

REGULATORY ANALYSIS

REGULATORY GUIDE (RG)-5.29 SPECIAL NUCLEAR MATERIAL CONTROL AND ACCOUNTING SYSTEMS FOR NUCLEAR POWER PLANTS (Draft was issued as DG-5028, dated May, 2012)

1. Statement of the Problem

Revision 1 to Regulatory Guide 5.29, “Nuclear Material Control Systems for Nuclear Power Plants,” issued June 1975, endorsed American National Standards Institute (ANSI) N15.8-1974, “Methods of Nuclear Material Control—Material Control Systems—Special Nuclear Material Control and Accounting Systems for Nuclear Power Plants,” as an acceptable method for implementing the U.S. Nuclear Regulatory Commission’s (NRC’s) requirements for special nuclear material control and accounting at nuclear power plants. However, this standard primarily addressed control and accounting of fuel assemblies and did not address fuel rods that are separated from the parent assembly.

Because ANSI N15.8-1974 did not provide specific guidance on control and accounting of pieces resulting from fuel damage, the NRC withdrew Regulatory Guide 5.29 in January 1998 (63 FR 2426; January 15, 1998).

In the absence of endorsed guidance, licensees relied on site-specific procedures and processes to implement material control and accounting requirements, and licensee programs and procedures were reviewed by the NRC on a case-by-case basis.

Subsequently, ANSI revised its standards for special nuclear material control and accounting and published ANSI N15.8-2009, “Methods of Nuclear Material Control—Material Control Systems—Special Nuclear Material Control and Accounting Systems for Nuclear Power Plants,” dated February 18, 2009. ANSI N15.8-2009 adds specific guidance on controlling and accounting for potential losses of licensed material when spent fuel rods or fuel assemblies are damaged and broken into pieces. Revision to Regulatory Guide 5.29 is also consistent with the recommendations in U.S. Government Accountability Office 05-339, “NRC Needs To Do More To Ensure That Power Plants Are Effectively Controlling Spent Nuclear Fuel,” dated April 8, 2005.

Therefore, the NRC needs to revise this regulatory guide to endorse ANSI N15.9-2009 as an acceptable method for implementing material control and accounting (MC&A) requirements at nuclear power plants.

2. Objective

The objective of this regulatory action is to endorse ANSI N15.9-2009 as an acceptable method for implementing material control and accounting requirements at nuclear power plants.

3. Alternative Approaches

The NRC staff considered the following alternative approaches:

1. Do not revise RG 5.29.
2. Revise RG 5.29.

Alternative 1: Do Not Revise RG 5.29

Under this alternative, the NRC would not revise guidance, and the existing guidance would remain withdrawn. If the NRC does not take action, the costs and benefits to the public, licensees, or the NRC would not change. However, the “no-action” alternative would not address the fuel damage concerns referenced above, which caused Regulatory Guide 5.29 to be withdrawn in January 1998. The NRC would continue to review each application on a case-by-case basis. This alternative provides a baseline condition for the assessment of any other alternatives.

Alternative 2: Revise RG 5.29

Under this alternative, the NRC would revise Regulatory Guide (RG) 5.29, taking into consideration the changes and additions made by ANSI in its update to ANSI N15.8-1974 through the publication of ANSI N15.8-2009.

One benefit of this action is that it would enhance safety and security of special nuclear material (SNM) at nuclear power plants by providing licensees with additional guidance on the control and accounting of 1) fuel rods that are separated from their parent assemblies; and 2) pieces of irradiated material that are separated as a result of fuel damage.

Currently, licensees have MC&A programs which have been reviewed, inspected and found acceptable by the NRC. There is no additional cost imposed by issuing the regulatory guidance in RG 5.29, as it is not a requirement, and its use is voluntary. Issuing the guidance would benefit new licensees, because of the certainty that the MC&A methods it discusses are acceptable to the NRC.

The MC&A methods discussed in ANSI 15.8-2009 are generally consistent with acceptable MC&A programs approved by the NRC. Nuclear power plant licensees are the community which uses the ANSI 15.8-2009 standard, and they participated in its development. ANSI 15.8-2009 thus reflects the licensees' occupational experience. The process of guidance development is iterative. A licensee's MC&A program likely contains most if not all considerations included within ANSI 15.8-2009, or the standard would not have been approved by the members. The staff has found that industry guidance, developed using consensus standards, can be a valuable repository of best available practices, and a tool for communication between stakeholders. Guidance developed in this manner often increases the depth of understanding of the subject matter.

The impact to the NRC is the relatively minor costs associated with preparing and issuing a revision to the regulatory guide, and further without having to develop the technical basis which exists within a consensus standard that has already been issued. The impact to the public would be the voluntary costs associated with reviewing the revision to the regulatory guide and submitting comments to the NRC during the public comment period. This is further minimized by the function of the ANSI consensus standard process, as the guidance has been vetted and found acceptable by users. The value to the NRC staff and its applicants 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. When found acceptable by the NRC to provide an adequate level of safety, guidance provided by consensus standards organizations provides dividends by making the standard widely available to all stakeholders.

Conclusion

The staff concludes that the proposed action will enhance safety and security by providing licensees and applicants with additional guidance on implementing material control and accounting requirements at nuclear power plants. It could also lead to cost savings for the industry, especially with regard to applications and license amendments, which could reference this regulatory guide instead of incurring costs associated with the review of those portions of licensing actions on a case-by-case basis. Based on this regulatory analysis, the NRC staff recommends revising Regulatory Guide 5.29.