

**REQUESTS FOR ADDITIONAL INFORMATION
WESTINGHOUSE COLUMBIA FUEL FABRICATION FACILITY
LICENSE RENEWAL APPLICATION, MATERIALS LICENSE SNM-1107**

By letter dated September 20, 2021, Westinghouse Electric Company, LLC (WEC) submitted a revised license renewal application (LRA) for its Columbia Fuel Fabrication Facility (CFFF) in Hopkins, South Carolina (Agencywide Documents Access and Management System Accession Nos. [ML21263A217](#) and [ML21263A218](#)). The WEC's application seeks renewal of its materials license SNM-1107 to continue to operate the CFFF for an additional 40 years.

This request for additional information (RAI) identifies additional information needed by the U.S. Nuclear Regulatory Commission (NRC) staff in support of its safety review of the LRA and development of an environmental impact statement (EIS). The NRC staff used the guidance in [Revision 1 of NUREG-1520](#), "Standard Review Plan for Fuel Cycle Facilities License Application," and [NUREG-1748](#), "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs."

Requests for Additional Information

Regulatory Basis RAI 1-4

This information is necessary to determine compliance with Section 70.62 of Title 10 of the *Code of Federal Regulations* (10 CFR), which requires license applicants and licensees to establish and maintain a safety program that demonstrates compliance with the performance requirements in 10 CFR 70.61. Specifically, the information is necessary to understand how the licensee has addressed accident sequences resulting from natural phenomena hazards, including consideration of flood related-hazards from river flooding, upstream dam failures, and precipitation/local storm runoff.

RAI-1 River Flooding

- A. Flood levels and flood events
 1. Provide the basis of the 100-yr flood elevation of [REDACTED] described in WEC Site and Structures Integrated Safety Analysis (ISA) Section 4.2.4, "Floods."
 2. Provide a basis for the statement in Section 4.2.4 of the Site and Structures ISA that "the main manufacturing building lies in FEMA Zone X, which is above the 100-year and 500-year flood elevations."
 3. With reference to the Site and Structures ISA, explain whether the recurrence intervals provided in Table 1.13, "Significant Flood Events," were used in evaluating flood hazard at the CFFF site.

- B. Base flood discharge
 1. Provide a reference for the U.S. Geological Survey evaluation of base flooding discharge for the Congaree River, described in the Site and Structures ISA Section 4.2.4.
 2. Explain how the base flood discharge estimates (described in the Site and Structures ISA) are used in the evaluation of flood hazards at the CFFF site.

RAI-2 Upstream dam failures

- A. Failure estimates
 1. Provide the basis for the Lake Murray Dam failure estimate.
 2. Explain whether failure of Buzzards Roost Dam (Lake Greenwood), or any other dam(s) upstream from Lake Murray (e.g., North Saluda Reservoir Dam or Table Rock Reservoir Dam), was considered in the failure estimate of Lake Murray Dam.

RAI-3 Precipitation/Local storm runoff

- A. Precipitation
 1. Provide the basis for the probable maximum precipitation estimates listed in the Site and Structures ISA, Table 1.7, “Maximum Precipitation Amounts by Month for Richland County.”
 2. Provide the basis for the rainfall intensity estimates listed in the Site and Structures ISA, Table 1.11, “Rainfall Intensities for the Columbia Area.”
 3. Provide the basis for the International Building Code (IBC) 2015 specified design rainfall event (100-year, 1-hour rainfall of 4 inches) described in Site and Structures ISA Section 4.2.2, “Precipitation.”
 4. Precipitation estimates for Columbia during the 2015 event are provided in the Site and Structures ISA Section 4.2.4, (20.8 centimeters (cm) (8.19 inches[in]) in 12 hours, 31.5 cm (12.4 in) over 4 days). Provide estimates of, and the basis for, precipitation at the CFFF site during the same event.
 5. Provide an evaluation of flooding at the CFFF site resulting from local intense precipitation, including estimates of potential flood hazards and the basis for those estimates.
 6. Describe the preventive and emergency management measures that would be taken should a large rainfall event result in flooding in the CFFF area.

