



NUCLEAR ENERGY INSTITUTE

RRR000619

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January 9, 2008

Dr. Jane Summerson
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Office of Civilian Radioactive Waste Management
1551 Hillshire Drive
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Subject: Nuclear Energy Institute Comments on the Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca, Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor; and the Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada

Dear Dr. Summerson:

The Nuclear Energy Institute (NEI),¹ on behalf of the nuclear energy industry, is pleased to submit these comments to the Department of Energy (DOE) on the Draft Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca, Mountain, Nye County, Nevada – Nevada Rail Transportation Corridor (Draft Rail Corridor SEIS) and the Draft Environmental Impact Statement for a Rail Alignment for the Construction and Operation of a Railroad in Nevada to a Geologic Repository at Yucca Mountain, Nye County, Nevada (Draft Rail Alignment EIS) (72 Fed. Reg. 58,071- October 12, 2007).

It is industry's position that the United States should pursue an integrated strategy² to the management of spent or used nuclear fuel – involving centralized interim storage, research, and development and demonstration of advanced recycling technologies to close the nuclear fuel cycle, and disposal in a geologic repository. The Draft Rail Corridor SEIS and the Draft Rail Alignment EIS support that goal by providing the groundwork for the rail transportation of used nuclear fuel to

¹ NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear material licensees, and other organizations and individuals involved in the nuclear energy industry.

² Attached as Enclosure 1 to this letter is an industry policy statement further explaining the integrated strategy to used fuel management.

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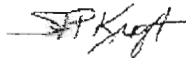
geologic repository at Yucca Mountain. These documents constitute an extensive and comprehensive summary of the impressive work that DOE has completed in preparation for the construction of the branch rail line to Yucca Mountain. These documents also demonstrate that the impacts of the proposed actions are so small as to have essentially no adverse impact on public health and safety and the environment. It is noted, however, that the impacts were calculated in a very conservative fashion, as documented in Enclosure 2, and that the real impacts are expected to be even smaller.

NEI and the nuclear energy industry have extensively reviewed these documents and, as a result of this review, offer specific comments in the following areas in Enclosure 2 to this letter:

- I. Industry's view that the extensive information and analysis presented in these documents provide a sound foundation upon which DOE can finalize a decision on the rail corridor and rail alignment and begin construction as soon as possible.
- II. Industry's endorsement of DOE's decision to provide shared use of the branch line, which will provide economic benefits to the surrounding communities.
- III. Concerns regarding the extent to which DOE has overestimated several of the impacts associated with the proposed actions as described in these documents.
- IV. Industry's view that the sabotage analysis in the Draft Rail Alignment Environmental Impact Statement is extremely over-conservative and highly speculative.
- V. Specific detailed technical comment.

NEI looks forward to maintaining an active ongoing dialogue with DOE on items of mutual interest with respect to transportation of used nuclear fuel to the Yucca Mountain repository. We would be pleased to address any questions the agency may have on our comments.

Sincerely,



Steven P. Kraft

Enclosure

- c: The Honorable Edward F. Sproat, Director, DOE, OCRWM
The Honorable James L. Connaughton, Council on Environmental Quality
Mr. Michael F. Weber, Director, U.S. Nuclear Regulatory Commission, NMSS
Ms. Elizabeth Cotsworth, Director, Office of Radiation and Indoor Air, Environmental Protection Agency

ENCLOSURE 1

Nuclear Energy Industry Supports Integrated Used Fuel Management Strategy

1 [**The industry supports a three-pronged integrated used fuel management strategy:**
1) interim storage until recycling or permanent disposal—or both—are available;
2) research, development and demonstration to close the nuclear fuel cycle;
and 3) developing a permanent disposal facility.

- Interim storage sites at volunteer locations will enable the Department of Energy to move used fuel from both decommissioned and operating plants before recycling facilities or the repository begin operating.
- Intermediate steps also are needed as the government pursues permanent disposal. These reflect the emphasis on closing the fuel cycle and sustainable development of advanced nuclear fuel cycle technologies. These technologies can reduce the volume, heat and toxicity of byproducts placed in the repository and reclaim a significant amount of energy that remains in used fuel.
- The industry's long-term objective is the isolation of byproducts and/or used fuel in a specially designed underground repository. This position is consistent with the international scientific consensus that deep geologic disposal is the most effective means of protecting public health and the environment. Congress has designated Yucca Mountain as the country's repository site, based on sound science supported by decades of rigorous investigation. The repository must be licensed by the Nuclear Regulatory Commission prior to construction and operation.

An integrated used fuel management program includes key deliverables phased in the short-, medium- and long-terms.

