PSEG/NRC Pre-Submittal Meeting

Salem Expanded Scope Leak-Before-Break Amendment Request

April 15, 2020

PSEG Nuclear LLC

Agenda

Overview of Proposed Change

Purpose and Scope of License Amendment Request

Specific Discussion Topics

Proposed Schedule

Overview of Proposed Change

Salem 1 & 2 License Amendment Request (LAR) S19-08

- Requests NRC Approval of Leak-Before-Break for Specific Piping Attached to Reactor Coolant System (RCS) Primary Loops
  - 6-inch Safety Injection (SI)
  - 10-inch Accumulator Lines
  - 14-inch Residual Heat Removal (RHR)
  - 14-inch Pressurizer Surge Line
- Evaluation Approach is Similar to Previously Approved LARs, e.g., D.C. Cook and Waterford

Overview of Proposed Change

- No Proposed Technical Specification Changes
- UFSAR Changes via 10CFR50.59 Part of Amendment Implementation
  - UFSAR Impact Described in LAR
  - Allows Removal of Dynamic Effects of Pipe Rupture for the In-Scope Piping

Purpose and Scope of LAR

- Supports Planned Core Upflow Conversion (UFC) Modification for the Salem 2 Fall 2021 Refueling Outage
  - UFC Reduces Baffle Bolt Loads but Requires Evaluation of Pipe Break Loads
  - Outage Planning Depends on Amendment Approval
- LAR Scope Similar to D.C. Cook and Waterford
  - SI, Accumulator and RHR Boundaries go to first RCS Pressure Isolation Valve (D.C. Cook) – Reduced Scope Compared to Supporting WCAPs
  - Entire Pressurizer Surge Line (Waterford)

LBB Evaluation Method

Westinghouse Evaluation Methods Using NUREG-0800 Standard Review Plan (SRP) Section 3.6.3 Criteria

- Loads calculated for as-built configuration and combined per SRP 3.6.3
- Plant-Specific Material Properties
- Leakage Crack Flow Rate with Margin of 10 to Leak Detection
- Fracture Mechanics Evaluation of Critical Crack Size with Margin of 2 from Leakage Flaw to Critical Flaw
- Additional Fatigue Crack Growth Evaluations
- Similar to Previously Approved Approaches

Screening Potential Degradation Mechanisms

LAR WCAP Evaluations Plus Plant-Specific Reviews

- No Mechanisms Challenge LBB Conclusions
- ISI Examination Results Reviewed for In-Scope Piping
  - No Relevant Indications
- Plant-Specific Reviews for Water Hammer and External Chloride Stress Corrosion Cracking (ECSCC)
- Water Hammer Generic Letter 2008-01 Actions and OE
- Potential ECSCC from Service Water Leaks
  - LBB piping not susceptible based on location
  - ECSCC is a mechanism considered in Risk-Informed ISI Program – LAR discusses exam results

RCS Leakage Detection

- 6-inch SI Leakage Crack Flow Rate = 5 gpm ➔ 0.5 gpm Leakage Detection
- R-11A Air Particulate Monitor
  - Preliminary Evaluation Using Fluorine-18 Shows Capability to Detect 0.5 gpm in One Hour
  - F-18 is Rx Power Dependent, not Relying on Fuel Defects or Corrosion Products
  - Current Setpoints and Alarm Response are Not Affected
- Containment Fan Cooler Condensate Detector Response 0.5 gpm in One Hour

RCS Leakage Detection

Discussion of Other RCS Leakage Capabilities

- Containment Sump Pump Stops and Starts
- Noble Gas Radiation Monitor
- Non-Tech Spec Parameters e.g., containment conditions, accumulator level and pressure, other tank levels
- Performance of Water Inventory Balance
- Leakage Monitoring and Evaluation per Inspection Manual Chapter 2515 Appendix D and Owners Group Guidance

RCS Leakage Detection

- Diverse Means to Detect and Evaluate Low Levels of Leakage
- Fatigue Crack Growth Evaluations for Limiting Piping (6-inch SI) Calculated Nearly Four Years to go from 10 gpm to Critical Crack
- No Change Proposed to Current Technical Specification Limit of One gpm Unidentified Leakage

Proposed Schedule

- PSEG to Submit LAR in April 2020
- Approval Needed for Unit 2 Fall 2021 Outage