RAI-4 Sampling program

In the Environmental Report submitted as part of the LRA, the WEC states that “in-process sampling” was “conducted during the flood period” (in relation to the 2015 historic flooding event). Describe the in-process sampling that is conducted after such flooding events, and discuss whether any changes have been made to considering (i) the data and information gathered through the implementation of the Consent Agreement with the State and (ii) the information provided in response to RAI-3 above.

Regulatory Basis- RAI-5

The LRA indicates that “These [environmental] sampling criteria, sensitivities, and/or locations can be changed without prior NRC Staff approval provided: (a) A documented evaluation by the Environmental Protection Function demonstrates that the changes do not decrease the overall effectiveness of the environmental sampling and monitoring program; and, (b) The changes are

Enclosure 2

submitted to NRC Staff as part of the subsequent updates of this License Application to enable opportunity to inspect the evaluation.”

Additionally, the LRA indicates that “Conduct of operations incorporates the management measures implemented on a continuing basis to reasonably assure that CFFF activities for protection of the environment, health and safety of employees and the neighboring public are conducted to a high standard of quality.”

This information is necessary to complete the NRC staff’s evaluation of the WEC’s environmental sampling and monitoring program.

RAI-5 Changes to the environmental sampling and monitoring program

- A. Explain the process and criteria the WEC uses to evaluate and implement changes to the environmental monitoring and sampling program to ensure its effectiveness does not decrease.
- B. Describe and explain how the management measures program is applied to the site’s environmental sampling and monitoring program.
- C. Explain the sufficiency of the current level of onsite and offsite sampling (e.g., sampling frequency, locations, and size) for fish considering the comments on the draft environmental impact statement from U.S. Department of Interior and South Carolina Department of Natural Resources.

Regulatory Basis RAI-6

The conceptual site model (CSM) is described in and is part of the LRA. The CSM is discussed in Sections 1.1.6.6, “Definitions,” 10.1.5, “Environmental Protection,” and 11.1.1, “Decommissioning,” of the LRA. Per the LRA, “The output [of the CSM] is used as a synopsis of site conditions that provide the environmental investigator with an understanding of data gaps or uncertainty, and how to move forward on a project” and “identifies the fate and transport of the contaminant in the future.” Additionally, “The process outlines actions that the site will take based on sample results for various environmental media. When determined necessary, the remediation process described in Section 11.1.1 of this License Application is followed.” The LRA explains that “To make an informed decision, the [remediation] process requires updating the CSM, including the migration pathways and potentially affected receptors.” Additionally, Section 10.1.5 of the LRA also describes an environmental data management, which directs appropriate action based on the environmental data results and detects potential trends with the environmental monitoring program.

There are currently, however, uncertainties associated with the fate and transport of contaminants during the proposed license renewal term. For example, the role of the unsaturated zone as a reservoir of contaminants, and the effects of lithologic heterogeneities on groundwater flow and contaminant transport are currently undefined, but may be needed to properly interpret existing observations and make inferences about future groundwater quality effects.

This information is necessary to complete the NRC staff’s review of the WEC’s environmental monitoring and sampling program and radiation safety program in accordance with 10 CFR 70.23(a).

RAI-6 Conceptual Site Model

Enclosure 2

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- A. Explain how the current CSM and environmental data management process are sufficient to be used as a decision-making tool and to inform the CFFF's sampling and monitoring program.
- B. Describe the WEC's training and qualifications in support of the CSM's function and environmental data management process.

Regulatory Basis RAI-7

The NRC requires licensees to implement procedures and practices that minimize the occurrence of leaks and spills and identify them soon after they occur. The information requested is necessary in accordance with 10 CFR 20.1406(c), which requires licensees, to the extent practical, to conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the NRC radiation protection requirements in Subpart B, "Radiation Protection Programs," and radiological criteria for license termination in Subpart E, "Radiological Criteria for License Termination," of 10 CFR Part 20.

RAI-7 Inadvertent releases, spills, and leaks of radioactive materials

- A. Describe WEC's plans to minimize contamination, including the subsurface, and reduce exposures as part of the radiation protection program established under 10 CFR Part 20.
- B. Describe WEC's plan to minimize waste in accordance with 10 CFR 20.1406, "Minimization of contamination."
- C. Explain whether and how impacts to surface water and groundwater from inadvertent releases was considered in the site emergency plan.
- D. Explain whether and how inadvertent releases, leaks, and spills over the last 10 years have been considered under "Risk Zone 2 (Meets performance criteria but unacceptable risk for long-term operation)" as described in Table 4.1, "Risk Analysis Table," (page 46) of the LRA.

