

Three Mile Island requirements set forth in 10 CFR 50.34(f) except paragraphs (f)(1)(xii), (f)(2)(ix) and (f)(3)(v);

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Dated at Rockville, Maryland, this 10th day of September 2003.

For the Nuclear Regulatory Commission.

Annette Vietti-Cook,

Secretary of the Commission.

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NUCLEAR REGULATORY COMMISSION

10 CFR Part 72

RIN 3150-AG93

Geological and Seismological Characteristics for Siting and Design of Dry Cask Independent Spent Fuel Storage Installations and Monitored Retrievable Storage Installations

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its licensing requirements for dry cask modes of storage of spent nuclear fuel, high-level radioactive waste, and power reactor-related Greater than Class C (GTCC) waste in an independent spent fuel storage installation (ISFSI) or in a U.S. Department of Energy (DOE) monitored retrievable storage installation (MRS). These amendments update the seismic siting and design criteria, including geologic, seismic, and earthquake engineering considerations. The final rule allows the NRC and its licensees to benefit from experience gained in the licensing of existing facilities and to incorporate rapid advancements in the earth sciences and earthquake engineering. The amendments make the NRC regulations that govern certain ISFSIs and MRSs more compatible with the 1996 amendments that addressed uncertainties in seismic hazard analysis for nuclear power plants. The amendments allow certain ISFSI or MRS applicants to use a design earthquake level commensurate with the risk associated with an ISFSI or MRS.

EFFECTIVE DATE: This final rule is effective on October 16, 2003.

FOR FURTHER INFORMATION CONTACT:

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I. Background

In 1980, the NRC added 10 CFR part 72 to its regulations to establish licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste (HLW) (45 FR 74693; November 12, 1980). In 1988, the NRC amended part 72 to provide for licensing the storage of spent nuclear fuel and HLW in an MRS (53 FR 31651; August 19, 1988). Subpart E of Part 72 contains siting evaluation factors that must be investigated and assessed with respect to the siting of an ISFSI or MRS, including a requirement for evaluation of geological and seismological characteristics. ISFSI and MRS facilities are designed and constructed for the interim storage of spent nuclear fuel that has aged for at least one year, other solidified radioactive materials associated with spent fuel storage, and power reactor-related GTCC waste, that are pending shipment to a high-level radioactive waste repository or other disposal site.

The original regulations envisioned ISFSI and MRS facilities as spent fuel pools or single, massive dry storage structures. The regulations required seismic evaluations equivalent to those for a nuclear power plant (NPP) when the ISFSI or MRS is located west of the Rocky Mountain Front (west of approximately 104° west longitude), referred to hereafter as the western U.S., or in areas of known seismic activity east of the Rocky Mountain Front (east of approximately 104° west longitude), referred to hereafter as the eastern U.S. A seismic design requirement, equivalent to the requirements for an NPP (appendix A to 10 CFR part 100) seemed appropriate for these types of facilities, given the potential accident scenarios. For those sites located in the eastern U.S., and not in areas of known seismic activity, the regulations allowed for less stringent alternatives.

For other types of ISFSI or MRS designs, the regulation required a site-specific investigation to establish site suitability commensurate with the specific requirements of the proposed ISFSI or MRS. The NRC explained that for ISFSIs 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).

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.

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. Specific problematic areas include the following:

1. 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. Appendix A to part 100 does not allow this application.

2. The limitations in data and geologic/seismic analyses, and the rapid evolution in geosciences have required considerable latitude in technical judgment. The inclusion of detailed geoscience assessments in Appendix A has inhibited the use of needed judgment and flexibility in applying basic principles to new situations; and

3. 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 NRC amended 10 CFR parts 50 and 100 to update the criteria