MODIFIED RULEMAKING PLAN
GEOLOGICAL AND SEISMOLOGICAL CHARACTERISTICS
FOR THE SITING AND DESIGN OF DRY CASK ISFSIs
10 CFR PART 72

## REGULATORY PROBLEM

In 1980, the Commission added 10 CFR Part 72 to its regulations to establish licensing requirements for the storage of spent fuel in an independent spent fuel storage installation (ISFSI), (45 FR 74693). Subpart E of Part 72 contains siting evaluation factors that must be investigated and assessed with respect to the siting of an ISFSI, including a requirement for evaluation of geological and seismological characteristics. The original provision (10 CFR 72.66) (45 FR 74708) distinguished between massive water basin and air-cooled canyon types of ISFSI structures and other types of ISFSI designs. For the former, section 72.66 (now section 72.102) required seismic evaluations equivalent to those required for nuclear power plants (NPPs) when the ISFSI was located west of the Rocky Mountain Front (approximately $104^0$ west longitude) or in areas of known potential seismic activity. At that time, ISFSIs were largely envisioned to be spent fuel pools or single, massive dry storage structures. A seismic design requirement, equivalent to the requirements for an NPP (Appendix A of 10 CFR Part 100) seemed appropriate for these types of facilities, given the potential accident scenarios. For other types of ISFSI designs, the regulation required a site-specific investigation to establish site suitability commensurate with the specific requirements of the proposed ISFSI. The Commission explained that "[f]or ISFSI's which do not involve massive structures, such as dry storage casks and canisters, the required design earthquake 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 (1980)]. The NRC staff believed that a major seismic event at an ISFSI storing spent fuel in dry casks or canisters would most likely have minor radiological consequences compared with a major seismic event at an NPP, spent fuel pool, or single massive storage structure.

Part 72 was amended in 1988 to include the U.S. DOE Monitored Retrievable Storage Installation (MRS), (53 FR 31651). The 1988 amendment also relocated the provision governing evaluation of geological and seismological characteristics to section 72.102. It also eliminated the distinction formerly made between criteria for massive water basin and air-cooled canyon types of ISFSI structures and other types of ISFSI designs such that the criteria designed for massive structures now applied to all ISFSI and MRS facilities. Thus, section 72.102 requires that, for any site located west of the Rocky Mountain Front or in any areas of known potential seismic activity, seismicity be evaluated by the techniques of Appendix A of Part 100 and that, for sites evaluated under the Appendix A criteria, the design earthquake be equivalent to the safe shutdown earthquake (SSE) for an NPP. For sites located east of the Rocky Mountain Front and not in areas of known seismic activity, the Appendix A criteria may be used to determine a site-specific design earthquake or, alternatively, a standardized design earthquake described by an appropriate response spectrum anchored at a peak ground acceleration of 0.25 g may be used.

The procedures in Appendix A of Part 100 for determining the design basis vibratory ground motion at a site require 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 this approach has not explicitly recognized uncertainties in geoscience parameters, probabilistic seismic hazard analysis (PSHA) methods have been developed that allow explicit expressions for the uncertainty in ground motion estimates and provide a means for assessing sensitivity to various parameters.

In 1997, the Commission amended Parts 50 and 100 of its regulations to update the criteria used in decisions regarding NPP siting, including geologic and seismic engineering considerations for future NPPs (61 FR 65157). The 1997 Part 100 amendments placed a new section 100.23 in the regulations (guidance provided in Regulatory Guide 1.165 and Standard Review Plan-NUREG 0800) requiring that the uncertainties associated with the determination of the safe shutdown earthquake ground motion be addressed through an appropriate analysis, such as a probabilistic seismic hazard analysis or suitable sensitivity analyses. This approach takes into account the shortcomings in the earlier siting requirements and is based on developments in the field over the past two decades. The Commission left Appendix A of Part 100 in place to preserve the licensing basis for existing plants and confined the applicability of section 100.23 to new NPPs. Because section 72.102 requires that seismicity be evaluated by the techniques of Appendix A of Part 100, new applicants for ISFSI licenses must follow the rules that applied to NPPs before the 1997 Part 100 amendments.