Short-term goals include:

- Continued waste confidence and a standard contract covering used fuel management for new plants.
- Starting the Yucca Mountain licensing process, including DOE's submittal of its application to the Nuclear Regulatory Commission.
- Developing a well-defined research and development program for fuel recycling technologies.
- Identifying and developing volunteer sites for advanced fuel cycle facilities, including interim storage of used reactor fuel.

▪ *Medium-term goals* include:

- Moving used fuel to interim storage sites by the federal government, ideally at advanced fuel cycle development sites.
- Continuing research, development and demonstration of advanced fuel recycling and fuel fabrication technologies to make them more cost-effective and efficient, and to maximize uranium recycling.
- Yucca Mountain repository licensing.

Long-term goals include:

- Operating advanced fuel recycling and fuel fabrication facilities.
- Operating the Yucca Mountain repository.]

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ENCLOSURE 2

NUCLEAR ENERGY INSTITUTE (NEI)
COMMENTS ON
THE US DEPARTMENT OF ENERGY'S
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR A GEOLOGIC
REPOSITORY FOR THE DISPOSAL OF SPENT NUCLEAR FUEL AND HIGH-LEVEL
RADIOACTIVE WASTE AT YUCCA MOUNTAIN, NYE COUNTY NEVADA – NEVADA
RAIL TRANSPORTATION CORRIDOR
(RAIL CORRIDOR SEIS)
AND
DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR A RAIL ALIGNMENT FOR THE
CONSTRUCTION AND OPERATION OF A RAILROAD IN NEVADA TO A GEOLOGIC
REPOSITORY AT YUCCA MOUNTAIN, NYE COUNTY, NEVADA
(RAIL ALIGNMENT EIS)

- 2 I. [The extensive information presented in the Draft Rail Corridor SEIS and Draft Rail Alignment EIS provides a sound foundation upon which DOE can finalize a decision on the rail corridor and rail alignment and begin construction as soon as possible.

In the Draft Rail Corridor SEIS and Draft Rail Alignment EIS, DOE has demonstrated that there are no significant adverse environmental impacts from building and operating a railroad to Yucca Mountain in either the Mina or Caliente corridors. Based on the information presented, DOE should finalize these documents and make a final decision on the corridor and alignment of the rail line. Construction should then begin as soon as possible so that a rail line will be available for use in repository construction and will be available well before repository operations are scheduled to commence. DOE's current schedule fully supports this goal, and industry encourages DOE to maintain the rail construction schedule to the best of its ability. Having rail available for infrastructure improvements and repository construction will minimize disruption of traffic in the repository vicinity and otherwise minimize environmental impacts to residents near the repository.]

- 3 II. [Shared use of the branch rail line will benefit the local communities.

Industry commends DOE for consideration of shared use of the branch rail line to the repository and for the inclusion of a shared-use analysis in these Draft EIS documents. Shared use of the branch rail line to the repository will provide opportunities for economic development to the communities along the rail line.]

- 7 [Previously¹, industry has urged DOE to discuss the possibility of connecting the route to the repository to the railroad south of the repository. Industry still supports this connection as it will bring further economic benefits to the communities along the rail line. However, industry urges DOE to begin the construction of the proposed branch line to the repository site as soon as possible and not delay construction to study an extension of the branch line south of the repository. An extension beyond the repository can be reviewed at a later date and should not affect the primary line.]

¹ Letter, Steven P. Kraft to Judith A. Holm, *Nuclear Energy Institute Comments on U.S. Department of Energy Office of Civilian Radioactive Waste Management Draft Outline for the National Transportation Plan dated February 23, 2007*, letter dated March 20, 2007

8 [Once the final shipments to the repository are complete, Industry encourages DOE to make the rail line and facilities available to local communities to the extent practicable rather than abandoning such facilities, which is an option discussed in the Draft Rail Alignment EIS, Section 2.2.3.]

4 III. [Even though the Draft Environmental Impact Statements find the impacts of the proposed action to be small, it has significantly overestimated these impacts in several respects.]

In conducting the analyses presented in the Draft Rail Corridor SEIS and Draft Rail Alignment EIS, DOE has built in a number of conservative assumptions intended to establish a certain margin of confidence in the results. While the use of conservative analyses does provide additional confidence in safety, it does not necessarily provide the public with a realistic representation of the expected radiological health and safety and environmental consequences. We understand the use of bounding analysis in the context of an EIS that must comply with both the National Environmental Policy Act (NEPA) and DOE's internal NEPA requirements. However, in our review of these documents, we found the following examples of areas where DOE's use of conservatism should be reduced or, at least, better explained.

