

9.0 ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT

9.1 Purpose of Review

The purpose of this Standard Review Plan (SRP) section on environmental protection and waste management is to present the regulatory requirements and regulatory guidance and to establish the acceptance criteria and review procedures to be used by reviewers. This section covers the environmental safety program, waste management program, compliance status report, and environmental reviews related to the compliance plan for an application to renew the certificates of compliance for the gaseous diffusion plants. The U.S. Nuclear Regulatory Commission (NRC) uses the review as the basis for determining the programs' adequacy and documenting the review in the Compliance Evaluation Report. The review also determines if the requirements in 10 CFR Part 76 that relate to the environmental program are met.

9.2 Responsibility for Review

Primary: Environmental Engineer or Environmental Scientist

Secondary: Certification Project Manager

Supporting: Resident Inspector Staff

9.3 Areas of Review

The staff will review the program for effluent control and the applicant's evaluation and demonstration of compliance with 40 CFR Part 61 and 10 CFR Part 20. The staff will review the description of the environmental safety program to assess the impact of certified activities. The staff will ensure that the applicant addresses the following: media to be monitored, frequency of sampling and analysis, action levels and actions to be taken when levels are exceeded, and trend analysis. The staff will review the waste management program to ensure that processing, management, and disposal of wastes are included in the discussion, and a commitment to waste minimization is made. The staff will review the compliance status report, including the environmental and effluent data. Furthermore, the staff will review information submitted to support preparation of an environmental assessment related to the compliance plan. The staff will review the Technical Safety Requirements (TSRs) for appropriate commitment to the program. In addition, the staff will review any compliance plan item that relates to environmental protection and waste management.

9.4 Review Procedures

9.4.1 Acceptance Review

The staff review should start with the primary reviewer's determination that sufficient information has been provided in the contents of the application to satisfy the requirements in 10 CFR 76.35, "Contents of Application," and 10 CFR 76.36, "Renewals," with respect to environmental protection and waste management for gaseous diffusion plant (GDP) facilities—see Standard Review Plan (SRP) Section 9.5.1, "Regulatory Requirements"—and that topics discussed in SRP Section 9.2, "Areas of Review," have been addressed.

If significant deficiencies are identified in the application, the applicant should be requested to submit additional material before the staff resumes the application review.

9.4.2 Evaluation

The staff will review the application portions related to environmental protection and waste management by comparing them to the acceptance criteria contained in Section 9.5 of this SRP.

On the basis of its review, the staff may request that the applicant provide additional information or modify the submittal to meet the acceptance criteria in SRP Section 9.5.

The final step in the review is the primary staff reviewer's writing of a Compliance Evaluation Report (CER) that summarizes the conduct of the review, identifies what material in the application forms the basis for a finding of reasonable assurance with respect to the acceptance criteria, and presents the bases for certificate conditions that may be necessary to conclude that reasonable assurance is achieved.

9.5 Acceptance Criteria

The regulatory requirements, regulatory guidance, and regulatory review criteria applicable to this SRP are listed in the following sections:

9.5.1 Regulatory Requirements

The regulatory requirements applicable to this section are as follows:

1. Section 76.35(a)(6) of 10 CFR requires the applicant to include a description of equipment and facilities, such as devices for the treatment and disposal of radioactive effluent and wastes.
2. Section 76.35(m) of 10 CFR requires the applicant to submit a description of the program for processing, management, and disposal of mixed and radioactive wastes and depleted uranium generated by operations. The description must include a description of the waste

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streams generated, estimates of annual volumes of depleted uranium and waste expected, identification of radioisotopes contained in the waste, identification of physical and chemical forms of the depleted uranium and waste, plans for managing the depleted uranium and waste, and plans for ultimate disposition of the waste and depleted uranium.

3. Section 76.60 of 10 CFR requires the applicant to comply with applicable provisions of 10 CFR Part 20.
4. Section 76.35(g) of 10 CFR requires the applicant to submit a compliance status report that includes status of various permits and provides environmental and effluent monitoring data.
5. Section 76.35(c) of 10 CFR requires the applicant to provide any relevant information concerning deviation from the published Environmental Impact Statement, Environmental Assessment (EA), or environmental permits under which the plant is currently operated, from which the Commission can prepare an EA related to the compliance plan.

