



NUCLEAR ENERGY INSTITUTE

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18

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October 30, 2009

Mr. Michael Lesar
Chief, Rulemaking and Directives Branch
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Office of Administration
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Subject: Industry Response to NRC Questions on the Disposal of Large Quantities of Depleted Uranium as stated in 74FR30175 dated June 24, 2009

Project Code: 689

Dear Mr. Lesar:

On behalf of industry, the Nuclear Energy Institute¹ (NEI) offers the enclosed responses to the questions noticed in the *Federal Register* on June 24, 2009 (74FR30175). We offer the general comments below and the enclosed specific responses to the questions. We trust that U.S. Nuclear Regulatory Commission (NRC) staff will find this information useful as it proceeds to potentially develop the technical basis for a proposed rule that would require site-specific analysis for the disposal of large quantities of depleted uranium.

We appreciate the time and effort that the NRC expended to solicit participation from a wide variety of stakeholders and conduct the very professional roundtable workshops in Maryland and Utah. Since the earlier workshops were focused on the potential proposed rule, we suggest that the NRC

¹ The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.

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consider conducting an additional roundtable workshop with technical experts who can provide detailed information on the myriad of issues that should be addressed in a guidance document and not the rule, e.g., geochemical factors, waste stabilization practices, and exposure scenarios. As such, we suggest that this workshop be held before the NRC issues the draft guidance for comment to better inform the drafting process.

We offer the following general comments for your consideration. First, it is not evident that a rulemaking is needed to affect the outcome that the NRC is seeking based on a review of the current Part 61 requirements and corresponding Agreement State regulations, which must be adequate and compatible with the NRC's rule, and current regulatory oversight. Further, there is no evidence to suggest that the current regulatory framework is not providing adequate protection to public health and safety or the environment. That being said, various representatives supported the September workshops as this matter is important to nuclear industry as a whole and the opportunity to provide such input then and now is appreciated.

Secondly, industry believes that any NRC rule on the disposal of large quantities of depleted uranium or other waste streams should be risk-informed and performance-based. Specifically, since the performance objectives in Part 61 already apply to waste disposal sites, any additional rule language should be kept to a minimum, e.g., require a site-specific assessment, period of performance and intruder dose limit, while leaving the engineering decisions and technical approaches at the discretion of the licensed waste site operator. The licensee's role is to demonstrate and provide the NRC or the Agreement State reasonable assurance that the performance objectives and standards can be met if implemented as described, which the regulator would then confirm through inspection as Agreement States do today. In addition, the supporting guidance should encourage and not inadvertently dissuade licensees to evaluate and consider unique site features, characteristics and practices that, when utilized, support the site performance assessment.

Third, as stated during the September 2009 public workshops, industry does not support including a definition of "unique waste stream" or "significant quantities" in the rule. The origin of the waste is irrelevant and its characteristics such as radionuclide concentration, volumes, waste form, etc., are all factors that would be considered by the applicant in its site-specific performance assessment and evaluated by the regulatory authority.

Finally, industry has the authority and responsibility to safely manage its inventories of depleted uranium or other waste streams. As such, it should not be assumed that current or future inventories of depleted uranium will be destined for permanent disposal since it can be considered a resource by its owner who makes decisions on its management based on current and future market conditions.

In summary, we appreciate the opportunity to provide further input and look forward to additional dialogue with NRC on these important matters. If you would like to discuss these matters further,

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you may contact me at 202.739.8126 or fmk@nei.org or Janet Schlueter at 202.739.8098 or jrs@nei.org.

Sincerely,

A handwritten signature in black ink that reads "Felix M. Killar, Jr." The signature is written in a cursive style with a large, stylized initial 'F'.

Felix M. Killar, Jr.

Attachment

c: Mr. Larry Camper, FSME/DWMEP
Ms. Priya Yadav, FSME/DWMEP

Industry Responses to NRC Questions on Disposal of Large Quantities of Depleted Uranium as discussed in 74FR30175 issued June 24, 2009

Question II-1.1—Should the NRC propose a regulatory definition to (a) specify general criteria that would capture both current and foreseeable unique waste streams; or (b) limit the definition to a known set of current unique waste streams including significant quantities of depleted uranium? What characteristics should NRC propose as defining for unique waste streams?

