



NUCLEAR ENERGY INSTITUTE

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**Nuclear Energy Institute Comments on the U.S. Department of Energy
Notice of Intent: *Supplement to the Final 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, 71
Federal Register 60490, October 13, 2006***

Dear Dr. Summerson:

The Nuclear Energy Institute (NEI)¹, on behalf of the nuclear energy industry, is pleased to comment on the Department of Energy's Notice of Intent (NOI) regarding a proposed *Supplement to the Final 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* (DOE/EIS-0252). The primarily canistered approach to the handling of commercial used nuclear fuel at the repository described in the NOI is a significant improvement in repository design. The nuclear industry agrees with the Department of Energy (DOE) that none of the modifications of repository design or operational plans associated with this approach would result in environmental effects not already considered in the 2002 Final Environmental Impact Statement (FEIS).

The design improvements associated with the primarily canistered approach will provide for an enhanced level of worker, public, and environmental protection at Yucca Mountain. In choosing to supplement the FEIS, even though the net effect of the design being evaluated will be to lessen the already small environmental impact of the repository, DOE has demonstrated an exemplarily high level of commitment

¹ NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. 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, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

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to thoroughness and openness that not only satisfies but exceeds the Department's responsibilities under the National Environmental Policy Act (NEPA).

We applaud DOE both for seeking to improve the repository design and for making its design evaluation transparent to the public through the NEPA process. Industry encourages DOE to move expeditiously forward with the proposed Supplement along with the planned application to the Nuclear Regulatory Commission (NRC) to construct and operate the repository. In support of these objectives, we offer the following comments on this NOI:

- Industry strongly supports the primarily canistered approach and the repository design changes associated with it. This concept enhances the ability of the Yucca Mountain project to be carried out in an environmentally sound manner and benefits the nuclear industry by allowing nuclear plant operators to load used fuel directly into packages that are certified for disposal.
- As DOE has stated in the NOI, the original FEIS recognized that repository design was always intended to evolve. DOE's decision to now go beyond what is required, by supplementing the FEIS, should not convey the implication that there is any requirement for design changes that are bounded by the original FEIS to undergo additional NEPA evaluation. The supplement should explicitly recognize this.
- DOE should maintain flexibility regarding the percentage of the commercial used nuclear fuel inventory expected to arrive at Yucca Mountain in standardized transportation, aging, and disposal (TAD) canisters. While the goal of placing as much as 90 percent of the commercial inventory in TADs is laudable, the actual amount of used fuel available for placement in TADs will depend on a number of factors including how much fuel has already been placed in existing dual purpose canisters for transport to Yucca Mountain at the time TADs become available – an amount which is already greater than 10 percent of the total inventory currently allowed by law for disposal at Yucca Mountain.
- Industry strongly supports the development, as described in the NOI, of a wet handling facility for the unloading of existing dual purpose canisters at Yucca Mountain in order for fuel to be transferred to a TAD canister. Wet handling of fuel is consistent with established industry practice. It is important for DOE to include this capability because DOE should not expect fuel already loaded in transportable canisters to be repackaged at reactor sites (in fact, at some shutdown reactor sites, on-site capability to repackage no longer exists).
- DOE should, in the supplement, recognize that TADs transported to Yucca Mountain will meet the same stringent requirements that govern existing used fuel shipments. Accordingly, the excellent and extensive safety record that has been achieved in the transportation of existing canister-based systems should be a key input to the proposed evaluation.

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- Industry believes that extensive use of rail-based TAD canisters is consistent with the "mostly rail" option DOE has selected for used fuel transportation. This will help minimize the number of truck shipments. However, DOE should recognize that some reactor sites may need to ship by truck due to infrastructure limitations. Accordingly, DOE should also consider use of a TAD that can be shipped by legal weight truck.
- Industry does not believe that the scope of this supplement should be extended to address aspects of repository design and operation that are not materially affected by the design change to a primarily canister based approach. The thermal operating characteristics of the underground repository, although described in the NOI, are not materially affected by these design changes and thus should not be considered to be within the scope of this supplement.
- DOE should not limit the period of retrievability of emplaced waste to 100 years after the start of emplacement as discussed in the NOI. DOE, in the original FEIS, had provided for a period ranging from 100 to 300 years. Industry believes, the longer time frame should be maintained to afford additional opportunity for advanced technologies to be applied to improving the repository and/or for recycling of used nuclear fuel.
- Industry agrees with DOE that there is no need to reanalyze the no action alternative.
- It is not appropriate for DOE to consider sabotage under NEPA as has been proposed in the NOI. The possibility of a terrorist attack is simply too far removed from the natural or expected consequences of the use of TADs to be considered under NEPA and such consideration is not required under law. Accordingly, DOE should withdraw this proposal and not extend the scope of the supplement to address sabotage.

