REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE (DG)-1315
SEISMIC DESIGN CLASSIFICATION FOR NUCLEAR POWER PLANTS
(Proposed Revision 5 of Regulatory Guide 1.29, issued March 2007)

1. Statement of the Problem

The NRC issued Revision 4 of Regulatory Guide (RG) 1.29 in March 2007 to provide licensees and applicants with agency-approved guidance for complying with the General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," as set forth in Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10, Part 50, of the *Code of Federal Regulations* (10 CFR Part 50), "Licensing of Production and Utilization Facilities. The guide describes methods acceptable for use in identifying and classifying those features of light-water-reactor (LWR) nuclear power plants that must be designed to withstand the effects of the safe-shutdown earthquake (SSE). The revision was to ensure that nuclear power plant structures, systems, and components (SSCs) important to safety are designed to withstand the effects of earthquakes without loss of capability to perform their safety functions.

The guide needs minor non-substantive changes that do not represent new regulatory requirements, but clarify the content in Section C, "Staff Regulatory Guidance by (1) addition of a reference to the definition of the reactor coolant pressure boundary in 10 CFR 50.2, and (2) a reorganization of systems and subsystems to add clarity to the staff guidance. In addition, it needs a comparison to related international standards and to be reformatted to align with the current program guidance for regulatory guides.

2. Objective

The objective of this regulatory action is to update the NRC guidance on the classification of those features of light-water-reactor (LWR) nuclear power plants that must be designed to withstand the effects of the safe-shutdown earthquake (SSE).

3. Alternative Approaches

The NRC staff considered the following alternative approaches for providing NRC guidance on acceptable methods and procedures for classification of those features of LWRs that must be designed to withstand the effects of the SSE:

1. Do not revise Regulatory Guide 1.29.
2. Withdraw Regulatory Guide 1.29.
3. Revise Regulatory Guide 1.29.

<u>Alternative 1: Do Not Revise Regulatory Guide 1.29</u>

Under this alternative, the NRC would not revise this guidance, and applicants would continue to use the present version of this regulatory guide. This is considered the "No Action" alternative. If NRC takes no action, there would be no cost to NRC in revising the guide. However, the "no-action" alternative would not provide an update to address the issues

identified above. This may result in requests from NRC to applicants for additional information. The requests will impose a burden on the NRC staff. Applicants would be burdened by the effort required to respond to the Requests for Additional Information (RAIs).

Alternative 2: Withdraw Regulatory Guide 1.29

Withdrawing this regulatory guide would eliminate the guidance regarding seismic design classification for LWRs. Applicants would be impacted by a withdrawal by having to propose and justify methods and procedures for the determination of static and dynamic soil and rock properties used in seismic response analyses and engineering design. NRC staff would be impacted by being required to review the alternate methods and procedures and the review may result in an increase in the number of RAIs which could extend the length of an application review. Applicants would be burdened by the effort required to respond to the RAIs.

Alternative 3: Revise Regulatory Guide 1.29

Under this alternative, the NRC would revise Regulatory Guide 1.29. The value to NRC staff and applicants in revising the guide would be the benefits associated with providing guidance based on current generally-accepted methods and procedures for laboratory investigation of soils and rocks for engineering analysis and design of new nuclear power plants. With such guidance the need for RAIs is reduced. That is a benefit for both NRC and applicants. The impact on the NRC would be the costs associated with preparing and issuing the regulatory guide. For parties who submitted a previous application, the impact would be in the cost of addressing a revised guide versus dealing with an established one they had used before. Applicants who have not submitted an application previously would not be affected by a revision of the guide.

4. Comparison of Alternatives

The three alternatives were compared against each other with respect to safety, as well as NRC and applicant resources.

With respect to safety, Alternative 1 updates and adds to the guidance references to various standards that have been updated, replaced, and or retracted when appropriate. The withdrawal of formal NRC guidance (Alternative 2) does not necessarily represent unsafe results since organizations would either continue to use existing methods with which they are familiar and have not proven unsafe, or they may even adopt methods more recent than those found in the previous revisions of the RG. Alternative 3 would be superior to Alternative 1 and possibly 2 in that it would update the RG to include, where appropriate, revised standards and procedures that offer enhanced safety, improved clarity, reduce the uncertainty in the results, or facilitate the licensing process.

With regard to NRC resources, Alternative 3 represents the greatest initial cost to the NRC, which is attributable to the costs associated with preparing and issuing the regulatory guide. However, when considered over the lifetime of the RG and the potential for additional staff resources expenditures associated with evaluating applicant/licensee submittals which do not meet the RG, it may be that the overall NRC cost of Alternative 3 is closer to or less than the overall cost of Alternatives 1 or 2.

With regard to licensee and applicant resources, Alternative 3 results in the least costs because the licensee's submittals may be delayed because the NRC may have to issue RAIs

and licensees may have to perform additional analyses to address those RAIs. These additional activities would lead to increased costs to licensees and to the NRC for the staff time required to issue and review the RAIs.

5. Conclusion

Based on this regulatory analysis, the NRC staff concludes that revision of Regulatory Guide 1.29 is warranted. The proposed action will enhance an applicant's ability to prepare submittals to NRC. An updated guide will reduce staff review time and the need for requests for additional information thus reducing costs to licensees, applicants, and the NRC. The cost to NRC in revising the RG and to licensees and applicants in adapting to a revised RG are deemed to be less than the benefits accrued by reducing the need for RAIs.