83FR06475
PR-61

PUBLIC SUBMISSION

As of: 4/17/18 2:07 PM
Received: April 16, 2018
Status: Pending_Post
Tracking No. 1k2-92mo-ngx0
Comments Due: April 16, 2018
Submission Type: Web

Docket: NRC-2017-0081
Greater-Than-Class C and Transuranic Waste

Comment On: NRC-2017-0081-0001
Disposal of Greater-than-Class C and Transuranic Waste; Public Meeting

Document: NRC-2017-0081-DRAFT-0010
Comment on FR Doc # 2018-03085

Submitter Information

Name: Daniel Shrum

General Comment

Please see the attached comments from EnergySolutions LLC

Thank you,

Treesa Parker

Sent on behalf of Daniel B. Shrum.
Sr. Vice President, Regulatory Affairs
EnergySolutions LLC

Attachments

EnergySolutions Comment Letter re Greater-Than-Class C and Transuranic Waste 83 FR 6475; Docket ID NRC20170081 (2)

April 16, 2018 CD18-0074

Annette Vietti-Cook
Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Rulemakings and Adjudications Staff

Subject: Greater-Than-Class C and Transuranic Waste – 83 FR 6475; Docket ID NRC–2017–0081

Dear Ms. Vietti-Cook:

Energy*Solutions* is submitting these comments in response to the subject notice. We appreciate the opportunity to comment on the NRC's development of a regulatory basis for the disposal of Greater-than-Class C (GTCC) and transuranic radioactive waste.

Our comments are summarized in the attachment. In general, Energy*Solutions* is in favor of a rulemaking that would define a new category of radioactive waste that is considered low level and suitable for disposal in a Part 61 regulated site. We have identified considerations that would be important in such a rulemaking. These detailed comments and our response to the questions posed in the *Federal Register* notice are attached.

Thank you again for this opportunity to comment. Questions regarding these comments may be directed to me at (801) 649-2109 or dshrum@energysolutions.com.

Sincerely,

Daniel B. Shrum
Senior Vice President
Regulatory Affairs

Attachment

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ENERGYSOLUTIONS

NRC GREATER THAN CLASS C (GTCC) RADIOACTIVE WASTE SCOPING STUDY

RESPONSE TO NRC REQUEST FOR COMMENT

Question 1. What are the important radionuclides that need to be considered for the disposal of the GTCC and transuranic wastes?

Answer. Energy*Solutions* believes that there are several considerations, of which identifying the important radionuclides is only one, for the defining this waste stream. We list several that we consider to be the most important here.

- **Don't call it GTCC.** The NRC should designate a new waste category specifically defining what it is. It should not be defined as what it is greater than, or what it isn't. We support a rulemaking that would define a specific waste category for what is now known as GTCC and transuranic waste. This waste, which we refer to herein for simplicity as Class D waste, may be suitable for shallow land burial in a facility licensed under 10 CFR Part 61. Waste that does not fall into that category will be *de facto* high-level radioactive waste that would require disposal in a geologic repository. It may be that additional regulatory or legislative action would be necessary to explicitly define that waste category, but from a practical perspective, the United States would have for the first time a system that defines and distinguishes between low-level and high-level radioactive waste.
- **Activity Levels** – The most fundamental consideration is how much activity can be disposed in a given site or disposal unit without posing an undue risk to health and safety as measured by the performance objectives in 10 CFR 61 Subpart C. We refer the NRC to the work done by the U.S. Department of Energy and the International Atomic Energy Agency to define these higher activity wastes as a good starting point for defining this new waste category. It would be a key element of the rulemaking to identify appropriate limits on activity for defining Class D waste.
- **Waste characteristics** – Class D waste could and *should* be defined by, or limited by, waste characteristics in addition to activity. Limits on thermal output and gas generation would be reasonable considerations for the rulemaking. 10 CFR 61.56 addresses waste characteristics and establishes the minimum requirements for all classes of waste. This section could be modified to address appropriate restrictions on Class D waste to ensure that it is suitable for disposal in a shallow land burial site.
- **Federal and State Roles –** It is essential that the NRC define what constitutes Class D waste. We believe that it is a federal responsibility to establish exactly what constitutes this new waste stream. It is not reasonable for an Agreement State to undertake this role any more than it would be appropriate for an Agreement State to redefine what constitutes Class A, B, or C waste. The classification tables in 10 CFR 61.55 are compatibility category B, which requires that "The State program element should be essentially identical to that of NRC."

It remains to be seen if it is reasonable to delegate to the states the licensing of facilities to take Class D waste. We believe that should be taken into consideration in the rulemaking. It is not unprecedented for the NRC *not* to delegate authority to an Agreement State for certain licensing considerations at a facility otherwise regulated by the Agreement State. The NRC currently retains control and authority over the disposal of certain quantities of special nuclear material (SNM) at Energy*Solutions*' Clive facility notwithstanding the fact that the site is regulated by the State of Utah.[1]

- **Surety** – The rulemaking should consider how surety requirements are affected by the disposal of this higher activity waste stream.
- **Performance Assessment** – The best way to determine what can be safely disposed at a given site is by the use of a performance assessment (PA). A performance assessment, however, is a tool for demonstrating compliance with established regulatory requirements. Merely using a PA for the purpose of back calculating waste acceptance criteria (WAC) at a given site is not adequate for defining the waste category. As such, it would not be acceptable for the NRC to default to this technique for determining the suitability of disposal of these wastes at a given site.

Question 2. How might GTCC and transuranic wastes affect the safety and security of a disposal facility during operations (i.e., pre-closure period)?

