

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
WASHINGTON, D.C. 20555-0001

December 6, 1995

NRC INFORMATION NOTICE 95-55: HANDLING UNCONTAINED YELLOWCAKE OUTSIDE OF A FACILITY PROCESSING CIRCUIT

Addressees

All Uranium Recovery Licensees.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to the hazards associated with the handling of uncontained yellowcake (natural uranium) at uranium recovery facilities. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not new NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances

During a routine NRC inspection of an operating conventional uranium mill, the inspector discovered that the licensee had used an unorthodox method for drying yellowcake which could have resulted in significant airborne exposure to workers. No worker received an internal exposure in excess of regulatory limits because of the careful work practices and procedures used for this job.

Fifteen barrels of yellowcake were stored outside for several months. Inleakage through the barrel bung holes resulted in the contents becoming wet and requiring re-drying before shipment. The licensee was unable to use the conventional yellowcake drying circuit of the mill because of delays in receiving a state permit to use this equipment; therefore, the licensee resorted to spreading the yellowcake over a 38 ft<sup>2</sup> trough and using propane heaters placed above and below the trough to dry the material. The material was dried in batches, and at various intervals workers raked the material to enhance the drying process. Afterwards, the yellowcake was shoveled back into the barrels. During this work the area was washed down on several occasions to reduce airborne concentrations and surface contamination. The wash water was routed to a process sump.

Air sample results ranged as high as 40 times the Derived Air Concentration for natural uranium specified in 10 CFR 20, Appendix B. However, use of safety measures, such as respiratory protection and protective clothing, resulted in no detectable levels of uranium in worker urine bioassay samples.

PDR I&E Notice

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## Discussion

Licenses issued to uranium recovery facilities do not specifically prohibit the kind of activity described above. However, NRC would expect that appropriate management oversight and planning would eliminate any need for such activities. Since production facilities and equipment are designed to reduce direct exposure to yellowcake by mill workers, special tasks that bypass these engineered controls should normally be avoided but, if required, be planned with special care to reduce worker exposure.

NRC requires that production facilities and equipment be designed: 1) to reduce or eliminate worker contact with yellowcake during product drying and packaging; and 2) to reduce emissions of dried yellowcake to prevent exposures to workers as well as members of the public. In particular, dryer enclosures are required and are designed to be maintained at a negative pressure relative to other mill areas in order to reduce yellowcake outleakage. Also, filtering components reduce yellowcake emissions from dryer stacks. These design requirements assume that direct contact with dried yellowcake by workers will occur only rarely and then only with relatively small quantities.

Uranium processing licensees occasionally may be required to handle yellowcake. Sampling may disclose that a product batch does not meet customer specifications and must be re-introduced manually into the process circuit. On occasion, yellowcake must be transferred from one drum to another. Such manual maneuvers have a high potential for airborne contamination and worker exposure.

Licensees are advised to take measures to minimize the need for special handling of yellowcake product outside of the processing circuit. When such work is required, these tasks should be carefully planned to reduce the potential for airborne contamination and worker exposure.

Each licensee is responsible for protecting the public health and safety by ensuring that all NRC requirements are met and that any potential hazards are promptly identified, corrected, and, if necessary, reported. This responsibility can only be fulfilled if there is persistent and adequate management oversight of licensed activities.

This information notice requires no specific action or written response. If you have questions about the information in this notice, please contact the technical contact listed below.

Original Signed By

John T. Greeves, Director  
Division of Waste Management  
Officer of Nuclear Material Safety  
and Safeguards

Technical contact: Chuck Cain, RIV  
(817) 860-8186

Attachments:

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

*\*Central File*

w/o Encl.: JSurmeier MFederline

DOCUMENT NAME: 95-55.IN

\*SEE PREVIOUS CONCURRENCE

OFC	HLUR*		RIV*		HLUR*				
NAME	CAbrams:cc		CCain		JHolonich		JGreeves		
DATE	11/09/95		11/08/95		11/17/95		11/28/95		

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LIST OF RECENTLY ISSUED  
 NMSS INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
95-51	Recent Incidents Involving Potential Loss of Control of Licensed Material	10/27/95	All material and fuel cycle licensees.
95-50	Safety Defect in Gammamed 121 Bronchial Catheter Clamping Adapters	10/30/95	All High Dose Rate Afterloader (HDR) Licensees.
95-44	Ensuring Combatible Use of Drive Cables Incorporating Industrial Nuclear Company Ball-type Male Conectors	09/26/95	All Radiography Licensees.
95-39	Brachytherapy Incidents Involving Treatment Planning Errors	09/19/95	All U.S. Nuclear Regulatory Commission Medical Licensees.
95-29	Oversight of Design and and Fabrication Activities for Metal Components Used in Spent Fuel Dry Storage Systems	06/07/95	All holders of OLs or CPs for nuclear power reactors.  Independent spent fuel storage installation designers and fabricators.
95-28	Emplacement of Support Pads for Spent Fuel Dry Storage Installations at Reactor Sites	06/05/95	All holders of OLs or CPs for nuclear power reactors
95-25	Valve Failure during Patient Treatment with Gamma Stereotactic Radiosurgery Unit	05/11/95	All U.S. Nuclear Regulatory Commission Medical Licensees.
94-64, Supp. 1	Reactivity Insertion Transient and Accident Limits for High Burnup Fuel	04/06/95	All holders of OLs or CPs for Nuclear Power Reactors and all fuel fabrication licensees.

LIST OF RECENTLY ISSUED  
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
95-54	Decay Heat Management Practices during Refueling Outages	12/01/95	All holders of OLs or CPs for nuclear power reactors.
95-53	Failures of Main Steam Isolation Valves as a Result of Sticking Solenoid Pilot Valves	12/01/95	All holders of OLs or CPs for nuclear power reactors.
95-47, Rev. 1	Unexpected Opening of a Safety/Relief Valve and Complications Involving Suppression Pool Cooling Strainer Blockage	11/30/95	All holders of OLs or CPs for nuclear power reactors.
94-13, Supp. 2	Control and Oversight of Contractors during Refueling Activities and Clarification of Applicability of Section 50.120 of Title 10 of The Code of Federal Regulations to Contractor Personnel	11/28/95	All holders of OLs or CPs for nuclear power reactors.
95-13, Supp. 1	Potential for Data Collection Equipment to Affect Protection System Performance	11/22/95	All holders of OLs or CPs for nuclear power reactors.
91-29, Supp. 3	Deficiencies Identified during Electrical Distribution System Functional Inspections	11/22/95	All holders of OLs or CPs for nuclear power reactors.
94-86, Supp. 1	Legal Actions Against Thermal Science, Inc., Manufacturer of Thermo-Lag	11/15/95	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License  
 CP = Construction Permit