REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE (DG)-1332
NUCLEAR POWER PLANT INSTRUMENTATION FOR EARTHQUAKES
(Proposed Revision 3 of Regulatory Guide 1.12, issued March 1997)

1. Statement of the Problem

The Nuclear Regulatory Commission (NRC) issued Revision 2 of Regulatory Guide (RG) 1.12 in March 1997, to provide licensees and applicants with agency-approved guidance for satisfying the requirements of Title 10 of the *Code of Federal Regulations* (CFR) Part 20, "Standards for Protection Against Radiation" and Appendix S, "Earthquake Engineering Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." The guide describes seismic instrumentation criteria acceptable to NRC such that the seismic response of nuclear power plant features important to safety can be evaluated promptly after an earthquake.

The current revision of RG 1.12 dates to 1997 and significant technological advances in seismic instrumentation have since been made that warrant revising this RG. In addition, lessons learned from the recent earthquakes that impacted the North Anna Power and Fukushima-Dai-ichi Nuclear Power Plants indicate a need to update seismic instrumentation guidance relative to instrument characteristics, locations, installation, and maintenance. In addition, it needs to be reformatted to align with the current program guidance for regulatory guides.

2. Objective

The objective of this regulatory action is to assess the need to update the NRC guidance on nuclear power plant instrumentation for earthquakes.

3. Alternative Approaches

The NRC staff considered the following alternative approaches for providing NRC guidance on acceptable seismic instrumentation criteria for nuclear power plants:

1. Do not revise Regulatory Guide 1.12.
2. Withdraw Regulatory Guide 1.12.
3. Revise Regulatory Guide 1.12.

<u>Alternative 1: Do Not Revise Regulatory Guide 1.12</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 initial 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 1.12

Withdrawing this regulatory guide would eliminate the guidance regarding seismic instrumentation criteria for nuclear power plants. Applicants would be impacted by a withdrawal by having to propose state of the practice seismic instrumentation criteria including instrumentation type, locations, characteristics, and maintenance. 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 1.12

Under this alternative, the NRC would revise Regulatory Guide 1.12. The value to NRC staff and applicants in revising the guide would be the benefits associated with providing guidance based on current state-of the practice seismic instrumentation criteria relative to instrument characteristics, locations, instrumentation, and maintenance. 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, In the case of Alternative 2 applicants may adopt alternate seismic instrumentation criteria such as those detailed in ANSI/ANS-2.2-2002, “Earthquake Instrumentation Criteria for Nuclear Power Plants.” However, this standard is also currently being revised to incorporate updates similar to the proposed revisions to RG 1.12. 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 additional staff resources needed for evaluating applicant/licensee submittals which do not meet the RG, the overall cost to NRC of Alternative 3 is expected to be 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 submittals may be delayed because the NRC may have to issue RAIs and applicants may have to perform additional analyses to address those RAIs. These additional activities would lead to increased costs to the applicants 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 1.12 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.