Additional details on each of these comments are provided in the enclosure to this letter. We look forward to continued dialogue on this subject and participation in the public evaluation process proposed for this supplement. If you have any questions, please do not hesitate to contact me at (202) 739-8082; rxm@nei.org.

Sincerely,



Rod McCullum

c: The Honorable Edward F. Sprgat, Director, OCRWM, DOE
Mr. Mark H. Williams, Director, Regulatory Authority, OCRWM, DOE
Mr. Lawrence Kokajko, Director, HLWRS, NMSS, NRC

ENCLOSURE

**Nuclear Energy Institute (NEI)
Detailed Comments On U.S. Department of Energy Notice of Intent:
*Supplement to the Final Environmental Impact Statement for a Geologic
Repository for the Disposal of Spent Nuclear Fuel and High-Level
Radioactive Waste at Yucca Mountain, Nye County, 71 Federal Register
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Support for the Primarily Canistered Approach

Industry's strong support for the primarily canistered approach and the repository design changes associated with it is based on the advantages that this approach offers both at the repository and at reactor sites:

- At the repository, this concept will greatly simplify the design of surface facilities at Yucca Mountain and significantly reduce the amount of fuel handling that will be conducted in those facilities. This simplification and reduction in scope of operations will add a measure of safety and enhance the ability of the Yucca Mountain project to be carried out in an environmentally sound manner. The citizens of Nevada will benefit from the additional assurances of protection provided by this approach. This approach should also result in a less complex license application which will facilitate timely and thorough review by NRC.
- At reactor sites this approach provides for plant operators to load used fuel into a multipurpose transportation, aging, and disposal (TAD) canister provided by DOE. Once loaded into a TAD, plant operators can be confident that there will be no need for any subsequent repackaging and additional handling of that fuel as the TAD will already be certified as acceptable for disposal in the repository. The fact that the TAD canister will be provided by DOE will help mitigate future impacts of DOE's delay in accepting commercial spent fuel while providing a valuable level of certainty for the plant operators in the implementation of TAD based dry storage systems at reactor sites (based on the knowledge that such systems will be compatible with repository systems and thus acceptable to DOE). This approach also provides an equally valuable level of confidence to stakeholders around the plant that a TAD system loaded with used nuclear fuel, being already certified for disposal, will eventually be removed from the site.

Over the past year DOE has interacted extensively with industry technical experts to assure that industry experience is considered in the development of this approach. Based on these interactions, DOE's recently published TAD performance specification, and what DOE has presented publicly concerning the repository design proposed for evaluation in this supplement, we are confident that this

approach can be carried out in a manner that is consistent with industry best practices. Doing so will facilitate improved integration of the overall waste management system – from at reactor storage, to transportation, to ultimate disposal at the repository.

Recognition of the Evolutionary Nature of Repository Design

DOE's 2002 Yucca Mountain Final Environmental Impact Statement (FEIS) recognized that repository design was always intended to evolve. The design changes intended to be addressed in the proposed supplement simply represent one stage in that evolution. While industry commends DOE for making its design evaluation process transparent to the public through the NEPA process, it is important to point out that a Supplement to the FEIS is not specifically necessary to satisfy National Environmental Policy Act (NEPA) requirements pursuant to the Nuclear Waste Policy Act. This was recognized by DOE in the October 13 Notice of Intent (NOI), Background section, in the following statement:

“(The FEIS) considered the potential environmental impacts of a repository design for surface and subsurface facilities, a range of canister packaging scenarios and repository thermal operating modes, and plans for the construction, operation and monitoring, and eventual closure of the repository. The Yucca Mountain FEIS also described and evaluated the transportation of spent nuclear fuel and high-level radioactive waste from commercial and DOE sites to the repository by two principal modes – mostly truck and mostly rail. DOE recognized at that time that these repository design concepts and operational plans would continue to develop during the design and engineering process.”

