

June 8, 2010

Ms. Annette Vietti-Cook
Secretary
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: SECY-10-0043 Blending of Low-Level Radioactive Waste

Dear Ms. Vietti-Cook:

The purpose of this letter is to provide the Commission with my views on the blending issues raised in the above SECY paper. I support the Staff's recommendation in SECY-10-0043 to adopt Option 2. However, I do not think that adopting Option 2 will be sufficient to address the current low-level waste challenges pending the completion of the effort to risk inform 10 CFR Part 61. For the reasons provided below, Option 2 should be expanded to require performance assessments demonstrating compliance with the performance objectives of Part 61 for **all** waste streams at low-level radioactive waste disposal facilities. There are a number of other changes that should also be made to Part 61 as part of any rulemaking to address depleted uranium and blended materials in advance of the effort to risk inform Part 61.

The Staff also noted that stakeholders in addressing blending raised questions concerning the timing of waste classification and attribution. These are important issues that have interstate commerce implications. NRC should address them to provide uniform national standards from a health and safety perspective.

Part 61 Issues

In the past year, the NRC has considered disposal issues associated with depleted uranium, unique waste, and blended waste streams. The regulatory concern is whether the existing regulatory structure provides a safe pathway for the disposal of these materials since the quantities and concentrations of radionuclides in these waste streams today are different from that considered in the development of Part 61. This concern is understandable given the time that has past and changes during the past three decades from uses of radioactive material, waste management processes, and regulatory direction. Option 2 as proposed by the Staff will address these known waste stream problems by requiring, among other things, performance assessments for these particular waste

streams. However, the Staff approach, guided in part by the language of the March 18, 2009 SRM on SECY 08-0147, appears to only address the specific waste streams at issue today, i.e., depleted uranium and blended waste.

But what will be the waste streams that are challenged in future years? It is not unrealistic to expect that in the future additional waste streams will be identified that have characteristics today that are different from that considered in the development of Part 61. In my view, the solution is to provide in Part 61 that each disposal site is required to have a site-specific performance assessment demonstrating compliance with the performance objectives of Part 61 that encompasses all of the waste at the site. With this approach there will be assurance that all waste disposed at a disposal site will meet the performance objectives of Part 61 and, therefore, the public will be protected. As the Commission stated in the Louisiana Energy Services proceeding, CLI-05-05 at page 11, January 18, 2005:

In the end, the "bottom line for disposal" of low-level radioactive wastes are the *performance objectives* of 10 C.F.R. Part 61, Subpart C, which set forth the ultimate standards and radiation limits for (1) protection of the general population from releases of radioactivity; (2) protection of individuals from inadvertent intrusion; (3) protection of individuals during operations; (4) and stability of the disposal site after closure.

This should not be a onerous rulemaking. In fact, in my view this is currently required as 10 CFR 61.12 and 13 address the need to demonstrate that the performance objectives will be met. A reasonable construction of the regulations would be that to achieve compliance with 10 CFR 61.12 and 13 a site-specific performance assessment is required for that demonstration. I recognize that the NRC has issued various guidance documents over the years that can be read as not necessarily requiring a site-specific intruder analysis for Class A waste. See NUREG-1573, Performance Assessment Methodology for Low-level Waste Disposal Facilities (2002).¹ However, NUREG-1573 states that separate intruder scenarios analyses may be necessary in cases where the projected waste spectra are fundamentally different from those considered in the technical analyses supporting the Part 61 draft environmental impact statement. Thus, I agree with the Staff statement in SECY 10-0043, at page 18 that

because the requirement to conduct a site-specific inadvertent intruder analysis is not specifically identified in 10 CFR Part 61 and may not be well understood, there is a concern that applicants or licensees could misinterpret the regulations to only require compliance with the concentration limits in the waste classification tables for ensuring protection of the intruder, as required by 10 CFR § 61.42.

¹ NUREG-1573 at page 1-13, footnote 7 states that "separate intruder scenario dose analyses are not envisioned to be included in an LLW performance assessment" based on 10 CFR 61.13(b). Section 61.13(b) provides that a demonstration be made that adequate barriers have been provided. In my view, a performance assessment is necessary to provide that demonstration.

