

**FINAL DRAFT REVISION 3 TO REGULATORY GUIDE 1.100 – SEISMIC
QUALIFICATION OF ELECTRICAL AND ACTIVE MECHANICAL EQUIPMENT
AND FUNCTIONAL QUALIFICATION OF ACTIVE MECHANICAL EQUIPMENT
FOR NUCLEAR POWER PLANTS**

Wednesday, July 8, 2009
10:15 – 22:45 am

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**STATUS REPORT
564th ACRS MEETING**

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PURPOSE: Staff are seeking Committee approval to issue the aforementioned regulatory guide as a final document.

COMMITTEE ACTION: To determine if the staff's proposed revisions are acceptable in light of the earlier public comments received.

LEAD MEMBER/STAFF: John Stetkar/Mike Lee

INVITED CONSULTANT: P.T. Kuo/NRC (retired)

SCHEDULED SPEAKER: John Burke/RES and others

BACKGROUND: In general, the Commission's regulations stipulate that nuclear power plants be designed and constructed in such a manner as to withstand the effects of seismic hazards without the loss of that facilities' capability to perform its intended safety function. These regulations can be found at 10 CFR Part 50. In addition to the regulations and the Standard Review Plan, the staff have also placed additional guidance to licensees in certain stand-alone guidance documents, such as Regulatory Guides. About 20 or so of NRC's Regulatory Guides pertain to seismic issues and the need to account for the effects of earthquake ground motion in the design and operation of nuclear power reactors.

Regulatory Guide 1.100 concerns the seismic qualification of structures systems and components (SSCs) that are important to safety (ITS). This particular Regulatory Guide was first issued in 1976. A second revision was issued in June 1988 about the time the staff completed its Seismic Margins/Individual Plant Examination of External Initiating Events program. An outcome of that program was the confirmation that there needs to be at least one safe shutdown path for all operating nuclear power plants that is comprised of SSCs that are ITS. In the area of seismic hazards, those SSCs that have been identified as ITS need to be hardened (designed) against the effects of severe earthquake ground motion. Regulatory Guide 1.100 describes methods that the staff considers acceptable for use in determining/establishing the seismic qualification of electrical and active mechanical equipment and the functional qualification of active mechanical equipment that are ITS.

With a few exceptions and clarifications, the previous version of Regulatory Guide 1.100 endorsed the Institute of Electrical and Electronics Engineers (IEEE) Std 344-1987, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," and extended the application of that standard to the seismic qualification of mechanical equipment. In extending the application of IEEE Std 344-1987 to mechanical equipment, the NRC staff recognized differences in seismic qualification methods for electric equipment [including instrumentation and control (I&C) components] and mechanical equipment.

DISCUSSION: In 1981, the NRC issued Revision 0 of Regulatory Guide 1.148, entitled "Functional Specification for Active Valve Assemblies in Systems Important to Safety in Nuclear Power Plants." With a few exceptions and clarifications that guide endorsed American National Standards Institute (ANSI) N278.1-1975, "Self-Operated and Power-Operated Safety-Related Valves Functional Specification Standard." In 1994, the ASME issued a standard, ASME QME-1-1994, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants." This ASME standard eventually replaced the ANSI N278.1 standard. The ASME QME-1 standard covers both seismic qualification and functional qualification of active mechanical equipment. The ASME subsequently revised and reissued the standard in 1997, 2000, and 2002, with the last revision issued in November 2007 as ASME QME-1-2007. Furthermore, the IEEE updated IEEE Std 344-1987 and issued it as IEEE Std 344-2004 in June 2005.

The NRC developed Revision 3 to Regulatory Guide 1.100 to endorse, with exceptions and clarifications, the IEEE Std 344-2004 and the ASME QME-1-2007. (This is the first time the NRC is endorsing ASME QME-1). This revision of the regulatory guide will also subsume Regulatory Guide 1.148. Regulatory Guide 1.148 is intended to be deleted when Revision 3 of Regulatory Guide 1.100 is approved. (This is also the first time the NRC is endorsing ASME QME-1.) Specifically, Sections B. 1 and C. 1 of this regulatory guide endorse, with exceptions and clarifications, the entire IEEE Std 344-2004 and Section QR, "General Requirements," and Nonmandatory Appendix QR-A, "Seismic Qualification of Active Mechanical Equipment," of ASME QME-1-2007 for the seismic qualification of electrical and active mechanical equipment.

SCHEDULED PRESENTATION: The staff received more than eighty comments from seven organizations and entities concerning their proposed revisions to Regulatory Guide 1.100. The presentation is expected to focus on the motivation behind the development of Revision 3, the nature and scope of the public comments received, and the staff's disposition of those comments in the final draft guidance document.

Attachments (3)

1. Final Draft regulatory Guide 1.100
2. Final Draft regulatory Guide 1.100 (line-in/line-out version)
3. Public Comment Matrix