

**RULEMAKING ISSUE
NOTATION VOTE**

July 18, 2013

SECY-13-0075

FOR: The Commissioners

FROM: R. W. Borchardt
Executive Director for Operations

SUBJECT: PROPOSED RULE: LOW-LEVEL RADIOACTIVE WASTE DISPOSAL
(10 CFR PART 61) (RIN 3150-AI92)

PURPOSE:

To request Commission approval to publish a proposed rule in the *Federal Register* that would amend Part 61 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Licensing Requirements for Land Disposal of Radioactive Waste."

SUMMARY:

The Commission adopted licensing requirements for the disposal of commercial low-level radioactive waste (LLRW) in land disposal facilities more than thirty years ago in 1982 (47 FR 57446). The proposed amendments would revise 10 CFR Part 61 to require LLRW disposal licensees and license applicants to conduct updated and new site-specific analyses and to permit the development of criteria for future LLRW acceptance based on the results of these analyses. These amendments would ensure that LLRW streams that are significantly different from those considered during the development of the current regulations will be disposed of safely and meet the performance objectives for land disposal of LLRW.

The proposed rule would update the existing technical analysis requirements for protection of the general population (i.e., performance assessment) to include a 10,000-year compliance period; add a new site-specific technical analysis for the protection of inadvertent intruders

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(i.e., intruder assessment) that would include a 10,000-year compliance period and a dose limit; add a new analysis for certain long-lived LLRW (i.e., performance period analysis) that would include a post-10,000 year performance period; and revise the technical analyses required at closure.

The U.S. Nuclear Regulatory Commission (NRC) would also add a new requirement to develop criteria for the acceptance of LLRW for disposal based on either the results of these technical analyses or on the existing LLRW classification requirements. This would facilitate consideration of whether a particular disposal site is suitable for future disposal of depleted uranium (DU), blended LLRW, or any other previously unanalyzed LLRW stream. Additionally, the NRC is proposing amendments to facilitate implementation and better align the requirements with current health and safety standards. This rule would affect LLRW disposal licensees and license applicants that are regulated by the NRC or the Agreement States.

BACKGROUND:

In the adjudicatory proceeding for the Louisiana Enrichment Services license application, the Commission, as part of Order CLI-05-05, dated January 18, 2005, determined that DU waste is properly classified as LLRW. Although the Commission stated that a literal reading of the current 10 CFR 61.55(a)(6) would render DU LLRW a Class A LLRW, it acknowledged that in creating the LLRW classification tables in 10 CFR 61.55, "Waste Classification," the NRC did not explicitly analyze the disposal of large quantities (greater than 629,000 megabecquerel (17 curies)) of DU LLRW that might result from commercial uranium enrichment. Because of this omission, in Order CLI-05-20, dated October 19, 2005, the Commission directed the staff, outside of the adjudication, to consider whether the potential quantities of DU LLRW generated by commercial uranium enrichment facilities warranted amending 10 CFR 61.55(a)(6) or the 10 CFR 61.55(a) LLRW classification tables.

Based on the direction in Order CLI-05-20, the staff performed a technical analysis to evaluate the impacts of near-surface disposal of large quantities of DU LLRW. The staff submitted the results of this analysis to the Commission in SECY-08-0147, "Response to Commission Order CLI-05-20 Regarding Depleted Uranium," dated October 7, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081820762). The paper presented four options that staff concluded would facilitate safe disposal of large quantities of DU LLRW.

In the staff requirements memorandum for SECY-08-0147, "Response to Commission Order CLI-05-20 Regarding Depleted Uranium," dated March 18, 2009 (ADAMS Accession No. ML090770988), the Commission approved the staff's recommendation to: a) proceed with rulemaking in 10 CFR Part 61 to specify a requirement for an updated site-specific technical analysis for the disposal of large quantities of DU and develop the technical requirements for such an analysis; and b) develop and seek public comment on a guidance document that outlines the parameters and assumptions to be used in conducting such site-specific analyses. The Commission also acknowledged that "for waste streams consisting of significant amounts of DU, there may be a need to place additional restrictions on the disposal of the DU at a specific site or deny such disposal based on unique site characteristics and those restrictions should be

determined by a site specific analysis.” The Commission did not approve altering the LLRW classification of DU as part of this limited scope rulemaking.

