

10.0 ENVIRONMENTAL PROTECTION

10.1 PURPOSE OF REVIEW

The purpose of this review is to determine whether an applicant for the construction and operation of a mixed oxide fuel fabrication facility has established environmental protection measures that are adequate to protect public health and the environment and comply with the regulatory requirements imposed by the Commission in 10 CFR Parts 20, 51, and 70.

In addition, pursuant to 10 CFR Part 51, the NRC will determine if the applicant submits an environmental report that is adequate for NRC use in preparation of an Environmental Impact Statement (EIS) for construction approval for the mixed oxide (MOX) fuel fabrication facility and an EIS for licensing the MOX fuel fabrication facility. This determination will be coordinated through the Division of Waste Management (DWM) since on May 17, 1999, the Office of Nuclear Material Safety and Safeguards (NMSS) assigned DWM the responsibility to prepare each NMSS EIS. As a result, guidance for reviewing an environmental report used to prepare an EIS is not provided in this chapter.

The Division of Fuel Cycle Safety and Safeguards (FCSS) currently retains the responsibility for determining if, pursuant to 10 CFR Part 51, an environmental report is adequate to support a licensing action that will result in the preparation of an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI). However, this type of licensing action is not anticipated until after the MOX fuel fabrication facility is licensed to possess and use special nuclear material (SNM). Staff should contact DWM for coordination and guidance and refer to the supplementary guidance in Appendix E to this SRP.

10.2 RESPONSIBILITY FOR REVIEW

Primary: Environmental Engineer/Scientist

Secondary: Project Manager

Supporting: Health Physicist Reviewer
Chemical Safety Reviewer
Primary Reviewer of SRP Chapter 15
Environmental Protection Inspector

10.3 AREAS OF REVIEW

The regulatory requirements for environmental protection are contained in 10 CFR Parts 20, 51, and 70. The NRC staff environmental review under Parts 20 and 70 is focused on that part of the applicant's facility-wide safety program that is established to control and assess the level of radioactive releases (gaseous, liquid, and solid) to the environment during normal and anticipated operations. Therefore, the effluent control portion of the applicant's radiation protection program, as well as effluent and environmental monitoring practices, are reviewed.

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This review complements the review conducted under Section 9.2 of this SRP, which addresses the radiation protection program as it applies to worker safety.

An applicant engaged in the fabrication of MOX fuel must perform an ISA in accordance with proposed Subpart H of 10 CFR Part 70 and submit an ISA Summary in accordance with proposed 10 CFR 70.65. Guidance on the ISA is covered in Chapter 5.0 of this SRP. The environmental review of the ISA Summary should include the identified potential accident sequences that result in radiological releases to the environment, the items relied on for safety that are specified by the applicant to reduce the risk of these accidents, and the associated management measures that provide reasonable assurance that the items relied on for safety will perform their designated safety functions as required by 10 CFR Part 70.

Thus, environmental protection includes three main components: (1) the radiation protection program, (2) effluent and environmental monitoring for normal and off-normal operations, and (3) the ISA Summary and other ISA documentation, as necessary.

The areas of review for each of these components should include:

A. Radiation Safety

- i. ALARA goals for effluent control;
- ii. Effluent controls to maintain public doses ALARA;
- iii. ALARA reviews and reports to management; and
- iv. Waste minimization practices and for new operations, design plans for waste minimization.

B. Effluent and Environmental Monitoring

- i. In-place filter testing procedures for air cleaning systems;
- ii. Known or expected concentrations of radionuclides in effluents;
- iii. Physical and chemical characteristics of radionuclides in discharges;
- iv. Discharge locations;
- v. Environmental media to be monitored and the sample locations;
- vi. Sampling collection and analysis procedures, including the minimum detectable concentrations of radionuclides, equipment used, and calibration information;
- vii. Action levels and actions to be taken when the levels are exceeded;
- viii. Permits, including air discharge and National Pollutant Discharge and Elimination System permits;
- ix. Leak detection systems for ponds, lagoons, and tanks;
- x. Pathways analysis methods to estimate public doses;
- xi. Recording and reporting procedures, including event notification; and
- xii. Solid waste handling and disposal programs.

