As of: January 08, 2013
Received: January 02, 2013
Status: Pending_Post
Tracking No. 1jx-82vx-3zym
Comments Due: January 02, 2013
Submission Type: Web

PUBLIC SUBMISSION

Docket: NRC-2012-0246
Consideration on Environmental Impacts on Temporary Storage of Spent Fuel After Cessation of Reactor Operation

Comment On: NRC-2012-0246-0001
Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation

(152)
10/25/2012
77 FR 65137

Document: NRC-2012-0246-DRAFT-0502
Comment on FR Doc # 2012-26295

Submitter Information

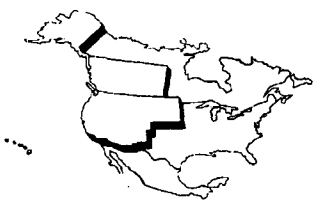
Name: Jim Williams
Address:
1600 Broadway
Suite 1700
Denver, CO, 80202
Submitter's Representative: Jim Williams
Organization: Western Interstate Energy Board
Government Agency Type: Regional

General Comment

See attached file(s)

Attachments

01-02-13 HLW Comments to NRC



Western Interstate Energy Board/ WINB

January 02, 2013

Carrie Safford, Deputy Director
Waste Confidence Directorate
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Docket ID NRC-2012-0246
http://www.regulations.gov

RE: Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation. U.S. Nuclear Regulatory Commission (NRC) Update of the Waste Confidence Decision and Rule – Notice of Intent (NOI) to Prepare a Draft Environmental Impact Statement (EIS) (Docket ID NRC-2012-0246)

The Western Interstate Energy Board High-Level Radioactive Waste Committee appreciates the opportunity to comment on NRC's Notice of Intent to prepare an Environmental Impact Statement to support rulemaking to update its Waste Confidence Decision and Rule. The WIEB High-Level Radioactive Waste Committee[1] is composed of nuclear waste transportation experts appointed by the WIEB Board. The Committee works with the U.S. Department of Energy, the U.S. Nuclear Regulatory Commission and other agencies to develop a safe and publicly acceptable system for transporting spent nuclear fuel and high-level radioactive waste. It has been active on this topic since the mid-1980s. The HLRW Committee's primary management directives come from a series of Western Governors' Resolutions dating back to 1985, which express the Governors' goal of "safe and uneventful transport of nuclear waste."

[1] The WIEB High-Level Radioactive Waste Committee includes representatives of eleven western state governments, and addresses issues related to the storage, transportation and disposal of commercial spent nuclear fuel (SNF) and high-level defense waste (HLW).

The Purpose and Role of the EIS. The EIS will consider the potential impacts of on-site storage after cessation of reactor operation until one or more repositories are available. Assumptions for repository availability are: a) mid-century (about 40 years), b) by the end of the century (about 90 years), or c) not until the 22nd century. We understand that, for NRC, "waste confidence" will be a necessary but not in itself the deciding factor in making site-specific decisions regarding: a) new reactor licenses; b) reactor license extensions; c) ISFSI licenses, and d) extension of ISFSI license terms. For example, were NRC to rule that it does *not* have confidence in the safety of on-site storage (after cessation of reactor operation) through the end of this century[2], it could not issue an ISFSI license or ISFSI license extension, and it would require the reactor owner-operator to address the continued storage of SNF already in on-site storage. If NRC rules that it *does* have such confidence, then, depending on site and technology-specific issues, it may issue such licenses.

The Scope of Concern. Since several currently operating reactors are likely to shut-down by the middle of this century[3] and the availability of one or more repositories is uncertain, the waste confidence rule will apply to an increasing inventory of spent nuclear fuel (SNF) in storage. Federally-provided consolidated storage facilities could provide a (presumably temporary) off-site storage option, but such facilities would be provided by DOE or its successor agency responsible for SNF management, not by NRC.

About 3,000 metric tons (MT) of SNF is currently in dry storage at nine shut-down reactor sites. Another 15,000 MT is in dry storage at sites with still-operating reactors. Since reactor pools at many of these sites are at or near capacity, we can expect increasing transfer of SNF from "wet" to "dry" storage—a process that could be accelerated by a separate NRC rulemaking to reflect findings from the Fukushima disaster. Thus, the NRC waste confidence decision will apply to an increasing inventory of SNF in on-site storage at reactor sites.

WIEB HLRW Committee Inquiries and Interests. We hope that, in the EIS or separately, the NRC can clarify: a) The technical bases for waste confidence decisions; b) How these might apply to licensing decisions at sites where cessation of reactor operations has occurred or is in prospect; and c) How the EIS informs revised NRC Waste Confidence findings.

