REGULATORY ANALYSIS

Qualification of Connection Assemblies for Nuclear Power Plants
(*Proposed Revision 1 to Regulatory Guide 1.156, dated November 1987*)

Background

Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 572-2006, "Qualification of Class 1E Connection Assemblies for Nuclear Power Generating Stations," is a revision to IEEE Std. 572-1985. The current standard is the result of a review of IEEE Std. 572-1985 and current practices in connection assembly qualification. This revision incorporates current practices and lessons learned from the implementation of previous versions of this standard by the nuclear industry. In addition, the scope of IEEE Std. 572-2006 was expanded to provide guidance for the qualification of most types of connection assemblies.

In November 1987, the U.S. Nuclear Regulatory Commission (NRC) staff issued Regulatory Guide 1.156, "Environmental Qualification of Connection Assemblies for Nuclear Power Plants," which endorses IEEE Std. 572-1985.

Statement of the Problem

Regulatory Guide 1.156 provides guidance on limited types of connection assemblies used in nuclear power plants. This guidance needs to be expanded to cover most types of connection assemblies used in nuclear power plants.

Objective

The objective of the regulatory action is to update NRC guidance on most types of connection assemblies. Revising a regulatory guide is consistent with the NRC policy of evaluating the latest versions of national consensus standards to determine their suitability for endorsement by regulatory guides. This approach will also comply with the NRC's directive that standards developed by consensus bodies must be used in accordance with Public Law 104-113, "National Technology Transfer and Advancement Act of 1995."

Technical Approach

IEEE Std. 572-2006 is an improved standard. An important concept in equipment qualification is the recognition that significant degradation can be caused by aging mechanisms resulting from the environment during the service life; therefore, safety-related cables and connector assemblies should be in a degraded state before the conduct of design-basis event simulations. IEEE Std. 572-2006 recognizes that the period of time for which acceptable performance is demonstrated is the "qualified life." This standard also recognizes that the condition of the equipment for which acceptable performance is demonstrated is the "qualified condition." During new license renewal and life extension options, the

qualified equipment should remain in a qualified condition. In conclusion, IEEE Std. 572-2006 reflects the current state of technology and is consistent with the NRC regulatory positions for equipment qualification.

IEEE made numerous changes to IEEE Std. 572-2006 in comparison to IEEE Std. 572-1985. The attachment to this draft regulatory guide lists these changes.

Alternative Approaches

The alternative would be to not publish an updated guide. However, the efficiency gained by providing the guidance is worth the low costs of staff preparation time and review by interested members of the public.

Conclusion

The NRC intends to issue this regulatory guide to enhance the licensing process. The staff has concluded that the proposed action will reduce unnecessary burden on both the NRC and its licensees and will result in an improved and more uniform process for qualifying safety-related connection assemblies. Moreover, the staff sees no adverse effects associated with issuing this regulatory guide.