C. Safety Assessment of the Design Basis or Safety Program Description and Integrated Safety Analysis Summary

The safety assessment of the design basis (application for construction approval) or the Safety Program Description and ISA Summary (license application) address similar material, as follows:

- i. Accident sequences (and associated facility processes) which, if unmitigated, result in releases to the environment;
- ii. Likelihood and consequences of these accident sequences;
- iii. Controls relied on to reduce the unmitigated risk from “high” risk to an acceptable level; and
- iv. Availability and reliability of items relied on for safety.

10.4 ACCEPTANCE CRITERIA

10.4.1 Regulatory Requirements

- A. 10 CFR Part 20, specifically the effluent control and treatment measures necessary to meet the dose limits and dose constraints for members of the public specified in Subparts B, D and F, the requirements for minimization of contamination specified in 10 CFR 20.1406, the survey requirements specified in Subpart F, the waste disposal requirements of Subpart K, the records requirements of Subpart L, and the reporting requirements of Subpart M.
- B. 10 CFR Part 51, specifically the applicant must establish effluent and environmental monitoring systems to provide the information required by 10 CFR 51.60(a).
- C. 10 CFR Part 51, specifically the applicant must submit an environmental report as required by 10 CFR 51.60(b), or to support a categorical exclusion as described in 10 CFR 51.22(c).
- D. 10 CFR Part 70, the applicant must demonstrate that proposed facilities and equipment, including measuring and monitoring instruments and devices for the disposal of radioactive effluents and wastes, are adequate to protect public health and the environment as specified 10 CFR 70.22(a)(7).
- E. 10 CFR Part 70, the application for a plutonium processing facility as defined in 10 CFR 70.4 must submit a safety assessment of the design basis of the principal structure, systems, and components of the facility, including provisions for protection against natural phenomena, as specified in 10 CFR 70.22(f).
- F. Proposed 10 CFR Part 70, an application for a facility to fabricate MOX fuel must contain an ISA summary that includes a list of the items relied on for safety established by the applicant and other elements as described in 10 CFR 70.65(b).

10.4.2 Regulatory Guidance

The regulatory guidance for environmental protection is contained in:

- A. NRC Regulatory Guide 4.5, "Measurements of Radionuclides in the Environment Sampling and Analysis of Plutonium in Soil."
- B. NRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations)--Effluent Streams and the Environment."
- C. NRC Regulatory Guide 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."
- D. NRC Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other than Power Reactors."
- E. NRC Regulatory Guide 8.37, "ALARA Levels for Effluents from Materials Facilities."
- F. NRC Information Notice 94-07, "Solubility Criteria for Liquid Effluent Releases to Sanitary Sewerage Under the Revised 10 CFR Part 20," January 28, 1994.
- G. NRC Information Notice 94-23: "Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program," March 1994.
- H. ANSI N13.1-1982, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities."
- I. ANSI N42.18-1980, "Specification and Performance of On-site Instrumentation for Continuously Monitoring Radioactive Effluents."
- J. NCRP Report No. 123, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground," January 1996.

10.4.3 Regulatory Acceptance Criteria

A. Radiation Safety

In accordance with 10 CFR 20.1101, each licensee must implement a radiation protection program, which is discussed in detail in Chapter 9.0 of this SRP. The environmental review of the radiation protection program focuses on the applicant's methods to maintain public doses ALARA in accordance with 10 CFR 20.1101. NRC guidance on compliance with these regulations can be found in Regulatory Guide 8.37, "ALARA Levels for Effluents from Materials Facilities," July 1993.

Specifically, 10 CFR 20.1101(d) requires the applicant to establish a constraint on air emissions of radioactive material to the environment, excluding Radon-222 and its decay products, such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent (TEDE) in excess of 0.1 mSv (10 mrem) per year from these emissions. The applicant must have procedures to report to the NRC in accordance with 10 CFR 20.2203 when this dose constraint is exceeded and to take prompt appropriate corrective action to ensure against recurrence. NRC guidance on compliance with this regulation can be found in Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other Than Power Reactors," December 1996.

The environmental review of the radiation protection program also focuses on the applicant's waste minimization practices. Applicant's for new licenses are required to comply with 10 CFR 20.1406, which states that the applicant must describe how facility design procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste. Applicant's requesting amendment or renewal of existing licenses must minimize and control waste generation during operations as part of the radiation protection program in accordance with 10 CFR 20.1101 [62 FR 39082].

Guidance for waste minimization programs can be found in NRC Information Notice No. 94-23: "Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program," March 25, 1994.