Subsequently, in an October 8, 2009, memorandum, “Blending of Low-Level Waste” (ADAMS Accession No. ML093070605), the Chairman directed the staff to conduct an analysis of issues associated with the large-scale blending of LLRW. This direction responded to the industry’s interest in large-scale blending of some types of Class B and Class C LLRW with similar Class A LLRW to produce a homogeneous Class A LLRW mixture. This homogeneous Class A LLRW mixture could then be disposed of at existing LLRW disposal facilities that only accept Class A LLRW, or in Class A disposal cells at facilities that accept Class A, Class B, and Class C LLRW. In SECY-10-0043, “Blending of Low-Level Radioactive Waste,” dated April 7, 2010 (ADAMS Accession No. ML090410531), the staff provided the Commission with the results of the staff’s analysis on the blending of LLRW. The staff recommended that the Commission’s position on large-scale blending be revised to be more risk-informed and performance-based. In the staff requirements memorandum for SECY-10-0043, “Blending of Low-Level Radioactive Waste,” dated October 13, 2010 (ADAMS Accession No. ML102861764), the Commission approved the staff’s recommendation and directed the staff to implement the recommendation through a combination of rulemaking and the issuance of guidance. Because the regulatory issues being addressed for large-scale blending were very similar to those in the ongoing DU rulemaking, these two regulatory efforts were combined into a single rulemaking.

On January 19, 2012, in Staff Requirements Memorandum (SRM)-COMWDM-11-0002/COMGEA-11-0002, “Revision to 10 CFR Part 61,” dated January 19, 2012 (ADAMS Accession No. ML120190360), the Commission directed the staff to expand the ongoing limited-scope revision to 10 CFR Part 61 to include the following issues: 1) allowing the licensees the flexibility to use International Commission on Radiological Protection (ICRP) dose methodologies in a site-specific performance assessment for the disposal of all radioactive LLRW; 2) developing a two-tiered approach that establishes a compliance period that covers the reasonably foreseeable future and a longer period of performance that is not for a predetermined set of years, but is established to evaluate the performance of the site over longer timeframes; 3) providing flexibility for disposal facilities to establish site-specific LLRW acceptance criteria based on the results of the site’s performance assessment and intruder assessment; and 4) adopting a compatibility category for the elements of the revised rule that ensures alignment between the States and Federal Government on safety fundamentals, while providing the States with the flexibility to determine how to implement these safety requirements. Based on the Commission’s direction, the NRC staff revised the regulatory basis document associated with this rulemaking, “Regulatory Basis for Proposed Revisions to Low-Level Waste Disposal Requirement (10 CFR Part 61)” (ADAMS Accession No. ML12356A242).

The NRC developed the current 10 CFR Part 61 based on assumptions regarding the types of LLRW likely to go into a commercial disposal facility in the late 1970s and early 1980s. These assumptions were based on a survey¹ of LLRW generators at that time. The results of this survey ultimately formed the regulatory basis for the source terms used in the analysis to define the allowable isotopic concentration limits in Tables 1 and 2 of 10 CFR 61.55, which established

¹ NRC, “Final Environmental Impact Statement on 10 CFR Part 61, ‘Licensing Requirements for Land Disposal of Radioactive Waste,’” NUREG-0945, Volumes. 1–3, November 1982, ADAMS Accession Nos. ML052590184, ML052920727, and ML052590187.

four classes of LLRW (Class A, Class B, Class C, and greater-than-Class-C) that are suitable for near-surface disposal. Currently, Table 1 provides limiting concentrations for long-lived radionuclides, and Table 2 provides limiting concentrations for short-lived radionuclides.

