SUNI Review Complete
Template=ADM-013
E-RIDS=ADM-03

ADD: Pamela Noto, Mary Neely
Comment (2)
Publication Date: 4/16/2021
Citation: 86 FR 20208

June 15, 2021

Ms. Pamela Noto
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

via email: Pamela.Noto@nrc.gov

RE: Docket ID NRC-2017-0091

Dear Ms. Noto:

Deep Isolation appreciates the opportunity to provide comments on the draft appendices to NUREG/BR-0058, Revision 5, *"Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission."* Deep Isolation is a leading innovator in spent nuclear fuel and high-level waste storage and disposal solutions. Deep Isolation has developed a patented solution using directional drilling and inclusive community engagement to safely isolate waste deep underground.

We have focused our comments, enclosed, on *Appendix G: Regulatory Analysis Methods and Data for Nuclear Facilities other than Power Reactors.* Specifically, we believe that the NRC should consider updating or replacing 10 CFR Part 60, *Disposal of High-Level Radioactive Wastes in Geologic Repositories.* It is widely accepted that this regulation is outdated and needs to reflect the same total system performance objective methodology that was adopted in 10 CFR Part 63, *Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada.* Over the past several years, we have seen significant technology-driven advancement in performance objectives – including radiological risk and performance assessment models – to safely manage backend fuel cycle waste streams. Accordingly, regulators have adapted rules to reflect these new standards in all disposal scenarios, except that of high-level radioactive waste and spent nuclear fuel. To provide a more consistent and effective regulatory framework, Deep Isolation strongly encourages the Commission to update 10 CFR Part 60 to more uniformly apply a risk-informed, performance-based approach to the governance of nuclear facilities.

Please do not hesitate to contact me at (214) 681-7176 or rod@deepisolation.com if I can answer any questions or be of assistance.

Sincerely,

Rod Baltzer
Chief Operating Officer

Enclosure

2001 Addison Street, Suite 300 Berkeley, CA 94704
Office +1 415 915 6505 | Fax +1 510 277 9070

COMMENTS ON NUREG DRAFT DOCUMENT:

APPENDIX G REGULATORY ANALYSIS METHODS AND DATA FOR NUCLEAR FACILITIES OTHER THAN POWER REACTORS

1. Section G.1, page G- 1: The opening paragraph identifies the document and discusses regulatory analysis methods/approaches for HLW repositories, while the last paragraph identifies the disposal of SNF. These two descriptions are incomplete, as SNF and HLW are two different "waste" types per DOE policy and as addressed in the Nuclear Waste Policy Act. The document should identify both with regard to disposal in a repository.
2. Section G.2, page G-3: Same comment as above.
3. Section G.2.7, beginning on page G-14: As stated above, HLW and SNF are two distinct waste types that are required by law and regulations to be disposed of in a mined geologic repository – or as an alternative or supplement, a deep borehole repository. This section is devoted strictly to SNF disposal. Both HLW and SNF will go through similar activities – transportation, loading/unloading of canisters, handling, emplacement, etc. – as described in this section. While commercial SNF will be ultimately shipped from numerous locations across the country (decommissioned power plants, ISFSIs, and centralized interim storage site(s)), HLW, which is owned by the US Department of Energy, will be shipped from four sites – Hanford Site, Idaho National Laboratory, Savannah River Site, and West Valley Demonstration Project – along with just over 2,000 MTHM of DOE-owned SNF. To be complete, perhaps the opening paragraph could acknowledge that disposal of both HLW and SNF is to be done in one or more repositories, and for the purposes of this document:
    a. only SNF is analyzed in detail, and
    b. only a mined geologic repository is considered in this analysis
4. Section G.2.7: This section includes a statement that "the development time for a repository is long (on the order of 100 years or more)". On page G-20, a sentence reads "The EIS specifies an operating period of 105 years, beginning with construction and ending with the permanent closure of the repository…". These two statements are not entirely congruent. More importantly, and notwithstanding experiences to date, the development time for a repository need not be on the order of 100 years. Whether re-invigorating Yucca Mountain, or starting anew, a mined repository development time could be substantially shorter than a century. This is, in-part, dependent upon gaining more social and political support in a consent-based siting model and this applies to borehole repositories also. In a scenario of increased social and political acceptability, boreholes can be developed much more rapidly than 100 years, given the more limited capacity of an individual borehole and the implementation methods that would be employed.
5. Section G.2.7: Transporting the SNF from individual sites to a repository may not be required if a borehole facility is co-located with a nuclear power plant. This option shouldn't be foreclosed in the NUREG. Transportation may be needed for boreholes not co-located with sites where waste is generated or processed, so this aspect should be listed as a possible risk depending on the locations of the repository and the SNF.
6. Table G-1, page G-15: The borehole canisters will be smaller, so there will be additional handling compared to a mined repository. An evaluation of the dose limits for a disposal canister other than a TAD should be developed or a general methodology provided to enable alternative disposal repository methods, such as boreholes. The 500 mrem annual limit as noted in the first

paragraph under Table G-1 is a reasonable statement on dose that can provide for different canisters and dose rates per canister.

7. Table G-2, page G-16: Since this NUREG includes Part 60, the table shouldn't be specific to Yucca Mountain; rather, it should include more general data about dose impacts.
8. G2.7.2, page G-19: Regarding drifts, we should note that an individual borehole is similar to a drift in that a repository of 100 boreholes may be licensed and designed, but emplacement and closure of the first boreholes may be completed prior to the construction of the final boreholes. The post-closure period may end for the first boreholes while the final boreholes are still in the pre-closure period. Flexibility for boreholes and drifts should be included in this section.
9. Section G.2.7.2, beginning on page G-20: Exposure to on-site workers and off-site individuals to natural sources of radiation (e.g., radon) during the pre-closure period for a deep borehole repository will be essentially zero, given how the borehole is drilled and made available for emplacement of waste. In particular, there will be no workers underground for construction and operation of a deep borehole repository – hence, no exposure to these natural sources of radiation. From a radiological safety perspective, this is a clear benefit of deep boreholes over mined geologic repositories. The importance of this point is punctuated by a statement on page G-34, where it is noted that public exposure to radon is 1,000 times greater than the dose from the SNF.
10. Table G-8, page G-25: This table is specific to a mined repository. It would be helpful for this guidance to provide for other disposal approaches that may not have workers underground or take a shorter amount of time to implement, fill and close.
11. Table G-3, page G-25: Same comment as above.
12. Section G.2.7.2, beginning on page G-27: The radiation dose to (involved and non-involved) subsurface workers in the case of a deep borehole repository would be essentially zero, which is another benefit of a borehole repository compared to a mined geologic repository.
13. *Exposure to Radioactive Waste from Operational Accidents*, page G-31: A borehole disposal canister will hold less than a TAD, so the magnitude of impact of an individual canister accident will be less. We will handle more canisters, so the probability of an accident may be higher. It is unclear if a borehole canister will get the same result or not as a TAD, but flexibility in this analysis should be allowed.
14. Section G.2.7.3, beginning on page G-33: The statement is made that a release from a repository in the distant future "is expected." To be consistent with total system performance assessments completed to date for the candidate repository site at Yucca Mountain, as well as modeling done on a deep horizontal borehole, a more accurate statement would be that a release from a repository in the distant future "could occur, but is highly unlikely or will have inconsequential health impacts".