Consistent with this philosophy, the design activities described in the NOI all fall within the previously evaluated range of alternatives considered in the FEIS as previously anticipated by DOE. Neither the proposed action nor the preferred alternative stated in the FEIS has changed (see pages S-9 and 2-2 of the FEIS). DOE should recognize this in the Supplement and take care not to narrow its description of the proposed action to a higher level of specificity than was done for the FEIS. The fact that DOE may now have more detailed design information regarding specifics of the proposed action, does not mean that the proposed action has changed. Moreover, DOE's description of an evolving design and operational scenarios is just as true today as when the FEIS was issued.

Nevertheless, the specifics outlined in current plans are improvements to the more general concepts previously considered by DOE, and are a reasonable step in the evolution of the repository project. While industry supports DOE's current plans, we offer caution that DOE should not limit its ability to modify its plans in the future by eliminating alternatives or ranges of operations already considered in the FEIS. As DOE has pointed out on numerous occasions, the repository design will

continue to evolve. Therefore, flexibility should be maintained in the Supplement to the FEIS to reconsider plans within the limits of the existing environmental analysis without having to reanalyze. The Supplement itself should explicitly recognize that DOE, in issuing the Supplement, is going beyond what is necessary and avoid conveying any implication that design changes such as the one described in the NOI *require* additional NEPA analysis.

Need for Flexibility in the Apportionment of Standardized Canisters

In the NOI, DOE makes the following statements regarding the extent to which TADs will be used to minimize fuel handling at Yucca Mountain:

“ . . . as much as 90 percent of the commercial spent nuclear fuel would be placed in TADs at the commercial sites prior to shipment.”

And

“The remaining nuclear fuel (about 10 percent) would be transported . . . to the repository in dual purpose canisters (canisters suitable for storage and transportation) or would be uncanistered.”

Industry agrees with DOE that maximizing the use of TADs to minimize the amount of used fuel requiring repackaging at the repository is a laudable goal. However, in pursuing this goal, DOE must leave sufficient flexibility to accommodate the ongoing accumulation of used nuclear fuel in dual purpose systems not based on the TAD canister concept.

While industry recognizes that the current NWPA limit of 70,000 metric tons placed on the amount of used fuel that can be disposed of at Yucca Mountain is arbitrary and the actual amount of used fuel that the repository is capable of handling is likely much greater, DOE does need to consider the relationship between this limit and inventories already stored in dual purpose systems. Specifically, industry has already placed approximately 9,500 metric tons of used nuclear fuel in dry storage systems that are not TADs. This represents 15 percent of the 63,000 metric tons of statutory repository capacity that DOE allocated for commercial used nuclear fuel in the FEIS.

The majority of existing non-TAD containers are either licensed for transportation to Yucca Mountain or are expected to be licensed for transportation in the future. Industry is emplacing additional used fuel in dry storage at a rate of about 1200 metric tons per year (equivalent to an additional 2 percent of the Yucca Mountain allocation) DOE should not expect reactor operators to repackage fuel already stored in containers that are suitable for transportation. Furthermore, in the case of some shutdown plants at which all fuel has been placed in dry storage, used fuel pools have been decommissioned, leaving no existing on-site capability to repackage. It is therefore industry's expectation that DOE will need to receive an amount of used fuel that exceeds 10 percent in packages other than TADs. Industry is committed to working with DOE to facilitate deployment of TADs in as timely a

manner as is possible to minimize the extent to which the 10% goal is exceeded, but it is already clear that flexibility for some exceedance of this goal will be necessary.

Additionally, there is no environmental policy reason for DOE to limit the use or nonuse of TADs to a specific percentage in the proposed supplement. The existing FEIS analysis covers a range of mostly canistered to mostly uncanistered used nuclear fuel. In order to preserve necessary flexibility, DOE should not seek to narrow this range.

Importance of a Wet Handling Facility at Yucca Mountain

Given the fact that, as discussed above, DOE expects a portion of the used fuel shipped to Yucca Mountain to arrive in packages other than TADs, the provision of capability to repackage used nuclear fuel at the repository site is an important element of the repository design. Industry agrees with DOE that a wet handling facility, such as that described in the NOI, is appropriate for this purpose and therefore strongly supports DOE's decision to include this facility in the repository design. A wet handling facility, relying on established technology and methods for unloading existing dual purpose canisters at Yucca Mountain in order for fuel to be transferred to a TAD canister will provide for safe and environmentally sound operations.