Regulatory Basis RAI-8

Westinghouse completed a technetium-99 (Tc-99) source investigation in 2020. Westinghouse determined that current operations are not the source of the Tc-99 contamination and concluded that current site operations do not have the potential to introduce Tc-99 levels above the maximum concentration limit into the environment (WEC's Comments on draft EIS). The source, however, of the Tc-99 contamination south of the plant is unknown. The LRA (page 23) describes the minimum content of the CFFF's radiation safety program including the development of procedures to control contamination, the evaluation of radioactive effluents and material releases from the site, and a program for maintaining exposures to radiation and radioactive materials, and releases of radioactive materials to the environment, ALARA.

The information requested is necessary to complete NRC staff's evaluation in accordance with 10 CFR 70.23(a) and to determine whether Westinghouse's radiation protection program is adequate.

RAI-8 Tc-99 Contamination

- A. Explain whether and how the results of the Tc-99 investigation were considered in determining whether changes to the radiation safety program are necessary.

Enclosure 2

- B. Explain whether and how the results of the Tc-99 investigation were considered in determining whether changes to the management measures are necessary.

Regulatory Basis RAI-9

Section 3.6, “Human Performance,” of WEC’s LRA explains that the basis of the human performance program at the CFFF is a series of behaviors executed to minimize the frequency and severity of events and help the individual worker maintain positive control of a work situation. Additionally, consistent with the NRC’s safety culture policy statement, the NRC encourages licensees to maintain a positive safety culture, which recognizes that weaknesses in safety culture or a deteriorating safety culture appear to increase the likelihood of performance problems and the consequences of those problems.

RAI-9 WEC’s human performance program

Describe the process for evaluating the effectiveness of WEC’s human performance program.

Regulatory Basis RAI-10

This information is necessary to complete the NRC staff’s analysis of cumulative impacts in the EIS in accordance with 10 CFR 51.75(d), which requires, in part, that the draft EIS include a preliminary analysis that considers and weighs the environmental effects, including any cumulative effects, of the proposed action.

RAI-10 Waste from the fabrication of tritium-producing burnable absorber rods (TPBARs)

- A. Provide the quantity of waste that is produced during TPBAR production.
- B. Describe and explain how TPBAR waste is classified (e.g., low level waste, nonhazardous, other).
- C. Describe the TPBAR waste disposal process and disposal capacity during the proposed license renewal term.

Regulatory Basis RAI-11

The information is necessary to evaluate potential impacts on historic and cultural resources as part of the NRC staff’s National Historic Preservation Act Section 106 and National Environmental Policy Act environmental reviews.

RAI-11 Historic and Cultural Resources

- A. The results of the cultural resources survey documented in the draft report “Cultural Resources Survey of the Westinghouse Electric Company’s Columbia Fuel Fabrication Facility” dated February 2022, include findings that there are no NRHP-eligible resources located in low and high potential areas of the CFFF site and additional management recommendations regarding avoidance of potential impacts to cultural resources during ground disturbing activities in developed areas.
1. Discuss whether the WEC’s cultural resource management procedures (e.g., RA-432 and associated map) will be updated considering the findings and management recommendations in the draft cultural resources survey report (e.g., recommended actions in response to “future ground disturbing activities in the developed areas inside the security fence that will extend more than four feet below the present ground surface”) as well as areas determined to have high potential in the draft survey report that are currently identified as disturbed areas in RA-432 map). If so, describe the updates.
 2. If the updated procedures are available, please provide these.
- B. The draft cultural resources survey report identified areas of low and high potential. New archaeological resources were identified in the high potential areas. The draft report also suggested that there is a high potential for cultural resources to exist below 4 feet in the developed areas of CFFF. The report does not provide a definition of the term developed but does provide a map depicting the developed area within the CFFF site (~68 acres). Clarify the distinction/definition of the terminology (i.e., disturbed) being used in RA-432 and the draft cultural resources survey report (i.e., developed) and explain any differences.