratory analysis was performed.

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Case 2: A nuclear fuel facility received four 55-gallon drums marked "AMSCO 140/TBP," which is a chemical mixture used in the solvent-extraction process in scrap recovery. One drum was introduced into the extraction system but did not perform properly (i.e., it failed to extract uranium from the feed solution). Chemical analysis of samples collected from the drum identified the material as toluene. Samples from a second drum were collected and sent to the supplier, who confirmed that the material was toluene. Facility personnel drained and flushed the system and checked the pipes and valves for damage. As a result of introduction of the improper chemical into the recovery process, facility personnel had to replace several damaged/leaking valves caused by chemical corrosion.

Discussion:

The events described in this information notice emphasize the need for licensees to adequately identify, store, and handle chemicals that will be used in nuclear fuel production activities. Some of the actions that should be considered are:

- Adequately marking and labeling storage tanks, access points, pipes, lines, and valves to preclude the inadvertent addition of the wrong chemical into storage tanks and process lines.
- Establishing procedures to check and verify the contents of containers of chemicals before their addition to storage tanks or direct introduction into production operations.
- Establishing procedures to adequately assess storage-tank content levels before the addition of more material.
- Requiring authorized personnel to review shipping manifests, accept delivery, and directly supervise delivery personnel, as the materials are off-loaded.
- Requiring storage tank areas to be periodically inspected to ensure that there are adequate markings and labels, spill containment systems are maintained, personal protective equipment and safety showers are available where required, and facilities are safe for continued operations.
- Establishing emergency response procedures for chemical spills and other credible chemical emergencies.
- Requiring response personnel to be adequately trained and to have appropriate protective equipment.
- Establishing a Hazard Communication Program as required by Title 29, Code of Federal Regulations, Part 1910.1200.

Licensees should also conduct hazard analyses of all operations to identify those operations and conditions that may cause or contribute to an accident, incident, or emergency condition that adversely impacts on production operations, facilities, equipment, and personnel. Corrective measures should be implemented, as warranted by these analyses, to eliminate or reduce the impact of any incidents or accidents; and licensees should periodically retrain employees on the hazards involved when conducting specific operations.

No specific action or written response is required by this information notice. If you have any questions, please contact the technical contacts 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: Edward McAlpine, RII
(404) 331-5547

Edwin D. Flack, NMSS
(301) 492-0405

Attachments:

1. List of Recently Issued NRC Information Notices
2. List of Recently Issued NMSS Information Notices

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
91-43	Recent Incidents Involving Rapid Increases in Primary-to-Secondary Leak Rate	07/05/91	All holders of OLs or CPs for pressurized-water reactors (PWRs).
91-42	Plant Outage Events Involving Poor Coordination Between Operations and Maintenance Personnel During Valve Testing and Manipulations	06/27/91	All holders of OLs or CPs for nuclear power reactors.
91-41	Potential Problems with The Use of Freeze Seals	06/27/91	All holders of OLs or CPs for nuclear power reactors.
88-63, Supp. 2	High Radiation Hazards from Irradiated Incore Detectors and Cables	06/25/91	All holders of OLs or CPs for nuclear power reactors, research reactors, and test reactors.
91-40	Contamination of Non-radioactive System and Resulting Possibility for Unmonitored, Uncontrolled Release to the Environment	06/19/91	All holders of OLs or CPs for nuclear power reactors.
91-39	Compliance with 10 CFR Part 21, "Reporting of Defects and Noncompliance"	06/17/91	All Nuclear Regulatory Commission (NRC) material licensees.
91-38	Thermal Stratification in Feedwater System Piping	06/13/91	All holders of OLs or CPs for nuclear power reactors.
91-37	Compressed Gas Cylinder Missile Hazards	06/10/91	All holders of OLs or CPs for nuclear power reactors.
91-36	Nuclear Plant Staff Working Hours	06/10/91	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
 CP = Construction Permit

LIST OF RECENTLY ISSUED
NMSS INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
91-39	Compliance with 10 CFR Part 21, "Reporting of Defects and Noncompliance"	06/17/91	All Nuclear Regulatory Commission (NRC) material licensees.
91-35	Labeling Requirements for Transporting Multi-Hazard Radioactive Materials	06/07/91	All U.S. Nuclear Regulatory Commission (NRC) licensees.
91-30	Inadequate Calibration of Thermoluminescent Dosimeters Utilized to Monitor Extremity Dose at Uranium Processing and Fabrication Facilities	04/23/91	All fuel cycle licensees routinely handling unshielded uranium materials.
91-26	Potential Nonconservative Errors in the Working Format Hansen-Roach Cross-Section Set Provided with The Keno and Scale Codes	04/02/91	All fuel cycle licensees and other licensees, including all holders of operating licenses for nuclear power reactors, who use physics codes to support criticality safety in the use of fissile material.
91-23	Accidental Radiation Overexposures to Personnel due to Industrial Radiography Accessory Equipment Malfunctions	03/26/91	All Nuclear Regulatory Commission (NRC) licensees authorized to use sealed sources for industrial radiography.
91-16	Unmonitored Release Pathways from Slightly Contaminated Recycle and Recirculation Water Systems At A Fuel Facility	03/06/91	All fuel cycle facilities.
91-14	Recent Safety-Related Incidents at Large Irradiators	03/05/91	All Nuclear Regulatory Commission (NRC) licensees authorized to possess and use sealed sources at large irradiators.

Licensees should also conduct hazard analyses of all operations to identify those operations and conditions that may cause or contribute to an accident, incident, or emergency condition that adversely impacts on production operations, facilities, equipment, and personnel. Corrective measures should be implemented, as warranted by these analyses, to eliminate or reduce the impact of any incidents or accidents; and licensees should periodically retrain employees on the hazards involved when conducting specific operations.

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ED/IN9144

EKraus: 6/12/91

*See previous concurrence

OFC:IMUF:*	IMSB:*	RII:*	IMOB:*	IMUF:*
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DATE:6/27/91:	6/27/91:	6/28/91:	7/01/91:	

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EF/CHEMICAL INFO NOTICE

EKraus: 6/12/91

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