A. Technical Bases

We hope that the EIS can provide good syntheses of current technical capabilities

---

[2] Even with confidence that a repository *will* be available by the end of the century.

[3] See: "Spent Nuclear Fuel Management: How centralized interim storage can expand options and reduce costs." Prepared for the Blue Ribbon Commission by Cliff W. Hamal, Julie M. Carey, and Christopher L. Ring, Navigant Economics, May 16, 2011

and understandings. Several areas come to mind:

1. **Monitoring SNF and cladding degradation in canisters.**
   Our understanding is that, once SNF is removed from pools and canistered, the ability to monitor the degradation of SNF and cladding is limited—meaning that NRC decisions regarding extended storage and transportation are based mainly on professional judgment, not on monitoring data. Without monitoring data, the NRC's basis for decisions to extend ISFSI license terms, or to return SNF to pools for repackaging, or to transport SNF for offsite storage is weak and subject to legitimate challenge—particularly, perhaps, if high burn-up fuel is involved.

2. **"Hardened" canisters for extended storage and transport.**
   Our understanding is that "hardened" canisters could enable decisions regarding extended storage and transport to be confidently made without monitoring data regarding the degradation of SNF and cladding contents of the canister. What is the current status of this technology? Is it available or in prospect? Is it dramatically more expensive or does it dramatically reduce canister capacity? Could NRC have "confidence" in extended storage and transportation of SNF in hardened canisters that it could not have in current canisters? Over what period of time might this confidence extend?

3. **Risk of spent fuel pool leaks.**
   Leaks increase the risk that SNF could be exposed to the atmosphere, but what are the factors that increase the risk of spent fuel pool leaks? The type of reactor pool? The quality of its original construction? Pool operations over time? Age? The density of pool storage? And/or, external events (e.g. flooding; earthquakes)? Based on these or other factors, is it possible to categorize pools regarding their risk of leaks? Also, is the range of risk broad or narrow? Can NRC specify a level of risk beyond which it would require accelerated removal of SNF from pools to dry storage? Does NRC intend to make this specification, and, if so, when?

4. **Risk of SNF fires.**
   Our understanding is that SNF fires are caused by exposure of zirconium cladding to the atmosphere after a substantial loss of pool water and onsite power for pool water circulation. If so, the causes and risk factors may be similar to those for spent fuel leaks. The hazard may be increased, however, by the portion of high burn-up fuel in wet storage and/or by near-site conditions. Based on these factors, is it possible to categorize pools according to their risk of SNF fires?

5. **Repackaging**
   Repackaging involves: a) determination (based on monitoring data or professional judgment) that repackaging is required; b) removal of canisters

from dry storage to an on-site operating SNF pool or to a hot cell of some type; c) opening the canister and removing the SNF assemblies; d) placing the SNF in a more confidence-inspiring storage-transport canister; and e) removing the repackaged SNF for continued on-site storage or transport. The DOE "System Architecture" study anticipates a significant potential need for repackaging in a reformulated waste management program. To what extent might repackaging become a factor in NRC's confidence in extended SNF storage and transport? Regarding SNF stored on-site in dual purpose canisters, is it safer to repackage now (assuming "hardened" canisters are available) rather than wait until later, when SNF and cladding degradation may be further advanced?

6. **Pool Storage Capacity**
   Our understanding is that pools operate most reliably as originally designed. Re-racking increases pool capacity, but, with increased SNF packed more tightly, hazards (including pool operation hazards) inevitably increase. The increase may depend, in part, on the type and age of the pool. We will appreciate NRC's synthesis assessment of the hazards introduced as SNF in wet storage increases, and the extent to which these hazards are decreased by transfer from wet to dry storage, even though the ability to monitor and address SNF and cladding degradation is less in dry storage than in pools.

B. Application of Waste Confidence in Licensing Decisions

Depending on the technical bases, the NRC will have differing confidence in the safety of onsite storage and subsequent transport after cessation of reactor operation, and the extension of this confidence in time will depend on reasonable expectations regarding the availability of consolidated offsite storage and/or disposal:

- Presumably, site-specific factors being equal, NRC will have greater confidence in extending the license term of a reactor with lower risk of pool leaks or SNF fires than in one with higher risks.
- Presumably, site-specific factors being equal, NRC will have greater confidence in extending the license term of an ISFSI at which it knows that SNF and cladding degradation pose very low extended storage-transport risk than at one where such risks are unknown and based mainly on professional judgment.
- In either of the above cases, NRC would presumably (site-specific factors being equal) have greater confidence in extending reactor or ISFSI license terms if it has reasonable confidence that a repository (or consolidated storage facility) would be available within 40 years rather than in 90 years, or sometime beyond 90 years.