In the past several years, dry cask designs for ISFSIs have become a dominant option to store spent fuel. This trend is expected to continue for the foreseeable future. The purpose of this rulemaking is to require the applicants to use state-of-the-art seismic hazard methodologies for site characterization. This will result in alleviating the need for applicants to request exemptions from 10 CFR 72.102(f)(1). For example, the U.S. Department of Energy (DOE) requested an exemption from 10 CFR 72.102(f)(1) for an ISFSI at the Idaho National Engineering and Environmental Laboratory (INEEL) to store fuel generated at the Three Mile Island-Unit 2 nuclear power plant.

## EXISTING REGULATORY FRAMEWORK

Section 72.102 describes the geological and seismological criteria for siting of ISFSI and MRS facilities. Separate siting criteria are specified in 10 CFR 72.102 for: (1) sites east of the Rocky Mountain Front, if not located in areas of known seismic activity; and (2) sites west of the Rocky Mountain Front and in other areas of known potential seismic activity. Section 72.102(a)(2) allows sites east of the Rocky Mountain Front, if not located in areas of known seismic activity, to use a standardized design earthquake described by an appropriate response spectrum (RS) anchored at a peak ground acceleration of 0.25 g, provided the results from foundation and geological investigations, literature review, and regional geological reconnaissance show no unstable geological characteristics, soil stability problems, or potential for vibratory ground motion at the site in excess of an appropriate RS anchored at a peak ground acceleration of 0.2 g. Alternatively, a site-specific design earthquake may be determined by using the criteria and level of investigations required by Appendix A of 10 CFR Part 100. Appendix A describes the principal seismological and geological criteria for assessing the suitability of sites for nuclear power plants and the suitability of the reactor plant design basis. These criteria describe the nature of the investigations required to obtain the geologic and seismic data necessary to

determine site suitability. Appendix A describes procedures for determining the design basis vibratory ground motion from an earthquake at a site and describes information needed to determine whether and to what extent a nuclear power plant needs to be designed to withstand the effects of surface faulting.

For sites west of the Rocky Mountain Front, and in other areas of known potential seismic activity, seismicity is evaluated by the techniques of Appendix A of Part 100 with the design earthquake for an ISFSI of no less than the SSE ground motion for an NPP (as defined in Appendix A of Part 100).

The rule also states that:

- Sites other than those on bedrock must be evaluated for their liquefaction potential or other soil instability caused by vibratory ground motion (10 CFR 72.102(c)).

- Site-specific investigations and laboratory analyses must show that soil conditions are adequate for the proposed foundation loading (10 CFR 72.102(d)).

- Sites with unstable geologic characteristics should be avoided (10 CFR 72.102(e)).

- For sites evaluated under the criteria of Appendix A of Part 100, the design earthquake must be equivalent to the SSE of the nuclear power plant, with a value of no less than 0.1g with the appropriate RS (10 CFR 72.102(f)(1) and (2)).

HOW THE REGULATORY PROBLEM WILL BE ADDRESSED BY RULEMAKING

This rulemaking will clarify the applicability of the proposed changes to Part 72 general and specific licensees. Applicants for a Part 72 specific license after the effective date of the rule for an ISFSI site, located in the western U.S. and not co-located with an NPP, must comply with the proposed changes. A Part 72 specific license applicant for an ISFSI site located in the western U.S. and co-located with an NPP has the option of using the proposed PSHA methodology for determining the design earthquake ground motion, or using the existing design criteria for the NPP. Where the existing design criteria for the NPP is used at sites with multiple NPPs, the criteria for the most recent NPP should be used. For all dry cask storage specific-license applicants, whose sites are located in the central and eastern U.S., the proposed changes are also optional. The proposed changes regarding the use of the PSHA method are not applicable to general licensees at existing NPPs operating an ISFSI under a Part 72 general license anywhere in the U.S.

The proposed changes also apply to the design basis of both dry cask storage ISFSIs and U.S. DOE monitored retrievable storage installations (MRS), because these facilities are similar in design. The Modified Rulemaking Plan uses the term “ISFSI” to include both ISFSI and MRS facilities. The NRC staff does not intend to revise the Part 72 geological and seismological criteria as they apply to wet storage because of the greater consequences associated with the potential accident scenarios for these facilities.

The NRC staff intends to leave present section 72.102 in place to preserve the licensing basis of present ISFSIs. The proposed provisions would be added as a new section 72.103, which would provide the requirements that would be utilized by new license applicants.

The rulemaking options are discussed below. It should be noted that all options for rulemaking changes (Options 2-4) will necessitate a revision to NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems," and NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities," and development of a new regulatory guide to provide guidance in meeting the changes in regulation.

OPTION 1: No action. The siting requirements for new dry cask ISFSIs would conform to the existing requirements of 10 CFR 72.102.

The benefit of this option is that no additional NRC resources would be expended in conducting a rulemaking. However, new licensees would need to conform to outdated criteria developed for power reactors, which are very conservative, not risk-informed, and may not be cost-effective for dry cask ISFSIs, especially when not co-located with an NPP site. Hence, this option is not recommended.

OPTION 2: Require new Part 72 license applicants to conform to 10 CFR 100.23 in lieu of 10 CFR Part 100 Appendix A.

The NRC staff notes that while strict adherence to the requirements in Appendix A for determining the design earthquake for the ISFSI (equivalent to an NPP SSE) will be removed, those applicants for ISFSIs, co-located with existing nuclear power plant sites, would be allowed to use all of the geophysical investigation information obtained from the original licensing process (which used the Appendix A requirements), in verifying that all applicable seismic data are considered in determining the design basis. The benefit of this option is that it would be a conforming change to Part 100 for evaluating geological and seismological criteria. It should be noted that under this option, the extent of site investigations and characterization remains the same as required in Part 100. Regulatory Guide 1.165, “Identification and Characterization of Seismic Sources and Determination of Safe Shutdown Earthquake Ground Motion,” was developed to provide general guidance on procedures acceptable to the staff for satisfying the requirements of 10 CFR 100.23 for NPPs. This guidance would be considered acceptable for ISFSIs.

Section 100.23 stipulates evaluations that must be performed to arrive at estimates of the SSE. The SSE is the vibratory ground motion for which certain structures, systems, and components (SSCs) of an NPP are required to remain functional. However, the criteria for determining which SSCs of an NPP should remain functional during a SSE do not directly relate to ISFSI SSCs. In contrast, a dry cask ISFSI does not contain active SSCs that must perform a safety-related function after an earthquake. Section 72.102(f)(1), which requires ISFSI structures to be designed to the SSE, is not risk-informed and does not consider the lower risk of an ISFSI consistent with protection of public health and safety. Hence, this option is not recommended.

OPTION 3: Require new Part 72 applicants to conform to 10 CFR 100.23 in lieu of 10 CFR Part 100 Appendix A (Option 2) and also give them the option to use a graded approach to seismic design for ISFSI SSCs in conjunction with Option 2. In general, a graded approach to

design requires those SSCs whose failure would result in greater accident consequences to use higher design requirements for phenomena such as earthquakes and tornadoes. Similarly, those SSCs whose failure would result in lesser accident consequences would be designed to less stringent requirements. This graded approach would be in lieu of section 72.102(f)(1), which requires sites that have been evaluated under the criteria of Appendix A of Part 100 to design structures to a design earthquake that is equivalent to the SSE for an NPP. It should be noted that under this option, the extent of site investigations and characterization remains the same as required in Part 100.

The specific approach proposed for dry cask ISFSIs would be comparable to the 10 CFR Part 60/63 graded approach to design ground motion for SSCs of pre-closure facilities. This graded approach would allow the SSCs of dry cask ISFSIs to be designed to either Category 1 design basis events or Category 2 design basis events, depending upon their importance to safety. For seismic events, the NRC staff has accepted the approach described in DOE Topical Report YMP/TR-003-NP, Rev. 2, Preclosure Seismic Design Methodology for a Geologic Repository at Yucca Mountain, pertaining to 10 CFR Part 63. In this approach Category 1 design basis ground motion refers to a mean annual probability of exceedance of 1.0E-03.[1] Category 2 design basis ground motion refers to a mean annual probability of exceedance of 1.0E-04.

Individual SSCs that are required to maintain the annual dose within the regulatory limits of 10 CFR Part 20 would be designed to a Category 1 design basis earthquake. Other SSCs needed to be functional to prevent the dose limit of 5 rem from being exceeded at the controlled area boundary would be designed to a Category 2 design basis earthquake. Thus, the seismic design of the SSCs would be commensurate with their importance to safety. Therefore, this design approach follows the Commission policy of using a risk-informed approach.

The advantages of this option for rulemaking are that: (1) it would enable applicants to take advantage of state-of-the-art methodology for evaluating geological and seismological criteria contained in section 100.23 (revised power reactor regulations); (2) it would allow the industry the flexibility to design ISFSI SSCs so that the costs would be more commensurate with the probability of radiological consequences from an earthquake at an ISFSI (i.e., more cost-effective); and (3) it would be comparable to the graded approach to design requirements for systems, structures, and components for pre-closure facilities in 10 CFR Part 60 (Disposal of High-Level Wastes in Geologic Repositories).

The disadvantages of this option are that it may unnecessarily increase the complexity in applications without any risk reduction and would be inconsistent with the previous NRC licensing action in response to an exemption request for an ISFSI. Hence, this option is not recommended.

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[1]The mean annual probability of exceedance, p, of an event is the reciprocal of the return period of that event (i.e., p = 1/T). As an example, consider a site at which the return period for an earthquake is 2,000 years. In this case, the mean annual probability of exceedance is 5.0E-04 (1/2,000) or 0.05 percent.

OPTION 4:

(1) Require new Part 72 specific licensees for sites located in the western U.S. and not co-located with NPPs, to comply with a new 10 CFR 72.103 (based on 10 CFR 100.23 as described in Options 2 and 3), in lieu of 10 CFR 72.102(f), which requires the use of Appendix A of Part 100. A Part 72 specific license applicant for an ISFSI site located in the western U.S. and co-located with an NPP has the option of using the PSHA method for determining seismological and geological design criteria, or using the existing design criteria for the NPP. Where the existing design criteria for the NPP is used at sites with multiple NPPs, the criteria for the most recent NPP would be used. For all dry cask storage specific-license applicants whose sites are located in the central and eastern U.S., the proposed changes are also optional. The proposed changes regarding the use of the PSHA method are not applicable to general licensees anywhere in the U.S. The appendix to this modified rulemaking plan contains a table summarizing the information in this paragraph.

    The proposed changes also apply to the design basis of both the dry cask storage ISFSI and MRS. The remainder of this plan uses the term "ISFSI" to include both ISFSI and MRS facilities because the facilities are similar in design. The NRC staff does not intend to revise the Part 72 geological and seismological criteria as they apply to wet storage because of the greater consequences associated with the potential accident scenarios for these facilities.

(2) Maintain the present Part 72 requirement of using a single-level design earthquake, but with a lower design earthquake ground motion that is commensurate with the level of risk associated with an ISFSI. This single-level design earthquake will have a mean annual probability of exceedance of 5.0E-04, which is lower than the current level for the SSE of an NPP.

Detailed guidance for the use of Option 4 will be provided in a guidance document for ISFSI licensees.

The NRC staff has determined that for new ISFSI facilities, a design earthquake with a mean annual probability of exceedance of 5.0E-04 is appropriate. The present design earthquake (equivalent to the SSE for an NPP) has a mean annual probability of exceedance of approximately 1.0E-04. In comparison with a nuclear power plant, an operating ISFSI facility is a relatively simple facility in which the primary activities are waste receipt, handling, and storage. An ISFSI facility does not have the variety and complexity of active systems necessary to support an operating nuclear power plant. After the spent fuel is in place, an ISFSI facility is a static operation. During normal operations, the conditions required for the release and dispersal of significant quantities of radioactive materials are not present. There are no high temperatures or pressures present during normal operations or under design basis accident conditions to cause the release and dispersal of radioactive materials. 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, and to the low inventory of volatile radioactive materials readily available for release to the environs. The long-lived and potentially biologically hazardous materials present in spent fuel are tightly bound up in the fuel materials and are not readily dispersible. The 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 an event of a fuel

assembly rupture, the canister surrounding the fuel assemblies would confine these nuclides. Therefore, the radiological risk associated with an ISFSI facility is significantly less than the risk associated with an NPP and the use of a lower design earthquake ground motion is justified.

The Commission indicated in the Statement of Considerations accompanying the initial Part 72 rulemaking that "[f]or ISFSI's which do not involve massive structures, such as dry storage casks and canisters, the required design earthquake 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 (1980)]. With more than 10 years of experience licensing dry cask storage systems, together with analyses demonstrating their robust behavior in accident scenarios involving earthquakes, the NRC staff concludes that designing ISFSI SSCs using a single-level design earthquake with a ground motion that is commensurate with the level of risk associated with an ISFSI, is sufficient to provide reasonable assurance in demonstrating public health and safety.

The rationale for the proposed mean annual probability of exceedance of 5.0E-04 (return period of 2,000 years) for a design earthquake is based on several points:

- Use of a mean annual probability of exceedance of 5.0E-04 (return period of 2,000 years) for the design earthquake is consistent with the Commission's approval of DOE's request for an exemption from section 72.102(f)(1) for a proposed ISFSI at the INEEL to store spent fuel generated at the Three Mile Island Unit-2 nuclear power plant. Section 72.102(f)(1) requires that for sites that have been evaluated under the criteria of Appendix A of Part 100, the design earthquake must be equivalent to the SSE for an NPP. In its evaluation of the request, NRC staff considered the relative risk posed by the ISFSI. The staff concluded that considering the minor radiological consequences expected from a cask failure resulting from a seismic event, and the lack of a credible mechanism to cause such a failure, the NRC staff believes that the design earthquake using a mean annual probability of exceedance of
  5.0E-04 for dry storage facilities at INEEL would be conservative.

- The total probability of exceedance for a design earthquake at an ISFSI facility with an operational period of 20 years (20 years x 5.0E-04 = 1.0E-02) is the same as the total probability of exceedance for an earthquake event at the proposed pre-closure facility at Yucca Mountain with an operational period of 100 years (100 years x 1.0E-04 = 1.0E-02).

- Because SSCs important to safety in an ISFSI are few, relative to those found in an NPP, the use of a graded approach for classifying ISFSI SSCs into one of two different categories for earthquake designs would unnecessarily increase the complexity in applications, without a commensurate improvement to safety. The SSCs important to safety in an ISFSI are associated with the storage cask, and include the canister, the canister handling systems, concrete pad supporting the cask, the transfer building supporting the handling systems, and the transfer cask. Since these SSCs are needed to be functional to prevent the dose limit of 5 rem being exceeded at the controlled area boundary, they would be required to be designed for a Category 2 design basis earthquake. Other SSCs important to safety may include the pressure monitoring system, protective cover, security lock and wire, etc. and can be designed for a lower Category 1 earthquake. However, it would be simpler to design all SSCs for a bounding Category 2 earthquake.

- The critical element for protection against radiation release is the confinement boundary for containing the spent fuel assemblies. Because the casks are rigid and have high natural frequencies, the damage from a drop or tip-over accident is expected to be far greater and more severe than the seismic inertial acceleration loads. Therefore, seismic inertia loads are bounded by other loads. The dry storage cask designs are very rugged and robust, and are expected to have substantial design margins to withstand forces from a seismic event greater than the design earthquake.

- During a seismic event, a cask may slide if lateral seismic forces are greater than friction resistance between the cask and the concrete pad. The sliding and resulting displacements are computed by the applicant to demonstrate that the casks, which are spaced to satisfy thermal requirements, are precluded from impacting other adjacent casks. Furthermore, the staff typically requests, as part of its approval process, that an applicant demonstrate that during a seismic event equal to the proposed design earthquake, the cask will not tip over. However, it follows from the discussion above that even if the casks slide or tip-over and then impact other casks or the pad during a seismic event greater than the proposed design earthquake, the casks have adequate design margins to ensure that they maintain their structural integrity to meet the Part 72 exposure limits for radiological protection.

- The mean annual probability of exceedance of 5.0E-04 for ISFSI facilities is consistent with the design approach used in DOE Standard DOE-STD-1020, “Natural Phenomena Hazards Design Evaluation Criteria for Department of Energy Facilities,” for similar type facilities.

Based on the preceding analysis, the NRC staff concludes that the rationale for designing ISFSI SSCs for a single design earthquake, using a mean annual probability of exceedance of 5.0E-04, is sufficient to ensure the public health and safety.

PREFERRED OPTION

Option 4 is preferred over the other options because it (1) is consistent with a previous NRC licensing decision in response to an exemption request for an ISFSI facility and (2) results in the design of ISFSI SSCs to be commensurate with the risk level. Additionally, Option 4, like other options, enables new licensees to take advantage of state-of-the-art methodology for evaluating geological and seismological criteria contained in proposed section 72.103 and would not unnecessarily increase the complexity in applications by classifying SSCs into more than one category.

ADDITIONAL PROPOSED CHANGE

Changes to 10 CFR 72.212(b)(2)(ii) are also needed to communicate that general licensees must perform both static and dynamic analyses for new ISFSIs after the effective date of the rule to ensure that casks are not placed in an unanalyzed condition. This proposed change would be included with any of the options requiring rulemaking (Options 2-4). Current practice already provides that specific licensees demonstrate that static and dynamic loads are considered. The change would state that the design of cask storage pads and areas must adequately account for dynamic loads (in addition to static loads). For example, dynamic effects can cause soil-structure interactions that could amplify ground motion to the point that

the acceleration on the casks is greater than the design earthquake acceleration, or that soil liquefaction could cause unacceptable pad and foundation settlement. A dynamic analysis of ISFSI pads and areas would ensure that the pad, which may be considered as failed in a seismic event, could continue to support the casks without placing them in an unanalyzed condition. In the past, this issue was addressed on a case-by-case basis. This is consistent with the Palisades Plant - NRC Final Safety Assessment of Independent Spent Fuel Storage Installation (ISFSI) Support Pad, September 20, 1994, the first ISFSI approved for a general licensee.

NRC STRATEGIC PLAN PERFORMANCE GOALS

The NRC staff considered the merits of the rulemaking within the context of the performance goals listed in the Agency's strategic plan. The rulemaking effort would increase NRC's effectiveness and efficiency and reduce unnecessary regulatory burden by reducing the number of exemption requests that would need to be submitted and reviewed. This rule would maintain safety by selecting the design earthquake level to be commensurate with the risk associated with an ISFSI. The changes to the design earthquake level are considered risk-informed, consistent with NRC policy to develop risk-informed regulations. This rule would increase realism by enabling ISFSI applicants to use the state-of-the-art approach to more accurately characterize the seismicity of a site. Public confidence may be adversely affected because the proposed risk-informed approach lowers the design earthquake level commensurate with the lower risk of an ISFSI facility.

OFFICE OF THE GENERAL COUNSEL LEGAL ANALYSIS

The Modified Rulemaking Plan proposes modifications to the approved Rulemaking Plan, SECY-98-126, "Rulemaking Plan: Geological and Seismological Characteristics for the Siting and Design of Dry Cask ISFSIs," dated June 4, 1998. During the development of the technical basis for the approved Rulemaking Plan, the staff determined that some of the changes proposed in the approved plan required modification. The Modified Rulemaking Plan includes a new option, Option 4, which reflects some of these proposed modifications.

The intent of this proposed Part 72 rulemaking is to reduce unnecessarily burdensome requirements with respect to evaluating the seismicity of potential ISFSI sites and determining a design earthquake for use in designing ISFSI structures, as those requirements appear in 10 CFR 72.102. The approved Rulemaking Plan (SECY-98-126) proposed to amend Part 72 to (1) require certain new Part 72 specific license applicants to use a probabilistic seismic hazard analysis (PSHA) approach (10 CFR 100.23), instead of the current deterministic approach (which is required by 10 CFR 72.102(f) and contained in Appendix A of 10 CFR Part 100), in determining design earthquake ground motion; (2) allow the use of a risk-informed graded approach to seismic design for ISFSI structures, systems, and components, in which SSCs are required to use one of two categories or levels of design earthquakes (for lower and higher accident consequences), depending on safety importance and risk levels, and (3) in the case of general licensees, require that the design of cask storage pads and areas account for dynamic loads and soil-structure interactions in addition to static loads by amending 10 CFR 72.212(b)(2)(ii).

Like Option 3, the newly added Option 4 would require that certain new Part 72 specific license applicants use the PSHA methodology based on 10 CFR Part 100.23 in lieu of the current deterministic approach. However, instead of simply referencing 10 CFR 100.23, Option 4 proposes the addition of a new section (10 CFR 72.103) based on section 100.23. In addition, Option 4 of the Modified Rulemaking Plan proposes an alternative to the risk-informed graded approach for seismic design of dry cask ISFSI SSCs that is contained in Option 3. Specifically, Option 4 proposes the use of a single-level design earthquake with a variable ground motion that is commensurate with the level of risk associated with an ISFSI. Finally, the Modified Rulemaking Plan retains the proposed amendment to 10 CFR 72.212(b)(2)(ii) requiring consideration of dynamic loads.

The Modified Rulemaking Plan clearly explains the rationale for designing ISFSI SSCs using a single-level design earthquake, concluding that use of this alternative will continue to meet the radiological criteria in Part 72 and therefore adequately protect public health and safety while reducing a regulatory burden. Given this, OGC does not foresee any basis for legal objection to this proposed rulemaking.

The proposed rule should emphasize that use of the PSHA methodology in conjunction with a single-level design earthquake with a lower ground motion would be mandatory only for specific ISFSI (and MRS) applicants who (1) apply for a specific license after the effective date of the rule; (2) are located in the Western U.S. or in any area of known potential seismic activity; and (3) are not co-located with a nuclear power plant. Specific license applicants who do not meet all of these criteria (such as applicants co-located with an NPP) would have the option of using the PSHA approach. Therefore, OGC believes that PSHA component of proposed rulemaking will not require a backfit analysis because it provides only a voluntary alternative for existing licensees.

However, in developing the wording of the proposed revision to 10 CFR 72.212(b)(2)(ii), which involves consideration of dynamic loads and soil-structure interactions by general licensees prior to use of an ISFSI, OGC cautions the staff to avoid potential backfit concerns. The proposed revision should be prospective in nature, applying to general licensees that have yet to commence use of new or future ISFSIs. Imposing new evaluation requirements on general licensees that are already using their ISFSIs could implicate the Backfit Rule in 10 CFR 72.62.

OGC notes that an environmental assessment and a regulatory analysis will be required in conjunction with the proposed rulemaking. Moreover, because the options presented would reduce the burden on the licensee with respect to information collection requirements, an OMB clearance statement would be required to comply with the Paperwork Reduction Act.

The proposed rule will not result in a $100 million impact upon nuclear power plant licensees. Therefore, it is not a “major rule.”

Because the rule addresses only areas of exclusive NRC regulatory authority, it does not raise any Agreement State implementation issues.

In conclusion, OGC has determined that there are no known bases for legal objection to the contemplated rulemaking.

BACKFIT ANALYSIS

A backfit analysis is not required for the proposed rule because the provisions of the PSHA methodology are mandatory for new applicants for Part 72 specific licenses only. The backfit provisions of 10 CFR 72.62 only apply to existing licensees. Existing general and specific licensees are not required to use the PSHA methodology contained in the proposed rule; however, they may choose to use the PSHA methodology provisions on a voluntary basis. Therefore, a backfit analysis is not required.

Additionally, the proposed change to 10 CFR 72.212(b)(2), related to designing ISFSI pads for both static and dynamic loads of the stored casks due to earthquake events, will be prospective in nature, applicable only to general licensees for new ISFSIs after the effective date of the rule. Therefore, a backfit analysis is not required.

AGREEMENT STATE IMPLEMENTATION ISSUES

This rule is classified as compatibility category “NRC” and addresses only areas of exclusive NRC regulatory authority.

MAJOR RULE

This is not a major rule.

SUPPORTING DOCUMENTS NEEDED

This rulemaking would require a Regulatory Analysis that would estimate the costs and benefits to licensees for each of the proposed changes. The information provided in the Regulatory Analysis for each change concerning the impact on small entities would be sufficient to support a Regulatory Flexibility Analysis or a certification that the proposed rule would not have a significant economic impact on a substantial number of small entities. An OMB Clearance Package may be needed because the rulemaking is expected to reduce reporting or recordkeeping requirements. This would require that the clearance package be submitted to OMB no later than the date the proposed rule is submitted to the Office of the Federal Register for publication. An Environmental Assessment would be needed to show, as the NRC staff currently believes, that there is no significant impact to public health and safety.

In addition, this rulemaking will necessitate a revision to NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems," and NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities," The development of a new regulatory guide to provide guidance in meeting the changes in regulation will also be needed.

ISSUANCE BY EXECUTIVE DIRECTOR FOR OPERATIONS OR COMMISSION

It is recommended that the Commission issue this rulemaking because it involves additions to existing policy on the siting of new dry cask ISFSIs.

RESOURCES NEEDED TO COMPLETE RULEMAKING

The estimated resources to complete and implement Options 1 or 2 are included in the FY 2001-FY 2002 budgets. With Commission approval, the staff is prepared to redirect resources, using the Planning Budgeting Performance Management process, to support Options 3 or 4.

Option 1: No additional FTE required.

Option 2: Since Option 2 does not lower the design earthquake level, fewer public comments would be expected as compared to Options 3 and 4, which do provide for a lower design earthquake level. This would also reduce the need for an expedited rulemaking schedule.

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| NMSS | 1.3 FTE | (develop proposed rule and draft guidance document, resolve public comments, develop final rule and guidance documents) |
| Other | 0.3 FTE | (provide support to NMSS) |
| Contractor | $50-65 K | (develop Environmental Assessment, Regulatory Analysis, Information Collection Burden Report, and assist in public comment analysis and guidance development) |

Options 3 and 4:

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| NMSS | 3.0 FTE | (develop proposed rule and draft guidance document, resolve public comments, develop final rule and guidance documents) |
| Other | 0.8 FTE | (provide support to NMSS) |
| Contractor | $200 K | (develop Environmental Assessment, Regulatory Analysis, Information Collection Burden Report, and assist in public comment analysis and guidance development) |

| STAFF LEVEL WORKING GROUP | Concurring Official |
|---|---|
| Keith McDaniel, NMSS/IMNS Task Leader | M. Virgilio, NMSS |
| Mahendra Shah, NMSS/SFPO | M. Virgilio, NMSS |
| Mysore Nataraja, NMSS/DWM | M. Virgilio, NMSS |
| Goutam Bagchi, NRR | S. Collins, NRR |
| Roger Kenneally, RES | A. Thadani, RES |
| Martin O'Neill, OGC | J. Gray, OGC |

MANAGEMENT STEERING GROUP

A management steering group is not required for this rulemaking.

PUBLIC PARTICIPATION

There is no need for enhanced public participation for this rulemaking. The rulemaking documents will be placed on the NRC electronic rulemaking bulletin board in addition to publishing the documents for public comments.

SCHEDULE

| | |
|---|---|
| Proposed rule to EDO | 2.0 months after approval of rulemaking plan |
| Final rule to EDO | 4.5 months following end of public comment period |

The NRC has decided to conduct this rulemaking on an expedited basis to support current licensing activities.

# APPENDIX

## Applicability of Proposed Changes

## Applicability of Proposed Section 72.103 to Specific License Applicants for ISFSI

| **Conditions** | **Western U. S.** | **Central and Eastern U. S.** |
|---|---|---|
| Not co-located with NPP, and for applications received after the effective date | Mandatory | Voluntary |
| Not co-located with NPP, and for applications received prior to effective date but under review | Voluntary | Voluntary |
| Co-located with NPP, and for applications received after or prior to the effective date | Voluntary | Voluntary |

Proposed change in section 72.103 regarding PSHA methodology does not apply to general licensees. General licensees must satisfy the conditions given in 10 CFR 72.212.

## Applicability of Proposed Section 72.212(b)(2) to General License Applicants for ISFSI

Proposed changes in Section 72.212(b)(2) regarding dynamic loads apply to general licensees for new ISFSIs after the effective date of the rule, and not to specific licensees. Current practice already provides that specific licensees demonstrate that static and dynamic loads are considered.