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General Comment

See attached file(s)

Attachments

NRC VLLW 022218 comments

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Comments for NRC-2018-0026 Very Low-Level Radioactive Waste Scoping Study

The following comments are being provided for the NRC request for information regarding Very Low Level Radioactive Waste. Comments are provided by Glen Vickers, Exelon Generation.

1. The United States does not have a formal regulatory definition of VLLW. What should the NRC consider in developing its own regulatory definition for VLLW? Is there another definition of VLLW that should be considered? Provide a basis for your response.

Response

A definition for VLLW may be created, but care should be taken to not interrupt current disposal practices for this low-concentration radioactive waste stream. This material is largely defined by the radioactive concentration levels permitted for alternate disposal by 10CFR20.2002 and accepted by state EPA regulators for RCRA Subtitle C and/or D facilities. The permissible concentration levels can vary from approximately 50 pCi/g of Co-60 to 4.7E7 pCi/g of Co-60 (10% of the Class A limit) depending on how the facility is regulated. A VLLW definition needs to be tolerant of the wide range of permissible concentrations and underlying causes for those differences.

The most common limit used today by 10CFR61 and EPA facilities is the dose to the public (e.g. <5 mrem/yr). EPRI has also proposed fixed concentration limits for a generic evaluation for <5 mrem/yr for the maximally exposed facility worker, transportation worker, and member of the public. A single dose limit to the public would provide common ground for all facilities recognizing secondary variables related to dose limits for site workers and the period for institutional control after closure may cause the final permissible concentration to vary.

2. The existing regulatory framework within 10 CFR 61.55 divides low-level radioactive waste into four categories: Class A, Class B, Class C, and Greater Than Class C. Should the NRC revise the waste classification system to establish a new category for VLLW? What criteria should NRC consider in establishing the boundary between Class A and VLLW categories?

Response

The creation of a single concentration limit similar to 10CFR61 may not be practical due to the currently varied concentration limits at different facilities. The NRC should review the similarities and differences in 10CFR61 and 10CFR20.2002 regulations to determine whether the controls should remain in 10CFR20.2002 or be moved to 10CFR61. The definition of VLLW may be placed in one or both regulations. A limit for dose to the public may be the best path for success as this could be common to all facilities.

The major driver in the significant variance of permissible concentration levels is how the facility is regulated. An EPA RCRA facility and 10CFR61 facility may have the same dose limits for the public, but the workers at the 10CFR61 site are considered occupational radiation workers and work to the occupational dose limits in 10CFR20, but the EPA workers are considered members of the public. The permissible concentrations at an EPA only site must be much less to maintain worker exposures to an EPA goal of <5 mrem/yr, but a RCRA facility within the bounds of a 10CFR61 would have workers working under a radiological license and following the occupational dose limits (<5000 mrem/yr).

Another significant variable affecting permissible concentrations is the period for institutional control after closure. A 10CFR61 site must maintain institutional control for 100 years after closure and a RCRA site only 30 yrs. This period would be approximately 6 half-lives for Co-60 (1/64) at an EPA site and approximately 20 half-lives (1/1,000,000) at a RCRA facility within a 10CFR61 facility. Approximately 16,000 times more Co-60 could be disposed at the 10CFR61 site and achieve the same dose to the public after the termination of institutional controls. Once again, both facilities have the same dose limit to the public, but the period for institutional control can have a significant effect on the permissible concentrations for disposal. Perhaps the NRC can keep the fixed dose limit and permit a variable range for institutional controls and the concentration limits would vary accordingly.

This response demonstrates two significant variables noted in current processes and the NRC needs to review these and other differences in how the material is currently treated at different facilities before determining how to define and set limits for this low-concentration radioactive waste stream. This will also determine whether VLLW belongs in 10CFR61 or 10CFR20.2002. The NRC will determine if it is too complicated to revise 10CFR61 to include this new waste class or to simply enhance the existing 10CFR20.2002 regulation.

EPRI has proposed fixed concentration limits for a generic evaluation for <5 mrem/yr for the maximally exposed facility worker, transportation worker, and member of the public. While this could be an approved generic evaluation, it should not restrict current processes. A site may be able to use the generic provisions rather than spend significant time and resources putting together a 10CFR20.2002 environmental transport study for alternate disposal approval. Perhaps licensees need only use the detailed review process in 10CFR20.2002 for those situations not bounded by the EPRI generic evaluation.

The most common limit used today by 10CFR61 and EPA facilities is the dose to the public (e.g. <5 mrem/yr). Using a singular dose limit could provide common ground for all facilities recognizing secondary variables related to dose limits for site workers and the period for institutional control after closure may cause the final permissible concentration to vary.

3. The NRC's alternative disposal request guidance entitled, "Review, Approval, and Documentation of Low-Activity Waste Disposals in Accordance with 10 CFR 20.2002 and 10 CFR40.13(a)," which is undergoing a revision, allows for alternative disposal methods that are different from those already defined in the regulations and is most often used for burial of waste in hazardous or solid waste landfills permitted under the Resource Conservation and Recovery Act (RCRA). Should the NRC expand the existing guidance to include VLLW disposal or consider the development of a new guidance for VLLW disposal? Why or why not?

Response

The NRC may find it more practical to use the current model in 10CFR20.2002 instead of attempting to add the VLLW concept to 10CFR61. This process is currently used to transfer the disposal of low-level material from a 10CFR61 disposal facility to an EPA RCRA Subtitle C or D facility.

While a revision to 10CFR61 to add VLLW could largely replace the alternative disposal request process of 10CFR20.2002, it should not replace that process entirely. Operating nuclear power facilities may have soils with low levels of radioactivity from effluent recapture or other processes. These materials within the owner controlled area restrict public access and should be able to remain on site until final resolution during site decommissioning. These cases would require an application for alternate disposal under 10CFR20.2002.

