



OFFICE OF THE  
SECRETARY

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-G001

June 18, 2002

COMMISSION VOTING RECORD

DECISION ITEM: SECY-02-0043

TITLE: PROPOSED RULE: GEOLOGICAL AND  
SEISMOLOGICAL CHARACTERISTICS FOR  
THE SITING AND DESIGN OF DRY CASK  
INDEPENDENT SPENT FUEL STORAGE  
INSTALLATIONS AND MONITORED  
RETRIEVABLE STORAGE INSTALLATIONS - 10  
CFR PART 72

The Commission (with all Commissioners agreeing) approved the subject paper as recorded in the Staff Requirements Memorandum (SRM) of June 18, 2002.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

  
Annette L. Vietti-Cook  
Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Meserve  
Commissioner Dicus  
Commissioner Diaz  
Commissioner McGaffigan  
Commissioner Merrifield  
OGC  
EDO  
PDR

VOTING SUMMARY - SECY-02-0043

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. MESERVE	X				X	5/21/02
COMR. DICUS	X				X	6/11/02
COMR. DIAZ	X				X	6/13/02
COMR. McGAFFIGAN	X				X	6/3/02
COMR. MERRIFIELD	X					6/5/02

COMMENT RESOLUTION

In their vote sheets, all Commissioners approved the staff's recommendation and some provided additional comments. Subsequently, the comments of the Commission were incorporated into the guidance to staff as reflected in the SRM issued on June 18, 2002.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: CHAIRMAN MESERVE  
SUBJECT: **SECY-02-0043 - PROPOSED RULE: GEOLOGICAL AND SEISMOLOGICAL CHARACTERISTICS FOR THE SITING AND DESIGN OF DRY CASK INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS AND MONITORED RETRIEVABLE STORAGE INSTALLATIONS - 10 CFR PART 72**

Approved x<sup>with comment</sup> Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS:

See attached comment and edits.



\_\_\_\_\_  
SIGNATURE

May 21, 2002

\_\_\_\_\_  
DATE

Entered on "STARS" Yes  No \_\_\_\_\_

## CHAIRMAN MESERVE'S COMMENTS ON SECY-02-0043

The staff seeks Commission approval to publish proposed amendments to the seismic requirements in Part 72 to require that a new specific license applicant for a dry cask storage facility located in certain geographic areas address uncertainties in seismic hazard evaluations by using appropriate analyses, such as a probabilistic seismic hazard assessment or "other suitable sensitivity analyses." The staff also seeks approval of proposed changes to Part 72 to specify that general licensees must evaluate dynamic loads, as well as static loads, in design of cask storage pads and areas. I approve the staff's request to publish the proposed amendments to Part 72 subject to the following comment.

The *Federal Register* notice states that the proposed changes apply to the design basis of both a dry cask storage type of ISFSI and MRS because these facilities are similar in design, but do not apply to wet modes of storage because the risk is higher for these latter facilities. SECY-02-0043, Attachment 2 at 10. Because the stated purpose of the rulemaking is to address uncertainties in seismic hazard analysis by using appropriate analyses, the fact that wet modes of storage may constitute a higher risk seems to argue for, not against, the use of probabilistic methods to address uncertainties in the seismic hazard analysis. The proposed rule should be revised to exclude wet modes of storage on the basis that new applications for this type of facility are not expected and, consequently, it is not cost-effective to allocate resources to develop the technical basis for such an expansion of the rulemaking.

I attach several minor editorial changes to the *Federal Register* notice.

proposed ISFSI or MRS. The Commission explained that for ISFSIs that do not involve massive structures, such as dry storage casks and canisters, the required design earthquake ground motion (DE) will be determined on a case-by-case basis until more experience is gained with the licensing of these types of units (45 FR 74697).

For sites located in either the western U.S. or in areas of known seismic activity in the eastern U.S., the regulations in 10 CFR Part 72 currently require the use of the procedures in Appendix A to Part 100 for determining the design basis vibratory ground motion at a site. Appendix A requires the use of "deterministic" approaches in the development of a single set of earthquake sources. The applicant develops for each source a postulated earthquake to be used to determine the ground motion that can affect the site, locates the postulated earthquake according to prescribed rules, and then calculates ground motions at the site.

Because the deterministic approach does not explicitly recognize uncertainties in geoscience parameters, probabilistic seismic hazard analysis (PSHA) methods were developed that allow explicit expressions for the uncertainty in ground motion estimates and provide a means for assessing sensitivity to various parameters. Yet Appendix A to Part 100 does not allow their application.

