



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 9, 2019

MEMORANDUM TO: Louise Lund, Director  
Division of Engineering  
Office of Nuclear Regulatory Research

FROM: Michael X. Franovich, Director /RA/  
Division of Risk Assessment  
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, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste." This RG provides guidance for radiological effluent monitoring and reporting of solid waste for nuclear power plants.

As discussed in Management Directive 6.6, "Regulatory Guides," the NRC staff reviews RGs approximately every 10 years to ensure that the RGs continue to provide useful guidance. Documentation of the NRC staff review is enclosed.

Based on the results of the periodic review, the staff concludes that changes to RG 1.21, Rev. 2 are warranted. The staff identified one clarification and two technical issues that require revision.

Enclosure:  
Regulatory Guide Periodic Review

CONTACT: Steven M. Garry, NRR/DRA  
301-415-2766

SUBJECT: RESULTS OF PERIODIC REVIEW OF REGULATORY GUIDE 1.21  
DATED: 9/09/2019

DISTRIBUTION:

SGarry, NRR  
KHsueh, NRR  
MFranych, NRR  
MEudy, RES  
TBoyce, RES

ADAMS Accession No.: ML19114A521

NRR-106

OFFICE	NRR/DRA/ARCB	NRR/DRA/ARCB: BC	NRR/DRA/ARCB: D
NAME	SGarry	KHsueh	MFranych
DATE	8/17/2019	8/27/2019	9/09/2019

**OFFICIAL RECORD COPY**

## 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:** Steven Garry

**Staff Action Decided:** Revise

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

Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," is a relevant and useable RG that describes radiological effluent monitoring for nuclear power plants.

A revision of RG 1.21 is not part of a rulemaking effort. There are no related agency documents that conflict with the RG. There are no staff positions in related agency documents that need to be made part of the RG. The previous periodic review (Agencywide Documents Access and Management System Accession No. ML15098A590, dated June 18, 2015) had a potentially misleading statement that "There are no regulatory requirements on reporting shipment of low-level waste from the facility unless a licensee made a specific licensing commitment." While there are no regulations on reporting shipments of low-level waste, many facilities have plant-specific technical specifications incorporated into their license with reporting requirements for low-level waste shipments. This situation should be clarified in Section C, "Regulatory Position."

In addition, the staff identified two other technical or regulatory issues during this review. The first is guidance is needed on acceptable methods for calibration of accident-range noble gas effluent monitors.

The second is that Section 3.2 "Atmospheric Transport and Diffusion" regarding the long-term, annual average  $\chi/Q$  and  $D/Q$  values for determining dose to individual members of the public should be re-evaluated. Currently, if the long term, annual average  $\chi/Q$  and  $D/Q$  are nonconservative by 10 percent or more, then the affected values should be revalidated, or the reason why such changes are not deemed necessary should be documented. In practice, the 10 percent acceptance value may be too low to provide meaningfully different results.

### **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?**

There is an impact to licensees of not updating the RG in that the current guidance on the regulatory requirements is unclear. For reporting low-level waste, during inspection activities

**Enclosure**

some licensees question why they must report shipments of low-level waste vs. waste disposed in a licensed disposal facility. For calibration of accident range effluent monitors, licensees do not have guidance on adequate calibration methods. For meteorology, some licensees have questioned the appropriateness of revising the long term, annual average  $\chi/Q$  and  $D/Q$  values when values are non-conservative by a relatively small amount (e.g., 10 percent).

**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 estimated 0.20 FTE level of effort is estimated.

**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.**

The U.S. Nuclear Regulatory Commission (NRC) plans to develop the draft RG for internal NRC staff review by the end of June, 2020, and issue the draft RG for public comment by the end of December, 2020.

**NOTE: This review was conducted in August 2019 and reflects the staff's plans as of that date. These plans are tentative and subject to change.**