

June 18, 2015

MEMORANDUM TO: Brian E. Thomas, Director  
Division of Engineering  
Office of Nuclear Regulatory Research

FROM: Lawrence E. Kokajko, Director /RA/  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

SUBJECT: RESULTS OF PERIODIC REVIEW OF REGULATORY GUIDE 1.21

This memorandum documents the U.S. Nuclear Regulatory Commission (NRC) periodic review of Regulatory Guide (RG) 1.21, Revision 2, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," published in June 2009. The RG describes radiological effluent monitoring for nuclear power plants. As discussed in Management Directive 6.6, "Regulatory Guides," the staff reviews RGs approximately every five years to ensure that the RGs continue to provide useful guidance. The documentation of the Office of Nuclear Reactor Regulation (NRR) staff review is enclosed.

Based on the results of the periodic review, the NRR staff concludes that a revision to RG 1.21 is warranted. The NRR staff has identified technical and regulatory issues in the review and currently plans to revise RG 1.21 by fourth quarter FY 2016.

Enclosure:  
As stated

CONTACT: Leslie Perkins, NRR/DPR  
301-415-2375

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## Regulatory Guide Periodic Review

Regulatory Guide Number: **1.21, Revision 2**

Title: **Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste**

Office/division/branch: **NRR/DRA/ARCB**

Technical Lead: **Manuel Jimenez**

Recommended Staff Action: **Revise**

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

RG 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," describes radiological effluent monitoring for nuclear power plants. Questions and observations have arisen as a result of comments from industry and inspections that have identified issues that warrant addressing. Clarification is needed on the regulatory background for the reporting requirements found in Section C, "Regulatory Position," on pages 31-32. The requirements apply to shipment of solid radioactive waste shipped for processing or disposal, specifically low-level waste. There are no regulatory requirements on reporting shipment of low-level waste from the facility unless a licensee made a specific licensing commitment. This should be clarified in Section B, the discussion section of the RG.

**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?**

For licensing activities, there are no new large power reactor license applications anticipated in the near future (next three to five years). Thus, there is no immediate need for revising the guide at this time to address their licensing. For small modular reactors at least one application is anticipated in the next two years.

For inspection activities, there is uncertainty as to how to report solid radwaste in the Annual Radiological Effluent reports (as described in this RG). This uncertainty has led to NRC inspectors questioning whether licensees are reporting correctly, and licensees questioning exactly what the NRC requires. Some licensees have challenged the inspector findings under the reactor oversight process (e.g., Diablo Canyon).

ENCLOSURE

- 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?**

Approximately 0.2 FTE of staff effort will be required to revise the RG. No contractor resources will be required.

- 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)?**

Revise.

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

1. Revise the RG in accordance with existing regulations. Estimated completion by the fourth quarter of FY 2016.
2. Transmit to the Regulatory Guidance and Generic Issues Branch for processing approximately in the second quarter of FY 2017.

**NOTE: This review was conducted in June 2015 and reflects the staff's plans as of that date. These plans are tentative and subject to change.**