Therefore, the Commission should clarify 10 CFR 61.13 to provide clear notice that low-level waste disposal sites must have a performance assessment that demonstrates that the performance objectives of Part 61 are met for all waste streams and not just for depleted uranium and blended waste. While this might be done by an interpretive rule, a more formal rulemaking is warranted in order to make a number of additional changes that would constitute more than a clarification of the existing requirements.

In addition, to recommending that 10 CFR 61.13 and 61.13(b) be clarified to require that the analyses required to demonstrate that the performance objectives of subpart C of part 61 will be met include a site specific performance assessment, I recommend that there be periodic updating of the performance assessment to reflect changed conditions at the site, past disposal history, and new methodology, if any. This is consistent with the approach taken by DOE at its disposal sites under DOE Order 435.1.

The attached October 30, 2009, letter (ML093090484) from Talisman International which I along with John Greeves sent to the NRC in response to the Federal Register Notice on depleted uranium, 74 FR 30175 (June 24, 2009), provides specific rule language to adopt the above recommendations and other changes that need to be done as part of the depleted uranium rulemaking to assure quality and consistent performance assessments. These include amending 10 CFR 61.41 to update the dose methodology used in Part 61 and 10 CFR 61.42 to codify the current dose standard of 500 mr and a compliance period of 10,000 years.

Waste Classification

It is important to have uniform waste classification standards to support robust interstate commerce within the United States. From a disposal perspective, the public's health and safety is based on the waste stream that is to be disposed not its pedigree prior to processing. Thus, it does not matter from the health and safety view why waste was blended and what the original concentrations were. There is no regulatory need to have a proscription on changing concentration levels or its equivalent classification level if a licensee desires for whatever reason to have a classification made prior to the final waste stream being ready for disposal. What is important are the concentrations and quantities of radionuclides at the time of the disposal that must be considered by the site-specific performance assessment to ensure that the performance objectives of Part 61 are met.

As stated by the Staff in SECY-10-0043,

waste is not required to be classified at intermediate points between its generation and disposal, such as processing and storage, because the characteristics of the waste at these intermediate points do not directly affect its safe disposal. Once waste is ready for disposal, it must be classified.

This is a fundamental concept that is reflected in NRC regulations in Part 20, Appendix G, Section III, which provides that the waste processor is responsible for classifying waste it has processed in accordance with 10 CFR 61.55. This is a compatibility B

requirement as it has significant direct transboundary implications. Accordingly Agreement states' requirements should be essentially identical to Appendix G of Part 20.

The Commission should ensure that the resulting rulemaking for blending, if option 2 is approved, provides clear notice to the public, States, and licensees that pursuant to the existing regulations in Part 20, Appendix G, classification is a disposal issue that is done at the time the decision is made to send the waste stream to a disposal site and not at intermediate steps along the way.

Attribution

When radioactive waste is processed, a question is raised as to who is the generator of the waste for purposes of completing required manifests under Part 20. In some cases the answer to this question is readily apparent if the processing involved only material from one generator such as in compaction or blending various materials from one generator. To the extent waste is reasonably traceable to the original generator it should be attributed to the generator. However, in many cases it is impractical to do so if, for example, the processing comingles materials from different generators. For example, unless a processor provides a complete cleaning and decontamination of its facility after each processing run, there will be comingled material whose source will be difficult to determine. Ash from incineration, slag from metal melting, sludge from processing tanks, floor sweepings, personnel protective equipment, sandblasting grit and HEPA filters will contain contaminated material from various generators. It is unrealistic to expect that there will be complete decontamination after each processing run so that any waste will be clearly traceable to the original generator. Part 20, Appendix G, Section I, recognizes this concept by defining residual waste as

low-level radioactive waste resulting from processing or decontamination activities that cannot be easily separated into distinct batches attributable to specific waste generators. This waste is attributable to the processor or decontamination facility, as applicable.

The definition of "residual waste" is fundamental to attribution. The regulator of the processing or decontamination licensee, i.e., NRC or a particular Agreement State, is in the best position to determine compliance with this definition. While Appendix G is as noted above, a category B compatibility level, the Statements of Consideration for Appendix G (60 FR 15649, March 27, 1995) notes that the NRC has encouraged States and Compacts to have a common definition for "residual waste."

The NRC has a degree of oversight over Agreement States based on the need to periodically assure that such states' regulatory program are adequate and compatible pursuant to section 274 (j) of the Atomic Energy Act of 1954, as amended. Thus, Agreement States should be applying the same definition of "residual waste."