- Sections 4.2.10.2.2 and 4.3.10.2.2 of the Draft Rail Alignment EIS, states the maximally exposed individual worker would receive 25 rem based on an assumption that he or she would receive an annual administrative limit of 500 millirem per year for a 50 year working life escorting shipments. Instead of making the unreasonable assumption that the same person would receive the maximum allowed dose for 50 consecutive years, only the maximum annual results should be presented.

Furthermore, even if an individual were to work the same job for 50 consecutive years, which would be unprecedented, use of the maximum annual results based on the administrative dose limit of 500 millirem would still be overly conservative. It should be noted that industry experience indicates that the average worker dose is less than 200 millirem per year.² We, therefore, do not agree with DOE's decision to assume that workers would receive the administrative dose limit of 500 millirem per year, every year, no matter how short or long his or her career might be.

- Section K.2.3 of the Draft Rail Alignment EIS, discusses methods for estimating transportation impacts. One of the assumptions is that the radiation levels emitted from transportation casks will be at the regulatory limit of 10 millirem per hour at a distance of 2 meters for every transportation cask. This should be recognized as conservative since not all casks will be loaded with fuel that has the characteristics that would result in the cask external dose rate being at the regulatory limit. In Electric Power Research Institute (EPRI) report, Assessment of Incident Free Transport Risk for Transport of Spent Nuclear Fuel to Yucca Mountain Using RADTRAN 5.5,³ EPRI noted that since more than 40% of the fuel shipped is likely to have been cooled for times greater than 20 years, cask external dose rates will be lower than the regulatory limit for the majority of packages shipped. Incident free dose is directly proportional to the cask external dose

² World Association of Nuclear Operators (WANO), 2004 Industry Performance Indicators, Collective Radiation Exposure, p. 16

³ EPRI, Assessment of Incident Free Transport Risk for Transport of Spent Nuclear Fuel to Yucca Mountain Using RADTRAN 5.5, # 1011821, September 2005 (EPRI 2005).

rate. Thus, if one assumes that the external dose rate is 30% lower than the regulatory limit, the calculated incident free dose will be 30% lower. It is suggested that DOE either replace this assumption with a more realistic assumption based on projected waste streams or on an estimate using statistical average radiation limits from previous shipments or include a more realistic estimate as a point of reference. As identified in EPRI 2005, there are also other conservative assumptions contained in the calculation of the radiological risk associated with incident free transportation that result in an overstatement of risk. These conservatisms should be recognized and identified to assist decision makers and the public in evaluating the results presented in the EIS.

- Sections 4.2.10.2.2.2 and 4.3.10.2.2.2 of the Draft Rail Alignment EIS, discuss impacts of severe accidents and presents a text box saying the State of Nevada has an opposing viewpoint that the consequences of severe accidents could be much greater than estimated by DOE. Many of the assumptions made by DOE in the calculation of accident risk are conservative, resulting in an overestimate of accident risk, and should be noted as such. For example, all material is assumed to be aerosolized and respirable and there is no interdiction or cleanup. In a re-assessment of transportation accident risk performed by EPRI in 2006, EPRI found that overall accident risk could be reduced by 35% to 40% with the use of less conservative, more realistic assumptions.⁴ If the accident analysis assumes evacuation, interdiction and cleanup, accident dose risk can be reduced by 70%. In addition, neither the accident analysis nor the sabotage analysis take credit for the fact that DOE assumes that at least 75% of the used nuclear fuel will be shipped in Transportation, Aging, and Disposal (TAD) canisters – an additional barrier that is not accounted for in the release fractions. Where inputs are unrealistically conservative, recognition of this should be highlighted. This recognition should be applied in responding to the State of Nevada viewpoint to show how DOE has applied the very conservative input assumptions to derive gross overestimates, as opposed to underestimates, of accident consequences.
- In Sections 4.2.10.2.2.2 and 4.3.10.2.2.2 of the Draft Rail Alignment EIS, the assessment of the maximum reasonably foreseeable accident considered accidents with a probability of more than 1×10^{-7} (1 chance in 10 million) – this is an order of magnitude lower than NRC guidance regarding “credible” accident, defined as accidents with a probability of 1 chance in 1 million.⁵ The Draft Rail Alignment EIS evaluated the maximum “reasonably foreseeable” transportation accident as having a frequency of 6×10^{-7} per year and would involve a long-duration, high-temperature fire that would engulf a cask. This maximum reasonably foreseeable accident does not take into account recent action by the U.S. Nuclear Regulatory Commission (NRC) staff and the American Association of Railroads (AAR) to reduce the probability of rail accidents that could result in a long-duration high-temperature fire. Specifically, in response to recommendations by a National Academy of Science committee that studied the transport of radioactive waste, the U.S. Nuclear Regulatory Commission considered transportation operational controls that could be implemented to prevent or mitigate the consequences of a long-duration fire associated with rail shipments.⁶ NRC staff re-

⁴ EPRI, Assessment of Accident Risk for Transport of Spent Nuclear Fuel to Yucca Mountain Using RADTRAN 5.5, #1013450, September 2006 (EPRI 2006).