In addition to determining the acceptability of LLRW for disposal in a near-surface land disposal facility, the LLRW classification system is also integral to determining Federal and State responsibilities for LLRW and requirements for transfers of LLRW intended for disposal. The Low-Level Radioactive Waste Policy Act of 1980 (as amended in 1985) defines Federal and State responsibilities for the disposal of LLRW based on 10 CFR 61.55. Specifically, the Act assigns responsibility for disposal of Class A, Class B, and Class C commercial LLRW to the States and responsibility for disposal of commercial LLRW with concentrations that exceed the limits for Class C LLRW to the Federal Government. [Note: These responsibilities would not be changed as a result of the proposed rule recommended by the staff in this paper].

Low-level radioactive waste streams generated by the U.S. Department of Energy, including large quantities of DU LLRW, were not considered in the original analysis to determine the concentration limits in Tables 1 and 2 of 10 CFR 61.55. LLRW streams from commercial uranium enrichment facilities and blended LLRW, which might result in large quantities of material near the upper bounds of an LLRW class, also were not considered. Further, new technologies might result in the future generation of different LLRW streams not evaluated when the current 10 CFR Part 61 regulations were developed. Thus, if LLRW differs significantly in quantity and concentration from what was considered in the development of the current 10 CFR Part 61, then it might be possible to dispose of LLRW that meets the disposal requirements but results in an intruder dose (if calculated) that exceeds the dose limit used to develop the LLRW classification tables (i.e., 5 milliSieverts per year (mSv/yr) (500 millirem per year (mrem/yr))).

Currently, 10 CFR Part 61, Subpart C, contains performance objectives that set standards for: a) "Protection of the general population from releases of radioactivity" (10 CFR 61.41), b) "Protection of individuals from inadvertent intrusion" (10 CFR 61.42), c) "Protection of individuals during operations" (10 CFR 61.43), and d) "Stability of the disposal site after closure" (10 CFR 61.44). License applicants under 10 CFR Part 61 must prepare an assessment of potential future dose impacts to the general population to demonstrate that they will meet the 10 CFR Part 61, Subpart C, performance objectives. License applicants must also demonstrate the protection of potential inadvertent intruders into the LLRW disposal facility who might occupy the site at any time after institutional controls over the LLRW disposal facility are removed and would be unaware of the radiation hazard from the LLRW. Under the current regulations, protection of inadvertent intruders is demonstrated by compliance with the LLRW classification (10 CFR 61.55) and segregation requirements (10 CFR 61.52, "Land disposal facility operation and disposal site closure"), and by providing adequate barriers to inadvertent intrusion.

Explicit dose limits for an inadvertent intruder are currently not provided in 10 CFR Part 61 because an intruder dose assessment is not specifically required, but the LLRW classification limits for radionuclides, in Tables 1 and 2 of 10 CFR 61.55, were based on a dose of 5 mSv/yr (500 mrem/yr) to an inadvertent intruder. The final LLRW classification tables were developed assuming that only a fraction of the LLRW being disposed would approach the LLRW classification limits. Thus, the dose to an intruder exposed to a large volume of disposed LLRW at the classification limits could exceed 5 mSv/yr (500 mrem/yr). By complying with the LLRW classification and segregation requirements, a licensee can demonstrate that an inadvertent intruder will be protected if the LLRW stream proposed for disposal is sufficiently similar to that

considered in the regulatory basis for the current 10 CFR Part 61 regulations, if the underlying assumptions are not violated.

Recently, there have been proposals for disposal of large quantities of DU LLRW and blended LLRW in commercial LLRW disposal facilities. The staff anticipates that in the future, other previously unanalyzed LLRW also might be considered for disposal in a commercial LLRW disposal facility. To best address current and future LLRW streams, the staff determined that the proposed rule's required analysis should include current inventories and result in LLRW acceptance criteria to be applied to acceptance of all future LLRW shipments that would be added to current inventory, rather than attempt to address each new LLRW stream in the current rulemaking. This approach will reduce the need for future rulemakings to address any new, unanalyzed LLRW, and reflect a risk-informed, performance-based approach.

