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Subject: Transmittal of "Virtual NRC Pre-submittal Meeting: **eVinci™**[1] Micro-Reactor Wave 3 White Papers" Presentation

I am pleased to submit on behalf of Westinghouse Electric Company the enclosed eVinci micro-reactor presentation. This presentation will be used to support the June 23, 2022 meeting between Westinghouse and NRC. The purpose of the June 23rd meeting and the presentation is to provide an overview of the eVinci micro-reactor Wave 3 white papers. These white papers are scheduled to be transmitted to NRC on June 30, 2022.

Correspondence with respect to this submittal should be addressed to Anthony J. Schoedel, Manager, Advanced Reactors Licensing Engineering, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 1, Cranberry Township, PA 16066.

Anthony J. Schoedel

Anthony J. Schoedel, Manager
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cc: Mohamed Shams (NRC)
Brian Smith (NRC)
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Amy Cubbage (NRC)
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Enclosure:
1. WAAP-12326, "Virtual NRC Pre-submittal Meeting: **eVinci™** Micro-Reactor Wave 3 White Papers"

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Virtual NRC Pre-submittal Meeting: eVinci™ Micro-Reactor Wave 3 White Papers

June 23, 2022

Westinghouse

Purpose & Agenda

Purpose: Provide an overview of the Wave 3 eVinci micro-reactor white papers

Agenda

- White Paper Development Plan Review
- Summary of Wave 3 White Papers
- Schedule

White Paper Development Plan Review

#	Topic	Submittal Wave
1	Facility Level Design Description	1 (Submitted)
2	Principal Design Criteria	1 (Submitted)
3	Safety and Accident Analysis Methodologies	1 (Submitted)
4	LMP Implementation	1 (Submitted)
5	Regulatory Analysis	2 (Submitted)
6	Deployment Model	2 (Submitted)
7	Safeguards Information Plan	2 (Submitted)
8	Test and Analysis Process	2 (Submitted)
9	Functional Containment and Mechanistic Source Term	2 (Submitted)
10	Composite Material Qualification and Testing	2 (Submitted)
11	Fuel Qualification and Testing	3 (Submitted)
12	Code Qualification	3

#	Topic	Submittal Wave
13	Advanced Logic System®(ALS) v2	3
14	Component Qualification	3
15	EPZ Sizing Methodology	3
16	Physical Security	3
17	Heat Pipe Design, Qualification, and Testing	3
18	Nuclear Design	3
19	Transportation	3
20	Operations and Remote Monitoring	4
21	Phenomena Identification and Ranking Table (PIRT)	4
22	Integral Effects and Transient Testing Report	4
23	Refueling and Decommissioning	4
24	Seismic Methodology	4

Summary of Wave 3 White Papers

Topic 1: Code V&V Plan for Design Basis Safety Analysis

- Purpose:
  - Keep NRC informed of the computer codes selected for the eVinci micro-reactor DBA safety analysis
  - Keep NRC informed of the process Westinghouse is following to perform DBA code V&V
- Request for NRC feedback:
  - Does NRC agree with the EM development and assessment process being followed to develop the eVinci micro-reactor DBA safety analysis methodology?
  - Does NRC have any specific concerns on the computer code V&V process and strategy or the scope of the test database supporting the code validation?

Summary of Wave 3 White Papers

Topic 2: Advanced Logic System v2 Platform Licensing Strategy

- Purpose:
  - Describe the process Westinghouse is following to develop, qualify, and test the ALS v2 platform
  - Describe Westinghouse's intention of seeking generic NRC approval of ALS v2 platform
  - Keep NRC informed on the current status of the ALS v2 platform design program
- Request for NRC feedback:
  - Westinghouse is requesting NRC feedback and observations on the approach and information discussed within the white paper

Summary of Wave 3 White Papers

Topic 3: Core Component ASME Design Qualification Strategy

- Purpose:
  - Describe the initial strategy for implementation and design qualification of eVinci micro-reactor core components
- Request for NRC feedback:
  - Westinghouse is looking for NRC feedback on the following topics/statements:
    - Design qualification using ASME BPVC Section III, Division 5 for guidance where applicable for a particular component, or independent of the ASME Code where the Code is not applicable
    - Alignment of the eVinci micro-reactor core components with the ASME BPVC Section III, Division 5 component classifications as outlined in the white paper
    - General material types selected for construction of core components

