



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

JAN 27 1988

cc: J. Allan

MEMORANDUM FOR: William T. Russell  
Regional Administrator, Region I

FROM: Hugh L. Thompson, Jr., Director  
Office of Nuclear Material Safety  
and Safeguards

SUBJECT: REGULATION OF RADIOACTIVE MATERIAL SUBSEQUENT TO DISCHARGE  
FROM A LICENSED FACILITY

In your memorandum of November 15, 1988, you requested a resolution of several policy and legal issues related to the regulation of radioactive material subsequent to discharge from a licensed facility in a sanitary sewage system. Enclosed are responses which constitute the current NMSS position. These responses have been coordinated with the Office of the General Counsel. Also enclosed is a copy of NRC Information Notice 88-22, "Disposal of Sludge from Onsite Sewage Treatment Facilities at Nuclear Power Plants," which discusses some of the same issues.

The current regulations do not specifically address the accumulation of radioactive material in sewer treatment sludge. Time and technology have overtaken the regulations in this respect. The Office of Nuclear Regulatory Research has research under way to examine radionuclide pathways and potential dose from sewage treatment systems following the release of radionuclides to sewers. When this information is available, it may serve as a basis for modifying the regulations.

The revision of 10 CFR Part 20 currently before the Commission contains changes that will reduce discharge limits for sewage disposal of radioactive materials, but does not directly address the issue of reconcentration. In addition, the radioactive material to be released must be "readily soluble (or is readily dispersible biological material) in water." Other types of "dispersible" materials, which were allowed under the existing 10 CFR 20.303, would not be permitted under the revised regulation.

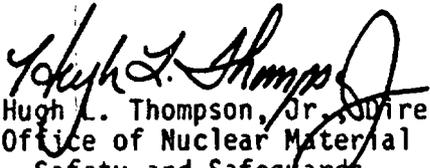
Another matter related to the discharge of radioactive material and its subsequent reconcentration in sanitary sewage sludge is the effort by the Commission to develop a general policy on exemptions. The current proposals under review by the staff involve exemption of practices in which the individual dose to the maximum individual (critical group) is on the order of a few mrem per year.

ATTACHMENT

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Our review of the information related to releases from Interstate Nuclear Services Corporation in Royersford, Pennsylvania (INS), indicates that the provisions of the regulations, both current and proposed, have been met by the licensee. The dose values reported by Oak Ridge Associated Universities for disposal of sewage sludge by land application as fertilizer indicates that this activity would fall within the criteria currently under consideration for exemption from further regulatory control. Thus, we continue to believe that these activities do not present a health and safety problem. We also continue to concur with the statement in the Region I letter to the Commonwealth of Pennsylvania that "(i)f The Commonwealth concludes that doses from landfill application are less than, or comparable to, disposal by land application, NRC would not object to landfill burial." As a separate matter, the proposed license amendment by INS to discharge to the Schuylkill River provides an option to alleviate the current sewer treatment sludge situation, if it meets the requirements of 10 CFR Part 20, and if discharges to the sanitary sewer are not continued.

While the Royersford case does not appear to present a health or safety problem, the generic issue of reconcentration from liquid effluents remains unresolved. We will continue to review the issue as the RES contractor completes research on the subject.

  
Hugh L. Thompson, Jr., Director  
Office of Nuclear Material  
Safety and Safeguards

Enclosures:  
As stated

cc: W. C. Parler, OGC  
M. L. Ernst, RII  
A. B. Davis, RIII  
R. D. Martin, RIV  
J. B. Martin, RV  
V. Miller, GPA/SLITP

## RESPONSE TO QUESTIONS

1. When a licensee discharges licensed radioactive materials from its facility and the discharges are in accordance with regulatory requirements with respect to concentration, solubility and dispersability, at what point has this material entered the environment and no longer should be considered to be the responsibility of the licensee?

### Response:

The discharge of certain concentrations of radioactive material to sanitary sewage is permitted by 10 CFR 20.303. This material is assumed to be the responsibility of the licensee so long as the material remains under the licensee's control. When a discharge which complies with 10 CFR 20.303 has reached a sanitary sewer which is not under the control of the licensee, then the material may be assumed to have entered the environment, and is no longer covered by the license.

2. If, subsequent to a licensee discharging licensed material at, or below, regulatory limits in Part 20, licensable quantities of radioactive material accumulate downstream of the discharge point of a licensed facility in a sewage treatment facility, etc., does the NRC have any regulatory authority regarding this material? Does the NRC have an obligation to exercise regulatory authority over the accumulated, licensable quantities of radioactive material, notwithstanding the fact that the staff has determined that there is no health and safety concern?

Response:

The presence of licensable quantities or concentrations of radioactive material provides the opportunity for NRC to exercise regulatory authority. This would particularly be the case if the presence of the radioactive material posed a health and safety hazard. However, in cases where there is no public health and safety concern, the NRC would not necessarily have to exercise that regulatory authority. The Commission is currently considering a general policy related to the exemption of radioactive materials from regulatory control. Under such a policy, certain concentrations or quantities of radioactive material could be exempted from regulatory control on the basis of low individual and collective doses. The general policy should provide a basis for appropriate action in future cases.

3. If the NRC does have regulatory authority over accumulated, licensable quantities of radioactive material, should the NRC license the person who possesses the material or compel the already licensed source of the material to take control of the radioactive material? For example, should the Borough of Royersford be required to be licensed?

Response:

The licensing of the person possessing the radioactive material, such as the Borough of Royersford, would be within the regulatory jurisdiction of NRC. However, we believe that in cases such as the Borough of Royersford, it might be better to carefully evaluate whether the licensee discharges are in keeping with the ALARA principle. When there are situations in which contamination has resulted from the discharge from a licensed facility in effluents in excess of regulatory limits, the licensee can be held responsible for the actions that may be necessary to remedy the situation. In cases where the effluent releases have all been within regulatory limits, the Commission has the authority to address other factors, such as, the degree of control of the licensee over the accumulated materials, the scope of the health and safety problems, etc. The NRC may then determine if the licensee or the person possessing the radioactive material should be required to take some action necessary to protect public health and safety. In this latter case, an Order to either or both parties would be the likely procedural approach to be taken.

4. When a licensee releases, via a sewer disposal, radioactive material that meets the regulatory requirements for such disposal to its own private sewage treatment facility and then, subsequently, this material is released to the environment in liquid and/or gaseous discharges or sludge from the sewage treatment plant, should the NRC regulate these releases from the sewage treatment plant? Are the licensee's discharges controlled by 10 CFR 20.303, 10 CFR 20.106, or both?

Response

As a part of the revision of 10 CFR Part 20, the term "sanitary sewerage" has been defined to mean "... a system of public sewers for carrying off waste water and refuse, but excluding sewage treatment facilities, septic tanks, and leach fields owned or operated by the licensee." We believe that this definition clarifies that NRC should regulate releases from a sewage treatment facility that is owned by the licensee. This is consistent with a philosophy of holding the licensee accountable for material which is still within its control. The discharges would be controlled by both 10 CFR 20.303 and 10 CFR 20.106, depending upon the release pathway.

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

May 12, 1988

NRC INFORMATION NOTICE NO. 88-22: DISPOSAL OF SLUDGE FROM ONSITE  
SEWAGE TREATMENT FACILITIES AT  
NUCLEAR POWER STATIONS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert licensees to two recent events indicating that not all licensees are fully aware of the potential for contamination of sewage sludge and the relevant regulatory requirements.

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 do not constitute NRC requirements; therefore, no specific action or written response is required.

Related Documents:

IE Bulletin 80-10 (Reference 1) requested that licensees review the design and operation of their facilities to identify systems that are considered non-radioactive (or described as non-radioactive in the facility's Final Safety Analysis Report (FSAR)) but that could become radioactive through interfaces with radioactive systems and result in unmonitored, uncontrolled releases in liquid and gaseous effluents. This bulletin stated that special consideration was to be given to particular systems, including the sanitary waste system; however, sludge from the sanitary waste system was not discussed specifically.

IE Information Notice No. 83-05 (Reference 2) called attention to the provisions of 10 CFR 20.302, "Method For Obtaining Approval Of Proposed Disposal Procedures," as a means for obtaining approval for disposal of, among other things, large volumes of material radioactively contaminated at very low levels. IE Information Notice No. 86-90 (Reference 3) informed licensees that, in Agreement States, applications to obtain approvals for such disposals should be sent to the Agreement State and not to the NRC.

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IE Information Notice No. 85-92 (Reference 4) emphasized the need for careful surveys of materials that may be contaminated and that are to be disposed of as "clean" waste; i.e., as waste that does not contain licensed radioactive material.

Description of Circumstances:

During an inspection at the Point Beach Nuclear Power Plant, it was found that the licensee had made onsite disposals of slightly contaminated sludge removed from aeration ponds and the aerobic digester in the onsite sanitary sewage treatment facility. The sludge was spread on licensee-owned land and mixed into the soil by plowing. Radionuclides identified by the licensee in the sludge included chromium-51, manganese-54, cobalt-58, cobalt-60, cesium-134, and cesium-137. The total activity for six onsite disposals was 300 micro-curies. Licensee representatives indicated their belief that these disposals were in compliance with regulatory requirements because (1) they met the requirements of 10 CFR 20.303, "Disposal By Release Into Sanitary Sewerage Systems," for disposal into a sanitary sewerage system and (2) their subsequent disposition of sludge was consistent with measures that would be taken by any operator of a sanitary sewerage system. The licensee was informed that these disposals were contrary to 10 CFR 20.301, "General Requirements (Waste Disposal)," and that 10 CFR 20.303 does not apply to contaminated sludge removed from onsite sewage treatment facilities. 10 CFR 20.303 only allows a licensee to discharge radioactive material into a sanitary sewerage system under limited conditions. It does not cover removal and land disposal of contaminated sludge from the licensee's sanitary sewage treatment facilities. Considering the very low level of radioactive contamination of the sludge and the licensee's estimate that these disposals would result in very low annual doses, the licensee applied for, and obtained, approval of future disposals of this type pursuant to 10 CFR 20.302.

Subsequently, during an inspection at the Surry Nuclear Power Station, it was found that the licensee had disposed of dried sludge from the onsite sewage treatment facility at the county sanitary landfill without determining if the sludge was contaminated with licensed material. Licensed radioactive material was found in sludge that had not yet been disposed of. The licensee was informed that failure to determine, before disposal, if the sludge was contaminated was contrary to 10 CFR 20.201, "Surveys," and that disposal of contaminated sludge by this means would be contrary to 10 CFR 20.301.

Before receiving the application from Point Beach, the NRC had received only one application pursuant to 10 CFR 20.302 for disposal of radioactively contaminated sewage sludge from a sanitary sewage treatment facility at a nuclear power station. This was a request from the Duke Power Company for disposal of contaminated sludge at its Oconee Nuclear Station. In this case, the requested method of disposal was by transfer to a contracted vendor for transport to a publicly owned treatment works. The NRC found the request acceptable; however, because Oconee is in an Agreement State, South Carolina, it was necessary for the licensee to obtain approval of the State for this disposal of byproduct material.

Discussion:

Licensees may wish to consider the following:

1. Sludge from onsite sewage treatment plants may be contaminated with licensed radioactive material which has been concentrated by the treatment system.
2. The provisions of 10 CFR 20.303 do not apply to the disposal of contaminated sludge removed from sanitary sewerage systems at nuclear power stations.
3. 10 CFR 20.201 covers surveys required before disposing of sewage treatment sludge, to determine if the sludge is contaminated. Gamma-ray spectrometry can be performed on representative samples of the sludge under conditions that provide a lower limit of detection (LLD) appropriate to measurements of environmental samples. Such measurements make it possible to distinguish licensed material from other radioactive materials (natural radioactive materials and world-wide fallout) that may be present in the sludge.
4. 10 CFR 20.301 covers the disposal of sewage sludge from a licensee's sewage treatment facility when contaminated with licensed radioactive material.
5. Licensees may apply in accordance with the provisions of 10 CFR 20.302 to dispose of sewage sludge containing very low levels of licensed radioactive material in a manner not otherwise authorized in the regulations. Applications for approval of such disposal may be made to the NRC or Agreement State, as appropriate.

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

*Charles E. Rossi*

Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: John D. Buchanan, NRR  
(301) 492-1097

W. Wayne Meinke, NRR  
(301) 492-3152

Attachment: List of Recently Issued NRC Information Notices

References

1. IE Bulletin No. 80-10, "Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment," May 6, 1980.
2. IE Information Notice No. 83-05, "Obtaining Approval for Disposing of Very-Low-Level Radioactive Waste - 10 CFR Section 20.302," February 24, 1983.
3. IE Information Notice No. 86-90, "Request to Dispose of Very-Low-Level Radioactive Waste Pursuant to 10 CFR 20.302," November 3, 1986.
4. IE Information Notice No. 85-92, "Surveys of Waste Before Disposal from Nuclear Reactor Facilities," December 2, 1985.

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-21	Inadvertent Criticality Events at Oskarshamn and at U.S. Nuclear Power Plants	5/9/88	All holders of OLs or CPs for nuclear power reactors.
88-20	Unauthorized Individuals Manipulating Controls and Performing Control Room Activities	5/5/88	All holders of OLs or CPs for nuclear power, test and research reactors, and all licensed operators.
88-19	Questionable Certification of Class 1E Components	4/26/88	All holders of OLs or CPs for nuclear power reactors.
88-18	Malfunction of Lockbox on Radiography Device	4/25/88	All NRC licensees authorized to manufacture, distribute, and/or operate radiographic exposure devices.
88-17	Summary of Responses to NRC Bulletin 87-01, "Thinning of Pipe Walls in Nuclear Power Plants"	4/22/88	All holders of OLs or CPs for nuclear power reactors.
88-16	Identifying Waste Generators in Shipments of Low-Level Waste to Land Disposal Facilities	4/22/88	Radioactive waste collection and service company licensees handling prepackaged waste, and licensees operating low-level waste disposal facilities.
88-15	Availability of U.S. Food and Drug Administration (FDA)-Approved Potassium Iodide for Use in Emergencies Involving Radioactive Iodine	4/18/88	Medical, Academic, and Commercial licensees who possess radioactive iodine.

OL = Operating License  
CP = Construction Permit