

TEMPORARY INSTRUCTION 2800/5

RECONCENTRATION OF RADIONUCLIDES IN SANITARY SEWERAGE SYSTEMS

2800/5-01 PURPOSE

This temporary instruction (TI) specifies requirements for inspecting a specific set of licensees to determine if there is a problem with reconcentration of radionuclides at sewerage treatment plants. The list of licensees below was provided by NMSS as having a potential for radionuclide reconcentration in sanitary sewerage systems.

2800/5-02 OBJECTIVE

To expedite inspections of certain licensees with a potential for reconcentration of radionuclides in sewerage systems. The regions should also be sensitive to this issue during routine inspections of other licensees if they have reason to believe that a potential for reconcentration may exist.

2800/5-03 LICENSEES TO INSPECT

Following is a list of licensees that NMSS believes have a real potential for releasing radionuclides into sanitary sewerage systems that later reconcentrate at sewerage treatments plants. The list may not be all inclusive and, except for one, does not involve americium-241.

Large Manufacturers

New England Nuclear
Gamma Diagnostics
Monsanto Chemical
Mallinckrodt Corporation
3 M Comany
Abbott Laboratories
Advanced Medical Systems
Minneapolis Honeywell

Large Institutions with Broad Licenses

Harvard University
Dept. of the Army - Fort Detrick
National Institutes of Health

Other

Amersham in Illinois - AM-241
(does not make foils but sometimes cuts them out)

2800/5-04 PROGRAM

Prior to July 31, 1985, the regions should inspect each named licensee to determine whether a reconcentration problem exists. The special inspection should include the taking of actual samples of sludge at the licensees' holdup tanks for analysis and, if practicable, a survey should be made of

licensees' sewer lines where the material is actually dumped. If contamination is found in the sludge or sewer lines at the licensee's facilities, reasonable efforts should be made to conduct a survey and take samples for analysis at the nearest sewerage treatment plant. If a problem is found, the Safeguards and Materials Programs Branch (SMPB), IE, should be notified promptly. A short written report showing the results of analyses, even if negative, should be sent to SMPB. The report should include a summary page showing the name and license number of the licensee and locations where samples were obtained. The report can be the report of the inspection if it contains the results of sample analysis.

2800/5-05 EXPIRATION

This TI will remain in effect through July 31, 1985.

2800/5-06 IF CONTACT

Questions regarding this TI should be addressed to J. R. Metzger, SMPB. Telephone (301) 492-4947.

2800/5-07 PRIORITY

The inspections requested in this TI have a high priority and should be done as soon as practicable with consideration given to other high priority inspection work. The list of licensees in 2800/5-03 are mostly all high priority licensees and a complete inspection may be done while implementing the provisions of this TI.

END

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, DC 20555

December 21, 1984

IE INFORMATION NOTICE NO. 84-94: RECONCENTRATION OF RADIONUCLIDES INVOLVING
DISCHARGES INTO SANITARY SEWAGE SYSTEMS
PERMITTED UNDER 10 CFR 20.303

Addressees:

All NRC materials licensees other than licensees that use sealed sources only.

Purpose:

This information notice is provided to alert recipients of a potentially significant problem involving reconcentration of radionuclides released to sanitary sewage systems. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Three recent occurrences have pointed out the need to focus attention on the possible reconcentration of radionuclides that are discharged into sanitary sewage systems under the provisions of 10 CFR 20.303. In these occurrences, radioactive contamination was found in sewer lines and in the municipal sewage treatment facility.

During a routine radiation survey, Oak Ridge Associated Universities found radioactive contamination in the sludge from the sewage treatment facility in Oak Ridge, Tennessee. The principal contaminant was cobalt-60 (Co-60). The State of Tennessee traced the apparent source of the contamination to a State licensee who occasionally discharged a few thousand gallons per day of liquid into the sanitary system at concentrations of 66-110 dpm/ml of Co-60. Although the discharge from the licensee's facility was mixed with 4 to 5 million gallons of liquid from other sources in the city, concentrations of 20,000-200,000 dpm/Kg were measured in the sludge from the treatment facility. Sludge had been used to fertilize a Department of Energy reforested area with the result that radiation levels 2 to 3 times background were measured there (about 10 μ R/hr). As a result of the discovery of the problem, the licensee has installed an improved filtration and ion exchange system.

84/2190503 5pp

In the second occurrence, americium-241 (Am-241) contamination was found in ash that remained in an incinerator used as a final treatment step at the Tonawanda, New York sewage treatment plant and in ash disposed of at the Tonawanda landfill. About 10,000 tons of ash containing about 500 picocuries per gram of ash has been disposed of at the landfill. About 30 tons of contaminated ash currently remain in the sewage treatment plant incinerator and in ancillary equipment.

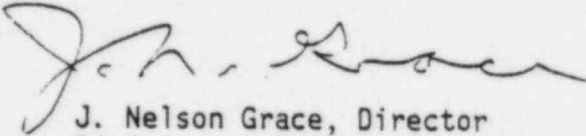
The contamination resulted from liquid releases made to the sanitary sewage system by a New York Agreement State licensee who formerly manufactured Am-241 foils at its Tonawanda facility. The licensee has since relocated its foil manufacturing operation to Mexico. Some decontamination of the licensee's Tonawanda facility was undertaken following the move.

