

Regulatory Guide Periodic Review

Regulatory Guide Number: **5.42**

Revision: **0**

Title: **Design Considerations for Minimizing
Residual Holdup of Special Nuclear Material in
Equipment for Dry Process Operations (January 1975)**

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

Technical Lead: **David Ditto**

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 issued in January 1975 to provide guidance on the appropriate equipment design features and characteristics that are acceptable to the Nuclear Regulatory Commission (NRC) staff for equipment design, layout, and measurement control to maximize the effectiveness and significance of reducing residual holdup in dry process operations following draindown and cleanout. This guide describes design features applicable to: (1) gas handling, (2) glovebox operations, (3) calcining, (4) dry solids transfer, (5) dry blending and classification, (6) packed bed conversions, and (7) comminution.

A material balance based on a measured physical inventory that provides conclusive evidence of the physical presence of the material is the only means for assuring that the physical protection and material control and accountability systems have been effective and that no significant losses or diversions have gone undetected. The design features in this RG lessen the severity of the problems associated with determining the residual holdup component of a physical inventory as required by 10 CFR 74.11, "Reports of loss or theft or attempted theft or unauthorized production of special nuclear material," 74.13, "Material status reports," 74.15, "Nuclear material transaction reports," 74.19, "Recordkeeping," 74.51, "Nuclear material control and accounting for strategic special nuclear material," 74.53, "Process monitoring," and 74.59, "Quality assurance and accounting requirements." However, RG 5.42 refers to the requirements in 10 CFR 70.22, "Special Nuclear Material," and 70.51, "Material Balance, Inventory, and Records Requirements," which were transferred to 10 CFR Part 74 in 2002. As a result, RG 5.42 is not cross-referencing to the correct regulatory citations.

- 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?**

Current licensees who experience residual holdup during dry process operations use this RG to achieve regulatory requirements in 10 CFR Part 74. This RG remains applicable to Category I, "High Enriched Uranium" fuel cycle facilities, and Category III, "Low Enriched Uranium" fuel cycle facilities licensed by the NRC. There would be minimal impact to internal or external stakeholders if this RG is not updated.

For future applicants, using the current RG may cause confusion due to the reference to 10 CFR 70.22 and 70.51, which no longer exist. However, this RG provides a standard format and content for developing material control and accounting (MC&A) programs for techniques to reduce residual holdup used in dry process operations and the terms used in this RG are current with methods and procedures used by licensees.

- 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 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 6.6, "Regulatory Guides," the NRC staff reviews RGs approximately every 5 years to ensure that these continue to provide useful guidance. During the next RG periodic review the NRC staff should consider addressing the identified regulatory and technical issues.

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