

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 technical field over the past two decades. Further, regulatory guides have been used to address implementation issues. For example, the NRC 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 NRC 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.

The NRC is now amending 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 design earthquake ground motion (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 an 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 an 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 than those that could arise at an NPP. 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.

The standards in part 72 Subparts E, "Siting Evaluation Factors," and F, "General Design Criteria," ensure that the dry cask storage designs are very rugged and robust. The casks must maintain structural integrity during a variety of postulated non-seismic events, including cask drops, tip-over, and wind driven missile impacts. These non-seismic events challenge cask integrity significantly more than seismic events. Therefore, the casks have substantial design margins to withstand forces from a seismic event greater than the design earthquake.

Hence, the seismically induced risk from the operation of an ISFSI or MRS is less than at an operating NPP. As a result, the NRC is revising the DE requirements for ISFSI and MRS facilities from the current part 72 requirements, which are equivalent to the SSE for an NPP.

As an additional minor change, the NRC is modifying § 72.212(b)(2)(i)(B) to require general licensees to evaluate dynamic loads, in addition to static loads, in the design of cask storage pads and areas for ISFSIs, to ensure that casks are not placed in unanalyzed conditions. Accounting for dynamic loads in the analysis of ISFSI pads and areas will ensure that pads continue to support the casks during seismic events. General licensees currently evaluate dynamic loads for evaluating the casks, pads and areas, to meet the cask design bases in the Certificate of Compliance, as required by § 72.212(b)(2)(i)(A). Therefore, the rule will not actually require any general licensees operating an ISFSI to re-perform any written evaluations previously undertaken. Specific licensees are currently required, under § 72.122(b)(2), to design ISFSIs to withstand the effects of dynamic loads, such as earthquakes and tornados.

The NRC published the proposed rule, "Geological and Seismological Characteristics for Siting and Design of Dry Cask Independent Spent Fuel

Storage Installations and Monitored Retrievable Storage Installations" in the **Federal Register** on July 22, 2002 (67 FR 47745) for public comment. The NRC stated on September 5, 2002 (67 FR 56876) that it intended to extend the comment period for an additional 15 days to allow interested persons additional time to provide meaningful comments. The public comment period expired on October 22, 2002.

The NRC received nine comment letters on the proposed rule. These comments and the NRC responses are discussed in Section VI of this document, "Summary of Public Comments on the Proposed Rule."

## II. Objectives

An ISFSI is designed, constructed, and operated under a part 72 specific or general license. A part 72 specific license for an ISFSI is issued to a named person upon application filed under part 72 regulations. A part 72 general license for an ISFSI is issued under 10 CFR 72.210 to persons authorized to possess an NPP license under part 50, without filing a part 72 license application. A general licensee is required to meet the conditions specified in subpart K of part 72. An MRS may be designed, constructed, and operated by DOE under a part 72 specific license.

The final rule reflects changes that are intended to (1) provide benefit from the experience gained in applying the existing regulation and from research; (2) provide needed regulatory flexibility to incorporate into licensing state-of-the-art improvements in the geosciences and earthquake engineering; and (3) make the regulations more risk informed, consistent with the Commission's recent policy.

The objectives of this final rule are to:

1. Require a new specific-license applicant for a dry cask storage facility located in either the western U.S. or in areas of known seismic activity in the eastern U.S., and not co-located with an NPP, to address uncertainties in seismic hazard analysis by using appropriate analyses, such as a PSHA or suitable sensitivity analyses, for determining the DE. All other new specific-license applicants for dry cask storage facilities will have the option of complying with the requirement to use a PSHA or suitable sensitivity analyses to address uncertainties in seismic hazard analysis, or other options compatible with the existing regulation. (§ 72.103)

2. Allow new ISFSI or MRS specific-license applicants using a PSHA to select a DE appropriate for and commensurate with the risk associated with an ISFSI or MRS; and