The homes, clothes, or cars of four former licensee employees were found to be contaminated. Because of exposure to airborne dust at the sewage treatment plant, six plant workers received whole-body counting to examine the potential for internal deposition. Two of the six were among 58 plant workers who received lung scans. No uptake of Am-241 was detected. Several issues remain to be resolved. These involve disposal of the contaminated ash at the sewage treatment plant, dealing with contaminated ash disposed to the landfill before identification of the contamination problem, decontamination of the sewer lines, and decontamination of the licensee's facility.

In a third occurrence, Am-241 contamination also was found in sludge at a sewage treatment plant in Grand Island, New York. The contamination resulted from liquid releases made to the sanitary sewage system by another New York Agreement State licensee also engaged in the manufacture of Am-241 foils. The measured concentration in the sludge was about 100 picocuries per gram of sludge dry weight. (For purposes of comparison, if this sludge were incinerated, concentrations of about 500 picocuries per gram would result in the ash produced.) In this case, however, the sludge is disposed directly to a local sanitary landfill.

The NRC regulation 10 CFR 20.303 permits discharges of small quantities of radionuclides into sanitary sewage systems within the limits specified in that section provided that the materials "are readily soluble or dispersible in water." Licensees who rely on this section have the burden of demonstrating that the materials they are discharging are indeed readily soluble or dispersible. The term "dispersible" may have caused introduction of substances into sanitary sewerage systems that do not qualify as readily dispersible, such as liquid scintillation media and ash. Ash is a special case, which may or may not be "readily dispersible" depending on its degree of comminution and tendency to agglomeration. In order to detect and correct any reconcentration problems involving NRC licensees, inspectors will pay particular attention to the possibility of reconcentration of radionuclides during their inspections of licensees who discharge materials into sanitary sewage systems.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate NRC regional office, or this office.



J. Nelson Grace, Director
Division of Quality Assurance, Safeguards,
and Inspection Programs
Office of Inspection and Enforcement

Technical Contact: L. I. Cobb
(301) 492-4935

Attachment:
List of Recently Issued IE Information Notices

Attachment
IN 84-94
December 21, 1984

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
84-93	Potential for Loss of Water from the Refueling Cavity	12/17/84	All boiling water reactor facilities holding an OL or CP
84-92	Cracking of Flywheel on Cummins Fire Pump Diesel Engines	12/17/84	All boiling water reactor facilities holding an OL or CP
84-91	Quality Control Problem of Meteorological Measurements Problems	12/10/84	All boiling water reactor facilities holding an OL or CP
84-90	Main Steam Line Break Effect on Environmental Qualification of Equipment	12/7/84	All boiling water reactor facilities holding an OL or CP
84-89	Stress Corrosion Cracking in Nonsensitized 316 Stainless Steel	12/7/84	All boiling water reactor facilities holding an OL or CP
84-88	Standby Gas Treatment System Problems	12/3/84	All boiling water reactor facilities holding an OL or CP
84-87	Piping Thermal Deflection Induced by Stratified Flow	12/3/84	All boiling water reactor facilities holding an OL or CP
84-86	Isolation Between Signals of the Protection System and Non-Safety-Related Equipment	11/30/84	All boiling water reactor facilities holding an OL or CP
84-85	Molybdenum Breakthrough from Technetium-99m Generators	11/30/84	All NRC licensed medical institutions and radiopharmaceutical suppliers
84-84	Deficiencies In Ferro- Resonant Transformers	11/27/84	All boiling water reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit

Dispatched 1/28/85

NRC FORM 218 (4-76) NRCM 0240		U.S. NUCLEAR REGULATORY COMMISSION		DATE 1/24/85	
TELEPHONE OR VERBAL CONVERSATION RECORD				TIME <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
<input checked="" type="checkbox"/> INCOMING CALL		<input type="checkbox"/> OUTGOING CALL		<input type="checkbox"/> VISIT	
PERSON CALLING Marvin Peterson		OFFICE/ADDRESS IP		PHONE NUMBER EXTENSION	
PERSON CALLED Paul H. Lohaus		OFFICE/ADDRESS Region I		PHONE NUMBER EXTENSION	
CONVERSATION					
SUBJECT NRC RESPONSE TO SEGOVIA-KANE LETTER					
SUMMARY <p>Marv was returning my call. I had called Marv to discuss NRC's response to Segovia-Kane's letter. Marv indicated IP had received no feedback from Segovia-Kane or Mexican authorities regarding the response. I expressed concern relayed to me by Marty Haas, consultant to EAD, that a quantity of gold (possibly as much as 100 ounces) was on the shipment sent to Segovia-Kane. (After my call to Marv, I called Marty Haas and Frank Bradley of the NY Labor Department and asked them to review their records to see if they could identify the specific amount of gold that was on the shipment.) I indicated we should bring this to the attention of the Mexican authorities, if we had not already done so, so that they could check and make sure contaminated gold in the shipment did not inadvertently find its way into the commercial marketplace. Marv indicated IP would relay this information to the Mexican authorities and let us know what the current status of the shipment was.</p>					
FYI cc: T. Murley J. Allar D. Nussbaumer J. Saltzman M. Peterson					
REFERRED TO:				<input type="checkbox"/> ADVISE ME OF ACTION TAKEN.	
ACTION REQUESTED				INITIALS <i>P.H. Lohaus</i>	
				DATE 1/28/85	
ACTION TAKEN				INITIALS	
				DATE	