The proposed radiation protection program is acceptable if, in addition to the acceptance criteria outlined in Section 9.2, it satisfies the following criteria:

i. Radiological (ALARA) Goals for Effluent Control

ALARA goals for effluent control are set at a modest fraction (10% to 20%) of the values in Appendix B, Table 2, Columns 1 and 2 and Table 3 and the external exposure limit in 10 CFR 20.1302(b)(2)(ii), or the dose limit for members of the public, if the applicant proposes to demonstrate compliance with 10 CFR 20.1301 through a calculation of the TEDE to the individual likely to receive the highest dose.

An applicant's constraint approach is acceptable if it is consistent with guidance found in Regulatory Guide 4.20 and the applicant's description of the constraint approach provides sufficient detail to demonstrate specific application of the guidance to proposed routine operations and non-routine operations including anticipated events.

ii. Effluent Controls to Maintain Public Doses ALARA

The applicant describes and commits to using effluent controls (e.g., procedures, engineering controls, and process controls) to maintain public doses ALARA. Common control practices include filtration, encapsulation, adsorption, containment, recycling,

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leakage reduction, and the storage of materials for radioactive decay. The applicant demonstrates a commitment to reducing unnecessary exposure to members of the public and releases to the environment.

Effluent controls during normal and likely facility conditions:

- a. Are capable of handling the expected volume of potentially radioactive waste;
- b. Are compartmentalized to reduce the potential for cross contamination. For example, storm water and sanitary sewage lines should be separate from lines carrying radioactive effluents. Laundry facilities and personnel decontamination facilities should send effluents to radioactive waste. There should be no means by which radioactive waste can bypass the effluent controls and be directly released to the environment.
- c. Are capable of safe shut down, consistent with the operating status of the facility.
- d. Are capable of safely handling the chemical characteristics of the effluent. For example, effluent controls in contact with strong acids or caustics should be corrosion resistant.
- e. Achieve a decontamination factor for each radionuclide sufficient to reduce the total radioactivity to an acceptable release level on a "once through" treatment basis. Provisions are made to recirculate effluents for further decontamination when radioactivity is above an acceptable release level.

iii. ALARA Reviews and Reports to Management

As part of the annual review of the content and implementation of the radiation protection program as discussed in Section 9.2, the applicant commits to review the effluent controls to maintain public doses ALARA. This review includes analysis of trends in release concentrations, environmental monitoring data, and radionuclide usage; determines whether operational changes are needed to achieve the ALARA effluent goals; and evaluates all designs for system installations or modifications. The applicant also includes a commitment to report the results to senior management along with recommendations for changes in facilities or procedures that are necessary to achieve ALARA goals.

iv. Waste minimization

The application contains a description of how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment and minimize, to the extent practicable, the generation of radioactive waste. The waste minimization programs is acceptable if the programs include:

- a. Top management support;
- b. Identification of responsibilities for waste minimization activities and assessments;
- c. Methods to characterize waste generation, including types and amounts, and waste management costs, including costs of regulatory compliance, paperwork, transportation, treatment, storage, disposal, etc.;
- d. Periodic waste minimization assessments to identify waste minimization opportunities and solicit employee or external recommendations;
- e. Provisions for technology transfer to seek and exchange technical information on waste minimization;
- f. Provisions to incorporate operational experience; and
- g. Methods for implementation and evaluation of waste minimization recommendations.

B. Effluent and Environmental Monitoring

The applicant is required to make, or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive material in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in 10 CFR 20.1301. Accordingly, the staff's acceptance criteria for the applicant's effluent and environmental monitoring for normal and off-normal operations are described in Sections 10.4.3(B)(i) and 10.4.3(B)(ii).

i. Effluent Monitoring

The reviewer should find that the applicant's effluent monitoring is acceptable if it meets the following criteria:

- a. The known or expected concentrations of radioactive materials in airborne and liquid effluents are below the limits in 10 CFR Part 20, Appendix B, Table 2 or below site specific limits established in accordance with 20.1302(c) and are ALARA.

If, in accordance with 20.1302(c), the applicant proposes to adjust the effluent concentrations in Appendix B to 10 CFR Part 20 to take into account the actual physical and chemical characteristics of the effluents, the applicant provides information related to aerosol size distributions, solubility, density, radioactive decay equilibrium, and chemical form. This information is complete and accurate for the radioactive materials to justify the derivation and application of the alternative concentration limits.

