

REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE (DG-3053) “NUCLEAR CRITICALITY SAFETY STANDARDS FOR NUCLEAR MATERIALS OUTSIDE REACTOR CORES”

(Proposed Revision 3 of Regulatory Guide 3.71, dated December 2010)

1. Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) is considering revising Regulatory Guide (RG) 3.71, “Nuclear Criticality Safety Standards for Nuclear Materials Outside Reactor Cores,” to update Revision 2 to this guide that was issued in December 2010. Since that time, several nuclear criticality safety (NCS) standards have been issued, reaffirmed, and revised by ANS.

This revision of the guide (Revision 3) provides up-to-date guidance based on the changes that have occurred with the American National Standards Institute/American Nuclear Society Subcommittee-8 standards (ANSI/ANS-8) listed in Regulatory Position C.1 to this guide. In addition, the scope of this revision is expanded beyond 10 CFR Part 70 fuel facilities to include transportation and storage facilities under 10 CFR Part 71 and 10 CFR Part 72. This revision would also endorse International Organization for Standardization (ISO) Standard 7753:1987, “Nuclear Energy—Performance and Testing Requirements for Criticality Detection and Alarm Systems.”

2. Objective

The NRC staff endorses, with some exceptions and clarifications, specific nuclear criticality safety standards on operations with fissionable material outside reactors that were developed by ANSI/ANS-8 and standards developed by the ISO Technical Committee 85, Subcommittee 5, Working Group 8 (TC85/SC5/WG8) on nuclear criticality safety. Because the ANSI/ANS-8 and ISO standards are frequently being issued, revised, reaffirmed, or withdrawn, the NRC staff believes the guidance associated with these standards should also be revised.

3. Alternative Approaches

The NRC staff considered the following alternative approaches:

1. Do not revise RG 3.71
2. Withdraw RG 3.71
3. Revise RG 3.71

Alternative 1: Do not revise RG 3.71

Under this alternative, the NRC would not revise RG 3.71 and the current guidance would be retained. If the NRC does not take action, there will be no additional costs to the public, licensees, or the NRC. However, this alternative also means no potential new benefits to the public, licensees, or the NRC and the identified concerns with the current version of the RG guide would not be addressed by taking advantage of state-of-the-art industry best practices, the

developments in the field of NCS, and the latest standards. If licensees decide to commit to updated versions of the standards, then the NRC staff would have to review each application on a case-by-case basis. This could result in inconsistent interpretation and application of the guidance.

Alternative 2: Withdraw RG 3.71

Under this alternative, the NRC would withdraw RG 3.71. This would eliminate the problems identified above regarding the RG. It would also eliminate the only readily available description of the methods the NRC staff considers acceptable for demonstrating compliance with the NRC regulations. Withdrawing the RG guide would be less costly than revising it; however, it would also mean that users would not have access to important regulatory guidance.

Alternative 3: Revise RG 3.71

Under this alternative, the NRC would revise RG 3.71 to endorse new or revised ANS-8 Series standards related to NCS. In addition to standards associated with 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," for fuel facilities, ANSI/ANS-8 Series standards, and other NCS standards (e.g., International Organization for Standardization (ISO) standards), applicable to other parts of the fuel cycle would be included.

The impact to the NRC would be the costs associated with preparing and issuing the RG revision. The costs to the public would be voluntary costs associated with reviewing and commenting on the RG during the public comment period. The benefit to NRC staff and to applicants would be 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 recommends revision of RG 3.71 with an expanded scope to include fuel cycle facilities, transportation, and storage applications. This will allow for more efficient and effective licensing reviews under 10 CFR Part 70, 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," and 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste."