

Periodic Review RG 4.22 Revision 0

Regulatory Guide Number: 4.22, Revision 0

Title: Decommissioning Planning During Operations

Office/division/branch: NMSS/DUWP/RDB

Technical Lead: Kathryn Robertson-DeMers

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 Regulatory Guide (RG)?

Regulatory Guide 4.22, Revision 0 (Rev. 0), "Decommissioning Planning During Operations" issued in December 2011, describes methods acceptable for implementing portions of the Decommissioning Planning Rule (DPR) (Ref 1) and meeting the regulatory requirements for effective decommissioning planning. The purpose of this RG is to provide information to operating facilities on minimizing the introduction of contamination and radioactive waste generation, conducting appropriate radiological surveys, including the subsurface, identifying affected areas of the site and estimating the volume of radiological contamination, maintaining records of residual radioactivity, and determining the adequacy of funding for the completion of decommissioning in order to comply with Section 20.1406, "Minimization of Contamination" and Section 20.1501 "General," of Part 20 of Title 10 of the *Code of Federal Regulations* (10 CFR 20.1406 and 10 CFR 20.1501, respectively). The technical and regulatory content in RG 4.22, Rev. 0 remains relevant however it could be updated to reflect changes in the format of RGs since its issuance in December 2011.

Additionally, a future revision of the RG should evaluate superseding documents for application to the RG and update references accordingly. Among them are:

- International Atomic Energy Agency (IAEA) safety standards
 - "Safety of Uranium Fuel Fabrication Facilities," Safety Standards Series SSG-6, Revision 1 was issued in 2023 (Ref 2).
 - "Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors," Safety Standards Series SSG-85 (Ref 3), which replaced "Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors," Safety Standard NS-G-4.6 (Ref 4).
 - "Safety of Nuclear Fuel Cycle Facilities," Safety Standards Series SSR-4 (Ref 5) which replaced "Safety of Nuclear Fuel Cycle Facilities," Safety Standard NS-R-5 (Ref 6).
 - "Remediation Strategy and Process for Areas Affected by Past Activities or Events.," Safety Standards Series GSG-15 (Ref 7) which replaced "Remediation Process for Areas Affected by Past Activities and Accidents.," Safety Standard WS-G-3.1 (Ref 8).
- NUREG-1757, Volume 2, Revision 2, "Consolidated Decommissioning Guidance –

Characterization, Survey, and Determination of Radiological Criteria” (Ref 9). Revision 2 issued in 2022 provides updated guidance on dose modeling, as low as is reasonably achievable analysis, composite sampling, characterization, engineered barrier analysis, subsurface radiological surveys, including additional surveys associated with excavations and reuse of soil, and lessons learned. A future revision of the RG should evaluate the revised and superseding documents for application to the RG and update references.

- RG 1.184, “Decommissioning of Nuclear Power Reactors,” dated October 2013 (Ref 10). The DPR requires licensees with significant radioactivity to arrange for sufficient funding for decommissioning and license termination, which is discussed in RG 4.22. Additional guidance on actions required for licensees to decommission reactors under the provisions of 10 CFR 50 and 10 CFR 52 is described in RG 1.184 which discusses decommissioning fund and appropriate use of funds. A future revision of RG 4.22 should consider inclusion of RG 1.184 as related guidance.

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?

In the next four years, the NRC expects to receive five to ten applications for small modular reactors. Additionally, there are a total number of 2,120 materials licensees under NRC jurisdiction. The agency issues approximately 2,000 new licenses, renewals, or amendments for existing materials licenses annually. RG 4.22 applies to reactor and materials facilities falling into the category of Decommissioning Group 3 or higher as defined in NUREG-1757, Volume 1, Rev. 3, “Consolidated Decommissioning Guidance - Decommissioning Process for Materials Licensees” dated September 2006 (Ref 11).

As no substantive technical or regulatory issues were identified, there is no impact to internal or external stakeholders resulting from these activities.

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 restructure the RG to the current RG template and to review and update revised or superseded references is between 0.10 full-time equivalent (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.

The potential changes cited in response to Question 1 do not impact the RG significantly. No revision to the RG is recommended at this time. Any further changes in the future will be assessed accordingly.

REFERENCES

1. U.S. Nuclear Regulatory Commission (NRC), "Decommissioning Planning Rule," Federal Register, Volume 76, Number 117, June 17, 2011, pp. 35512-35575.
2. International Atomic Energy Agency (IAEA), "Safety of Uranium Fuel Fabrication Facilities," Revision 1, Safety Standards Series No. SSG-6, Vienna, Austria, 2023.
3. --- "Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors," Safety Standards Series No. SSG-85, Vienna, Austria, 2023.
4. --- "Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors," Safety Standards NS-G-4.6, Vienna, Austria, 2023.
5. --- "Safety of Nuclear Fuel Cycle Facilities," Safety Standards Series No. SSR-4, Vienna, Austria, 2017.
6. --- "Safety of Nuclear Fuel Cycle Facilities," Safety Standard NS-R-5, Vienna, Austria, 2008.
7. --- "Remediation Strategy and Process for Areas Affected by Past Activities or Events," Safety Standards Series No. GSG-15, Vienna, Austria, 2022.
8. --- "Remediation Process for Areas Affected by Past Activities and Accidents," Safety Standard WS-G-3.1, Vienna, Austria, 2007.
9. NRC, "Consolidated Decommissioning Guidance – Characterization, Survey, and Determination of Radiological Criteria," NUREG-1757, Volume 2, Revision 2, July 2022, ADAMS Accession No. ML22194A859.
10. NRC, "Decommissioning of Nuclear Power Reactors," Regulatory Guide 1.184, October 2013.
11. NRC, "Consolidated Decommissioning Guidance – Decommissioning Process for Materials Licensees," NUREG-1757, Volume 1, Revision 2, September 2006, ADAMS Accession No. ML063000243.

NOTE: This review was conducted in August 2024 and reflects the staff's plans as of that date. These plans are tentative and subject to change.