This conclusion is supported by decades of industry operating experience at over 100 fuel pools similar to the one now planned for Yucca Mountain. The outstanding record of safety and environmental compliance established at these facilities forms a solid precedent which should be considered in this supplement. A wet handling facility at Yucca Mountain that is designed and operated to the same high standard of safety should have virtually no environmental impact. Furthermore, in general, environmental impacts from repository surface facility construction and operations are not sensitive to the number and type of buildings DOE includes unless there's a significant difference in the amount of land disturbed or a difference in facility safety. Since DOE is not proposing significant changes in the size of the surface operations area and all of the same safety requirements will be met if a repository is to be licensed, no significant differences in environmental impacts from the FEIS analysis should be anticipated based on DOE's current plans.

Applicability of Established Transportation Safety Record

More than 3,000 shipments of used nuclear fuel, covering more than 1,700,000 miles, have been completed safely over the last 40 years in the United States. In fact, none of these shipments resulted in any injury due to the release of radioactive materials. There have been only four accidents, with no release of radioactive materials to the environment in any of them. Worldwide, more than 70,000 metric tons of used fuel has been transported safely in more than 21,000 shipments.

DOE should, in the Supplement, recognize that TADs transported to Yucca Mountain will meet the same stringent requirements that govern existing

commercial used fuel shipments. These shipments are routinely made using robust shipping containers certified by the Nuclear Regulatory Commission. These regulations require stringent safety tests, extensive operational controls, and designed-in protection in order to assure that there will be no harmful release of radioactive materials even in extreme accident conditions.

This exemplary safety record should be a key input to the proposed Supplement, as was the case in the existing FEIS. Given this safety record, and the fact that it is fully representative of what can be expected of TADs, specific details such as the number of TADs that might be shipped in comparison to the number of dual purpose casks that might be shipped should not result in any significant difference from the low environmental impacts described in the original FEIS. Similar to what was discussed above in our comment on design evolution, DOE should not – via this supplement – narrow its range of options with respect to transportation.

Considerations Regarding Rail and Truck Standardized Canisters

Industry believes that extensive use of rail-based TAD canisters is consistent with the “mostly rail” option DOE has selected for used fuel transportation. Thus far, the only proposed TAD design that has been publicly presented by DOE has been for a canister that will be shipped by rail. DOE’s objective of receiving as much fuel as possible in TADs will, therefore, help minimize the number of truck shipments.

While we agree that a rail-based TAD is the most effective option, DOE should also recognize that some reactor sites may need to ship by truck due to infrastructure limitations. Accordingly, DOE should also consider use of a TAD that can be shipped by legal weight truck in its design planning. Industry is willing to support this objective by engaging the Department in discussions regarding the possibility of developing such a truck shippable TAD.

Repository Thermal Operating Mode

The Supplement need not reconsider thermal operating modes to the exclusion of the range already considered in the FEIS so long as the current planned thermal operating mode is within the range already considered. Based on our reading of the existing FEIS, and what DOE has presented publicly regarding the current plans, we believe that the current mode is within the range already considered.

Furthermore, we do not see any possible way that repository thermal operating conditions can be materially affected by the design change to a primarily canister based approach because the TADs will meet, at the time of emplacement, the same 11.8 kw thermal limit that DOE had imposed on the waste package prior to this change.

Additionally, no limits, either real or implied, on future reconsideration of thermal operating mode should be included in the Supplement. There is no reason to limit the proposed action by imposition of a particular thermal mode. The current preference of a higher-thermal mode should be recognized as just that, a current

preference. The option to change to a lower-thermal mode should not be precluded by the Supplement to the FEIS. The original FEIS covers the potential environmental impacts from a wide range of thermal modes and preclosure operating periods from 100 to 300 years.

Period of Retrievability

It is important that DOE not limit the period of retrievability of waste to 100 years after the start of emplacement, even though DOE's current plans may call for 50 years of retrievability (the minimum regulatory limit) following a 50 year emplacement period. The FEIS covered a range of up to 300 years after final emplacement of waste and the Supplement should not limit DOE's flexibility in choosing how long to maintain the ability to retrieve SNF.

