REGULATORY ANALYSIS

Proposed Revision 1 to Regulatory Guide 1.141, "Containment Isolation Provisions for Fluid Systems."

Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) staff's review of the lessons learned from the accident at Three Mile Island Nuclear Generating Station, Unit 2, revealed that an isolation signal derived from containment pressure alone was not sufficient to ensure containment isolation in the event of an incident.

The radiation level within containment is an appropriate signal/parameter for taking action to protect the public health and safety; therefore, licensees should monitor these levels. An isolation signal derived from an actuation of an engineered safety feature system or subsystem is a diverse method to ensure containment isolation under those conditions that warrant an engineered safety feature actuation. These three parameters (containment pressure, radiation level, and engineered safety feature actuation) provide diversity for containment isolation to prevent the release of radioactivity beyond the accepted limits under abnormal occurrences or credible accident conditions.

Objective

The objective of this regulatory action is to update the NRC guidance on acceptable design, testing, and maintenance requirements that licensees may use to comply with their plant-specific design criteria, which meet the intent of General Design Criteria (GDC) 54, 55, 56, and 57 of Appendix A to Title 10, of the *Code of Federal Regulations*, Part 50, "Domestic Licensing of Production and Utilization Facilities" (10 CFR Part 50) for the isolation of fluid systems that penetrate the primary containment of light-water-cooled reactors.

Alternative Approaches

The NRC staff considered the following alternative approaches:

Do not revise Regulatory Guide 1.141.
Revise Regulatory Guide 1.141.

<u>Alternative 1: Do Not Revise Regulatory Guide 1.141</u>

Under this alternative, the NRC would not revise this guidance, and the current guidance would be retained. If the NRC does not take action, there would be no changes in costs or benefit to the public, licensees, or the NRC. However, the "no-action" alternative would not provide licensees with the current staff positions on acceptable design, testing, and maintenance requirements that licensees may use to comply with their plant-specific design criteria, which meet the intent of GDC 54, 55, 56, and 57 of Appendix A to 10 CFR Part 50 for the isolation of fluid systems that penetrate the primary containment of light-water-cooled reactors.

<u>Alternative 2: Revise Regulatory Guide 1.141</u>

Under this alternative, the NRC would revise Regulatory Guide 1.141, taking into consideration the improved regulatory guidance resulting from the NRC staff's review of the lessons learned from the accident at Three Mile Island Nuclear Generating Station, Unit 2; and to provide the updated staff

positions on the American National Standards Institute (ANSI), ANSI N271-1976, taking into consideration the subsequent years of operating experience since the last revision of the guide.

One benefit of this action is that it would enhance reactor safety by improving regulatory guidance based on the lessons learned from the Three Mile Island accident. In addition, an updated Regulatory Guide 1.141 would provide licensees with the current staff positions on acceptable design, testing, and maintenance requirements that licensees may use to comply with their plant-specific design criteria, which meet the intent of GDC 54, 55, 56, and 57 of Appendix A to 10 CFR Part 50 for the isolation of fluid systems that penetrate the primary containment of light-water-cooled reactors.

The cost to the NRC would be the one-time cost of issuing the revised regulatory guide (which is expected to be relatively small), and applicants would incur little or no cost.

Conclusion

Based on this regulatory analysis, the staff recommends that the NRC revise Regulatory Guide 1.141. The staff concludes that the proposed action reflects the current staff positions on acceptable design, testing, and maintenance requirements that licensees may use to comply with their plant-specific design criteria, which meet the intent of GDC 54, 55, 56, and 57 of Appendix A to 10 CFR Part 50 for the isolation of fluid systems that penetrate the primary containment of light-water-cooled reactors.