Answer. As the NRC notes in the *Federal Register* notice, sufficient quantities of GTCC and transuranic wastes could have significant operational impact on a low-level radioactive waste (LLW) disposal facility. We believe that it is important that NRC use considerations of safety and security to help define a Class D waste stream. Just as waste characteristics are important in defining this new waste stream, so are safety and security considerations. As we stated above, activity limits alone are not sufficient for defining Class D waste.

Security – 10 CFR 61.16(a) imposes the security requirements of Part 73 on LLW facilities that receive certain quantities of special nuclear material (SNM).[2] Some, but certainly not all, of the non-SNM waste that could become Class D waste also pose a security hazard that is more significant than the typical LLW waste stream. High-activity sealed sources, for example, could be attractive for the purposes of building a radiological dispersal device, or dirty bomb. While some additional security measures may be necessary, the application of Part 73 to a Part 61 facility more broadly is not a straightforward exercise.

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[1] Letter, Stephen Dembek, U.S. NRC to Daniel B. Shrum, Energy*Solutions*, August 16, 2016.

[2] 10 CFR 73.1(b)(1)(iii) requires a Part 61 licensee to provide for the physical protection of "…formula quantities of strategic special nuclear material or special nuclear material of moderate strategic significance or special nuclear material of low strategic significance."

Radiological sabotage – a deliberate act directed against a LLW facility – is not a high risk because of the nature and location of the facilities. The geographical isolation away from populated areas and the fact that the target of the saboteurs is most likely subsurface combine to minimize both the attractiveness of the facility as a target and the potential consequences. It would be difficult for even a well-trained, dedicated adversary as defined in 10 CFR 73.1(a)(1) to carry out a successful sabotage mission at a LLW facility.

Similarly, *theft and diversion* of disposed waste is not feasible, or at least not easily accomplished. As with the sabotage scenario, it would be difficult for even a well-trained, dedicated adversary as defined in 10 CFR 73.1(a)(2) to divert a strategic quantity of SNM that has been disposed. At a minimum, the time to accomplish such a mission would allow for off-site security personnel or police to respond to the threat.

The real threat related to these higher activity wastes is before they are disposed. Providing enhanced security for waste in receipt and processing would justify increased security requirements for a site that disposes of Class D waste, or at least some types of Class D waste. We propose that as part of its rulemaking, the NRC should consider a definition for Class D waste that places limits that, below which, only minor enhancements in security would be necessary. A definition of Class D waste that would necessitate security restrictions similar to those required for a Part 50 license facility for a LLW facility would not be prudent. Rather, there should be a limit that considers security requirements in defining what is suitable for shallow land burial.

Safety – Similarly, 10 CFR 61.16(b)(1) addresses criticality: "Any application to receive and possess special nuclear material in quantities that would be subject to the requirements of § 70.24, 'Criticality accident requirements' of part 70 of this chapter shall demonstrate how the requirements of that section will be met…" As with the security considerations, the NRC should consider in its rulemaking process a limit that accounts for what would be a reasonable increase in the safety requirements for a LLW facility. The NRC should consider in its rulemaking a definition that bounds the amount of SNM suitable for shallow-land burial in a manner that does not impose extensive criticality controls on the facility.

Question 3. How might GTCC and transuranic wastes affect disposal facility design for post-closure safety including protection of an inadvertent intruder?

Answer. Many of the considerations and potential controls important for ensuring post-closure safety are the same as those for addressing operational safety and security. Such controls may include limits on the waste allowable for disposal that are not simply based on the concentration of activity for a given isotope but, for example, impose restrictions on the total volume of a given type of waste. It is not just economic feasibility, but the ultimate safety and security of a site that would necessitate such controls. If, for example, measures comparable to those for providing

security at a Part 50 license facility would be necessary to protect a disposal facility, then it is not reasonable to dispose of such a volume of waste in a land burial site. The very nature of a Part 61 facility is that at some point in time, active measures are no longer necessary to provide adequate safety and security. Disposing of a waste stream that requires active security in perpetuity is not reasonable. This is another reason why this waste stream should not be defined by activity concentrations alone.

Energy*Solutions* agrees that it would be reasonable for NRC to consider in the rulemaking a requirement that Class D wastes be separated by category within a disposal unit. While it is premature to conclude at this time that such a requirement is necessary, it merits consideration. This would likely be the best way to evaluate, using a PA, how such wastes may behave, and thus affect disposal site design over extended periods of time.

As for post-closure analysis scenarios, we believe it would be reasonable to require that these be identified as part of the licensing process. Because it is conceivable that some sites will only be interested in or suitable for disposing of a discrete portion of this waste stream, it is not possible to define a set of scenarios that would universally apply. For example, disposing of irradiated hardware that is currently GTCC is arguably much simpler than disposing of larger quantities of SNM. The scenarios for evaluating the suitability of a site for these two waste streams are vastly different.

Intruder analysis. Energy*Solutions* believes that the intruder analysis contemplated by the ongoing Part 61 rulemaking is adequate for the analysis of the waste that would constitute a Class D waste category. A site that disposes of these more hazardous waste streams would have to comply with the performance objects in Subpart C just as any site does today. The hazard associated with the waste may require that additional measures be taken to isolate the waste from the biosphere, e.g., deeper burial or more robust containers; but the analytical approach is the same.

Scenarios for evaluating the potential impact to an intruder need not differ from those used today. The *Concentration Averaging and Encapsulation Branch Technical Position*[3] describes acceptable approaches for defining site-specific scenarios for analyzing how a given disposal technique will provide protection for the inadvertent intruder. This approach would be suitable for demonstrating that a given waste stream could meet the Class D requirements just as it is used today for classifying wastes.

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[3] *Concentration Averaging and Encapsulation Branch Technical Position, Rev. 1.*, Volume 1, U.S. NRC, February 2015, p. 36.