Industry further requests that DOE consider revisiting its current plans to preserve the opportunity take full advantage of time periods up to the 300 year period provided for in the FEIS. Use of a longer time frame would afford additional opportunity for monitoring results to be applied to improving the repository and/or the development of capability to recycle used nuclear fuel. It is particularly important for such opportunities to be preserved at a time where there is increased focus on advanced fuel treatment technologies such as those envisioned by DOE's Global Nuclear Energy Partnership (GNEP) program. DOE recently sought expressions of interest in recycling technology and provided a funding availability opportunity for the study of specific recycling sites. In order to harmonize the Department's repository program with its broader technology initiatives in the area of used fuel management, this supplement should not seek to limit the period of retrievability.

Reanalysis of the No Action Alternative

Given that there have been no relevant changes in circumstances or information that might affect the no action alternative, industry agrees with DOE's statements in the NOI that there is no need to reanalyze this aspect of the FEIS in the supplement. The No Action Alternative analysis in the FEIS analyzed the broadest possible range of alternative scenarios ranging from – at one end of the spectrum – maintaining institutional control over existing at reactor storage sites for thousands of years to – at the other extreme – abandoning institutional controls after 100 years. Then as now, any conceivable no action scenario would fall somewhere between these two end points and is, therefore, bounded.

Consideration of Sabotage

According to the NOI, DOE intends to address the potential radiological impacts to workers and the public from terrorist sabotage of transportation and repository operations in the FEIS supplement. Industry recognizes the importance of assuring security and is committed to protecting used fuel shipments from terrorism.

Industry further understands that DOE will include many features aimed at preventing sabotage in its repository design. However, under NEPA, there is no requirement to address the potential impacts of a terrorist attack, and DOE should not do so in the proposed supplement.

An EIS is not an appropriate vehicle for addressing the challenges of terrorism. The purpose an EIS is to inform the decision-making authority and public of the range of environmental impacts that will result, with a fair degree of likelihood, from a proposed project, not to speculate on “worst-case” scenarios and how to prevent them.

The possibility of a terrorist attack is simply too far removed from the natural or expected consequences of the use of TADs to be considered under NEPA. Supreme Court decisions in *Metropolitan Edison Co. v. People Against Nuclear Power*, 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 sensibly be held responsible, even if their actions might “cause” those impacts in a strictly “but-for” sense. Nor should NEPA be interpreted to require agencies to perform analyses that would not meaningfully inform agency decisions about whether or how to take a particular action.

In *Metropolitan Edison*, the Court held that NEPA did not require the NRC to consider the “severe psychological distress” that local residents might allegedly suffer if a nuclear plant resumed operations, even though relicensing of the plant would be a “but-for” cause of any such distress. 460 U.S. at 774. The Court explained, “[t]ime and resources are simply too limited for us to believe that Congress intended to extend NEPA to cover every conceivable impact of an agency’s decision.” *Id.* at 776. Considered in light of the relevant “underlying policies or legislative intent,” the relationship between the federal action at issue, an ensuing change in the physical environment, and the feared distress was “too attenuated” to make the agency potentially “responsible for [the feared] effect” in a way that required NEPA analysis. *Id.* 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 case involved an announcement by the President that he would lift a ban on cross-border operations by Mexican motor carriers, subject to 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 regulations, but not 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. The Supreme Court agreed. Although the

regulations were necessary to permit the cross-border traffic, and would inevitably trigger any environmental effects of that traffic, that was “insufficient to make [FMCSA] responsible for [those] effect[s] under NEPA” *Id.* 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 serve to 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 decisionmaking 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 767-768 (citations omitted)

The only case of which industry is aware wherein a court has held that consideration of terrorism was appropriate under NEPA was the Ninth Circuit Court of Appeals decision in *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (2006). The case involved the licensing of an Independent Spent Fuel Storage Installation at a nuclear power plant. That decision, however, is currently the subject of a request for Supreme Court review (*Pacific Gas and Electric Company v. San Luis Obispo Mothers for Peace, et al.*, No. 06-466), and the NRC has not yet taken action to implement the decision. For the foregoing reasons, DOE need not and should not address the potential impacts of a terrorist attack in the FEIS supplement.