We will appreciate NRC's effort in the EIS to clarify how it expects various combinations of technical factors to provide greater or lesser confidence (site-specific factors being equal) in various licensing or license extension decisions.

C. The Waste Confidence EIS and the Waste Confidence Decision Rule

How will the EIS inform the findings of NRC's revised Waste Confidence Decision? We understand that the NRC will retain the current "five-findings structure", but adapt it to reflect the results of the EIS as well as current policy circumstances and prospects. We would appreciate a careful discussion of the linkages between various combinations of technical factors (and their impacts) with the five findings that make up NRC's (revised) Waste Confidence Decision.[4] In the following the findings are summarized (in italics), followed by WIEB HLRW Committee observations:

1. *A mined geologic repository is technically feasible.* We assume that the EIS will not suggest changes in this finding.

2. *At least one repository will be available within a certain period of time.* The longer the period of time, the more SNF will have been discharged from reactors; the more SNF will have been moved from wet to dry storage; the more reactors will cease operations and shut-down; and the greater the need for confidence-inspiring on- and/or off-site storage. Since the temporary storage problem (site-by-site and overall) differs significantly under each time period assumption, it seems that, in order to make Waste Confidence decisions, the NRC must adopt one of the three time period assumptions above, and then be prepared to revise its Waste Confidence decisions when evidence suggests that another assumption is more appropriate. Further, it seems that the current most appropriate assumption regarding the availability of a repository is "not until the 22nd century". We assume that the EIS will consider each time period assumption, but adopt the single most appropriate assumption for waste confidence rulemaking.

3. *SNF will be managed safely until sufficient repository capacity is available for disposal.* It appears (referring to finding #4) that the NRC generally assumes that a still-operating reactor assures that SNF in both wet and dry on-site storage is managed safely—because the still-operating pool is available to address issues that may arise. However, since the ability to monitor SNF and cladding degradation in sealed canisters is limited, and the hazards in repackaging dual purpose canisters are substantial, and experience in conducting such repackaging is limited, this assumption appears more

[4] It may be appropriate for this discussion to be separate from the Waste Confidence EIS.

warranted regarding the current safety of SNF in on-site dry storage than regarding prospective safety.

SNF can be safely stored for a period of time after shutdown of the reactor from which it has been discharged—this storage may occur on-site (at an ISFSI still operated by the reactor owner) *or off-site* (likely at a federally-developed ISFSI, where the federal government "accepts" SNF). It would seem that the NRC should express its confidence in the safety of on-site and off-site storage separately or sequentially rather than on an either-or basis as in the current finding.

- On-site storage after cessation of reactor operation is the default if neither a repository nor off-site storage is available. The reactor owner is responsible, but the ability to monitor SNF and cladding degradation is limited, and, even if a problem were detected, no operating pool is available for repackaging.
- By contrast, off-site storage after cessation of pool operation is not a "default," but the uncertain result of a significant federal legislative, siting and transportation planning process. Even if such an ISFSI included capability for repackaging, siting it and transporting SNF to it would be easier if it is clear that its main purpose of repackaging capability is to prepare SNF for disposal, not to remedy extended storage and transportation issues not previously detected or addressed.

4. *Storage capacity will be made available if needed.* Regarding on-site storage capacity, the NRC is dealing with its licensees, over which it has regulatory authority. Regarding off-site storage capacity, NRC is likely dealing with a sister federal agency with its own Congressional authorization and appropriations, over which it has no direct authority. Again, it would seem that the NRC should express its confidence in the sufficiency of on- and off-site storage capacity separately or sequentially rather than on an either-or basis as in the current finding.

We appreciate the opportunity to make these comments, and hope that they are useful to the NRC in structuring an EIS that provides an improved basis for licensing and license renewal decisions, and improved waste confidence findings. We will appreciate NRC's effort to respond to key comments received from WIEB and others.

Sincerely,

Ken Niles

1600 Broadway, Suite 1700, Denver, CO 80202
Phone 303/573-8910 Fax 303/534-7309
Home Page http://www.westgov.org/wieb/

Committee Chair
High-Level Radioactive Waste

1600 Broadway, Suite 1700, Denver, CO 80202
Phone 303/573-8910 Fax 303/534-7309
Home Page http://www.westgov.org/wieb/