

August 17, 2026

Jody C. Martin
Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemakings and Adjudications Staff

Subject: American Nuclear Society Comments on Proposed Rule, “Integrated Low-Level Radioactive Waste Disposal” [Docket ID NRC-2011-0012]

Reference: Integrated Low-Level Radioactive Waste Disposal Proposed Rule, Federal Register Vol. 91, No. 125, July 1, 2026, pp. 40290 – 40348.

Dear Mr. Martin:

The American Nuclear Society (ANS) represents the nuclear professional community – serving as the premier nonprofit organization for those who embrace nuclear science and technology for their vital contributions to improving people’s lives and preserving the planet. ANS serves as the forum for scientific exchange across America’s nuclear sector – fostering technical collaboration, hosting scientific meetings, and publishing peer-reviewed research to guide the development of nuclear technologies, from energy, medicine, and healthcare to agriculture, industry, and space exploration. ANS remains committed to advancing, fostering, and promoting the development and application of nuclear sciences and technologies to benefit society.

On behalf of our more than 12,000 members, ANS is pleased to provide comments as requested by the U.S. Nuclear Regulatory Commission (NRC) in 91 Fed. Reg. 40290 on the Proposed Rule, “Integrated Low-Level Radioactive Waste (LLRW) Disposal.” We appreciate the NRC staff’s efforts in developing this proposed rule that will hopefully lead to improved framework for the disposal of the many types of radioactive wastes that are or will be generated from a wide variety of industrial activities.

The origins of this proposed rule date back to the Commission’s October 19, 2005, decision in the Louisiana Energy Services adjudication, CLI-05-20. In that decision, the Commission directed the NRC staff, “...outside of the Louisiana Energy Services adjudication, to consider whether the quantities of depleted uranium (DU) at issue in the waste stream from uranium enrichment facilities warrant amending section 61.55(a)(6) or the section 61.55(a) waste classification tables.” Since then, the NRC has pursued revisions to 10 CFR

Part 61, but those efforts have not resulted in a final rule. ANS commends the NRC for returning to this important rulemaking and encourages the Commission to maintain a sustained effort to bring the modernization of Part 61 to completion.

Modernization of 10 CFR Part 61 is long overdue. The current framework should make greater use of risk-informed and performance-based approaches and should be updated to address important issues such as the disposal of depleted uranium, Greater-Than-Class-C (GTCC) waste, and waste incidental to reprocessing. These issues have evolved considerably since Part 61 was originally developed, and the regulatory framework should evolve accordingly.

The need for a modernized framework is particularly pressing as the United States anticipates the deployment of new nuclear facilities and technologies over the coming decades. The expected growth in nuclear energy – including new reactors and other nuclear facilities – will create new and potentially different radioactive waste streams and present new challenges for waste management. In addition, initiatives such as the Department of Energy’s Nuclear Lifecycle Innovation Campuses could have significant implications for the back end of the nuclear fuel cycle and the management of radioactive materials and waste.

However, the need to modernize Part 61 does not depend on the success or timing of these future developments. The existing regulatory framework has remained largely unchanged while the nuclear industry, waste streams, technologies, and approaches to risk-informed regulation have evolved. Modernizing Part 61 is therefore necessary regardless of how quickly new nuclear facilities and fuel-cycle initiatives advance.

The Requirement for a Safety Case

For certain facilities, including those involving the disposal of GTCC waste, the NRC proposes to require under 10 CFR 61.10(c) that a license application include a Safety Case that:

demonstrates that the land disposal facility will be constructed and operated safely, provides a summary of the safety basis that the disposal site will meet the performance objectives in subpart C of this part, and describes the defense-in-depth protections that enhance the resiliency of the facility in complying with the performance objectives specified at §§ 61.41 and 61.43.

ANS supports this requirement. The concept of a Safety Case is well established internationally and has become an important element of radioactive waste disposal safety

frameworks. The International Atomic Energy Agency (IAEA) defines a Safety Case as “a collection of arguments and evidence in support of the safety of a facility or activity.”¹ Formal documentation of a Safety Case is particularly valuable for facilities subject to complex regulatory requirements and specialized performance analyses, as would be the case under the proposed Part 61 framework. A well-developed Safety Case can provide an integrated explanation of the facility’s safety basis, including the relationship among the performance assessment, waste acceptance criteria, engineered and natural barriers, and defense-in-depth measures.

A clearly documented Safety Case could also significantly enhance public participation in the licensing and oversight of LLRW disposal facilities. ANS believes that meaningful public participation is an important component of the long-term acceptance of such facilities by host communities and surrounding regions.

ANS recognizes the counterargument that providing information addressing the specific requirements of 10 CFR 61.10(a) and (b) may be sufficient to support an application. However, addressing individual requirements on a disconnected basis does not necessarily provide an integrated evaluation of facility safety or demonstrate how the various elements of the safety case work together to provide defense-in-depth. This integrated perspective is particularly important when evaluating facilities using performance analyses that necessarily incorporate significant uncertainty over long time periods.

Regulatory Authority for Greater-Than-Class-C Waste

Additionally, the proposed framework for GTCC disposal would benefit from clearly defined roles for the states in which such facilities are located. ANS believes that the NRC should remain the sole licensing authority for GTCC disposal facilities to ensure a consistent federal regulatory framework. However, states hosting GTCC disposal facilities should have a clearly defined role in appropriate aspects of facility regulation and oversight, including licensing participation, operational oversight, facility closure, and long-term monitoring. Clearly defining these roles would provide host states with meaningful opportunities to participate in decisions affecting their communities while maintaining the NRC’s responsibility for licensing and ensuring nationally consistent safety standards.