The Staff notes in SECY-10-0043 that some States and Compacts believe that the NRC should establish a national attribution policy. However, NRC does not have oversight

over Compacts. Nevertheless, NRC is in a position to serve as a central point for national guidance.

The Commission should develop a policy statement that provides a national attribution policy and guidance for determining when waste is sufficiently commingled that it should be attributed to the processor and, if not, how it should be assigned ownership. In this regard, NRC should consider holding a workshop with the various Compacts, Agreement States, processors, disposal sites, and other stakeholders to obtain insights for developing a policy statement.

I appreciate the opportunity to provide these comments to the Commission. I would be pleased to respond to any questions or comments. I can be contacted at 301-299-3607 or JL @ LIEBLET.COM.

Respectively submitted,

Jim Lieberman

Jim Lieberman

Attachment: Letter to M. Lesar, NRC, from John Greeves and Jim Lieberman, Talisman International, LLC., "Comments on Potential Rulemaking for Safe Disposal of Unique Waste Streams Including Significant Quantities of Depleted Uranium – 74 FR 30175," October 29, 2009

cc:

Chairman Gregory B. Jaczko
Commissioner Kristine L. Svinicki
Commissioner George Apostolakis
Commissioner William D. Magwood, IV
Commissioner William C. Ostendorff
William Borchardt, EDO
Stephen Burns, OGC



October 30, 2009

Michael Lesar
Chief, Rulemaking and Directive Branch
Division of Administrative Services
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Comments on Potential Rulemaking for Safe Disposal of Unique Waste Streams Including Significant Quantities of Depleted Uranium – 74 FR 30175

Dear Mr. Lesar:

We are filing these comments on behalf of Talisman International, LLC, in response to the subject notice. In our view, it is important to establish a clear requirement in 10 CFR Part 61 to perform performance assessments to ensure sites meet the performance objectives of Part 61. In that regard, there are several fundamental changes that need to be made to Part 61 to strengthen that requirement. Other matters to improve the implementation of Part 61 can be treated by NRC guidance. Our comments are contained in the attachment.

Questions regarding these comments may be directed to Jim Lieberman at (301) 299-3607 or jl@lieblet.com and to John Greeves at (301) 452-3511 or greevesj@aol.com.

Sincerely,

Jim Lieberman

Jim Lieberman
Senior Regulatory Nuclear Consultant

John Greeves

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Comments on Potential Rulemaking
Safe Disposal of Unique Waste Streams including
Significant Quantities of Depleted Uranium

We support the concept of a rulemaking to specify a requirement for a site-specific analysis and associated technical requirements for the disposal of significant quantities of depleted uranium as directed by the Commission in *Staff Requirements—SECY-08-0147—Response to Commission Order CLI-05-20 Regarding Depleted Uranium*.

1) 10 CFR 61.13

The issue before the Commission is what changes should be made to 10 CFR Part 61 to ensure that large quantities of depleted uranium and other unique waste streams are disposed safely. In our view the solution to this issue is to a large degree clarifying the requirements to perform a site specific performance assessment demonstrating that the performance objectives of Part 61 are met. This is consistent with the view of the Commission in the Louisiana Energy Services proceeding, CLI-05-05 at page 11, January 18, 2005, that:

In the end, the "bottom line for disposal" of low-level radioactive wastes are the *performance objectives* of 10 C.F.R. Subpart C, which set forth the ultimate standards and radiation limits for (1) protection of the general population from releases of radioactivity; (2) protection of individuals from inadvertent intrusion; (3) protection of individuals during operations; (4) and stability of the disposal site after closure. Thus, while there may not yet be detailed technical criteria established for all of the kinds of land disposal that might be proposed under Part 61, criteria can be developed "on a case-by-case basis," as needed. After all, any technical requirements are "intended to help ensure that the performance objectives established in Subpart C are met," but they are "not the end in themselves, ... [only] a means of achieving the end," which are the performance standards. (Citations omitted)

Currently, 10 CFR 61.12 and 13 addresses the need to demonstrate that the performance objectives will be met. However, these provisions have been interpreted by some to not require the submittal of a site specific performance assessment. As to protection against the intruder, NRC

appears to have accepted the provisions of 10 CFR 61.52 (a)(2) for either five meter depth or the 500 year intruder barrier to meet the performance objectives of 10 CFR 61.42. While these depths and barriers may be sufficient in many cases to meet the performance objectives, without a site specific performance assessment there is not assurance that the performance objectives will be met for all waste packages regardless of the radionuclides.