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- b. If the licensee proposes to demonstrate compliance with 10 CFR 20.1301 through a calculation of the TEDE to the individual likely to receive the highest dose in accordance with 10 CFR 20.1302(b)(1), calculation of the TEDE by pathways analyses uses appropriate models and codes and assumptions that accurately represent the facility, the site, and the surrounding area; assumptions are reasonable; input data is accurate; all applicable pathways are considered; and the results are interpreted correctly.

National Council on Radiation Protection (NCRP) Report No. 123, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground," January 1996, provides acceptable methods for calculating the dose from radioactive effluents. Computer codes are acceptable tools for pathways analysis if the applicant is able to demonstrate that the code has undergone validation and verification to demonstrate the validity of estimates developed using the code for established input sets. Dose conversion factors used in the pathways analyses are acceptable if they are based on the methodology described in International Council on Radiation Protection (ICRP) 30, "Limits for Intakes of Radionuclides by Workers," as reflected in Federal Guidance Report 11. Such methods are acceptable for determining the dose to the maximally exposed individual during normal facility operations and anticipated events.

- c. All liquid and airborne effluent discharge locations are identified and monitored. Monitoring locations are identified, and for those effluent discharge points that have input from two or more contributing sources within the facility, sampling each contributing source is evaluated for effective effluent control.
- d. Airborne effluents from all routine operations and non-routine operations, as well as anticipated events associated with the facility, including effluents from areas not used for processing special nuclear material such as laboratories, experimental areas, storage areas, and fuel element assembly areas, are continuously sampled.

Effluents are sampled unless the applicant has established, by periodic sampling or other means, that radioactivity in the effluent is insignificant and will remain so. In such cases, the effluent is sampled at least quarterly to confirm that effluents are not significant. For the purposes of this SRP, an effluent is significant if the concentration averaged over a calendar quarter is equal to 10% or more of the appropriate concentration listed in Table 2 of Appendix B to 10 CFR Part 20.

- e. The sample collection and analysis methods and frequencies are appropriate for the effluent medium and the radionuclide(s) being sampled. Sampling methods ensure that representative samples are obtained by use of appropriate sampling equipment and sample collection and storage procedures. For liquid effluents, representative samples are taken at each release point for the determination of concentrations and quantities of radionuclides released to an unrestricted area, including discharges to sewage systems. For continuous releases, samples are continuously collected at each release point. For batch releases, a representative sample of each batch is

collected. If periodic sampling is used in lieu of continual sampling, the applicant shows that the samples are representative of actual releases. Monitoring instruments are calibrated at least annually, or more frequently if suggested by the manufacturer.

- f. Radionuclide specific analyses are performed on selected composited samples unless either:
- The gross alpha and gross beta activities are so low that individual radionuclides could not be present in concentrations greater than 10 percent of the concentrations specified in Table 2 or 3 of Appendix B to 10 CFR Part 20; or
 - The radionuclide composition of the sample is known through operational data, such as the composition of the feed material.

Monitoring reports in which estimates of quantities of individual radionuclides are based on methods other than direct measurement include an explanation and justification of how the results were obtained.

Examples of cases in which operational data may not be adequate for the determination of radionuclide concentration are (1) facilities processing uranium in which extraction, ammonium diuranate precipitation, ion exchange, or other separation processes could result in concentration of thorium isotopes (principally Th-234); (2) facilities in which uranium of varying enrichments is processed; and (3) facilities processing plutonium in which significant variation in the Pu-238/Pu-239 ratio among batches and the continuous in-growth of Am-241 would preclude the use of feed material data to determine the radionuclide composition of effluents.

Radionuclide analyses are performed more frequently than usual under three circumstances: (1) at the beginning of the monitoring program until a predictable and consistent radionuclide composition in effluents is established; (2) whenever there is a significant unexplained increase in gross radioactivity in effluents; or (3) whenever a process change or other circumstance might cause a significant variation in the radionuclide composition.

- g. The minimum detectable concentration (MDC) for sample analyses is not more than 5 percent of the concentration limits listed in Table 2 of Appendix B to 10 CFR Part 20. If the actual concentrations of radionuclides in samples are known to be higher than 5 percent of the 10 CFR Part 20 limits, the analysis methods need only be adequate to measure the actual concentration. However, in such cases, the MDC is low enough to accommodate fluctuations in the concentrations of the effluent and the uncertainty of the MDC.
- h. The laboratory quality control (QC) procedures are adequate to support the validity of the analytical results. These QC procedures include the use of established standards such as those provided by the National Institute of Standards and

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Technology (NIST), as well as standard analytical procedures, such as those established by the National Environmental Laboratory Accreditation Conference.

- i. The proposed action levels and actions to be taken if the action levels are exceeded are appropriate. The action levels are incremental, such that each increasing action level results in a more aggressive action to assure and control effluents. A slightly higher than normal concentration of a radionuclide in effluent triggers an investigation into the cause of the increase. An action level is specified that will result in the shutdown of an operation if this level is exceeded. These action levels are selected based on the likelihood that a measured increase in concentration could indicate potential violation of the effluent limits.
 - j. The descriptions of applicable Federal and/or State standards for discharges and any permits issued by local, State, or Federal governments for gaseous and liquid effluents are complete and accurate.
 - k. The systems for the detection of leakage from ponds, lagoons, and tanks are adequate to detect and assure against any unplanned releases to groundwater, surface water, or soil.
 - l. Releases to sewer systems are controlled and maintained to meet the requirements of 10 CFR 20.2003, including (i) the material is water soluble; (ii) known or expected discharges meet the effluent limits of 10 CFR 20 Appendix B, Table 3; and (iii) the known or expected total quantity of radioactive material released into the sewer system in a year does not exceed 5 Ci (185 GBq) of ^3H , 1 Ci (37 GBq) of ^{14}C , and 1 Ci (37 GBq) of all other radioactive materials combined. Solubility is determined in accordance with the procedure described in NRC Information Notice 94-07.
 - m. Reporting procedures comply with the requirements of 10 CFR 70.59 and the guidance specified in Regulatory Guide 4.16. Reports of the concentrations of principal radionuclides released to unrestricted areas in liquid and gaseous effluents are provided and include the MDC for the analysis and the error for each data point.
 - n. The applicant's procedures and facilities for solid and liquid waste handling, storage, and monitoring result in safe storage of the material and timely disposition.
- ii. Environmental Monitoring

The applicant's environmental monitoring is acceptable if it is commensurate with the scope of activities at the facility and the expected impacts of operations as identified in the environmental report and meets the following criteria:

- a. Background and baseline concentrations of radionuclides in environmental media have been established through sampling and analysis.

- b. A preoperational monitoring program is initiated prior to operation. The preoperational program should be of sufficient length to allow a sufficient data base for comparison with operational data.
- c. Monitoring includes sampling and analyses for important pathways for the anticipated types of radionuclides released from the facility into the environment from routine operations and non-routine operations including anticipated events. The pathways include air, surface water, groundwater, soil, sediments, and vegetation, as appropriate. Important environmental media are sampled to estimate radionuclide concentrations in important biota.
- d. The description of monitoring identifies adequate and appropriate sampling locations and frequencies for each environmental medium, the frequency of sampling, 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.
- e. Monitoring procedures employ acceptable analytical methods and instrumentation to be used, and monitoring procedures and analytical methods are subject to quality controls. The applicant commits to a program of instrument maintenance and calibration appropriate to the instrumentation, as well as participation in round-robin measurement comparisons if the applicant proposes use of its own analytical laboratory for analysis of environmental samples.
- f. Appropriate action levels and actions to be taken if the levels are exceeded are specified for each environmental medium and radionuclide.

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 are ALARA. The action levels specify the concentrations at which an investigation would be performed and levels at which process operations would be shut down.

- g. MDCs are specified for sample analyses and are at least as low as those selected for effluent monitoring in air and water. MDCs for sediment, soil, and vegetation are selected based upon the action levels to ensure sampling and analytical methods are sensitive and reliable enough to support application of the action levels.
- h. Data analysis methods and criteria to be used for evaluating and reporting the environmental sampling results are appropriate and will indicate when an action level is being approached in time to take corrective actions.
- i. The description of the status of all licenses, permits, and other approvals of facility operations required by Federal, State, and local authorities is complete and accurate.

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- j. Environmental monitoring is adequate to assess impacts to the environment from potential radioactive and nonradioactive releases as identified in high and medium risk accident sequences in the ISA.

C. Safety Assessment of the Design Basis and the Safety Program Description and Integrated Safety Analysis Summary

In accordance with 10 CFR 70.22(f), an applicant for a MOX fuel fabrication facility is required to submit a safety assessment of the design basis as part of its application for construction approval. Prior to submitting the license application for possession and use of SNM, pursuant to Subpart H to the proposed 10 CFR Part 70, an applicant for a MOX fuel fabrication facility is required to submit a Safety Program Description and an ISA Summary. Both the design basis and the ISA Summary include items relied on for safety identified to prevent or mitigate against accidents. The applicant's treatment of environmental protection in the safety assessment of the design basis or the Safety Program Description and ISA Summary is acceptable if the applicant:

- i. Provides a complete list of accident sequences that result in radiological releases to the unrestricted area.
- ii. Provides a reasonable estimate for the likelihood of each accident sequence identified.
- iii. Uses acceptable methods for estimating consequences from accident sequences which result in radiological releases to the environment. For the purposes of this review, consequences include dose to the public and the 24-hour averaged release of radioactive material outside the restricted area as defined in proposed 10 CFR 70.61. Acceptable methods are described in NUREG/CR-6410, "Nuclear Fuel Cycle Facility-Accident Analyses Handbook." Models used for consequence analysis are verified and validated.
- iv. Items relied on for safety (or systems and components) are identified for each accident sequence that results in consequences greater than the limits defined in proposed 10 CFR 70.61. The items relied on for safety prevent or mitigate risk sequences to an acceptable level of protection.
- v. Affords adequate levels of assurance to the items relied on for safety to ensure that they will be reliable and available to perform their safety functions. This may be accomplished through configuration management, training, maintenance activities, or other management measures as appropriate.

10.5 REVIEW PROCEDURES

10.5.1 Acceptance Review

The primary reviewer should perform an acceptance review to determine if the application for construction approval or license application adequately addresses the items in Section 10.3, "Areas of Review."

Guidance specific to the application for construction approval and the license application is provided below.

A. Application for Construction Approval

Specifically, the safety assessment of the design basis should address Section 10.3(C) consistent with the level of design. Sections 10.3(A) and (B) should be addressed to the extent that the material therein supports information provided in the environmental report, e.g, environmental monitoring as a mitigation measure. Where information is under development or not yet available, the applicant may use a commitment to provide the material with the license application in lieu of the actual material.

B. License Application for Operations

Specifically, the safety assessment of the license application should address Sections 10.3(A)-(C) in full.

If the primary reviewer verifies that environmental protection is adequately addressed (construction or operations), the primary reviewer should accept the application for the safety evaluation in Section 10.5.2. If the primary reviewer identifies significant deficiencies in the material provided, the primary reviewer should request that the applicant submit additional information prior to the start of the safety evaluation.

10.5.2 Safety Evaluation

After determining that the application is acceptable for review in accordance with Section 10.5.1, the primary reviewer should perform a safety evaluation against the acceptance criteria described in Section 10.4. On the basis of its review, the staff may request that the applicant provide additional information or modify the application to meet the acceptance criteria in SRP Section 10.4.

Guidance specific to the application for construction approval and the license application is provided below.

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A. Application for Construction Approval

The primary reviewer should establish that the applicant's facility design as described in the safety assessment of the design basis and other commitments, as they relate to environmental protection, meet or exceed the regulatory acceptance criteria in Section 10.4.3(C).

B. License Application

The primary reviewer should establish that the applicant's facility design, operations, and chemical safety items provide reasonable assurance that they will function as intended and provide for the safe handling of licensed materials at the facility. The primary reviewer should identify the mechanisms that will allow the applicant to identify and correct potential problems.

In support of the primary reviewer for Chapter 9.0, the environmental protection reviewer should determine whether the acceptance criteria in Chapter 9.0 have been met as they relate to environmental review of the radiation protection program. The primary reviewer should also support the primary reviewer for Chapter 8.0 to ensure that the acceptance criteria for Chapter 8.0 have been met as they relate to effluent controls to maintain public doses ALARA.

In support of the primary reviewer for Chapter 5.0, the environmental reviewer should review the ISA Summary. All accident sequences identified in the ISA that can have significant consequences due to releases to the unrestricted area, should be reviewed to determine that the list of potential accidents is complete and properly identified. Detailed review should only be conducted of the accident sequences which, when left unmitigated, are rated as "high-consequence" events by the applicant, as well as approximately 10% of the "intermediate-consequence" events and a smaller number of the lower risk sequences. However, additional "high-consequence" and "intermediate-consequence" events may be evaluated based on the results of the initial review.

The primary reviewer should provide input on the ISA Summary to the primary reviewer of Chapter 5.0 and input on management measures (if any) to the primary reviewer of Chapter 15.0.

In addition, for renewal and amendment applications, review of environmental protection by the primary reviewer will include coordination with the inspector responsible for environmental protection (supporting reviewer). Any comments or concerns that the inspector identifies will be addressed and resolved, and the Safety Evaluation Report (SER) (described in Section 10.6.1) for the licensing action will contain a statement indicating if the inspection staff has any objections to approval of the proposed licensing action. In addition, if applicable, the primary reviewer will review inspection reports and semi-annual effluent reports submitted in accordance with 10 CFR 70.59 to assure licensee performance in environmental protection.

When the safety evaluation for the application for construction approval or license application is complete, the primary reviewer, with assistance from the other reviewers, should prepare the environmental protection input for the SER as described in Section 10.6 using the acceptance criteria from Section 10.4.

10.6 EVALUATION FINDINGS

Documentation of the evaluation findings for the environmental protection review is contained in two types of products. The SER documents the review of the environmental protection measures and the design basis (application for construction approval) or the Safety Program Description and ISA Summary (license application). The EA or EIS documents the staff's independent assessment of the environmental impacts of the proposed action.

Environmental protection measures may be summarized in the EA or EIS. However, the EA or EIS does not become part of the license. The primary reviewer should document the safety evaluation by preparing material suitable for inclusion in the SER. The primary reviewer should describe the review, explain the basis for the findings, and state the conclusions (see the supplementary guidance in Appendix E to this SRP).

If an EA or EIS was prepared for the licensing action, the date the document was issued should be reported in the environmental protection section of the SER. If the EA resulted in a FONSI, the FONSI's publication date in the Federal Register should be included in the SER. If an EIS was prepared, the SER would include the Federal Register publication date for the Record of Decision. When applicable, the SER also documents the determination that an action meets a categorical exclusion.

The staff could document the safety evaluation for the application for construction approval as follows:

The staff prepared an environmental impact statement (EIS) [publication date] for the construction approval for [insert name of facility]. Based on the EIS, the NRC stated in its Record of Decision [publication date in the Federal Register] that the preferred option was [state preferred option here].

For the preferred option, the staff reviewed the environmental protection measures for construction approval for [insert facility name] according to Chapter 10.0 of NUREG-1718. The staff evaluated [state what was evaluated] and found [state what was found]. The staff concluded that the applicant's design basis has adequate environmental protection measures to protect the public and the environment against natural phenomena and the consequences of potential accidents in accordance with the regulatory requirements imposed by the Commission in 10 CFR Part 70.

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

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The staff prepared an environmental impact statement (EIS) [publication date] for this licensing action as required by 10 CFR 51.20. Based on the EIS, the NRC stated in its Record of Decision [publication date in the Federal Register] that the preferred option was [state preferred option here].

For the preferred option, the staff reviewed the environmental protection measures for issuing a license to possess and use SNM for [insert facility name] according to Chapter 10.0 of NUREG-1718. The staff evaluated [state what was evaluated] and found [state what was found]. The staff concluded that the applicant has adequate environmental protection measures, including: (1) environmental and effluent monitoring and (2) effluent controls to maintain public doses ALARA as part of the radiation protection program, to protect public health and the environment and comply with the regulatory requirements imposed by the Commission in 10 CFR Parts 20, 51, and 70.

10.7 REFERENCES

- A. American National Standards Institute, N13.1-1982, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities."
- B. American National Standards Institute, N42.18-1980, "Specification and Performance of On-site Instrumentation for Continuously Monitoring Radioactive Effluents."
- C. National Council on Radiation Protection and Measurements, NCRP Report No. 123 I & II, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground," January 1996.
- D. NRC Information Notice No. 94-23: "Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program," March 25, 1994.
- E. NRC Information Notice 94-07, "Solubility Criteria for Liquid Effluent Releases to Sanitary Sewerage Under the Revised 10 CFR Part 20," January 28, 1994.
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