Advances in the sciences of seismology and geology, along with the occurrence of some licensing issues not foreseen in the development of Appendix A to Part 100, have caused a number of difficulties in the application of this regulation to ISFSIs. Specific problematic areas include the following:

24. The limitations in data and geologic and seismic analyses and the rapid accumulation of knowledge in the geosciences have required considerable latitude in judgment. The inclusion of detailed geoscience assessments in Appendix A has caused difficulties for applicants and the NRC staff by inhibiting the use of needed judgment and flexibility in applying basic principles to new situations; <sup>and</sup> requiring the use of Appendix A has also

inhibited the use of evolving methods of analyses (for instance, probabilistic) in the licensing process; and

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Various sections of Appendix A are subject to different interpretations. For example, there have been differences of opinion and differing interpretations among experts as to the largest earthquakes to be considered and ground motion models to be used, thus often making the licensing process less predictable.

In 1996, the Commission amended 10 CFR Parts 50 and 100 to update the criteria used in decisions regarding NPP siting, including geologic and seismic engineering considerations for future NPPs (61 FR 65157; December 11, 1996). The amendments added a new § 100.23 requiring that the uncertainties associated with the determination of the safe shutdown earthquake ground motion (SSE) be addressed through an appropriate analysis, such as a PSHA or suitable sensitivity analyses in lieu of Appendix A to Part 100. This approach takes into account the problematic areas identified above in the earlier siting requirements and is based on developments in the field over the past two decades. Further, regulatory guides have been used to address implementation issues. For example, the Commission provided guidance for NPP license applicants in Regulatory Guide 1.165, "Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion," and Standard Review Plan NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Reactors," Section 2.5.2, "Vibratory Ground Motion," Revision 3. However, the Commission left Appendix A to Part 100 in place to preserve the licensing basis for existing plants and confined the applicability of § 100.23 to new NPPs.

With over 10 years of experience licensing dry cask storage (10 specific licenses have been issued), the Commission is now proposing a conforming change to 10 CFR Part 72 to

require applicants, at some locations, to address uncertainties in seismic hazard analysis by using appropriate analyses, such as a PSHA or suitable sensitivity analyses, for determining the DE. The use of a probabilistic approach or suitable sensitivity analyses to siting parallels the change made to 10 CFR Part 100.

In comparison with a NPP, an operating dry cask ISFSI or MRS facility, storing spent nuclear fuel, is a passive facility in which the primary activities are waste receipt, handling, and storage. An ISFSI or MRS facility does not have the variety and complexity of active systems necessary to support safe operations at a NPP. Further, the robust cask design required for non-seismic considerations (e.g., drop event, shielding), assure low probabilities of failure from seismic events. In the unlikely occurrence of a radiological release as a result of a seismic event, the radiological consequences to workers and the public are significantly lower *in than those* ~~comparison to~~ a NPP. *that will arise at* This is because the conditions required for release and dispersal of significant quantities of radioactive material, such as high temperatures or pressures, are not present in an ISFSI or MRS. This is primarily due to the low heat-generation rate of spent fuel that has undergone more than one year of decay before storage in an ISFSI or MRS, and to the low inventory of volatile radioactive materials readily available for release to the environment. The long-lived nuclides present in spent fuel are tightly bound in the fuel materials and are not readily dispersible. Short-lived volatile nuclides, such as I-131, are no longer present in aged spent fuel. Furthermore, even if the short-lived nuclides were present during a fuel assembly rupture, the canister surrounding the fuel assemblies is designed to confine these nuclides. Hence, the Commission believes that the seismically induced risk from the operation of an ISFSI or MRS is less than at an operating NPP. Therefore, the Commission proposes to revise the DE requirements for ISFSI and MRS facilities from the current Part 72 requirements, which are equivalent to the SSE for a NPP.

analyses, or using the standardized DE described by an appropriate response spectrum anchored at 0.25 g (subject to the conditions in proposed § 72.103(a)(1)), or using the existing design criteria for the most recent NPP (if applicable), for determining the DE.

(4) The proposed § 72.103 is not applicable to a general licensee at an existing NPP operating an ISFSI under a Part 72 general license anywhere in the U.S.