The generic evaluation proposed by EPRI for concentrations not exceeding the current EPA dose targets of <5 mrem/yr could significantly reduce cost and duration for application and approval for the licensee and regulator. If a material were not bounded by the generic concentration limits in the EPRI VLLW document, then the licensee could prepare a traditional 10CFR20.2002 evaluation.

It should also be noted that this material currently may be sent to a radioactive waste processor or 10CFR61 disposal facility where it is screened and then disposed of as Class A waste or forwarded to a RCRA waste facility. The screening determines the waste meets the concentration limits of the proposed RCRA facility. This current practice provides for assessment by an independent party and works well for licensees and disposal site operators. Licensees would comply with the waste acceptance criteria of the 10CFR61 facility and that facility would perform the assessment for final 10CFR61 or EPA disposal. Any NRC actions should not impede this current practice.

Guidance for licensees in preparing a 10CFR20.2002 application could be improved. There is a recent publication for review criteria for NRC regulators to look at portions of different regulatory references, but there is no singular document providing an approved methodology for licensees. A clear approved methodology would help the licensee and ultimately the approving regulator assess cost and duration for the application and approval.

Enhancement of the 10CFR20.2002 process with use of the EPRI concentration limits or 10CFR20.2002 application may result in improvements in the current process with the least number of adverse impacts. Additional investigation of the similarities and differences for regulating VLLW under 10CFR61 or 10CFR20.2002 are needed to be able to make the most correct decision.

4. If the NRC were to create a new waste category for VLLW in 10 CFR part 61, what potential compatibility issues related to the approval of VLLW disposal by NRC Agreement States need to be considered and addressed? How might defining VLLW affect NRC Agreement State regulatory programs in terms of additional responsibilities or resources?

Response

Regulation 10CFR61 is compatibility category B and 10CFR20.2002 is category D. There is very clear guidance and no variance of limits under 10CFR61 by state regulators. There is less clear guidance and resulting varied acceptance criteria under 10CFR20.2002 by different state regulators. Perhaps more clear regulatory guidance and application of compatibility category B might provide for a more consistent path for success for both licensees and regulators under 10CFR20.2002.

5. Following the Low-Level Radioactive Waste Policy Amendments Act of 1985, states formed regional compacts for the disposal of low-level radioactive waste. If the NRC were to create a new waste category for VLLW, does it fall within regional compact authority to control VLLW management and disposal? How might defining VLLW affect regional compacts in terms of additional responsibilities or resources?

Response

If materials are governed under 10CFR61, then the current compact requirements would apply. Currently, if materials qualify for an EPA site whether screened by a waste processor or approved for alternate disposal by 10CFR20.2002 then material may be disposed at an EPA facility in a state that is not within the compact of the generator.

6. Environmental Protection Agency imposed waste analysis requirements for facilities that generate, treat, store, and dispose of hazardous wastes are defined in 40 CFR parts 264 through 270. How would NRC incorporate and apply waste analysis requirements for VLLW at RCRA Subtitle C and D facilities? Should the NRC impose concentration limits and/or treatment standards for VLLW disposal?

Response

There are already significant volumes of low-level radioactive waste going to RCRA Subtitle C and D facilities under the provisions of 10CFR20.2002. Radioactive waste is not a hazardous waste and some facilities may dispose at a Subtitle C hazardous waste facility and some may dispose at a Subtitle D non-hazardous waste facility. Outside of complying with concentration limits provided by the disposal facility, there should be no additional hurdles.

No treatment standard is required as radioactive waste is not considered a hazardous waste. A disposal facility would need to provide concentration limits for customers to use whether the NRC provided dose or concentration-based limits. Such a facility should have a formal Waste Acceptance Guide for shipment requests, acceptable material forms, radioactive concentration limits, and approval processes. Licensees already comply with a system of limits and waste acceptance criteria compliance under 10CFR61.

7. Are there any unintended consequences associated with developing a VLLW waste category?

Response

The NRC can draw upon the previous experiences of RCRA facilities under 10CFR20.2002. Receiving sites should have equivalent formal waste acceptance criteria as 10CFR61 facilities for material forms, quantities, approvals, etc to ensure materials are properly bounded within the controls for that facility. The NRC should ensure future regulation does not prohibit any of the currently approved processes in use today.

Based upon the radiation exposure limits for workers under a radiological license versus members of the public under the EPA, it may be advantageous for existing 10CFR61 sites to create VLLW cell or others to create VLLW-only facilities since the dose limits and institutional control period at a RCRA facility are a limiting value. The dose limits to the public are the same, but the dose limits for workers at the facility working closely with the waste would be vastly different permitting different concentration limits. Conversely, it may be advantageous for an EPA site to seek a radiological license so their workers would then be considered occupational radiation workers and increase permissible concentration limits for a specific facility.

8. What analytical methods/tools should be used to assess the risk of disposing of VLLW at licensed LLW disposal facilities or RCRA Subtitle C and D facilities? (i.e., generic or site specific)

Response

There are already mature methods for performing these types of environmental transport assessments (e.g. RESRAD) which have been used numerous times under 10CFR20.2002 and for current EPA sites accepting radioactive waste. These references are noted in NRC guidance for the review of 10CFR20.2002 applications.

9. How should economic factors be considered in the VLLW Scoping Study?

These materials are currently moved between 10CFR61 and EPA sites and different compacts. Future practices would likely mimic those in place today as significant volumes of low level radioactive waste are being disposed at multiple EPA locations in the US.