

Regulatory Guide Number: 1.61, Revision 1

Title: DAMPING VALUES FOR SEISMIC DESIGN OF NUCLEAR POWER PLANTS

Office/division/branch: RES/DE/SGSEB

Technical Lead: Marcos Rolón-Acevedo

Staff Action Decided: Revise

1. What are the known technical or regulatory issues with the current version of the Regulatory Guide (RG)?

Regulatory Guide (RG) 1.61, "Damping Values for Seismic Design of Nuclear Power Plants", Revision 1, issued in March 2007, specifies the damping values that the NRC staff considers acceptable for complying with the agency's regulations and guidance for seismic analysis.

Staff review has identified the need to update regulatory position C.1.2 for consistency with SRP Section 3.7.2 (Revision 4), subsection II.3.C which includes additional acceptance criteria related to the concrete properties and damping values for use in the development of in-structure response spectra (ISRS). The revision will also consider as needed, revisions under consideration in the update of consensus standards for seismic analysis and design of nuclear power plant structures such as ASCE 4, "Seismic Analysis of Safety-Related Nuclear Structures" and ASCE 43, "Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities." Staff review has also identified the need to update RG 1.61 to include guidance on damping for Steel-Plate Composite (SC) walls.

2. What is the impact on internal and external stakeholders of not updating the RG for the known issues, in terms of anticipated numbers of licensing and inspection activities over the next several years?

Regarding the updates to the RG, given the existence of the additional acceptance criteria in SRP 3.7.2 there's no immediate impact on the ongoing and anticipated licensing activities. However, to ensure consistency between RG 1.61 and SRP 3.7.2, RG 1.61 should be updated promptly.

Additionally, as indicated above, RG 1.61 lacks guidance on damping values for SC walls. The lack of established NRC position regarding this subject would hinder the quality of licensing applications, including small modular reactors and non-light water reactor reactors, and respective NRC review. The NRC would review each application on a case-by-case basis which may result in the issuance of multiple requests for additional information.

3. What is an estimate of the level of effort needed to address identified issues in terms of full-time equivalent (FTE) and contractor resources?

NRC staff requires approximately 0.4 FTE to complete a full revision of Regulatory Guide 1.61.

4. Based on the answers to the questions above, what is the staff action for this guide (Reviewed with no issues identified, Reviewed with issues identified for future consideration, Revise, or Withdraw)?

Revise RG 1.61 in light of the current staff positions contained in SRP 3.7.2 Revision 4 and to include guidance on damping for SC walls.

5. Provide a conceptual plan and timeframe to address the issues identified during the review.

1. Identify the portions of RG 1.61 that need revision.
2. Review the pertinent consensus standards.
3. Identify dependencies between any items both within the RG itself as well as between other RGs.
4. For any additional technical problems that may arise based on this review, identify which may be already addressed in other RGs and perform literature review or calculations as necessary to satisfy the problem.
5. Review the revised RG to ensure agency standards are met.
6. Transmit to the Regulatory Guide and Programs Management Branch for processing in the 4th Quarter of FY22

REFERENCES

1. U.S. Nuclear Regulatory Commission (NRC), NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 3.7.2, "SEISMIC SYSTEM ANALYSIS," Washington, DC.
2. American Society of Civil Engineers (ASCE), ASCE/SEI 4-16. "Seismic Analysis of Safety-Related Nuclear Structures." American Society of Civil Engineers, Reston, Virginia. 2016
3. American Society of Civil Engineers (ASCE)/SEI 43-19, "Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities," 2019.
4. American National Standards Institute (ANSI)/American Institute of Steel Construction (AISC), "Specification for Steel-Related Steel Structures for Nuclear Facilities," ANSI/AISC N690-18, Chicago, IL, June 2018.

NOTE: This review was conducted in 03/2022 and reflects the staff's plans as of that date. These plans are tentative and subject to change.