No. As discussed during the September workshops, industry does not support the inclusion of a definition of "unique waste stream" in the proposed or final rule which was the subject of the workshop. Defining a "unique waste stream" is unnecessary, potentially arbitrary, and could inadvertently preclude the disposal of yet-to-be developed or identified waste streams that would meet applicable disposal requirements. Instead, waste disposal site applicants and licensees should be required to meet the applicable performance objectives contained in Part 61 regardless of the origin of the waste stream.

Question II-1.2—What waste streams containing radionuclides listed in the waste classification tables at 10 CFR 61.55 are currently, or possibly in the foreseeable future, being disposed of in quantities significantly greater than initially considered in the development of 10 CFR Part 61?

Industry is not aware of any information to suggest that there are waste streams containing radionuclides, listed in the waste classification tables, which are currently being disposed of in significant quantities greater than initially considered in the development of 10 CFR Part 61 and which pose any threat to public health and safety or the environment.

Question II-1.3—What waste streams containing radionuclides that are not listed in the waste classification tables at 10 CFR 61.55 are currently, or possibly in the foreseeable future, being disposed of in concentrations or quantities significantly greater than initially considered in the development of 10 CFR Part 61?

Question II-1.4—What waste streams that were not considered in the initial development of 10 CFR Part 61 should be considered under the definition of "unique waste streams"?

Question II-1.5—Should the NRC consider waste streams that result from spent fuel reprocessing and are not high-level or greater-than-class C waste in the definition of "unique waste streams"?

Question II-1.6—Are there other characteristics besides concentration and quantity that NRC should consider when defining "unique waste streams"?

Response to Questions II - 1.3 - 1.6

Currently, and in the foreseeable future, there may be a need to dispose of depleted uranium from commercial and government inventories in quantities that are potentially greater than initially considered in the development of 10 CFR 61, based on the information contained in this FRN and SECY-08-0147. However, it should be recognized that holders or owners of depleted uranium may consider it to be a resource depending on current or future market conditions. As such, current and

future inventories may or may not be destined for permanent disposal. Finally, industry is not aware of any information to suggest that there are other waste streams that are currently or could be in the foreseeable future being disposed of in concentrations or quantities significantly greater than those considered during the development of Part 61. As stated previously, defining a "unique waste stream" is unnecessary, potentially arbitrary, and could inadvertently preclude the disposal of yet-to-be developed or identified waste streams that would meet applicable disposal requirements.

Question II–2.1—Should the NRC (a) specify a single time period to evaluate the performance of facilities disposing of all unique waste streams in the near surface; (b) specify criteria requiring the consideration of how the hazard for each unique waste stream evolves over time; or (c) permit a licensee to justify a period of performance?

Question II–2.2—If NRC were to specify a single time period for site specific analysis of facilities disposing of unique waste streams in the near surface, what would be an appropriate period? What factors should NRC consider in determining a single time period of performance?

Question II–2.3—If NRC were to specify criteria requiring the consideration of how the hazard evolves over time for each unique waste stream, what factors should NRC consider in determining these criteria?

Question II–2.4—If NRC were to permit a licensee to justify a time period of performance, what factors should NRC consider when evaluating a licensee's justification?

Question II–2.5—If NRC were to specify criteria requiring the consideration of how the hazard evolves over time, or permit a licensee to justify a time period of performance, should the NRC consider limiting the maximum extent of the time period considered? If so, what factors should NRC consider when specifying a maximum period of performance?

Question II–2.6—What other approaches might NRC consider when specifying criteria for a period of performance for facilities disposing of unique waste streams in the near surface?

Response to Question II – 2.1-2.6

There are advantages and disadvantages of specifying the period of performance for disposal facilities utilizing near surface disposal methods in the rule versus the guidance. However, industry generally supports specifying the period of performance in the rule for consistency across the disposal facilities nationwide and to provide for a more transparent and predictable regulatory process. Industry suggests that the period of performance be set at 10,000 years for consistency with NRC's existing regulatory guidance for low-level waste disposal facilities and other federal regulations, e.g., 40 CFR 191 and the Uranium Mill Tailings Radiation Control Act. Industry does not support specifying criteria for hazards analysis in the rule. This level of detail and information on how to comply with the performance objectives is more appropriate for a guidance document.

