



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

July 29, 2020

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

FROM: Michael X. Franovich, Director *Gregory Bowman* Bowman, Gregory signing on behalf
Division of Risk Assessment of Franovich, Michael
Office of Nuclear Reactor Regulation on 07/29/20

SUBJECT: RESULTS OF PERIODIC REVIEW OF REGULATORY GUIDE
1.143, REVISION 2

This memorandum documents the U.S. Nuclear Regulatory Commission (NRC) periodic review of Regulatory Guide (RG) 1.143, Revision 2, "Design Guidelines for Radioactive Waste Management Systems, Structures and Components installed in Light Water-Cooled Nuclear Power Plants." A review of the guide is enclosed with this memorandum.

The RG, which was last revised in 2001, describes methods that NRC staff considers acceptable for complying with the NRC's regulations in the design, construction, installation, and testing of the structures, systems, and components of radioactive waste management facilities in light water-reactor 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 guides continue to provide useful guidance.

Based on the results of the periodic review, the staff concludes that no changes to RG 1.143, Revision 2 are warranted at this time. However, the staff identified some technical or regulatory issues in the review that could warrant addressing in a future revision. A revision to the RG could benefit new reactor applications. With few light water reactor applicants expected in the coming years and significant staff resources necessary to revise the RG, the staff does not believe that a RG update is justified at this time. The staff will evaluate the need to revise the RG during the next periodic review.

Enclosure:
Regulatory Guide Periodic Review

CONTACT: Edward Stutzcage, NRR/DRA
301-415-5345

SUBJECT: RESULTS OF PERIODIC REVIEW OF REGULATORY GUIDE
1.143, REVISION 2 DATED: _

DISTRIBUTION:

Michael Franovich, NRR
Greg Bowman, NRR
Kevin Hsueh, NRR
Edward Stutzcage, NRR
Edward O'Donnell, RES

ADAMS Accession No.: ML20190A131

NRR-106

OFFICE	NRR/DRA/ARCB	NRR/DRA/ARCB: BC	NRR/DRA: D
NAME	EStutzcage	KHsueh	MFranovich <i>/RA/ G.Bowman for</i>
DATE	7/21/2020	7/29/2020	7/29/2020

OFFICIAL RECORD COPY

REGULATORY GUIDE PERIODIC REVIEW

Regulatory Guide Number: 1.143, Revision 2

Title: Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants

Office/Division/Branch: NRR/DRA/ARCB

Technical Lead: Edward Stutzcage

Staff Action Decided: Reviewed with issues identified for future consideration

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

RG 1.143, Rev. 2, was issued in November 2001 as part of an effort to update guidance on radioactive waste treatment and processing structures, systems, and components (SSCs). The revision addressed the design, construction, testing, and quality assurance guidance for these SSCs. Rev. 2 allows flexibility in the design requirements for these SSCs based on the potential radiological hazards associated with the SSCs (i.e., SSCs posing a lower radiological hazard can be less robust than SSCs posing a larger radiological hazard). The threshold for buildings is based on an unmitigated exposure for site personnel inside the protected area (i.e., worker dose) of 5 rem and an unmitigated release at the protected area boundary (public dose) of 500 mrem. However, the 500 mrem value is based the previous public dose limit from 10 CFR 20, which was changed to 100 mrem in the 1990s. This change should be addressed in a future update to the RG.

In addition, there are other items that should be addressed in the future revision to RG 1.143, including: (1) the RG should provide guidance on how to perform the unmitigated dose calculations or indicate what assumptions should be made in performing the calculation; and (2) the RG should clarify whether waste in storage should be considered in the classification of SSCs (e.g., it is unclear if waste in storage areas, including waste packaged for shipment in accordance with 10 CFR 71, "Packaging and Transport of Radioactive Material," is within the scope of the RG and should be included within the SSC classification calculations).

Thus far, these issues have resulted in challenges associated with the current use of RG 1.143 for staff and applicants, including the need for several rounds (in some cases) of requests for additional information (RAIs) for some applications. If not corrected in an update to the RG, the identified items could have schedule impacts for future reviews.

Enclosure

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?

RG 1.143 focuses on the design, construction, installation, and testing of radwaste SSCs in light-water-cooled power reactors licensed under 10 CFR Part 50 and 10 CFR Part 52. The purpose of a future revision to the RG would be to update guidance for reactors that are not yet in the application phase, primarily to improve the licensing process and provide additional clarity for future applications. Operating reactors and reactors whose applications have already been submitted are not expected to revise their radwaste system designs, licenses, or applications based on a revision to the RG. There are not many new light water reactor applications expected in the near future and some potential future applicants may have significantly different radwaste system design and design specifications than large light water reactors. In addition, current guidance continues to provide an acceptable way to meet U.S. Nuclear Regulatory Commission (NRC) requirements for applicants, and any significant gaps can be addressed through pre-application meetings, regulatory audits, or RAIs. Since a RG update would only benefit new applicants and few light water reactor applications are expected over the next several years, there should be little overall impact from not updating the RG.

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

Revision of the RG would take approximately 0.2 FTE of NRC staff time over a 2 year period. No contract dollars are needed.

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. The staff will evaluate the need to revise the RG during the next periodic review.

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

A revision to the RG could benefit new reactor applications. With few light water reactor applicants expected in the coming years and significant staff resources necessary to revise the RG, the staff does not believe that a RG update is justified at this time. The staff will evaluate the need to revise the RG during the next periodic review.

NOTE: This review was conducted in July 2020 and reflects the staff's plans as of that date. These plans are tentative and subject to change.