⁵ U.S. NRC, Memorandum and Order, In the matter of Private Fuel Storage LLC, Docket No. 72-22-ISFSI, CLI-01-22, November 14, 2001.

⁶ NRC, 2007a. Reyes, Luis A., Executive Director for Operations, U.S. NRC, to NRC Commissioners, Staff Actions Taken in Response to the National Academy of Sciences’ Study on Transportation of High-Level Waste and Spent

questioned that the AAR consider revising the AAR Circular on railroad operating practices for transport of hazardous materials, OT-55, to prohibit a train carrying flammable gases or liquids from being in a tunnel at the same time as a train carrying used nuclear fuel. AAR has revised OT-55 to include such a prohibition. NRC staff has concluded that this action to revise the AAR recommended operating practices combined with DOE's stated policy to use dedicated trains for transporting used nuclear fuel have effectively addressed operational controls that would decrease the probability of rail accidents that could result in long duration fires. DOE should recognize this action on the part of the NRC and AAR in the Draft Rail Alignment EIS and remove from the list of "reasonably foreseeable" accidents those accidents that consider long-duration high-temperature fires – since the probabilities of this type of accident occurring would now be much lower due to the actions of AAR.

- In the "Accidents at the Cask Maintenance Facility" portion of Sections 4.2.10.2.2.2 and 4.3.10.2.2.2 of the Draft Rail Alignment EIS, DOE notes that the public would be located about 11 km from the facility. Yet, in calculating the population dose for a fire at the facility, DOE assumes that the entire population would be exposed at the same level as a member of the public located 300 meters from the facility. This results in an unrealistic collective dose of 1.3 person-rem given the extremely conservative assumptions regarding the location of the population.
- Sections 4.2.10.2.2.2 and 4.3.10.2.2.2 of the Draft Rail Alignment EIS summarize the "collective dose" to the public from transportation operations. As an example, Table 4-119 lists the population receiving a calculated radiation dose of 87 person-millirem to 210 person-millirem, with a latent cancer fatality probability of 0.000052 to 0.00013 – which is essentially zero. Based on these results, the dose to an individual will be negligible and the latent cancer fatality probability essentially zero. The National Council on Radiation Protection and Measurement (NCRP) cautions on the use of collective dose, noting that there are questions regarding the "applicability of the collective dose concept to large populations with very small individual doses and to populations that will exist several generations hence."⁷ If DOE plans to continue to utilize collective dose in this document, DOE should include a discussion that puts the collective dose into perspective. Results from more reasonable scenarios and assumptions should also be presented in order to provide the public with more realistic consequences.]

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IV. [The sabotage analysis in the Draft Supplemental Environmental Impact Statement is extremely conservative and highly speculative

Used nuclear fuel transportation and storage containers are extremely robust and highly resistant to sabotage. The same defense-in depth design philosophy that protects these systems against severe accidents, drops, puncture, fires and submersion in water also makes them highly resistant to terrorist attack. Additionally, NRC regulations⁸ require that a strict security plan be in place for all shipments which will carefully track and monitor the shipments as well as establish specific procedures to protect against sabotage and theft.

Nuclear Fuel in the United States, SECY-07-0095, June 6, 2007

⁷ NCRP, Principles and Application of Collective Dose In Radiation Protection, NCRP Report No. 121, November 30, 2005

Industry believes that DOE has not taken these security precautions properly into account and, as a result, the Draft Rail Alignment EIS significantly overestimates both the likelihood and potential consequences of a sabotage event. The extreme over-conservatism in the Department's approach diminishes the value of this document as a public communication tool, as it can potentially raise concerns that are not justified. Several examples of this problem, as well as recommendations for better communicating the context of the scenarios evaluated, are provided below.