As with any period of performance to demonstrate regulatory compliance, it is best to identify a time period where the regulator can determine and the licensee can demonstrate with reasonable assurance, and using current technology and methodology, that the applicable regulatory release and exposure limits can be met. It is also important that the rule allow for a risk-informed and

performance-based approach by the applicant or licensee to demonstrate compliance with applicable standards.

NRC should not specify any such criteria in the rule. Any criteria related to evaluating the evolution of a waste stream over time should be included in a guidance document, if at all, that is performance based and not prescriptive, or radionuclide or waste stream specific. The licensee should be required to demonstrate that the applicable regulatory limits or requirements can be met regardless of its characteristics, e.g., waste origin, quantity, concentration, radionuclide concentration, and the regulator's role is to verify that the approach proposed by the licensee can, theoretically, be met which would then be verified through inspection. NRC should solicit additional stakeholder input through focused and well orchestrated public roundtable workshops, such as those conducted in September 2009, to gather information from experts on such technical matters before issuing the draft guidance for comment. Finally, as stated above, industry does not support the specification of criteria for the period of performance in the rule.

Question II-3.1—Should NRC specify technical criteria for, or permit licensees to justify, site-specific exposure scenarios for demonstrating compliance with the performance objective protecting members of the public for unique waste streams?

Industry believes that NRC should permit licensees to justify site-specific exposure scenarios for demonstrating compliance with the applicable performance objectives. Each site may have unique characteristics based on its geographic location, geologic features, local zoning ordinances and preferences by its residents and elected officials, State oversight, level of community involvement, activities at adjacent facilities or properties, etc. that would need to be considered when demonstrating compliance with the performance objectives.

What factors should NRC consider in specifying technical criteria or reviewing licensee justifications for exposure scenarios associated with members of the public?

Licensees should be expected to use realistically conservative assumptions in any dose modeling or exposure scenario calculations and NRC should verify the appropriateness and completeness of these assumptions. However, this approach should be performance-based, in that, the applicable regulatory requirements including radionuclide release limits and radiation exposure limits must be demonstrated to be met and verified through inspection. NRC should solicit additional stakeholder input through focused and well orchestrated public roundtable workshops, such as those conducted in September 2009, to gather information from experts on such technical matters before issuing the draft guidance for comment.

Question II-3.2—Should NRC specify technical criteria for, or permit licensees to justify, site-specific exposure scenarios for demonstrating compliance with the performance objective protecting individuals from inadvertent intrusion for unique waste streams?

What factors should NRC consider in specifying technical criteria, or reviewing licensee justifications, for inadvertent intruder exposure scenarios?

As stated in response to Question II-3.1, each site may have unique characteristics. Such characteristics may have a direct or indirect bearing on the likelihood and consequences of, timeline associated with, and realistically conservative assumptions associated with an inadvertent intrusion scenario. However, similar to the issue of a period of performance, industry generally supports including an intruder dose limit in the rule and suggests that NRC consider setting a 500 millirem per year limit consistent with existing public exposure limits from residual activity at certain sites under

Part 20.1403 and considered during a previous Part 61 rulemaking. NRC should solicit additional stakeholder input through focused and well orchestrated public roundtable workshops, such as those conducted in September 2009, to gather information from experts on such technical matters before issuing the draft guidance for comment.

Question III–1.1—Should NRC specify a lower quantity limit in the definition of “significant quantities” for near surface disposal?

If so, what factors should NRC consider in setting an appropriate lower threshold for near surface disposal?

Question III–1.2—Should NRC specify an upper quantity limit in the definition of “significant quantities”?

If so, what factors should NRC consider in setting an appropriate upper threshold for near surface disposal?

Question III–1.3—Are there alternative methods NRC should consider when specifying criteria to define “significant quantities”?