The proposed changes apply to the design basis of both a dry cask storage type ISFSI and MRS, because these facilities are similar in design. The Commission does not intend to revise the 10 CFR Part 72 geological and seismological criteria as they apply to wet modes of storage <sup>because applications for this means of storage are not expected</sup> ~~because the risk associated with potential accident scenarios for wet modes of storage is greater than the risk for dry cask modes of storage. This is because wet modes of storage require active systems, such as systems to remove heat and maintain adequate water levels.~~ <sup>and it is not cost-effective to allocate resources to develop the technical basis for such an expansion of the rulemaking</sup>

~~These active systems have a higher probability of failure than the passive systems used in dry cask modes of storage, thus resulting in a greater seismic risk for wet modes of storage.~~

<sup>Start</sup> The Commission also does not intend to revise the 10 CFR Part 72 geological and seismological criteria as they apply to dry modes of storage that do not use casks because of the lack of experience <sup>gained</sup> in licensing these facilities.

#### Applicability of Modified § 72.212(b)(2)(i)(B)

<sup>continues</sup> The proposed changes in § 72.212(b)(2)(i)(B) regarding the evaluation of dynamic loads for the design of cask storage pads and areas would apply to all general licensees for an ISFSI.

The applicability of the proposed § 72.103 and modified § 72.212(b)(2)(i)(B) is summarized in the table below.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: COMMISSIONER DICUS

SUBJECT: **SECY-02-0043 - PROPOSED RULE: GEOLOGICAL AND SEISMOLOGICAL CHARACTERISTICS FOR THE SITING AND DESIGN OF DRY CASK INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS AND MONITORED RETRIEVABLE STORAGE INSTALLATIONS - 10 CFR PART 72**

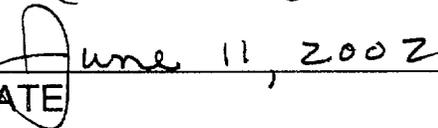
Approved  Disapproved  Abstain

Not Participating

COMMENTS:

Concur with the Chairman's comments.

  
\_\_\_\_\_  
SIGNATURE

  
\_\_\_\_\_  
DATE

Entered on "STARS" Yes  No

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER DIAZ  
SUBJECT: **SECY-02-0043 - PROPOSED RULE: GEOLOGICAL AND SEISMOLOGICAL CHARACTERISTICS FOR THE SITING AND DESIGN OF DRY CASK INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS AND MONITORED RETRIEVABLE STORAGE INSTALLATIONS - 10 CFR PART 72**

Approved XX  Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_  
Not Participating \_\_\_\_\_

COMMENTS:

I approve publication of the proposed amendments to the seismic requirements in Part 72 for dry cask independent spent fuel storage (ISFSI) and monitored retrievable storage (MRS) installations. I continue to support efforts to risk-inform our regulations, which this proposed rulemaking would accomplish, in part by allowing an ISFSI or MRS applicant to use a design earthquake ground motion that is commensurate with the lower risk associated with these facilities relative to a nuclear power plant.

  
\_\_\_\_\_  
SIGNATURE

June 13, 02  
\_\_\_\_\_  
DATE

Entered on "STARS" Yes XX No \_\_\_\_\_

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER MCGAFFIGAN  
SUBJECT: **SECY-02-0043 - PROPOSED RULE: GEOLOGICAL AND SEISMOLOGICAL CHARACTERISTICS FOR THE SITING AND DESIGN OF DRY CASK INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS AND MONITORED RETRIEVABLE STORAGE INSTALLATIONS - 10 CFR PART 72**

Approved  <sup>w/comment</sup> Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS:

See attached comments.

  
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SIGNATURE

  
\_\_\_\_\_  
DATE

Entered on "STARS" Yes  No \_\_\_\_\_

**Commissioner McGaffigan's Comments on SECY-02-0043**

I approve the staff's recommendation in SECY-02-0043 to publish in the Federal Register the proposed amendments to the seismic requirements in 10 CFR Part 72. I also agree with the Chairman's comments regarding the reason for excluding the wet modes of storage from these rulemaking changes. I would add that the changes recommended by the Chairman for the proposed rule also should be applied to similar discussions in the Environmental Assessment and the draft Regulatory Guide DG-3021.

*E MS*

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER MERRIFIELD  
SUBJECT: **SECY-02-0043 - PROPOSED RULE: GEOLOGICAL AND SEISMOLOGICAL CHARACTERISTICS FOR THE SITING AND DESIGN OF DRY CASK INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS AND MONITORED RETRIEVABLE STORAGE INSTALLATIONS - 10 CFR PART 72**

Approved  Disapproved  Abstain

Not Participating

COMMENTS:

*No additional comments.*

  
SIGNATURE

*6/5/02*  
DATE

Entered on "STARS" Yes  No