Long-term Regulation Expectations

The objective of regulations such as 10 CFR Part 61 is to provide reasonable assurance of adequate protection of public health and safety. Achieving that objective for facilities that must maintain safety functions over long periods presents unique challenges. These

¹ IAEA Nuclear Safety and Security Glossary – Terminology Used in Nuclear Safety, Nuclear Security, Radiation Protection and Emergency Preparedness and Response, 2022 (Interim) Edition.

challenges can be addressed, but the regulatory framework should remain realistic about what can – and cannot – be demonstrated or assured many years into the future.

The proposed language concerning inadvertent intrusion illustrates this issue. For example, 10 CFR 61.13(b) states “An inadvertent intruder assessment demonstrates protection of an inadvertent intruder for the duration of the compliance period. An inadvertent intruder assessment demonstrates that any inadvertent intruder will not receive a dose that exceeds the limits in the performance objective set forth in § 61.42 (a) for the duration of the compliance period. The term “demonstrates” coupled with “will not” conveys a high degree of certainty that is not appropriate in this instance. An inadvertent intruder assessment necessarily relies on stylized scenarios and assumptions about future human activities, site conditions, and the performance of engineered barriers. Those assumptions are appropriate and necessary for purposes of regulatory analysis, because the applicant cannot fully capture the range of conditions that may exist over such extended periods. The regulatory language should acknowledge this inherent uncertainty rather than imply a level of predictive certainty that cannot reasonably be achieved.

ANS therefore recommends that the NRC consider language in 10 CFR 61.13(b) such as: “An inadvertent intruder assessment projects doses to an inadvertent intruder during the compliance period, consistent with certain assumptions, for comparison with the regulatory limits established for such analyses.”

There is no need to include a statement in 10 CFR 61.13(b) about the value of the regulatory limits. Those values are addressed in 10 CFR 61.42 (a), which states “the inadvertent intruder assessment must demonstrate that an inadvertent intruder will not disrupt or contact emplaced waste during any part of the compliance period in which the waste remains a radiological hazard. The inadvertent intruder assessment must also demonstrate that the annual dose to any inadvertent intruder within the compliance period from any onsite releases ... will not exceed 5 milliSieverts (500 millirems).

Again in 10 CFR 61.42(a), the combination of “demonstrate” and “will not” implies a certainty that cannot exist. Accordingly, ANS recommends that the NRC consider language for 10 CFR 61.42(a) such as: “the inadvertent intruder assessment must demonstrate a low likelihood that an inadvertent intruder will disrupt or contact emplaced waste during any part of the compliance period in which the waste remains a radiological hazard. The results of the inadvertent intruder assessment within the compliance period from any onsite releases ... will not exceed 5 milliSieverts (500 millirems).”

The issue is not whether the NRC should establish performance objectives or require rigorous analyses of long-term performance. It should. Rather, the regulatory language should accurately characterize what those analyses can establish and avoid conveying a level of certainty that is inconsistent with the inherent uncertainties associated with predicting conditions over very long time periods. Clear and appropriately calibrated

language would strengthen, rather than weaken, public confidence in the regulatory framework.

Clarification of EPA's Role in the Regulation of Transuranic Waste

The proposed rule also raises important questions regarding the relationship between NRC and EPA regulatory authorities over certain radioactive waste streams. Because EPA currently has regulatory authority over transuranic (TRU) waste disposal under 40 CFR Part 191, and specifically establishes requirements applicable to the Waste Isolation Pilot Plant (WIPP) under 40 CFR Part 194, the NRC should clarify how the proposed classification of certain TRU waste as low-level radioactive waste would affect EPA's existing regulatory role.

A clear delineation of federal regulatory responsibilities will be particularly important if materials currently subject to EPA requirements could be classified as LLW under the proposed framework. The NRC should explain how such a classification would interact with EPA's authorities and requirements, including whether and to what extent EPA requirements would continue to apply.

ANS recommends that the NRC coordinate with EPA and obtain EPA concurrence on this clarification before finalizing the rule. Coordination between the agencies would help ensure that the final framework does not create overlapping, inconsistent, or ambiguous regulatory requirements and would provide licensees and stakeholders with a clear understanding of the applicable regulatory authorities.

A Performance-Based Approach to Disposal Depth

ANS also recommends that the NRC reconsider the proposed mandatory five-meter burial depth requirement for GTCC and waste streams with significant long-lived radionuclides. A fixed burial depth may provide a straightforward regulatory criterion, but it may not be appropriate for every disposal site or waste stream under a modern, risk-informed and performance-based Part 61 framework.

Instead, burial depth should be determined based on the characteristics and demonstrated performance of the disposal facility. Relevant factors should include site-specific performance assessments, geology and hydrology, engineered barriers, and waste characteristics. These factors collectively provide a more technically meaningful basis for determining whether a disposal configuration will meet applicable performance objectives than a uniform minimum burial depth.

ANS therefore recommends replacing the fixed five-meter requirement with a performance-based standard that allows applicants to demonstrate compliance through appropriate technical analyses. This approach would provide greater flexibility to account

for site-specific conditions while maintaining the NRC's performance objectives and standards for protection of public health and safety.

In closing, ANS supports the NRC's proposed modernization of 10 CFR Part 61 as an important step toward a more risk-informed, performance-based framework for the disposal of radioactive waste. ANS encourages the NRC to carefully consider and address stakeholder comments, retain the Safety Case in the final rule, modify language to avoid overselling the certainty associated with long-term performance analyses, and provide more thorough, plain English explanations and bases for the provisions in the rule. If you have questions, please contact ANS Director of Public Policy, John Starkey: jstarkey@ans.org.