Response to Question III -- 1.1-1.3

As discussed during the September public workshops, industry does not believe that NRC should attempt to define or set a specific quantitative limit for a “significant” quantity of depleted uranium proposed for disposal. Setting a somewhat arbitrary quantitative limit does not necessarily reflect a risk-informed and site-specific approach nor does it help licensees or applicants demonstrate compliance with the regulatory performance objectives since site characteristics, waste form, waste concentration and other unique characteristics will need to be considered when determining whether certain quantities of radionuclides can be disposed of at a specific site and whether the performance objectives can be met. As such, an “appropriate lower threshold” may be rendered meaningless and, may also, inadvertently become a defacto regulatory standard.

Question III–2.1—If NRC were to specify a single time period for the site specific analysis of near-surface disposal of unique waste streams (see Question II.2.1), what factors associated with disposal of significant quantities of depleted uranium should NRC consider in determining a single time period of performance for unique waste streams, including significant quantities of depleted uranium?

As stated previously, NRC should solicit additional stakeholder input through focused and well orchestrated public roundtable workshops, such as those conducted in September 2009, to gather information from experts on such technical matters before issuing the draft guidance for comment.

Question III–2.2—If NRC were to specify criteria requiring the consideration of hazards for each unique waste stream evolving over time (see Question II.2.1), what factors should NRC consider in determining these criteria for disposal of significant quantities of depleted uranium?

Industry does not support the specification of criteria for hazards consideration in an NRC rule. As stated previously, the rule should be risk-informed and performance-based and any information to guide applicants or licensees on the type and completeness of information needed to demonstrate compliance with the regulation should be contained in a guidance document.

Question III–2.3—If NRC were to permit a licensee to justify a time period of performance (see Question II.2.1), what factors should NRC consider when evaluating a licensee’s justification for disposal of significant quantities of depleted uranium?

Question III–2.4—If NRC were to specify criteria requiring the consideration of how the hazard evolves over time, or permit a licensee to justify a reasonable time period of performance (see Question II–2.1), should the NRC consider limiting the maximum extent of the time period considered for disposal of significant quantities of depleted uranium? If so, what factors should NRC consider when specifying a maximum period of performance?

Question III–2.5—What other approaches might NRC consider when specifying criteria for a period of performance for near-surface disposal of significant quantities of depleted uranium?

Response to Question III -- 2.3-2.5

Industry generally supports including a period of performance in the rule and suggests that NRC considering using 10,000 years consistent with existing NRC guidance.

Question III–3.1—What factors specific to disposal of significant quantities of depleted uranium should NRC consider in specifying criteria or reviewing a licensee’s justification for exposure scenarios for protection of members of the public?

Question III–3.2—What factors specific to disposal of significant quantities of depleted uranium should NRC consider in specifying criteria or reviewing a licensee’s justification for exposure scenarios for the protection of individuals from inadvertent intrusion?

Response to Question III -- 3.1-3.2

Industry has no additional information to provide on this matter at this time. NRC should solicit additional stakeholder input through focused and well orchestrated public roundtable workshops, such as those conducted in September 2009, to gather information from experts on such technical matters before issuing the draft guidance for comment.

Question III–4.1—Should NRC specify or permit licensees to propose physical or chemical forms (e.g., UF₆, U₃O₈, metal) for disposal of significant quantities of depleted uranium?

If so, what factors should NRC consider in specifying criteria for or developing guidance to review an analysis of physical or chemical forms?

NRC should not attempt to specify physical or chemical forms for disposal of significant quantities of depleted uranium in the rule. The rule should set the performance objectives or dose limits to be met with the burden on the applicant or licensee to demonstrate compliance with the applicable limits and regulations. Any criteria for or guidance regarding the analysis of the forms should only be included in a guidance document and not the rule. Again, a focused workshop with experts should be conducted before any draft guidance is issued for public comment.

Question III–4.2—Should NRC specify criteria for, or permit licensees to justify, stabilizing admixtures (e.g., grout) for disposal of significant quantities of depleted uranium?

If so, what factors should NRC consider in specifying criteria for, or developing guidance to review, an analysis of admixtures?

Yes, NRC should allow licensees to add stabilizing admixtures (e.g., grout) to depleted uranium to ensure that the performance objectives can be met. As stated above, the rule should set the performance objectives or dose limits to be met with the burden on the applicant or licensee to demonstrate compliance with the applicable limits and regulations. Any criteria for or guidance regarding the analysis of the forms should only be included in a guidance document and not the rule.