DISCUSSION:

The staff is proposing amendments to 10 CFR Part 61 to add new definitions and concepts, require LLRW disposal licensees and license applicants to conduct updated and new site-specific technical analyses, as well as develop site-specific LLRW acceptance criteria, and introduce amendments to facilitate implementation and better align the requirements with current health and safety standards. The site-specific technical analyses required by the proposed amendments would include: a) an updated analysis to demonstrate protection of the general population, called a performance assessment, which would use a defined compliance period; b) a new analysis to demonstrate protection of inadvertent intruders, called an intruder assessment, which would also use a defined compliance period; and c) new performance period analyses to evaluate how the disposal system could mitigate the risk from the disposal of long-lived LLRW after the expiration of the compliance period. The site-specific technical analyses would also need to be included with any application to amend the license for closure.

In response to the Commission's direction in SRM-COMWDM-11-0002/COMGEA-11-0002, the staff is recommending a two-tiered approach for the analysis with a "compliance period within 10,000 years" and a "performance period of 10,000 or more years." In the compliance period analysis, the licensee would demonstrate compliance with the performance objectives, and during the performance period, the licensee would demonstrate how the facility design will mitigate the long-term impacts. In the performance period analyses, the licensee would also communicate the uncertainties associated with disposing of long-lived LLRW. The performance period analyses may identify the need to limit the disposal materials in the future to ensure proper management of these uncertainties. The staff's recommended elements for this approach are the following: a) a compliance period within 10,000 years; and b) analyses for 10,000 or more years following closure of the disposal facility that demonstrates releases will be minimized to the extent reasonably achievable, as an indicator of long-term facility performance.

The staff proposes that performance period analyses be required to consider the uncertainties associated with the disposal of long-lived LLRW streams and evaluate how the disposal system could mitigate the risk from the disposal of long-lived LLRW. The performance period analyses, which would be required by proposed 10 CFR 61.13(e), would also help determine whether limitations on the disposal of some LLRW streams at certain sites might be needed to properly manage the disposal of LLRW. The performance period analyses only apply for disposal sites containing long-lived radionuclides exceeding concentrations listed in the proposed Table A of 10 CFR 61.13(e) or if necessitated by site-specific conditions. The staff is proposing

requirements that would update the terminology and specify updated requirements for a performance assessment, and add a new requirement—a site-specific intruder assessment which would include a proposed annual dose limit of 5 mSv/yr (500 mrem/yr) as specified in 10 CFR 61.13, “Technical analyses.” Once completed, the licensee would develop site-specific acceptance criteria for future shipments based on the existing LLRW classification system or on the technical analyses prepared in accordance with this proposed rule, as required by the new requirements proposed in 10 CFR 61.58, “Waste acceptance.” The staff is also proposing corresponding changes to Appendix G of 10 CFR Part 20, “Standards for Protection Against Radiation,” to be consistent with the new requirements in 10 CFR 61.58. In addition, the staff is proposing an amendment to 10 CFR 61.28, “Contents of application for closure,” to require licensees to include updated site-specific analyses in their applications to amend their licenses for closure to provide greater assurance of compliance with the performance objectives of 10 CFR Part 61, Subpart C, and to enhance the safe disposal of LLRW.

The staff will publish a draft NUREG guidance document, “Guidance for Conducting Technical Analyses for 10 CFR Part 61” (ADAMS Accession No. ML13112A282), for public comment concurrently with the publication of this proposed rule. Once issued in final form, the guidance document will supplement existing guidance on performance assessment and provide guidance on the new requirements that would be added to 10 CFR Part 61 by this rulemaking.

In addition to the *Federal Register* notice (FRN) for the proposed rule (Enclosure 1), the staff is providing the Commission with a draft regulatory analysis (Enclosure 2). If approved by the Commission, this document will be published for public comment concurrently with the proposed rule.

