

October 17, 2000

MEMORANDUM TO: John T. Greeves, Director
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

FROM: John A. Zwolinski, Director */RA/*
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: REQUEST FOR ASSISTANCE REGARDING THE IMPACT OF
INTERACTIVE DOSE EFFECTS ON PARTIAL SITE RELEASES

The Division of Licensing Project Management in the Office of Nuclear Reactor Regulation (NRR) requests assistance from the Division of Waste Management in the Office of Nuclear Material Safety and Safeguards (NMSS) in providing licensee and staff guidance regarding the evaluation of potential interactive or synergistic dose effects as a result of partial site releases prior to power reactor license termination. The guidance is needed in support of NRR's partial site release rulemaking currently scheduled for publishing as a Proposed Rule in May 2001. Based on preliminary discussions with NMSS on the scope of the work, it is anticipated that NMSS's Environmental and Performance Assessment Branch will provide the needed guidance for scenario development and assessment, and that the Decommissioning Projects Branch will ultimately incorporate the guidance as a revision to the NMSS Decommissioning Standard Review Plan currently being issued.

Background

On April 26, 2000, the Commission approved a rulemaking plan (SECY-00-023, ML003674188) to add a new section to 10 CFR Part 50, separate from the current decommissioning and license termination rules, that identifies a regulatory process that a licensee would use to reduce the size of its site before approval of a license termination plan (LTP) ("partial site release"). The suggested rule is narrowly focused on power reactor licensees of both operating plants and those in decommissioning who request partial releases for unrestricted use.

The intent of the current license termination rule in 10 CFR 50.82 is to ensure that the entire site, as defined in the original license, will be included in the LTP to ensure that the full area meets the requirements of 10 CFR Part 20, Subpart E, at the time the license is terminated. Because 10 CFR 50.82 applies to the decommissioning of an entire site as originally licensed, it is also necessary to ensure that any partial site releases also comply with Subpart E.

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As a result of the suggested rulemaking, licensees must:

- Demonstrate that a partial site release meets the radiological criteria of Subpart E, at Section 20.1402 for unrestricted release at the time the release is performed.
- Account for any dose from released portions of the site in determining the dose levels for the entire original site for comparison against the radiological criteria of Subpart E at the time of license termination.

During preparation of the rulemaking plan, a concern was raised that interactive or “synergistic” dose effects could occur between parts of a site as they are released before license termination, or between parts of a site previously released and the remainder of the site as it exists when the license is terminated. Currently there is no established guidance for evaluating these effects to provide assurance that combined doses would not exceed the limits of 10 CFR Part 20, Subpart E, Section 20.1402 (25 mrem/yr reduced to as low as reasonably achievable [ALARA]). In the staff requirements memorandum associated with the rulemaking plan, the Commission stated that “because the nature and scope of the proposed evaluation of ‘synergistic’ effects is unclear, the staff should, as it finalizes the rulemaking plan, more clearly define the possible role of ‘synergistic’ effects. In addition, the staff should ensure that this effort is coordinated, as necessary, with NMSS’ development of the standard review plan for license termination.”

A number of synergistic dose effect scenarios have been envisioned. An example described in the rulemaking plan considers a partial site release that results in a 15 mrem/yr dose due to direct radiation from residual radioactivity, which would likely be acceptable. However, if a subsequent partial release, or the remainder of the site as it existed at the time of license termination, resulted in a 15 mrem/yr dose due to direct radiation or due to eating crops grown on the land, the combined dose could conceivably exceed the radiological limit of 25 mrem/yr imposed by Section 20.1402. Because the two property releases would take place at different times, a method is required to provide assurance that the combined doses do not exceed the limits of Section 20.1402.

Scenarios involving the potential transport of radionuclides across proposed partial release boundaries, such as those involving groundwater pathways, need also to be considered. Preliminarily, however, it seems that such releases would not be allowed as partial site releases due to their complexity and due to the potential for adverse dose impacts to areas surrounding the proposed release.

Additionally, the Commission raised the following questions in the staff requirements memorandum associated with the rulemaking plan:

- Would the dose contribution from the released portion of the site need to be calculated (or recalculated at license termination), particularly in cases where residual radioactivity has significantly decayed, thereby reducing the potential public dose?
- What would happen in cases where subsequent owners of the released portion of the site engage in activities (licensed or unlicensed) that result in a higher dose contribution from this portion of the site--would this dose “count against” the Part 20 allowable dose limit for unrestricted use?

- Would the contribution from the groundwater pathway need to be recalculated if years have elapsed between the partial site release and license termination?

Also to be considered is that a partial site release for unrestricted use that contains residual radioactivity that is distinguishable from background may have to meet a standard lower than the radiological criteria of 10 CFR Part 20 Subpart E (25 mrem/yr and ALARA). This is because the combined dose from the partial site release and the dose from the reactor facility must meet the EPA's fuel cycle dose limit of 25 mrem/yr. This limitation does not exist when a reactor license is terminated. In addition, licensees may need to revise their demonstration of compliance with the public dose limits to include the dose, if any, from a partial site release.

Objectives

Technical assistance is requested from NMSS in order to accomplish the following objectives:

1. Identify scenarios and determine the extent to which interactive or synergistic dose effects could occur between parts of a site as they are released before license termination, and between parts of a site previously released and the remainder of the site as it exists when the license is terminated. Additionally, provide responses to the Commission's questions listed above.
2. Identify needed changes to the guidance currently provided in the NMSS Decommissioning Standard Review Plan in order to address partial site releases and provide licensees with acceptable methods for demonstrating compliance with the dose criteria of 10 CFR Part 20, Subpart E, where interactive or synergistic dose effects could occur.
3. Provide NRR with any suggested changes in licensee record keeping, historical site assessments, radiological surveys, or other related requirements as a result of identified guidance in accounting for synergistic or interactive dose effect issues. NRR will then modify the proposed rulemaking language for partial site release as appropriate to reflect the suggested changes. The currently proposed rulemaking language can be found in the Commission Paper for partial site release (SECY-00-023, ML003674188).
4. Incorporate the guidance identified in Objective #2 above into the NMSS Decommissioning Standard Review Plan. Note that it is anticipated that the additional guidance on partial site release will probably be in the form of a staff position or addendum since it may not be desirable to revise the standard review plan during the 2-year span between revision 0 and revision 1. In this case, the staff position and guidance would then be incorporated into the standard review plan at revision 1.

Requested Need Dates

Office concurrences for the Partial Site Release proposed rule package are presently scheduled to begin on January 1, 2001. The proposed rule is scheduled to be published in May 2001 and the final rule in June 2002.

NRR requests that Objectives 1 through 3 be completed by March 15, 2001 in order to incorporate them into the rulemaking concurrence package.

Incorporation of the licensee guidance on partial site release into the NMSS Decommissioning Standard Review Plan, or issuance of the staff position or addendum as described in Objective #4, above, is requested to be complete by issuance of the final partial site release rule.

Resources

NRR estimates that the resources, including supervision and management, needed to complete this request are approximately 0.4 FTE as follows:

	FTE
Objective #1:	0.1
Objective #2:	0.1
Objective #3:	0.1
Objective #4:	0.1
Total	0.4

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