Question III–4.3—What other factors should NRC consider when specifying criteria, or developing technical guidance, regarding waste forms for disposal of significant quantities of depleted uranium in near-surface facilities?

A focused workshop with experts should be conducted before any draft guidance is issued for public comment.

Question III–4.4—Should NRC require a site-specific analysis to capture previously disposed quantities of depleted uranium?

If so, what factors should NRC consider when specifying criteria, or developing technical guidance, regarding previously disposed quantities of depleted uranium?

To date, depleted uranium has been disposed of in accordance with applicable regulations and with the approval of the appropriate regulatory authorities. There is no evidence to suggest that worker, environmental or public health and safety has been compromised since applicable requirements including dose and release limits can be met. That being said, it appears appropriate that NRC require a total site-specific analysis to capture previously disposed quantities of depleted uranium to the degree that this information is readily available or can be calculated based on available or readily available information. Such quantities of depleted uranium clearly contribute to the overall site performance assessment and the licensee's ability to demonstrate compliance with the applicable performance objectives.

Question III–5.1—Should NRC specify regulatory criteria for, or permit licensees to justify, site-specific geochemical parameters for the analysis of disposal of significant quantities of depleted uranium?

Question III–5.2—If NRC should specify regulatory criteria, then what factors should NRC consider in developing criteria for geochemical parameters for a site-specific analysis for disposal of significant quantities of depleted uranium?

Question III–5.3—If NRC should permit licensees to justify site-specific geochemical parameters, then what factors should NRC consider when reviewing a licensee's justification?

Question III–5.4—What new or alternative approaches should NRC consider regarding the incorporation of geochemical parameters in a site specific analysis for disposal of significant quantities of depleted uranium?

Response to Question III -- 5.1-5.4

NRC should not specify regulatory criteria on site-specific geochemical parameters for the disposal of depleted uranium or other waste streams since such an approach is not risk-informed or performance-based. Rather, NRC should consider including such technical information in a guidance document that should be developed, as stated previously, based on input gathered through an additional public workshop with technical experts.

Question III–6.1—What new approaches for modeling radon emanation, migration, and exposure pathways, including the effects of differences in the physical and chemical properties between radon and its progeny, should NRC consider?

Question III–6.2—Should NRC require licensees to evaluate the effects of radon in a site-specific analysis for disposal of significant quantities of depleted uranium in near-surface facilities?

Question III–6.3—Should NRC specify by regulation, or develop guidance on, the technical parameters for evaluating radon emanation, migration, and exposure in a site-specific analysis of significant quantities of depleted uranium?

Question III–6.4—If NRC should specify by regulation the technical parameters for evaluating radon emanation, migration, and exposure, what factors should NRC consider in specifying technical parameters for a site-specific analysis for significant quantities of depleted uranium?

Question III–6.5—If NRC should develop guidance on the technical parameters for evaluating radon emanation, migration, and exposures to accompany regulatory criteria, then what factors should NRC consider in the development of guidance for evaluating technical parameters for a site-specific analysis for disposal of significant quantities of depleted uranium?

Question III–6.6—What societal uncertainties should NRC consider when developing guidance for scenarios of exposure to radon gas released from the disposal of significant quantities of depleted uranium?

Question III–6.7—What alternative methods should NRC consider when developing guidance on evaluating the impacts of radon gas exposures?

For instance, U.S. Environmental Protection Agency standards at 40 CFR Part 192 for the control of residual radioactive materials from inactive uranium mill tailings sites specify that releases of radon-222 to the atmosphere will not exceed an average release rate of 20 picocuries per square meter per second or increase the annual average concentration of radon-222 in air at or above any location outside the disposal site by more than 0.5 picocuries per liter.

Response to Question III -- 6.1-6.7

No, NRC should not require licensees to evaluate and calculate the potential contribution from radon in a site-specific analysis for disposal of large quantities of depleted uranium or other waste streams in near surface facilities. As NRC is aware, radon is ubiquitous and adequately addressed by the Environmental Protection Agency and individual States. NRC has not, and should not; begin to attempt to regulate radon and its contribution to dose by requiring licensees to consider its contribution to any source of exposure regulated by NRC, e.g., uranium mining and milling, industrial, medical, low-level waste disposal, etc.