The Commission approved Option 2 in SECY-10-0043, “Blending of Low-Level Radioactive Waste,” dated April 7, 2010 (ADAMS Accession No. ML090410246), in which the staff proposed that “...disposal of blended ion exchange resins from a central processing facility would be compared to direct disposal of the resins, onsite storage of certain wastes when disposal is not possible and further volume reduction of the Class B and Class C concentration resins.” The staff addressed this comparison of alternatives in the form of a comparative environmental evaluation of the specified ion exchange resin LLRW handling options. A draft report on this comparative evaluation was completed in September 2012 and was made available for public comment in a separate FRN (77 FR 58416) because the analysis is not related to the 10 CFR Part 61 rulemaking action as currently proposed by the staff. The public comment period on the draft report ended on January 18, 2013, and the staff is currently in the process of responding to the 60 comments received and preparing the final report.

Finally, in SRM-SECY-10-0043, the Commission stated, “The staff should not include waste at Greater-Than-Class C (GTCC) concentrations in the scope of this rulemaking; GTCC waste is a Federal responsibility and these volumes should not be made into a State responsibility, even if the waste has been blended into a lower classification.” Consistent with 10 CFR Part 20, Appendix G, Section I.C.12, LLRW is not required to be classified until it is shipped for disposal (i.e., consigned to a LLRW disposal facility). Low-level radioactive waste classified as GTCC LLRW cannot be disposed of in a facility licensed to receive only Class A, Class B, or Class C LLRW, unless specifically authorized by the regulatory authority. For these reasons, the staff has not specified new requirements for disposal of GTCC LLRW within the scope of this rulemaking. In addition, the staff believes the amount of blendable LLRW at GTCC concentrations to be small in any case. Licensees avoid producing ion exchange resins (the

principal blendable LLRW stream that could reach GTCC levels) at these concentrations because of the difficulty of disposing of them.

CUMULATIVE EFFECTS OF REGULATION:

In developing this proposed rule, the NRC has had considerable public interactions, including licensees, disposal site operators, Agreement States, and the Advisory Committee on Reactor Safeguards (ACRS), as part of the implementation of the cumulative effects of regulation process enhancements and as directed by the Commission in SRM-SECY-11-0032, "Consideration of the Cumulative Effects of Regulation in the Rulemaking Process" (ADAMS Accession No. ML112840466). These public interactions and feedback on the 10 CFR Part 61 preliminary proposed rule documents, including feedback from the ACRS and the Agreement States, are summarized in "Summary of Public and Advisory Committee on Reactor Safeguards (ACRS) Interactions and Comments Received in Response to Preliminary Documents for Low-Level Radioactive Waste Disposal (10 CFR Part 61) Rulemaking" (Enclosure 3).

Additionally, in the FRN for the proposed rule, the staff has included a request for specific comments on the cost estimates provided in the Regulatory Analysis, and any potential unintended consequences of the proposed rule. The staff is also publishing draft guidance for public comments along with the proposed rule. The staff plans to conduct at least one public meeting on the proposed rule during the comment period.

PUBLIC INTERACTIONS:

On May 3, 2011, the staff published preliminary proposed rule language and an associated regulatory basis document on <http://www.regulations.gov>, under Docket ID NRC-2011-0012, for public comment (76 FR 24831). The staff also conducted a public meeting on May 18, 2011, to discuss the preliminary proposed rule language and the associated regulatory basis document. Based on additional direction from the Commission in SRM-COMWDM-11-0002/ COMGEA-11-0002 (ADAMS accession number ML120190360), the staff conducted three public meetings to solicit the public's input for the development of the regulatory basis, revised the regulatory basis document associated with this rulemaking, and developed a second version of the preliminary rule language. On December 7, 2012, the staff published the revised preliminary rule language on <http://www.regulations.gov>, under Docket ID NRC-2011-0012, for public comment (77 FR 72997). The staff also met with the ACRS several times in 2012 and 2013. Public interactions and feedback on the 10 CFR Part 61 preliminary proposed rule documents, including feedback from the ACRS, are summarized in "Summary of Public and Advisory Committee on Reactor Safeguards (ACRS) Interactions and Comments Received in Response to Preliminary Documents for Low-Level Radioactive Waste Disposal (10 CFR Part 61) Rulemaking" (Enclosure 3).