9.5.2 Regulatory Guidance

The NRC Regulatory Guides (RGs) and American National Standards Institute (ANSI) standards applicable to the environmental protection and waste management programs that generally describe a basis acceptable to the staff for implementing the requirements in 10 CFR Part 76 are:

1. ANSI N13.1–1982, “Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities.”
2. ANSI N42.18–1980, “Specification and Performance on On-Site Instrumentation for Continuously Monitoring Radioactive Effluents.”
3. NRC, RG 4.15, “Quality Assurance for Radiological Monitoring Programs (Normal Operations) Effluent Streams and the Environment.”
4. NRC, RG 4.16, “Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants.”
5. NRC, RG 4.20, “Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other than Power Reactors.”
6. NRC, RG 8.37, “ALARA Levels for Effluents from Materials Facilities.”

9.5.3 Regulatory Review Criteria

The staff should use the following regulatory review criteria, or information demonstrating acceptable alternatives, in its review of the application. Acceptability should be based on the following:

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The applicant's effluent control and monitoring program is acceptable if it meets the following criteria:

1. There is a commitment to the as low as reasonably achievable (ALARA) principle as it pertains to effluents and a commitment to review the environmental data as part of the plant ALARA committee annual review.
2. The program description includes a discussion of each emission or effluent control point and the emission/effluent controls, as appropriate. The applicant includes the most recent National Emissions Standards for Hazardous Air Pollutants (NESHAP) Annual Report.
3. There is a commitment that all major sources are continuously monitored. For minor sources, the applicant may use periodic sampling, indirect monitoring, or emission estimating methods as established in NESHAP regulations to estimate source emissions. If the applicant uses methods other than actual measurement, the applicant either commits that those methods comply with the requirements of 40 CFR Part 61 or provides adequate justification. For liquid effluents, continuous flow proportional sampling is used for continuous flow outfalls, and grab samples are collected for intermittent outfalls.
4. The program includes establishment of action levels and actions for each continuously monitored location. Action levels ensure that operational control system deficiencies are documented and acted upon in a time frame to remain within regulatory limits. Action levels are incremental, such that each increasing action level results in a more aggressive action. Levels are established for both uranium and technetium-99 (Tc-99).
5. The applicant specifies the sampling and analysis frequency, sample types, location, and parameters. It is acceptable if the sampling and analysis frequency is in accordance with permits. At a minimum, analysis includes alpha (or total uranium) and beta and Tc-99. Analysis frequency can vary from daily to quarterly composites.

The applicant briefly describes its analytical support program. This may be in a separate section of the application. The program is acceptable if it includes the analytical techniques and minimum detectable levels and describes the control of the analytical process, including traceability of standards, calibration of instruments, chain of custody, and use of quality control.

The applicant's environmental monitoring program is acceptable if it establishes the following:

1. Monitoring includes sampling and analyses for important pathways for the anticipated types of radionuclides released from the facility into the environment. The pathways include direct radiation, air, surface water, groundwater, soil, sediments, and vegetation, as appropriate.
2. The applicant's description of environmental monitoring identifies adequate and appropriate sampling locations and frequencies for each environmental medium, the frequency of analyses, and the analyses to be performed on each medium. Sampling methods ensure that representative samples are obtained by use of appropriate sampling equipment, sample collection, and sample storage procedures. At a minimum, as appropriate for the media being monitored, the applicant:

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- a. Collects annual samples for soil, sediment, and vegetation and analyze for uranium;
 - b. Collects air samples on a continuous basis, with a monthly collection and analysis for gross alpha and beta;
 - c. Collects water samples at a frequency in accordance with issued permits. Water samples include both composite and grab samples, as appropriate for the water body, and are analyzed for both gross alpha and beta; and/or
 - d. Collects and reads thermoluminescent dosimeters to measure direct radiation on a quarterly basis.
3. The applicant specifies for each environmental medium the appropriate action levels and actions to be taken if the levels are exceeded.
 4. Action levels are selected based upon a pathways analysis that demonstrates that below those concentrations, doses to the public will be below the limits in 10 CFR Part 20, Subpart B, and ALARA. The action levels specify the concentrations at which an investigation would be performed and levels at which process operations would be shut down.
 5. The reviewer should verify that the applicant commits to conducting a trend analysis of the environmental sampling data.

The applicant provides the results of its dose calculations for the maximally exposed individual. It is acceptable if the applicant briefly explains the inputs for the computer codes. The computer code is acceptable if it is an authorized code by U.S. Environmental Protection Agency under 40 CFR Part 61. The dose is acceptable if it is less than 10 mrem per year.

The waste management program includes both waste and the depleted uranium tails. The depleted uranium may be addressed in a separate document. The waste management program description is acceptable if it includes the following:

1. A brief description of the waste minimization program.
2. A brief description of the various waste streams, including estimated volume.
3. The principle radiological contaminants in the waste, e.g., U^{235} , Pu^{239} , etc.
4. The waste characterization.
5. A description of the waste management activities, including waste separation and collection, processing, and storage.
6. The plans for disposition (disposal).

For the tails, the plan is acceptable if it includes the following:

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1. An estimate of depleted uranium production for future years and the current inventory, and,
2. A discussion of the management and disposition plan. The U.S. Department of Energy is responsible for actual disposition of the depleted uranium tails, upon request by the applicant. The applicant is responsible for the cost.

The TSRs related to environmental protection and waste management programs are acceptable if they contain an appropriate commitment to the program as described in the application.

The compliance status report is acceptable if it provides: (1) a discussion of the status of compliance with the Federal, State, and local permits, licenses, approvals, and other entitlements that are held by the facility; and (2) the environmental and effluent monitoring data for both radiological and nonradiological components.

9.6 Evaluation Findings

The staff's review should verify that sufficient information has been provided in the application to satisfy the intent of requirements in 10 CFR 76.35, "Contents of Application," and 10 CFR 76.36, "Renewals," with respect to environmental protection and waste management and that the information is consistent with the guidance in this SRP. On the basis of this information, the staff should be able to conclude that the evaluation is complete.

The staff could document the evaluation for the application as follows:

The staff has reviewed the environmental protection and waste management plans for [name of facility] according to SRP Sections 9.3, 9.4, and 9.5 and according to the requirements of 10 CFR 76.35 and 10 CFR 76.60. [The report should document the adequacy of the application, describe the bases for the findings, and recommend additional conditions in areas where the application is not adequate. Documentation should include the bases for the conclusions, including a discussion of the areas of review and how the information demonstrates that the acceptance criteria have been met and the conclusion that the application meets the requirements of 10 CFR Part 76. The documentation should also contain a conclusion relative to the adequacy of the TSR commitments to the program.]

On the basis of its review, the NRC has staff concluded that the environmental protection and waste management plans are acceptable to support the recertification.

9.7 References

American National Standards Institute (ANSI). ANSI N13.1-1982, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities." ANSI: La Grange Park, Illinois. 1982.

_____. ANSI N42.18-1980, "Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactive Effluents." ANSI: La Grange Park, Illinois. 1980.

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National Council on Radiation Protection (NCRP) Commentary No. 3, Rev. 1, "Screening Techniques for Determining Compliance with Environmental Standards," NCRP: January 1989.

Code of Federal Regulations, *Title 10, Energy*, Part 20, "Standards for Protection Against Radiation."

_____. *Title 10, Energy*, Part 76, "Certification of Gaseous Diffusion Plants."

Nuclear Regulatory Commission (U.S.) (NRC). Regulatory Guide 4.15, Rev. 2, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) Effluent Streams and the Environment." NRC: Washington, D.C. 1995.

_____. Regulatory Guide 4.16, Rev. 2, "Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants." NRC: Washington, D.C. December 1985.

_____. Regulatory Guide 8.37, "ALARA Levels for Effluents from Materials Facilities." NRC: Washington, D.C. July 1993.