REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE DG-1412

QUALIFICATION OF CLASS 1E BATTERY CHARGERS, INVERTERS, AND UNINTERRUPTIBLE POWER SUPPLY SYSTEMS FOR PRODUCTION AND UTILIZATION FACILITIES

(Proposed Revision 1 of Regulatory Guide 1.210 Revision 0, June 2008)

1. Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) is considering revising Regulatory Guide (RG) 1.210, "Qualification of Safety-Related Battery Chargers and Inverters for Nuclear Power Plants," Revision 0, issued June 2008, to provide improved guidance for the qualification of certain equipment in the direct current power systems in nuclear power plants.

Given the recent focus on environmental qualification by the NRC and licensees, it is anticipated that current licensees and new applicants would wish to use the latest technical information. Further, for purposes of license renewal, for example, a licensee may be motivated to use updated technical information for its time-limited aging analyses. Therefore, the staff needs to determine whether revision of this RG is warranted to provide guidance that reflects updated information for the qualification of Class 1E battery chargers, inverters, and uninterruptible power supply (UPS) systems for production and utilization facilities.

This RG endorses the Institute of Electrical and Electronics Engineers (IEEE) Standard 650-2017, "IEEE Standard for Qualification of Class 1E Static Battery Chargers, Inverters, and Uninterruptible Power Supply Systems for Nuclear Power Generating Stations," which is the latest version of the standard.

2. Objective

The objective of this regulatory action is to assess the need to update the guidance for applicants and licensees of nuclear power plants to incorporate into RG 1.210 (1) the qualification of safety-related UPS systems and programmable digital devices in the safety-related UPS systems, battery chargers, and inverters located in a mild environment, and (2) the testing for this equipment to be able to perform their functions during transients.

3. Alternative Approaches

The NRC staff considered two alternative approaches:

(1) Do not revise RG 1.210.
(2) Withdraw RG 1.210.
(3) Revise RG 1.210.

Alternative 1: Do Not Revise RG 1.210

Under this alternative, the NRC would retain the current RG without revision. This alternative is considered the "no-action" alternative and provides a baseline condition from which any other alternatives will be assessed. If the NRC takes no action, there would not be

any changes in costs or benefit to the public, licensees, or the NRC. However, the “no-action” alternative would not update the current version of the RG. Given the technological changes since 2008, this may result in the NRC issuing requests for additional information (RAIs) to licensees and applicants. Licensees and applicants would be burdened by the effort required to respond to these RAIs, and the NRC staff would be burdened by the need to review the associated responses.

Alternative 2: Withdraw RG 1.210

Under this alternative, the NRC would withdraw RG 1.210, which would eliminate the problems identified above. However, it would also eliminate the only readily available description of the methods the NRC staff considers acceptable for demonstrating compliance with 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” and 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants” related to the qualification of safety related or Class 1E battery chargers, inverters, and uninterruptible power supply systems for production and utilization facilities. Although this alternative would be less costly than the proposed recommended alternative, it would impede the public’s ability to determine the NRC’s position on the qualification of safety related or Class 1E battery chargers, inverters, and uninterruptible power supply systems for production and utilization facilities.

Alternative 3: Revise Regulatory Guide 1.210

Under this alternative, the NRC would revise RG 1.210. This revision would incorporate the latest information and supporting guidance to address the qualification of battery chargers, inverters, and UPSs for nuclear power plants. By doing so, the NRC would ensure that the RG guidance available in this area is current and accurately reflects the staff’s position on the qualification of this equipment.

The impact to the NRC would be the costs associated with preparing and issuing the RG revision. The impact to the public would be the voluntary costs associated with reviewing and providing comments to the NRC during the public comment period. The value to the NRC staff and its applicants and licensees would be the benefits associated with enhanced efficiency and effectiveness in using a common guidance document as the technical basis for license applications and other interactions between the NRC and its regulated entities.

4. Conclusion

Based on this regulatory analysis, the NRC staff concludes that revision of RG 1.210 is warranted. The action will enhance safety of nuclear power plants and other nuclear facilities by providing up-to-date guidance and information on qualifying safety-related battery chargers, inverters, and UPSs located in mild environments. It may also lead to cost savings for the industry, especially in supporting new, near-term reactor licensing activities.

Revising this RG to endorse Institute of Electrical and Electronics Engineers (IEEE) Standard 650-2017, “IEEE Standard for Qualification of Class 1E Static Battery Chargers, Inverters, and Uninterruptible Power Supply Systems for Nuclear Power Generating Stations,” is consistent with the NRC policy of evaluating the latest versions of national consensus standards to determine their suitability for endorsement by RGs. This approach also will comply with the NRC’s Management

Directive 6.5, “NRC Participation in the Development and Use of Consensus Standards,” dated October 28, 2016 (Agencywide Documents Access and Management System Accession No. ML18073A164. This is in accordance with the National Technology Transfer and Advancement Act of 1995 (Public Law 104-113).