Industry Response to NRC's Request for Comments on Retrievability, Cladding Integrity and 10 CFR 71/72 Alignment

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Overview

- Industry commends NRC's active role in advancing regulations in 10 CFR Parts 71 and 72 to meet current technology in dry storage systems (DSS).
  - Request for Comments on Retrievability, Cladding Integrity and Safe Handling of Spent Fuel at an Independent Spent Fuel Storage Installation and During Transportation – Federal Register 78FR3853, January 17, 2013.
- Extensively focused on retrievability and cladding integrity requirements.

Overview

- Industry requests NRC's combined consideration of topics addressed in this FRN with industry's parallel, recent petition for rulemaking.
  - Standardizing, by rule, the format and content of DSS CoC's, and extending the backfit rule to CoCs is foundational to success in this area.
- Industry request included a re-examination of the role of cladding integrity in the regulatory framework.

Overview

- Holistically improve dry cask storage regulatory framework.
  - Storage and transportation rules evolved independently and not always in concert.
- 10 CFR Part 72 cladding integrity requirements – protect the cladding such that used fuel can be retrieved from storage without operational safety problems.
- 10 CFR Part 71 cladding integrity requirements – the package remains subcritical and the geometric form of the contents would not be substantially altered during normal conditions of transport.

Industry Recommended Framework for Retrievability and Cladding Integrity

Purpose of proposed industry framework:
To ensure that used fuel is stored and transported in a manner which provides reasonable assurance that licensee activities are fully protective of public health and safety.

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Industry Recommended Framework for Retrievability and Cladding Integrity

- Dry Storage Systems (DSS's) and the used fuel contained therein are relied upon to provide three main nuclear safety functions:
  - Criticality control
  - Confinement
  - Shielding
- DSS provides confinement and shielding; cladding provides defense-in-depth criticality (geometry control) and additional confinement.

Industry Recommended Framework for Retrievability and Cladding Integrity

- However, the DSS safety function previously assigned to cladding is already met in other ways:
  - System's ability to confine used fuel from the environment conversely prevents intrusion of moderator (water) required for criticality.
  - Low reactivity of used fuel minimizes the risk of an inadvertent criticality *even if* moderator were introduced into the DSS.
- Cladding continues to serve secondary role in the safety functions of criticality and confinement.

Industry Recommended Framework for Retrievability and Cladding Integrity

- Role of cladding redefined based upon a risk-informed, performance based approach.
  - DSS perform the safety functions, with cladding as defense-in-depth.
- Reasonable assurance of DSS safety can be demonstrated with moderator exclusion and burnup credit.
- Technologies exist today which allow safe handling of used fuel with gross ruptures or other structural defects.
  - Retrievability by “normal means” not necessary to ensure safety.

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Industry Recommended Framework for Retrievability and Cladding Integrity

- In this role, used fuel cladding is an engineered barrier, operating independently in its environment.
- Cladding safety function not dependent upon the introduction of moderator or the physical properties of the used fuel (reactivity/burnup).

Industry Recommended Framework for Retrievability and Cladding Integrity

- Consideration of future DOE activities is unnecessary to provide reasonable assurance of storage and transportation safety today.
- Include common sense measures to prevent operational safety concerns downstream.
- Operational safety at future DOE facilities are best left to the licensing of these facilities under regulations appropriate for that purpose.
  - 10 CFR Part 63 (Yucca Mountain repository)
  - Proposed 10 CFR Part 7x (reprocessing)
  - 10 CFR Part 60 successor regulation (new repository)

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Industry Responses to NRC Questions

- Should regulatory framework assume direct disposal of high-capacity canisters without repackaging?
- Yes
  - Not required for Parts 71 & 72.
  - Safe, off-normal handling of used fuel, while not routine, is very achievable.
  - Future repository designs are already considering direct disposal possibilities.

Industry Responses to NRC Questions

- Should regulatory framework assume repository can handle and package potentially damaged fuel on a large scale?
  - This is not a safety issue, it is an operational matter to handle/repackage on a large scale.
  - Can be built into DOE facility operations.

Industry Responses to NRC Questions

- What effects, if any, would a canister-based retrievability policy have on a future reprocessing facility?
  - None.

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Industry Responses to NRC Questions

- What other factors, such as cost, dose or time, should be considered?
  - Where the regulatory framework does not impact public health and safety, its associated costs should be evaluated and justified.
  - Otherwise, we agree that reasonable assurance that our activities are fully protective of public health and safety is our “job number one”.

Additional Thoughts and Considerations

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- Enhancement – definition of specific periods for storage and disposition.
  - Request for comments is “open-ended” and does little to promote the Commission’s long-held tenet that it does not endorse indefinite on-site storage of used fuel and GTCC waste.
  - Helps clarify the benefits and methods of obtaining data required.

Slide 15

rxm3 I'm not sure what we are trying to say with this slide, recommend deleting
Rodney McCullum, 5/6/2013

Additional Thoughts and Considerations

- Recognize the responsibility of the federal government.
  - Obligation to use systems and components compatible with the site.
  - Repackaging is not a site obligation.

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