

Jim McKnight

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

July 31, 1997

**NRC INFORMATION NOTICE 97-58: MECHANICAL INTEGRITY OF IN-SITU LEACH
INJECTION WELLS AND PIPING**

Addressees

Holders of and Applicants for Licenses for In-Situ Leach Facilities.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert licensees to leaks related to faulty coupling and configuration of piping at in-situ leach facilities. Recipients should review the information notice for applicability to their facilities and consider actions, as appropriate, to prevent similar problems. However, recommendations contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

In one case, an injection well (IW) leak, detected during routine 5-year mechanical integrity testing (MIT), caused an excursion above the ore zone. In a separate incident, a failure occurred in an injection trunk line, resulting in a spill of barren lixiviant.

1. IW Leak:

A leak in an IW was detected during routine 5-year MIT work. Further testing identified a faulty coupling 12 meters (40 feet) below the ground as the source of the leak. Initial operation of the leaking IW occurred from March 1992 to September 1994. The well was then dormant from October 1994 to October 1995. A lixiviant re-circulation, using extraction water that had not passed through the ion exchange facility, was initiated in November 1995 and lasted until January 1996. The well was then dormant until the MIT of March 1996.

After the MIT results, a monitoring well (air drilled) was installed to the proper depth interval to monitor around the IW for groundwater contamination in the shallow fresh water aquifer. An excursion was detected in a monitoring well, 3 meters (10 feet) from the IW. The sample from this well had a conductivity of 5540 uMho/cm and 27.6 ppm uranium oxide (U₃O₈). Normal aquifer conductivity is 300 Umho/cm. Pursuant to conditions in the license agreement, the licensee informed NRC of the excursion within 24 hours of detection. Additional shallow monitoring wells were installed around the IW to

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begin delineation of the excursion. Monitoring wells 30 to 42 meters (100 to 138 feet) from the IW were at normal background levels for conductivity and uranium concentrations.

The licensee is taking corrective action by pumping the contaminated shallow monitoring wells to recover the excursion. The effectiveness of the fluid recovery operation will be monitored by weekly sampling of the contaminated shallow monitoring wells and the shallow monitoring wells outside the excursion limits. These weekly groundwater samples will be analyzed for sodium, chloride, sulfate, alkalinity, and conductivity. The licensee has concluded that a pressure buildup, caused by the downhole oxygen (O₂) injection system, led to the loss of integrity at the casing coupling in the IW, and that minor excursions occurring in other IWs have similar causes. The licensee plans to remove the O₂ stingers from injection wells.

2. Trunk Line Failure:

A leak was detected in a primary injection trunk line which supplies barren lixiviant to the well fields. The trunk line system consists of two 30-cm (12-in) diameter high density polyethylene buried lines (one injection line, one recovery line) that carry lixiviant to and from the plant to the various well fields. The failure consisted of a separation at a fusion weld, where a 30-cm to 20-cm (12-in to 8-in) short reducer was welded onto the 30-cm (12-in) line.

The licensee believes the failure of the fusion weld was caused by the configuration of the line reducer and 90-degree tee at this point in the system. The full injection flow placed a large stress on the short reducer, before making the 90-degree turn toward the well fields. The trunk line has been repaired, with the 90-degree tee replaced with a 30-cm (12-in) steel elbow with threaded ends and a gentler bend. An investigation of the trunk line systems found this configuration, where the failure occurred, unique.

Discussion

The licensees are addressing corrective action and cleanup for these incidents pursuant to clean-up and restoration license conditions and/or site procedures. No new NRC requirements have been established for the involved licensees or other licensees as a result of these incidents. Excursions from losses of mechanical integrity in wells are generally preventable since they are often manifested by structural weaknesses induced by improper well construction. Licensees with similar IW arrangements should be aware that more frequent integrity testing may be necessary to prevent this type of excursion in the future. Likewise, licensees should avoid piping configurations similar to the 90-degree bend in the trunk line. The staff plans to thoroughly review data associated with similar piping/injection arrangements at other licensee facilities during future inspections.

This information notice requires no specific action or written response. If you have any 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
Office of Nuclear Material Safety
and Safeguards

Technical contact: J. Robert Tinsley, NMSS
(301) 415-6251
E-mail: jrt1@nrc.gov

Attachments:

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

Attachments filed in Jacket

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OFC	URB	TECH ED	URB	GEN COMM COORD	DWM *
NAME	*JRTinsley/dh	*EKraus	*JHolonich	*KRamsey	JGreeves
DATE	7/02/97	7/02/97	7/02/97	7/06/97	7/23/97

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LIST OF RECENTLY ISSUED
 NMSS INFORMATION NOTICES

Date of Notice No.	Subject	Issuance	Issued to	Information
97-57	Leak Testing of Packaging Used in the Transport of Radioactive Material	07/30/97	Suppliers and users of packaging for the transportation of radioactive material required to perform packaging leak tests	
97-56	Possession Limits for Special Nuclear Material at the Environcare of Utah Low-Level Radioactive Waste Disposal Facility	07/28/97	All licensees authorized to possess special nuclear material	
97-55	Calculation of Surface Activity for Contaminated Equipment and Materials	07/23/97	All Uranium Recovery Licensees	
97-51	Problems Experienced with Loading and Unloading Spent Nuclear Fuel Storage and Transportation Casks	07/11/97	All holders of OLs or CPs for nuclear power reactors	
			Designers and fabricators of independent spent fuel storage installations	
			All holders of or applicants for licenses to operate ISFSIs	
97-50	Contaminated Lead Products	07/10/97	All U.S. Nuclear Regulatory Commission licensees	
97-47	Inadequate Puncture Tests for Type B Packages Under 10 CFR 71.73(c)(3)	06/27/97	All "users and fabricators" of type B transportation packages [as defined in 10 CFR 171.16(10(B))]	

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97-55	Calculation of Surface Activity for Contaminated Equipment and Materials	07/23/97	All Uranium Recovery Licensees
97-54	NRC Licensed Operators at Six Non-Power Reactor Facilities Allow their Operator Licenses to Expire	07/18/97	All holders of OLs or CPs for test and research reactors and all licensed operators at test and research reactor facilities
97-53	Circuit Breakers Left Racked Out in Non-Seismically Qualified Positions	07/18/97	All holders of OLs or CPs for nuclear power reactors
97-52	Inadvertent Loss of Capability for Emergency Core Cooling System Motors	07/17/97	All holders of OLs or CPs for nuclear power reactors

OL = Operating License
CP = Construction Permit

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OFC	URB	TECH ED	URB	GEN COMM COORD	DWM
NAME	*JRTinsley/dh	*EKraus	*JHolonich	*KRamsey	JT Greeves
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2. Trunk Line Failure:

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