Enclosure 1

Pre-Submittal Meeting Slides (Non-Proprietary)

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NRC Pre-Submittal Meeting

Use of Cobalt Burnable Absorbers (COBAs) in Salem Generating Station

June 25, 2025

Meeting Agenda

- Introductions
- Provide summary overview of scope of Co-60 program
- Describe outline and content of LAR
  - Change to Operating License
- Dose Consequence Evaluation
- Decay Heat Assessment
- Spent Fuel Pool Criticality
- COBA Testing to Date
- Digital Serialization
- Co-60 Implementation Schedule
- Questions / Comments

Overview of Cobalt-60 Program

- Collaboration between Westinghouse and Nordion
- Provide a domestic supply of Co-60 for irradiation services
  - Gamma source for sterilization of single-use medical devices
  - Food and pharmaceutical ingredient irradiation
  - Global shortage in Co-60 sources
- Cobalt Burnable Absorbers (COBAs) inserted into fuel assemblies
  - Fuel insert similar to WABAs
  - Neutron irradiation of [ ]^{a,c} within each rodlet
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  -]^{a,c}
    - Core location of COBAs optimized for each cycle of irradiation
- COBA capsule harvesting in SFP by Westinghouse and shipped to Nordion
  - Blended with other Co-60 slugs to create finished sources of specific activity

Updated COBA Assembly Design Concept

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Outline / Content of LAR

- LAR to provide overview of key analyses and testing supporting COBA
  - Structural integrity
  - Thermal hydraulics
  - Vibration and wear
  - Mechanical creep
  - Corrosion
  - Analysis of COBA failure
  - Co-60 capsule positioning
  - Nuclear Design
- LAR sections will reference Westinghouse Supporting Information
  - General and Site-Specific Attachments to LAR – proprietary and redacted versions
- Site specific assessment and analyses
  - Chemistry sampling for Co-60
  - Co-60 impacts to Chapter 15 LOCA dose consequences
  - Dose and decay heat analysis for SFP and cask pit area
  - Decay heat addition to RCS for normal, upset and ELAP events

License Changes

- Changes to Salem FOL
  - Allow for transfer/use of Co-60 in accordance with 10 CFR Part 30
  - Allow for production, possession, receipt and transfer of Co-60
    - Similar changes made for Hope Creek Co-60 initiative
    - Allows production & transfer of Part-30 source material within a Part-50 license
  - Describe COBA SFP storage requirements
    - Ensures gamma flux limits are within 10^{10} MeV/cm^2-sec limit for SFP concrete
- Mark-ups of FOL changes in LAR attachment

Dose Consequence Evaluations

- COBA design limits Chapter 15 Impact
  - Detection of Co-60 via routine RCS chemistry sampling
  - Co-60 source term non-gaseous
    - Only affects events with direct RCS release
- LOCA dose consequences revised for additional Co-60 source term
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  - Results of dose consequence analyses show a not more than minimal (<10%) increase due to Co-60
    - Calculation changes performed under 50.59

Decay Heat and Gamma Energy Assessment

- Contribution of COBA decay heat evaluated
  - Normal Shutdown Cooling
  - Loss of RHR at Mid-loop / Natural Circ Cooldown
  - Flex Operation
  - SFP Cooling
- Sufficient cooling margin exists to accommodate additional COBA heat

Decay Heat and Gamma Energy Assessment cont.

- COBA decay heat/gamma energy accident analyses
  - Small and Large Break LOCA
  - LOCA Containment Integrity
  - Post-LOCA Long Term Cooling
  - SGTR
  - Steam Line Break and Locked Rotor Steam Release
- Sufficient margin in all events to ensure adequate cooling
- COBA gamma energy incident on wall and floor of SFP and cask pit
  - Impact to SFP floor is minimal
  - Impact to SFP walls maintained by plant procedures based on time of offload

Spent Fuel Criticality Analysis

- Plant specific SFP criticality analysis updated with RG 1.240 including operating with COBA
- Updates the new fuel storage area analysis
- WCAP report generated with all pertinent details
  - Pre-submittal meeting held with staff March 6, 2025
  - LAR S25-02 for new criticality analysis submittal June/July 2025
- Presence of COBA treated as a conservative penalty in SFP criticality analysis

COBA Testing to Date

- CFD Validation Testing
  - Performed at WEC Churchill facility at PWR conditions: pressure, temperature, thimble tube flow, capsule heating
  - Flow rates measured in COBA rodlet, and thimble tube are similar to flow rates predicted in prior CFD analysis and other hydraulic predictions
  - Confirms that boiling does not occur for expected normal operating conditions in reactor
- Wear Testing
  - Also performed at WEC Churchill facility at PWR conditions
  - Unlike CFD testing, capsule heating was excluded in place of production capsules and slugs
  - The first COBA article showed no discernable wear after 6 weeks of testing.
  - The second COBA article just completed a 3-month duration and is currently being evaluated.

Digital Serialization of Capsules

- Digital Serialization ensures [

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  - White paper submitted to NRC on February 7, 2025
  - Meetings with NMSS staff on April 17 and May 15
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  - Complies with NSTS requirements described in 10 CFR 20.2207 and maintains [ ]a,c
  - Approach to be further described within LAR

Co-60 Implementation Schedule

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Co-60 Timeline

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Questions / Discussion

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Thank *you*