- Sections 4.2.10.2.2.2 and 4.3.10.2.2.2 of the Draft Rail Alignment EIS, discuss severe accident and sabotage scenarios and the resulting estimated consequences. Based on the information in the document Appendices and references, the analysis includes very conservative input assumptions regarding response to the sabotage or accident events. This should be noted in the text along with analytical results of more reasonable scenarios. For instance, estimates assuming evacuation within a few hours one half mile from the severe event would be more reasonable and should be included as a point of reference. Bounding analysis is useful to DOE impact analysts, but, absent qualification, it tends to misinform the public.
- In Section K.2.6 of the Draft Rail Alignment EIS it is recognized that DOE plans to operate the repository using primarily TAD canisters which would hold 21 PWR assemblies. However, DOE chose to estimate the consequences of a rail sabotage event based on the radionuclide inventory in 26 PWR assemblies, "which overestimated consequences by about 24 percent in comparison to the inventory in 21 pressurized-water reactor spent nuclear fuel assemblies." (Section K.2.6, page K-52).

As a core legal matter, NEI notes that evaluating the environmental impacts of potential terrorist attacks against nuclear facilities and activities not only severely distorts the National Environmental Policy Act (NEPA), it is not a general legal requirement. U.S. Supreme Court decisions in *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766 (1983), and *Department of Transportation v. Public Citizen*, 541 U.S. 752 (2004), make clear that NEPA should not be construed to force agencies to consider environmental impacts for which they cannot reasonably be held responsible. In *Metropolitan Edison*, the Court held that NEPA did not require the Nuclear Regulatory Commission (NRC) to consider the "severe psychological distress" that local residents might suffer if a nuclear plant resumed operation, even though relicensing the plant would be a "but-for" cause of any such distress. *Metropolitan Edison*, 460 U.S. at 774. The Court explained that "[t]ime and resources are simply too limited" for Congress to have intended to extend NEPA to cover every conceivable impact of any agency's decision. *Id.* at 776. Instead, the Court recognized that NEPA's underlying policies and Congress's intent limit the Act's scope in a manner similar to "the familiar doctrine of proximate cause from tort law." *Id.* at 774. Applying that limitation, the Court found the causal relationship between the federal action at issue, an ensuing change in the physical environment, and the feared distress of residents "too attenuated" to make the NRC potentially "responsible for [the feared] effect" in a way that required NEPA analysis. *Id.* at n.7. The residents' claim "lengthen[ed] the causal chain beyond the reach of NEPA." *Id.* at 775.

In *Public Citizen*, the Court again recognized common sense limitations on the scope of NEPA. The President had made clear that he would lift a ban on cross-border operations by Mexican motor carriers, subject to the promulgation of safety regulations by the Federal Motor Carrier Safety Administration (FMCSA). The FMCSA's NEPA assessment considered the increased emissions and noise that would result directly

from the inspection regime to be established by the regulations, but not the environmental consequences that might be caused by the increased cross-border traffic itself. The agency reasoned that those consequences resulted from the President's decision to permit the traffic, not from the agency's safety regulations. *Public Citizen*, 541 U.S. at 760-61.

The Supreme Court agreed. Although the regulations were a condition precedent to the cross-border traffic, and would inevitably trigger the environmental effects, that was "insufficient to make [the FMCSA] responsible for [those] effect[s] under NEPA." *Id.* at 767. Moreover, while NEPA aims to ensure that agencies consider information about potential environmental effects before deciding whether and how to take a particular action, and to facilitate public participation in that consideration, those purposes also limit the statute's reach:

[I]nherent in NEPA and its implementing regulations is a "rule of reason," which ensures that agencies determine whether and to what extent to prepare an [Environmental Impact Statement (EIS)]. . . based on the usefulness of any new potential information to the decision making process. Where the preparation of an EIS would serve "no purpose" in light of NEPA's regulatory scheme as a whole, no rule of reason worthy of that title would require an agency to prepare an EIS. *Id.* at 767 (citations omitted).

The foregoing notwithstanding, NEI recognizes that the controlling law in the Ninth Circuit is to the contrary. See *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (2006), *cert. denied*, -- U.S. --, 127 S. Ct 1124 (2007). Accordingly, since Yucca Mountain is within the geographic boundaries of the Ninth Circuit's jurisdiction, DOE's analyses are compelled under the circumstances. Nevertheless, in conducting such analysis DOE should either take care to avoid excessive speculation and conservatism or, at least, explain the speculative and conservative nature of its analysis.]

6 V. [**Specific detailed technical comment**

In addition to the overall recommendations made above, we offer the following specific comment for DOE's consideration.

Incorrect Reference

Section 5.2.6.2 of the Draft Rail Corridor SEIS, page 5-21, references Section 2.2.3. It appears that the appropriate reference should be Section 3.2.6.]



FAX Cover Sheet

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Comments: