

October 24, 2007

MEMORANDUM TO: Steven M. Garry Team Leader
Health Physics Team
Division of Inspection and Regional Support, NRR

FROM: Roger Pedersen, Sr. Health Physicist/**RA**/
Health Physics Team
Division of Inspection and Regional Support, NRR

SUBJECT: FORTHCOMING MEETING WITH THE NUCLEAR ENERGY
INSTITUTE TO DISCUSS A DRAFT REGULATORY ISSUES
SUMMARY CONCERNING THE RETURN/RE-USE OF WATER
CONTAINING PREVIOUSLY DISCHARGED RADIOACTIVE
EFFLUENTS

DATE & TIME: Thursday, November 8, 2007
12:00 p.m. - 2:00 p.m.

LOCATION: U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike, Room O-11 B2
Rockville, Maryland 20852

PURPOSE: The purpose of this meeting is for Nuclear Energy Institute (NEI) to
obtain stakeholder input on the issues discussed in the enclosed Draft
Regulatory issues Summary. A preliminary agenda is also enclosed.

CATEGORY 2*: This is a Category 2 Meeting. The public is invited to participate in this
meeting by discussing regulatory issues with the Nuclear Regulatory
Commission (NRC) at designated points identified on the agenda. For
information regarding participating via teleconference, please contact
Roger Pedersen at 301-415-3162 or rlp1@nrc.gov.

CONTACT: Roger Pedersen, NRR
301-415-3162

R. L. Pedersen

-2-

PARTICIPANTS: Participants from the NRC include members of the Office of Nuclear Reactor Regulation.

NRC

Roger Pedersen
Elaine Keegan
Steven Garry
Stacie Sakai

NEI

Ralph Andersen
George Oliver

Project No. 689

Enclosure:

1. Agenda
2. Draft RIS: RETURN/RE-USE OF WATER CONTAINING PREVIOUSLY DISCHARGED RADIOACTIVE EFFLUENTS FROM OPERATING NUCLEAR POWER PLANTS

* Commission's Policy Statement on "Enhancing Public Participation in NRC Meetings," (67 FR 36920), May 28, 2002

cc w/encl: See next page

R. L. Pedersen

-2-

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(67 FR 36920), May 28, 2002

cc w/encl: See next page

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DATE	10/24/07

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AGENDA FOR NOVEMBER 8, 2007, PUBLIC MEETING WITH NEI
DISCUSSION OF DRAFT REGULATORY ISSUES SUMMARY (RIS) CONCERNING THE
RETURN/RE-USE OF WATER CONTAINING PREVIOUSLY DISCHARGED RADIOACTIVE
EFFLUENTS

- | | | |
|----|---|----------------|
| 1. | Introduction | NRC & NEI |
| 2. | Purpose | NRC |
| 3. | Discussion and Comments on Draft RIS | NRC & NEI |
| 4. | Opportunity for Public Comment or Questions | Public and NRC |
| 5. | Summary | NRC & NEI |

Enclosure 2

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, DC 20555-0001

, 2007

DRAFT
NRC REGULATORY ISSUE SUMMARY 2007-xx
RETURN/RE-USE OF WATER CONTAINING PREVIOUSLY DISCHARGED RADIOACTIVE
EFFLUENTS
FROM OPERATING NUCLEAR POWER PLANTS

ADDRESSEES

All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel, and fuel cycle licensees.

INTENT

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to clarify its regulations related to controls over previously discharged radioactive materials in gaseous or liquid effluents that are returned from the environment to an operating nuclear power facility. This RIS requires no action or written response on the part of an addressee.

BACKGROUND INFORMATION

During an NRC inspection at the Wolf Creek Generating Station, NRC inspectors found that tritium was present in the fire protection system as a result of using Coffey County Lake as a water supply. The Coffey County Lake is in the unrestricted area and serves as the plant's ultimate heat sink and recipient of discharges of radioactive liquid effluents.

As part of its operations, the Wolf Creek plant releases radioactive liquid effluent (primarily tritium) into the Coffey County Lake in accordance with NRC regulations and its Offsite Dose Calculation Manual. The lake water contains an average tritium concentration of approximately 13,000 picocuries per liter. The NRC has determined that there is very little risk significance to this concentration of radioactivity and that prior effluent disposals were within the criteria of Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as Is Reasonable Achievable' for Radioactive Material in Light-Water-Cooled Power Reactors," to Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," of the *Code of Federal Regulations* (10 CFR Part 50).

Enclosure 1

The water supply for the Wolf Creek fire protection system is the Coffey County Lake, and thus the fire protection system contains tritium that has been returned from the environment to the plant. During routine maintenance of the fire protection system, workers flush the system by opening the onsite fire hydrants and discharging the fire system water onto the ground. Most of the water returns to the lake as surface water runoff. The Wolf Creek plant also draws large amounts of cooling water from the lake into its circulating water and service water systems, which is then promptly returned to the lake.

SUMMARY OF ISSUE

The NRC inspector questioned whether the discharge of fire protection system water containing tritium was subject to the radiological survey requirements in 10 CFR Part 20, "Standards for Protection Against Radiation," Subpart F, "Surveys and Monitoring," and the effluents disposal requirements of 10 CFR Part 20, Subpart K, "Waste Disposal."

Generally, the NRC has determined that radioactive material properly released in gaseous or liquid effluents to the environment is not considered licensed material when returned to the facility. The water containing radioactive material returned from the environment can be used by the licensee and returned to the environment without being considered a new radioactive material effluent release, since the radioactive material has already been released and accounted for, provided that the following conditions apply:

- Before returning the radioactive materials to the environment, licensees have demonstrated that the radioactive material was previously disposed of in accordance with 10 CFR 20.2001(a)(3);
- Subsequent use, possession, or release does not involve the entraining of other unaccounted for radioactive materials; and
- The concentration of radioactive material does not exceed 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," exempt concentration limits (otherwise a general or specific license is required).

Licensees are responsible for evaluating any new exposure pathways and the resultant radiological hazards associated with the return of radioactive material to the operating facility and its subsequent discharge to the environment. As described in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, issued October 1977, licensees must evaluate any new exposure pathways to members of the public that contribute 10 percent or more of the total effluent dose and include these dose assessments in their demonstration of compliance with Appendix I to 10 CFR Part 50. Licensees are also responsible for disposing of any radioactive material, previously unaccounted for, that is entrained with returned/re-used radioactive material as a new effluent disposal per 10 CFR 20.2001.

This RIS applies to radioactive material in gaseous and liquid effluents, and does not apply to radioactive material in solid materials or soil. Nothing in this RIS is intended to alter the requirement for decommissioning facilities to account for all radioactive material resulting from activities under the licensee's control. During decommissioning, licensees must meet the decommissioning standards of 10 CFR 20, Subpart E as they apply to residual radioactivity (i.e., licensed and unlicensed radioactive material).

This RIS provides two example scenarios that may occur during plant operations. The first is the return and re-use of lake water containing radioactive material by the licensee (as at Wolf Creek), and the second is the return of radioactive material to the site as the result of a natural process, such as rainfall, or through equipment condensation.

In the first scenario, the licensee uses lake water containing previously disposed radioactive material in its plant secondary systems and then subsequently releases that lake water back to the environment. The licensee has evaluated the occupational radiological hazards to workers of re-using the lake water under its radiological protection program, and has evaluated the dose to members of the public under its radiological effluent controls program. The occupational exposure evaluation demonstrated that there was no significant increase in occupational exposure. For public exposure, there were no new exposure pathways contributing 10% or more of the total dose from all pathways. Therefore, the licensee can release the lake water back to the environment, and will not be subject to any additional disposal requirements of 10 CFR 20.2001, "General Requirements," provided that the concentration of radioactive material in the re-used lake water remains within the 10 CFR Part 30 exempt concentration limits and that the discharge of such lake water does not involve the entraining of any unaccounted for radioactive materials.

In the second scenario, a licensee disposes of radioactive material within gaseous effluents to the atmosphere in accordance with 10 CFR 20.2001(a)(3), and that radioactive material returns to the licensed facility as part of a natural process, such as rainfall, or through equipment condensation. The radioactive material is subsequently discharged through a drain line to a receiving body of water in the unrestricted area. The licensee has evaluated the radiological hazards to occupationally exposed workers and to members of the public with the same results as in the first scenario. Therefore, the subsequent discharge of this radioactive material would not be subject to additional disposal requirements, provided that the concentration of radioactive material in the discharge remains within the 10 CFR Part 30 exempt concentration limits and that the discharge of such lake water does not involve the entraining of any unaccounted for radioactive materials.

BACKFIT DISCUSSION

This RIS requires no action nor written response and is, therefore, not a backfit under 10 CFR 50.109. Consequently, the staff did not perform a backfit analysis.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because this RIS is informational and pertains to a staff position that does not represent a departure from current regulatory requirements and practice.

CONGRESSIONAL REVIEW ACT

This RIS is not a rule as designated by the Congressional Review Act (5 U.S.C. *et seq.*).

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain information collections and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*).

CONTACT

This RIS requires no specific action nor written response. If you have any questions about this summary, please contact the individual listed below or the appropriate regional office.

Robert C. Pierson, Director
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and Safeguards
Office of Nuclear Material Safety
and Safeguards

Michael J. Case, Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

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Note: NRC generic communications may be found at the NRC public website at <http://www.nrc.gov>, under Electronic Reading Room/Document Collections.

Memorandum to Steven M. Garry from Roger L. Pedersen Stacie dated xxxx xx, 2007

Subject: Forthcoming Meeting with the Nuclear Energy Institute (NEI) to Discuss a Draft
Regulatory Issues Summary Concerning the Return/Re-use of Water Containing
Previously Discharged Radioactive Effluents

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