AGREEMENT STATE COMMENTS:

On September 28, 2011, the staff provided a pre-decisional copy of the draft proposed rule and draft implementation guidance document to the Agreement States for review and comment. The NRC received comment letters from the Organization of the Agreement States, the Conference of Radiation Control Program Directors, and the State of Utah Division of Radiation Control. On March 13, 2013, after receiving additional Commission direction in the January 2012 SRM, the staff provided a revised pre-decisional copy of the draft proposed rule and draft

implementation guidance document to the Agreement States for review and comment. The Agreement State comments are summarized in "Summary of Public and Advisory Committee on Reactor Safeguards (ACRS) Interactions and Comments Received in Response to Preliminary Documents for Low-Level Radioactive Waste Disposal (10 CFR Part 61) Rulemaking" (Enclosure 3).

AGREEMENT STATE COMPATIBILITY:

The NRC staff has analyzed the proposed rule in accordance with the procedures established in Part III of the Handbook to Management Directive 5.9, "Categorization Process for NRC Program Elements." The staff is proposing Agreement State compatibility designations for the newly proposed sections of 10 CFR Part 61 and is proposing to modify the designations for a number of existing sections. The proposed Agreement State compatibility designations are discussed in detail in Section VI of the enclosed FRN for the proposed rule. The Standing Committee on Compatibility reviewed the proposed rule and agreed that these amendments to the NRC regulations are a matter of compatibility between the NRC and the Agreement States. The Committee agreed with the staff's proposed compatibility designations.

One particular compatibility designation proposed by the staff that is directly related to the Commission direction outlined in SRM-COMWDM-11-0002/COMGEA-11-0002 is for the development of LLRW acceptance criteria in 10 CFR 61.58. The staff recommends that 10 CFR 61.58 be designated as Compatibility Category C. As a Compatibility Category C designation, the Agreement State would have to adopt all the essential objectives of the section but could also impose more stringent requirements. The staff notes that, if the Commission approves the staff's recommendation with 10 CFR 61.58 designated as Compatibility Category C, the Commission direction outlined in SRM-COMWDM-11-0002/COMGEA-11-0002 would allow licensees the flexibility to base LLRW acceptance criteria on the technical analyses developed for 10 CFR 61.13 or on the classification tables. The expectation is that the Agreement States would preserve the flexibility in implementing this provision, however States are allowed to develop the language in their compatible regulations which may include decreased flexibility.

COMMITMENTS:

This action includes no new commitments other than routine rule-related actions.

RECOMMENDATIONS:

The staff recommends that the Commission take the following actions:

Approve: for publication, in the *Federal Register*, the proposed amendments to 10 CFR Part 61 (Enclosure 1).

Note:

- a. That the public will be provided 75 days to comment on the proposed amendments.

- b. That the Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification and the reasons for it, as required by the Regulatory Flexibility Act, 5 U.S.C. § 605(b).
- c. That, as noted, a draft environmental assessment resulting in a draft finding of no significant impact is included in the FRN for the proposed rule, and a separate draft regulatory analysis has been prepared for this rulemaking (Enclosure 2).
- d. That appropriate Congressional committees will be informed of this action.
- e. That the Office of Public Affairs will issue a press release when the proposed rulemaking is filed with the Office of the Federal Register.
- f. The resources needed to complete the rulemaking are included in non-public Enclosure 4.

An Office of Management and Budget (OMB) Paperwork Reduction Act review is required and a clearance package will be forwarded to OMB no later than the date on which the proposed rule is submitted to the Office of the Federal Register for publication.

/RA M. Weber for/

R. W. Borchardt
Executive Director
for Operations

Enclosures:

- 1. *Federal Register* notice
- 2. Draft Regulatory Analysis
- 3. Summary of Stakeholder Feedback
- 4. Resources for 10 CFR Part 61 Rulemaking

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R. W. Borchardt
 Executive Director
 for Operations

Enclosures:

- 1. *Federal Register* notice
- 2. Draft Regulatory Analysis
- 3. Summary of Stakeholder Feedback
- 4. Resources for 10 CFR Part 61 Rulemaking

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