

Regulatory Guide Periodic Review

Regulatory Guide Number: 1.209, Revision 0

Title: Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants

Office/Division/Branch: RES/DE/ICEEB

Technical Lead: Derek Halverson

Staff Action Decided: Revise

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

The current version of this RG (Agencywide Documents Access and Management System (ADAMS) Accession No. ML070190294) states that IEEE Std. 323-2003 is generally appropriate for satisfying the environmental qualification of safety-related computer-based I&C systems for service in mild environments at nuclear power plants with a few exceptions. This RG also complements RG 1.89, “Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants,” which addresses compliance with 10 CFR 50.49, “Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants,” as well as related topics such as smoke and electromagnetic phenomena.

The 2013 periodic review of this RG (ML17047A171) identified issues for future consideration, but predicated the revision upon a revision to 10 CFR 50.55a(h). This revision did not occur. However, revisions to RG 1.89 and RG 1.152 have.

Revision 2 to RG 1.89 was issued in 2023 by the NRC ([ML22272A602](#)). This revision endorses the joint standard IEC/IEEE Std. 60780-323, Edition 1, 2016-02 (which supersedes IEEE Std 323-2003) with clarifications, exceptions, and supplements. Due to the technical nexus between RG 1.89 and RG 1.209, RG 1.209 should be updated for regulatory consistency between the RGs that discuss environmental qualification.

In addition, the current version of RG 1.209 references RG 1.180, Revision 1, and IEEE 7-4.3.2-2003. RG 1.180, Revision 2, was issued in December 2019. RG 1.152, Revision 4, references IEEE 7.4.3.2-2016. Therefore, revising RG 1.209 provides staff the opportunity to reference and discuss the latest revisions to RG 1.180, RG 1.152 and IEEE 7.4.3.2-2016.

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?

The impact of not updating this RG increases the potential for technical or regulatory challenges because different versions of IEEE Std. 323 are referenced in NRC guidance discussing equipment qualification.

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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 0.35 FTE to complete the technical evaluation and produce an update to this RG.

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.

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

A technical evaluation to revise this RG will commence in FY24 followed by issuance of a draft RG for public comment.

References:

- International Electrotechnical Commission (IEC)/ Institute of Electrical and Electronics Engineers (IEEE) Std. 60780 323, “Nuclear Facilities —Electrical Equipment Important to Safety—Qualification,” Edition 1, 2016 02.”
- RG 1.89, Revision 2, “Environment Qualification of Certain Electric Equipment Important to Safety for Nuclear Plants” (ML22272A602)
- RG 1.152, Revision 4, “Criteria for Programmable Digital Devices in Safety-Related Systems of Nuclear Power Plants” (ML23012A242)
- RG 1.180, Revision 2, “Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems” (ML19175A044)

NOTE: This review was conducted in November 2023 and reflects the staff’s plans as of that date. These plans are tentative and are subject to change.