

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
WASHINGTON, DC 20555

October 30, 1996

**NRC INFORMATION NOTICE 96-57: INCIDENT-REPORTING REQUIREMENTS INVOLVING INTAKES, DURING A 24-HOUR PERIOD THAT MAY CAUSE A TOTAL EFFECTIVE DOSE EQUIVALENT IN EXCESS OF 0.05 Sv (5 rem)**

Addressees

All U.S. Nuclear Regulatory Commission licensees.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to remind recipients of certain incident notification requirements found in 10 CFR 20.2202(b)(1)(i) relating to intakes received during a 24-hour period that may cause a Total Effective Dose Equivalent (TEDE) in excess of 0.05 Sv (5 rem). It is expected that recipients will review the information for applicability to their facilities, to ensure that this information is considered when making a decision about the reporting of a radiation exposure incident. However, this information notice does not contain NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances

Recently, NRC was informed of, and responded to, two incidents involving phosphorus-32 (P-32) and the resulting internal contamination of individuals at biomedical research facilities. P-32 is a radioisotope widely used in research institutions, as are many other radionuclides. Although only one of these events raised a question associated with reporting requirements and is discussed below, our concerns regarding reporting of incidents involving internal exposure extend to all facilities using licensed material.

On October 16, 1995, a licensee informed the NRC that an incident involving internal contamination of a researcher had occurred at its facility almost two months earlier. The licensee's final evaluation of the TEDE received by the individual was 0.048 Sv (4.8 rem) which was within 5 percent of the annual limit of 0.05 Sv (5 rem). An NRC Incident Investigation Team analysis (NUREG-1535, "Ingestion of Phosphorus-32 at Massachusetts Institute of Technology, Cambridge, Massachusetts, Identified on August 19, 1996") concluded that the licensee's final dose assessment was appropriate, but further concluded

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that data available within the first week was sufficient to indicate that the event *threatened to cause* an individual to receive a TEDE in excess of 0.05 Sv (5 rem). Licensee officials told NRC staff that they had not reported the incident earlier because their analysis indicated that the researcher's TEDE *received during the first 24 hours* did not require reporting, pursuant to 10 CFR 20.2202(b)(1)(i).

The pertinent rule, 10 CFR 20.2202(b)(1)(i), states "...each licensee shall, within 24 hours of discovery of the event, report any event involving loss of control of licensed material possessed by the licensee that may have caused, or threatens to cause, any of the following conditions:

- (1) An individual to receive, in a period of 24 hours--
  - (i) A total effective dose equivalent exceeding 5 rem (0.05 Sv);or..."

The licensee had interpreted this to mean that the dose actually received by the individual during the particular 24 hours following the event had to exceed 0.05 Sv (5 rem) before the 24-hour notification was required. This interpretation is not consistent with the definitions of TEDE, committed effective dose equivalent (CEDE), and committed dose equivalent (CDE) in 10 CFR 20.1003.

#### Discussion

As noted above 10 CFR 20.2202(b)(1)(i) requires 24-hour notification if a loss of control of licensed material may have caused, or threatens to cause, an individual to receive, in a period of 24 hours, a TEDE exceeding 0.05 Sv (5 rems). NRC's interpretation of the rule is derived from the definitions in 10 CFR 20.1003 as follows: TEDE is defined as the sum of the deep-dose equivalent (for external exposures) *and* the CEDE (for internal exposures), CEDE is the sum of the products of the weighing factors applicable to each of the body organs or tissues that are irradiated and the CDE to these organs or tissues, and CDE means the dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

Licensees are required by 10 CFR 20.2202(b)(1)(i) to report the TEDE received by an individual that is based on all doses received during the 24-hour period, including committed doses (i.e., the CEDE) and not just the doses delivered during the 24-hour period. For internal doses, the 24-hour period specified in 10 CFR 20.2202(b)(1) refers to the period of intake and not the period of dose delivery. In the case described above, the CEDE from the intake received during the event (in a period of 24 hours) threatened to exceed 0.05 Sv (5 rem). Because this case does not involve external exposure (rather, only ingestion), CEDE is equal to TEDE. In such a case, a licensee would be required by 10 CFR 20.2202(b)(1)(i) to notify NRC within 24 hours of discovery of the event.

This information notice requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contacts listed below or the appropriate regional office.



Thomas T. Martin, Director  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation



Donald A. Cool, Director  
Division of Industrial and  
Medical Nuclear Safety  
Office of Nuclear Material Safety  
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Attachments:

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

*Attachment filed in Jacket*

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**\*SEE PREVIOUS CONCURRENCES**

DOCUMENT NAME: 96-57.IN

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DATE	10/24/96	10/28/96	10/29/96	10/30/96	

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**LIST OF RECENTLY ISSUED  
NMSS INFORMATION NOTICES**

<b>Information Notice No.</b>	<b>Subject</b>	<b>Date of Issuance</b>	<b>Issued to</b>
96-54	Vulnerability of Stainless Steel to Corrosion When Sensitized	10/17/96	All material licensees
96-53	Retrofit to Amersham 660 Posilock Radiography Camera to Correct Inconsistency in 10 CFR Part 34 Compatibility	10/15/96	All industrial radiography licensees
96-52	Cracked Insertion Rods on Troxler Model 3400 Series Portable Moisture Density Gauges	09/26/96	All U.S. Nuclear Regulatory Commission portable gauge licensees and vendors
96-51	Residual Contamination Remaining in Krypton-85 Handling System After Venting	09/11/96	All material licensees
96-47	Recordkeeping, Decommissioning Notifications for Disposals of Radioactive Waste by Land Burial Authorized Under Former 10 CFR 20.304, 20.302, and Current 20.2002	08/19/96	All U.S. Nuclear Regulatory Commission licensees
96-35	Failure of Safety Systems on Self-Shielded Irradiators Because of Inadequate Maintenance and Training	06/11/96	All U.S. Nuclear Regulatory Commission irradiator licensees and vendors

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<b>Information Notice No.</b>	<b>Subject</b>	<b>Date of Issuance</b>	<b>Issued to</b>
96-56	Problems Associated with Testing, Tuning, or Resetting of Digital Control Systems While at Power	01/22/96	All holders of OLs or CPs for nuclear power reactors
96-55	Inadequate Net Positive Suction Head of Emergency Core Cooling and Containment Heat Removal Pumps Under Design Basis Accident Conditions	10/22/96	All holders of OLs or CPs for nuclear power reactors
96-54	Vulnerability of Stainless Steel to Corrosion When Sensitized	10/17/96	All materials licensees
96-53	Retrofit to Amersham 660 Posilock Radiography Camera to Correct Inconsistency in 10 CFR Part 34 Compatibility	10/15/96	All industrial radiography licensees
95-04, Supp. 1	Excessive Cooldown and Depressurization of the Reactor Coolant System Following Loss of Offsite Power	10/11/96	All holders of OLs or CPs and vendors for nuclear power reactors

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OL = Operating License  
CP = Construction Permit