

Regulatory Guide Periodic Review

Regulatory Guide Number: **5.58**

Revision: **1**

Title: **Considerations for Establishing Traceability of Special Nuclear Material Accounting Measurements (Feb 1980)**

Office/division/branch: **NMSS/FCSE/MCAB**

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Recommended Staff Action: **Reviewed with issues identified for future consideration**

1. What are the known technical or regulatory issues with the current version of the Regulatory Guide (RG)?

This RG was revised in February 1980, and presents acceptable conditions and approaches for establishing and maintaining traceability of special nuclear material (SNM) control and accounting measurements meeting the requirements in 10 CFR Part 70.51, "Material Balance, Inventory, and Records Requirements." The former 10 CFR Part 70.51 required licensees to calculate material unaccounted for (MUF) and the limit of error of the MUF value (LEMUF) following each physical inventory and to compare the LEMUF with prescribed standards.

However, in 2002, the NRC revised 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material," and the requirements in 10 CFR Part 70 were transferred to 10 CFR Part 74. Specifically, the NRC revised 10 CFR Part 74.31, "Nuclear material control and accounting for special nuclear material of low strategic significance," 10 CFR Part 74.41, "Nuclear material control and accounting for special nuclear material of moderate strategic significance," and 10 CFR Part 74.51, "Nuclear material control and accounting for strategic special nuclear material." As a result, RG 5.58 is not cross-referencing to the correct regulatory citations.

In addition, there are technical issues regarding the terminology used in the RG related to inventories and their evaluation. For example, the terms used in the guide such as "MUF" and "LEMUF" are outdated. The current relevant terms, used in the regulations and other guidance documents, are "inventory difference" (ID) and "standard error of the inventory difference" (SEID).

Also, the RG references American National Standards Institute (ANSI) standards: (1) ANSI 15.18-1975, "Mass Calibration Techniques for Nuclear Material Control," which was reaffirmed in 1988 and is currently inactive (withdrawn); (2) ANSI 15.19-1975, "Volume Calibration Techniques for Nuclear Material Control," which was reaffirmed in 1989 and is currently inactive (withdrawn); and (3) ANSI N15.20-1975, "Guide to Calibrating Nondestructive Assay Systems, which was reaffirmed in 1987 and is

currently inactive (withdrawn). Although these standards have been withdrawn the RG, in its current form still provides useful information for licensees for establishing traceability of special nuclear material (SNM) accounting measurements.

Currently, a number of American Society for Testing and Materials (ASTM) standards such as ASTM C1068-15, "Standard Guide for Qualification of Measurement Methods by a Laboratory Within the Nuclear Industry," are available and active for establishing and maintaining traceability of SNM control and accounting measurements.

Also, although dating to the 1970s, it should be noted that most of the thirteen references listed in the guide are still available using a web search on the internet.

2. What is the impact on internal and external stakeholders of not updating the RG for the known issues, in terms of anticipated numbers of licensing and inspection activities over the next several years?

The staff is not expecting any new applications for the next 2-3 years where this RG could be used and therefore, there is no impact on licensing and inspection activities. However, during the next review the staff should review the most current technology and standards available that could be endorsed in the revised guide.

Current licensees already implemented their measurement systems and measurement methods for all SNM, including the establishment of traceability of SNM control and accounting measurements. Additionally, licensees are also familiar with the terms ID and SEID, since they have been using these terms since the 1980s. Current material control and accounting (MC&A) guidance in NUREG documents (e.g., NUREG-1280, "Acceptable Standard Format and Content for the Material Control and Accounting Plan Required for Strategic Special Nuclear Material," for Category I, "High Enriched Uranium" fuel cycle facilities, and NUREG-1065, "Acceptable Standard Format and Content for the Material Control and Accounting Plan Required for Special Nuclear Material of Low Strategic Significance," for Category III, "Low Enriched Uranium," fuel cycle facilities) include detailed discussions of measurement systems and measurement methods.

3. What is an estimate of the level of effort needed to address identified issues in terms of full-time equivalent (FTE) and contractor resources?

An estimate of the effort needed to correct the identified issues is between 0.10 full-time equivalent (FTE) and 0.20 FTE.

4. Based on the answers to the questions above, what is the staff action for this guide (Reviewed with no issues identified, Reviewed with issues identified for future consideration, Revise, or Withdraw)?

Reviewed with issues identified for future consideration.

5. Provide a conceptual plan and timeframe to address the issues identified during the review.

As discussed in Management Directive (MD) 6.6, "Regulatory Guides," the NRC staff reviews RGs approximately every 5 years to ensure that these guides continue to provide useful guidance. The staff will consider the regulatory citation issues and any other technical information that may need to be updated during the next periodic review of the guide.

NOTE: This review was conducted in August 2016, and reflects the staff's plans as of that date. These plans are tentative and subject to change.