Therefore, we recommend that 10 CFR 61.13 be clarified to require that the analyses required to demonstrate that the performance objectives of subpart C of part 61.41 and 61.42 will be met include a site specific performance assessment. We also recommend that there be periodic updating of the performance assessment to reflect changed conditions at the site, past disposal history, and new methodology, if any. This is consistent with the approach taken by DOE at its disposal sites under DOE Order 435.1.

In addition, we recommend that this amendment adopts a Part 61 compliance a period of 10,000 years consistent with NUREG 1573 and 40 CFR 191. However, recognizing the peak dose may occur after this period, we recommend that the rule require a qualitative analysis if the peak occurs beyond 10,000 years for input into the environmental analysis consistent with section 3.2.3 of NUREG-1573, A Performance Assessment Methodology for Low-Level Radioactive Waste Disposal Facilities (2000), to determine if there is a need for environmental mitigation. This is also consistent with Section IV.A.6 of the Decommissioning Criteria for the West Valley Demonstration Project at the West valley Site (67 FR 5003, 5006, Feb 1, 2002). See also section 4.1.1.1 of NUREG-1854, NRC Staff Guidance for Activities Related to US DOE Waste Determinations (2007). A period of compliance in the rule would assure consistent assessment of compliance by all parties.

Recognizing that performance assessments require the use of assumptions and scenarios, we also recommend that the proposed language provides that the assumptions and scenarios used in performance assessments be reasonably foreseeable to avoid undue speculation and overly conservative approaches. NRC should permit licensees to justify, site-specific assumptions and exposure scenarios based on reasonably foreseeable circumstances to evaluate the critical group that could reasonable encounter material that is released from the disposal cell after the institutional control period based on reasonably foreseeable circumstances. This would include

residential use; farming; resident farming; and any other reasonable use consistent with the current environment of the specific site. For example, a site would not be expected to consider a groundwater pathway if the groundwater was not useable for irrigation or human consumption. In addition, the assumptions for the performance analyses would not need to project changes in society, the biosphere, human biology, or increases or decreases of human knowledge or technology except for foreseeable changes to the geology, hydrology, and climate based upon cautious, but reasonable assumptions of the changes in these factors that could affect the disposal site. The actual details for performing performance assessments consistent with the regulatory language would be treated in NRC guidance which can be updated periodically by the NRC without a rule change.

Specifically, we would recommend that the introductory sentence of 10 CFR 61.13 be amended to read:

The specific technical information must also include the following analyses needed to demonstrate that the performance objectives of subpart C will be met: a site specific performance assessment to demonstrate that the performance objectives of subpart C of this part will be met. The performance assessment would need to be updated for Commission approval at a five year frequency unless the license provides an alternative period for updating it. The performance assessment shall include the following analyses and be preformed for a compliance period of 10,000 years using reasonably foreseeable assumptions and scenarios. If the peak dose occurs after 10,000 years, a qualitative analysis shall be prepared up to the time of the peak dose for consideration in the site's environmental evaluation.

2) 10 CFR 61.13 (b)

An important aspect of the performance assessment is to demonstrate that the performance objective for the intruder is met. Demonstration of meeting the applicable performance objective is currently in paragraph (a).

Therefore, we recommend that the requirements for the analysis required in 10 CFR 61.13 (b) be amended to be consistent with section 61.13(a).

Section 61.13(b) would read:

(b) Analyses of the protection of individuals from inadvertent intrusion must include demonstration that there is reasonable assurance the waste classification and segregation requirements will be met and that adequate barriers to inadvertent intrusion will be provided. The analyses must clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes. The analyses must clearly demonstrate that there is reasonable assurance that the exposure to humans from the release of radioactivity will not exceed the limits set forth in § 61.42.

3) 10 CFR 61.41

We recommend that an amendment to section 61.41 be made to update the annual dose methodology to the newer methodology of ICRP 26 and 30 used in 10 CFR Part 20 rather than the methodology used in Part 61 based on ICRP 2 recommendations. This is consistent with the approach taken in sections 3.3.7.1.2 and 3.3.7.3.1 of NUREG 1573; footnote 6 of the Decommissioning Criteria for the West Valley Demonstration Project at the West Valley Site (67 FR 5003, 5005, Feb 1, 2002); and section 4.6.1.3 of NUREG-1854.

In addition, section 61.41 should be amended to be consistent with the period of compliance stated in the proposed amendment to 10 CFR 61.13. Section 61.41 would read:

Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems total effective dose equivalent for a compliance period of 10,000 years ~~25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ~~ of to any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

4) 10 CFR 61.42

10 CFR 61.42 currently requires "...protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste;" however, the regulations are silent on the specific dose standard to apply. We recommend that section 61.42 be amended to provide a dose standard for an intruder of 500 mr/yr. This would provide in the rule the dose standard that currently is only stated in guidance. It is noted that the 500 millirem was the standard proposed in Part 61 in 1981. (46 FR 38081, July 24, 1981). The Statement of Considerations for the final rule did not object to the number. It was removed apparently at the request of EPA because of its concern of how one would monitor it or demonstrate compliance with it, but not because EPA disagreed with it. (47 FR57446, 57449, December 27, 1982). A dose standard of 500 mr/yr is also used as part of the license termination rule dose standard for intruders (10 CFR 20.1403). A dose objective would assure consistent assessment of compliance by all parties.

Section 61.42 would read:

Design, operation, and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed. The intrusion must not result in an annual dose exceeding an equivalent of 500 millirems total effective dose equivalent for a compliance period of 10,000 years.

5) 10 CFR 61.55

If the Commission adopts the above changes, performance assessments would be the norm for disposal sites. However, such performance assessments would be performed initially when the applicant applied for its license and then periodically thereafter. There could be a situation where a licensee desired to dispose of depleted uranium or other radionuclide not addressed in the tables under situations where either the performance assessment had not considered the depleted uranium or other radionuclide, or the performance assessment had yet to be performed. This could be addressed by establishing a requirement that would provide for a site specific performance assessment if the quantity of the radionuclide to be disposed had not been previously considered in a performance assessment

approved by the NRC. Such a performance assessment would need to meet the amended provisions discussed above. However, this does not necessarily mean that a new performance assessment would need to be developed. Depending on the scope and detail of an existing performance assessment, a current performance assessment may only need minor changes to update it to include the new radionuclide.

We recommend that 10 CFR 61.55 (a)(6) be amended to read:

(6) Classification of wastes with radionuclides other than those listed in Tables 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A. However, before such waste can be disposed a performance assessment must be approved by the Commission.

6) Definition of Significant Quantity and Unique Waste Stream

The subject Federal Register notice sought input on how the NRC should define a “significant quantity” of depleted uranium and unique waste streams. In light of the recommended changes discussed above, it is unnecessary to define these terms as the performance assessment will address them.

7) Guidance vs. Regulation

Regulations provide for certainty, consistency, and enforceability. However, changing regulations entails significant effort and time. Guidance while not directly enforceable is easier to change over time. Consequently, it is our view that the fundamental objectives should be in regulations leaving the details for guidance. This leaves the regulator in the position to offer its positions on implementation to the industry as guidance and the industry the ability to defend other ways to implement the fundamental objectives. However, it is important that the development of guidance like regulations involve public input that would allow for public comments on drafts before such guidance is issued for use by either the staff or industry.

Accordingly, we recommend as indicated above that requirements include the need to demonstrate meeting of performance objectives through performance assessments, compliance periods, dose standards, and the

standard for scenarios and assumptions used in performance assessments. However, the details for achieving compliance which are often site related should be in guidance. In that regard, the subject Federal Register notice addressed a number of issues for consideration in this rulemaking, e.g., geochemical parameters, impacts of radon gas releases, and details of performance assessments. In our view, the issues other than the ones we addressed above should be addressed in NRC guidance and not made a part of this rulemaking.

8) Implementation

It is recognized that existing licensees may need an appropriate time period to prepare quality performance assessments so that ongoing operations will not be unduly interrupted. It is suggested that the effective date be 12 months after publication in the Federal Register. However, recognizing it is difficult to predict how long it may take for a regulator to review and approve a performance assessment, the rule should provide that disposals made after the effective date may be made if the required performance assessment was submitted for approval at least six months prior to the effective date.