

Periodic Review for NRR/DNRL Refueling Regulatory Guides (RGs)

Office/division/branch: NRR/DNRL/NLIB

Technical Lead: Victoria Huckabay

Staff Action Decided: Reviewed with issues identified for future consideration

This periodic review applies to the following regulatory guides:

Regulatory Guide	Title
RG 3.6 Revision 0	Content of Technical Specifications for Fuel Reprocessing Plants
RG 3.17 Revision 0	Earthquake Instrumentation for Fuel Reprocessing Plants
RG 3.18 Revision 0	Confinement Barriers and Systems for Fuel Reprocessing Plants
RG 3.19 Revision 0	Reporting of Operating Information for Fuel Reprocessing Plants
RG 3.20 Revision 1	Process Offgas Systems for Fuel Reprocessing Plants
RG 3.22 Revision 0	Periodic Testing of Fuel Reprocessing Plant Protection System Actuation Functions
RG 3.26 Revision 0	Standard Format and Content of Safety Analysis Reports for Fuel Reprocessing Plants
RG 3.27 Revision 1	Nondestructive Examination of Welds in the Liners of Concrete Barriers in Fuel Reprocessing Plants
RG 3.30 Revision 0-R	Selection, Application, and Inspection of Protective Coatings (Paints) for Fuel Reprocessing Plants
RG 3.31 Revision 0-R	Emergency Water Supply Systems for Fuel Reprocessing Plants
RG 3.32 Revision 0	General Design Guide for Ventilation Systems for Fuel Reprocessing Plants
RG 3.40 Revision 0	Design Basis Floods for Fuel Reprocessing Plants and for Plutonium Processing and Fuel Fabrication Plants

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

In general, the technical issues for these RGs stem from the fact that the RGs were written to address aqueous reprocessing techniques. However, since these RGs were issued, industry has expressed an interest in other reprocessing techniques, particularly electrochemical processing. This technique involves different safety issues than aqueous techniques, so the RGs would need to be supplemented with guidance for this technique. In addition, these RG may need to be updated to reflect operating experience in other countries that use reprocessing, variations in aqueous reprocessing techniques that have emerged since the RGs were issued, and potentially other types of reprocessing techniques.

In general, regulatory issues for these RGs stem from the licensing framework that would be applicable for reprocessing facilities, including changes in the applicable regulations and related regulatory guidance since these RGs were issued. As background, Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," establishes requirements for the licensing of production and utilization facilities. In SECY-09-0082, "Update on Reprocessing Regulatory Framework – Summary of Gap Analysis," (ML091520243) the staff provided a summary of the regulatory gap analysis for developing the necessary framework to license reprocessing facilities. In SECY-11-0163, "Reprocessing Rulemaking: Draft Regulatory Basis and Path Forward," (ML113202350) the staff provided a draft regulatory basis document that addressed the 23 regulatory gaps identified in SECY-09-0082.

In SECY-13-0093, "Reprocessing Regulatory Framework – Status and Next Steps," (ML13178A233) the staff recommended finalization of the draft regulatory basis document and development of a reprocessing-specific rule (e.g., 10 CFR Part 7x). However, in SECY-21-0026, "Discontinuation of Rulemaking – Spent Fuel Reprocessing," (ML20301A387) the staff recommended that the rulemaking activity be discontinued because the effort was not cost-justified based on the limited interest expressed or expected from potential applicants for reprocessing facilities. The staff further concluded that licensing a reprocessing facility could be adequately accomplished under the existing 10 CFR Part 50 framework, recognizing that there would be a need for exemptions. In SRM-SECY-21-0026 (ML21175A0634), the Commission approved the staff's recommendation to discontinue the Spent Fuel Reprocessing rulemaking activity.

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?

While there are currently no holders of fuel reprocessing plant licenses, the staff anticipates a limited number of applicants for reprocessing facilities in the next several years. Applicants for these facilities, particularly those using electrochemical processing techniques, would not have current guidance and acceptance criteria for their proposed facilities, so they may not initially provide the appropriate scope and depth of their applications. The staff would also not have current guidance that can be used to review the applications, reducing regulatory predictability and efficiency of the reviews. This situation would likely lengthen the time required for industry and the staff to complete the application reviews for the proposed facilities.

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?

The staff is currently assessing the technical and regulatory issues for these RGs. Until the staff completes the assessment and identifies specific updates that may be necessary for the RGs listed above, resource estimates cannot be determined. Use of both staff and contractor resources is anticipated to be necessary for this assessment and any updates to the RGs.

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.

The NRR staff formed an agency working group in May 2023 to conduct an evaluation of the existing regulatory framework and develop the following items:

1. Areas where existing guidance documents that apply to reprocessing facilities would require updates and/or instances where new guidance needs to be developed. Guidance updates may be needed to bring existing RGs in line with current regulatory requirements and/or to incorporate technology-neutral considerations.
2. A high-level description of the updates needed to the existing regulatory guidance and infrastructure.
3. A recommendation regarding the use of contractor resources.
4. A recommendation on further communications with the Commission.

The working group plans to address the items above within a couple of years. Although the NRC does not currently have definitive plans to revise these RGs, the staff's evaluation is anticipated to identify any updates that may be needed, and the staff will consider updating the review for these RGs accordingly.

NOTE: This review was conducted in June 2023 and reflects the staff's plans as of that date. These plans are tentative and subject to change.