

REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE DG-1377

Measuring, Evaluating, And Reporting Radioactive Material In Liquid And Gaseous Effluents And Solid Waste

(Proposed Revision 3 of Regulatory Guide 1.21)

1. Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) is considering revising current Regulatory Guide (RG) 1.21 to provide applicants and licensees subject to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20, “Standards for Protection Against Radiation,” with updated guidance on measuring, evaluating, and reporting plant-related radioactivity in effluents and solid radioactive waste shipments from NRC licensed facilities. These evaluations and reports are integral to the technical foundation for assessing and reporting the public dose to demonstrate compliance with 10 CFR Part 20, and 40 CFR Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations” and nuclear power plant Technical Specifications.

This RG also incorporates the risk-informed principles of the Reactor Oversight Process. A risk-informed, performance-based approach to regulatory decision making combines the “risk-informed” and “performance-based” elements discussed in the staff requirements memorandum to SECY-98-144, “Staff Requirements—SECY-98-144—White Paper on Risk-Informed and Performance-Based Regulation,” dated February 24, 1999 (Agencywide Document Access Management System (ADAMS) Accession No. ML003753593).

Substantial changes are integrated in this revision and listed as follows (refer to the Objective Section below for additional details):

1. Adopt the new template format for Regulatory Guides.
2. Provide guidance on acceptable methods for calibration of accident-range radiation monitors and accident-range effluent monitors.
3. Provide updated guidance on reviewing and updating long-term, annual average χ/Q and D/Q values used for determining dose to individual members of the public.
4. Provide clarification on reporting requirements for low-level waste shipments from the site that waste classification does not need to be reported.
5. Clarify that drinking water sampling is only required when the calculated dose from I-131 is greater than 1 mrem/yr.
6. Provide a listing of related international standards documents.
7. Provide guidance on how to implement existing requirements on making changes to the effluent and environmental monitoring programs, including licensees with power plants in decommissioning.

8. Incorporate information into the RG from Regulatory Issue Summary 2008-03 on the return and reuse of previously discharged effluents.

The NRC published Revision 2 of Regulatory Guide 1.21, "Measuring, Evaluating, And Reporting Radioactive Material In Liquid And Gaseous Effluents And Solid Waste" in June 2009 to provide licensees and applicants with agency-approved guidance for complying with Title 10, of the Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation." The current version of Regulatory Guide 1.21, Revision 2 does not provide current guidance on the above-mentioned topics.

2. Objective

The objective of this regulatory action would be to provide new guidance on acceptable methods to demonstrate compliance with the 10 CFR Part 20 requirements for measuring, evaluating, and reporting radioactive material in liquid and gaseous effluents and solid waste. The specific 10 CFR Part 20 requirements are in 10 CFR 20.1302, as supplemented for Part 50 and Part 52 licensees by the facility license Technical Specifications.

The proposed revision of the guide (Revision 3) would address the above-mentioned topics which need clarification and/or revision as follows:

1. A revision would update the regulatory guide to the current format of NRC regulatory guides.
2. A revision would include previous 1982 time-frame guidance on the calibration of accident-range radiation monitors and accident-range effluent monitors. In addition, a new simplified method of calibration would be provided.
3. A revision would provide updated guidance that long-term, annual average χ/Q and D/Q values do not need to be updated until substantial changes in meteorological conditions occur.
4. A revision would provide a correction on the reporting guidance to clarify that low-level waste classification does not need to be reported for low-level waste shipments from the site.
5. A revision would provide clarification of previous guidance in NUREG-1301/1302 that sampling of drinking water for I-131 would be performed when the estimated/calculated dose from I-131 is greater than 1 mrem/yr.
6. A revision would list related international standards to which the NRC effluent and environmental programs are harmonized with.
7. A revision would provide guidance on making changes to the effluent and environmental monitoring programs, including power plants in decommissioning.
8. A revision would incorporate information from Regulatory Issue Summary (RIS) 2008-03 on the return and reuse of previously discharged effluents.

3. Alternative Approaches

The NRC staff considered the following alternative approaches:

1. Do not revise Regulatory Guide 1.21
2. Withdraw Regulatory Guide 1.21
3. Revise Regulatory Guide 1.21 to address the current methods and procedures.

Alternative 1: Do Not Revise Regulatory Guide 1.21

Under this alternative, the NRC would not revise guidance, and the current guidance would be retained. If NRC does not take action, there would not be any changes in costs or benefit to the public, licensees or NRC. This alternative is considered the “no-action” alternative and provides a baseline condition from which any other alternatives will be assessed. However, the “no-action” alternative would not address identified concerns with the current version of the regulatory guide.

Alternative 2: Withdraw Regulatory Guide 1.21

Under this alternative the NRC would withdraw this regulatory guide. This would result in NRC not providing guidance for measuring, evaluating, and reporting radioactive material in liquid and gaseous effluents and solid waste. It would also eliminate the currently available guidance on the methods the NRC staff considers acceptable for demonstrating compliance with 10 CFR 20.1301. Although this alternative would be less costly than the proposed alternative, it would impede public accessibility to the most current regulatory guidance.

Alternative 3: Revise Regulatory Guide 1.21

Under this alternative, the NRC would revise Regulatory Guide 1.21. This revision would incorporate the latest information in the radioactive effluents program, add supporting guidance, and update existing radioactive effluent measuring, evaluating and reporting guidance. By doing so, the NRC would ensure that the guidance available in this area is current, and accurately reflects the staff’s position. The revision would not increase regulatory burden or impose a new requirement because:

1. The formatting of NRC regulatory improves the readability of the RG.
2. The inclusion of historical staff draft guidance on the calibration of accident-range radiation monitors and accident-range effluent monitors is not imposing a new requirement.
3. The inclusion of a new simplified method of calibration allows licensees to use a less burdensome calibration process than previous NRC guidance.
4. The use of less restrictive criteria for when to make changes to long-term, annual average χ/Q and D/Q values will result in less frequent updates to dose assessment computer software.

5. The correction to the reporting guidance to remove the need for reporting the low-level waste classification will reduce the burden on licensees.
6. The clarification of previous guidance in NUREG-1301/1302 on when to sample for I-131 in drinking water will reduce the burden on licensees because less frequent sampling would be performed.
7. A listing of international standards will provide licensees the international perspective on effluent and environmental programs and it does not impose new program requirements.
8. NRC requirements on how to make changes to effluent and environmental monitoring programs is already included in plant Technical Specifications.
9. NRC guidance on the return and reuse of previously discharged effluents was previously issued as a Regulatory Issue Summary 2008-03.

The impact to the NRC would be the costs associated with preparing and issuing the regulatory guide revision. The impact to the public would be the voluntary costs associated with reviewing and providing comments to NRC during the public comment period. The value to NRC staff and its licensees and applicants would be the benefits associated with enhanced efficiency and effectiveness in using a common guidance document as the technical basis for operating licensees radioactive effluent measuring, evaluating and reporting programs, for use by license applications and other interactions between the NRC and its regulated entities.

Conclusion

Based on this regulatory analysis, the NRC staff concludes that the issuance of a new revision is warranted. The action would enhance a licensee's and applicant's ability to perform effluent monitoring and public health and safety by providing relevant information to meet the 10 CFR Part 20. This action could also lead to cost savings for the industry, especially with regards to NRC staff review time and the need for requests for additional information when reviewing license amendment requests, applications for standard plant design certifications, and combined licenses.