Summary of Wave 3 White Papers

Topic 4: EPZ Sizing Methodology

- Purpose:
  - Inform NRC of the planned process for determination and justification of EPZ sizing and associated consequence analysis
  - The methodology is principally based on using the event selection and source term approach discussed in other white papers and utilizing the 2017 EPA PAGs as the broad acceptance criteria for EPZ acceptability
- Request for NRC feedback:
  - Does NRC foresee any restrictions, or the need for any additional considerations for those discussed in the white paper, related to adopting the EPA PAGs as the acceptance criteria for this methodology?
  - The event selection portions of the methodology proposed in the white paper are primarily addressed through the LBE identification process discussed in a separate white paper – are there any specific elements of accident scenario selection applicable for emergency planning considerations that would require a different process or assumptions to be used?

Summary of Wave 3 White Papers

Topic 5: Preliminary Assessment Against 10 CFR 73.55 Requirements

- Purpose:
  - Keep NRC informed on the process Westinghouse is following to ensure the eVinci micro-reactor program meets the physical protection rules set forth in 10 CFR 73.55
  - Inform NRC of Westinghouse's expectations that portions of 10 CFR 73.55 may require exemptions
- Request for NRC feedback
  - Requesting feedback on the approach discussed within the white paper. Does NRC have any concerns with Westinghouse's approach for the eVinci micro-reactor security?

Summary of Wave 3 White Papers

Topic 6: Heat Pipe Design, Qualification, and Testing

- Purpose:
  - Inform NRC of the expected process related to heat pipe design, qualification, and testing for the eVinci micro-reactor design
- Request for NRC feedback
  - Are there any specific considerations to include in the heat pipe material and structural qualification development program which are not discussed in the white paper?
  - Design by test qualification approaches may be employed as practicable and applicable. Are there any specific considerations to include in which are not discussed in the white paper?
  - The goal is to qualify the heat pipes for operation with no planned in-service maintenance and no periodic in-service inspections. Are there any specific considerations to include in heat pipe design qualification to support this approach which are not discussed in the white paper?

Summary of Wave 3 White Papers

Topic 7: Nuclear Design

- Purpose:
  - Provide an overview of the eVinci micro-reactor nuclear design and steady-state analysis methods
- Request for NRC feedback
  - Westinghouse is looking for NRC feedback on the following topics/statements:
    - The software and methods presented are acceptable and sufficient to provide adequate data and analyses to support the licensing of the design.
    - The high-level software verification and validation plan presented is acceptable and sufficient to satisfy licensing criteria.
    - The sample results presented provide the expected key reactor physics parameters necessary to support licensing of the design.

Summary of Wave 3 White Papers

Topic 8: U.S. Transportation Strategy

- Purpose:
  - Keep NRC informed of Westinghouse process to develop a transportation strategy
  - Communicate details of the cask design that will ensure transportation requirements are met to achieve a CoC for transportation licensing
- Request for NRC feedback
  - Transportation strategy assumes the same criteria applied to fuel transportation casks in 10 CFR Part 71 are applicable to a fully fueled micro-reactor, pre- and post-operation. Does NRC have any concerns with this assumption?
  - Does NRC identify any concerns with the proposed eVinci micro-reactor licensing path for transportation packages?
  - Does the stated path to obtain a 10 CFR Part 71 CoC represent a viable regulatory approval pathway? If not acceptable, what is the basis?

Summary of Wave 3 White Papers

Topic 8: U.S. Transportation Strategy (con't)

- Request for NRC feedback (con't)
  - Does the rationale for Functional Containment for transportation represent an acceptable approach as it pertains to loss or dispersal of radioactive contents defined in 10 CFR 71.51? If not, what are the concerns with the approach and the basis for these concerns?
  - Is NRC agreeable with a risk-informed, performance-based approach to transportation and/or industry developing guidance for using a transportation PRA to demonstrate compliance within existing 10 CFR 71 regulations?

Schedule

- Submittal to NRC: June 30th
- Request for NRC Feedback: September 30th

Questions