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Palisades Nuclear Plant (PNP) Pre-Submittal Meeting (Open Portion)

License Amendment Request to Support Leak Before Break (LBB) Application in the PNP Licensing Basis

and

Licensee Amendment Request to Support Repairing of Steam Generator Tubes by Sleeving

January 14, 2025

Overall Meeting Agenda

HOLTEC PALISADES

Open Session

- Introductions & Opening Remarks
- License Amendment Request to Support Leak Before Break (LBB) Application in the PNP Licensing Basis
- License Amendment Request to Support Repairing of Steam Generator Tubes by Sleeving
- Public Questions and Comments

Closed Session

- License Amendment Request to Support Repairing of Steam Generator Tubes by Sleeving
- Questions

Introductions

HOLTEC PALISADES

- U.S Nuclear Regulatory Commission (NRC) Staff

- Holtec Decommissioning International, LLC (HDI)
  - Jean Fleming, Vice President of Licensing and Regulatory Assurance
  - Michael Schultheis, Palisades Director, Regulatory & Site Strategies
  - Jim Miksa, Palisades Manager, Regulatory Assurance
  - Joe Jerz, Palisades Director, Engineering

- Framatome Inc.
  - Morris Byram, Regulatory Affairs Licensing Manager / Engineer
  - Philip Opsal, Regulatory Programs Director
  - Richard Coe, Consulting Engineer
  - Raj Persad, Project Engineer

Additional HDI and Framatome subject matter experts participating remotely

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Palisades Nuclear Plant (PNP) Pre-Submittal Meeting (Open Portion)

License Amendment Request to Support Leak Before Break (LBB) Application in the PNP Licensing Basis

January 14, 2025

LBB Meeting Agenda

Open Session

- Introductions
- Meeting Purpose & Outcome
- Background
- License Amendment Request (LAR) Content
- Schedule
- Questions

Introductions

HOLTEC PALISADES

- U.S Nuclear Regulatory Commission (NRC) Staff
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  - Joe Jerz, Palisades Director, Engineering
- Framatome Inc.
  - Morris Byram, Regulatory Affairs Licensing Manager / Engineer

Additional HDI and Framatome subject matter experts participating remotely

Meeting Purpose & Outcome

- Purpose:
  - Present the proposed Palisades License Amendment Request to revise the Permanently Defueled Licensing Basis to support LBB methodology for transition to power operations
- Objective:
  - Engage in dialogue with the NRC staff regarding the regulatory criteria and standards to be applied during the NRC staff's review of the future licensee submittal
  - Solicit NRC Staff questions and comments ahead of submittal
  - Provide schedule and technical information to support NRC acceptance for review and resource allocation

Background (General)

- March 13, 2023, HDI submitted a description of the regulatory path to reauthorize power operations (ADAMS Accession No. ML23072A404)
- December 14, 2023, HDI submitted License Amendment Request to Support Resumption of Power Operations Technical Specifications (POTS) (ADAMS Accession No. ML23348A148)
  - This LAR is an update to the December 14, 2023, application which included a statement that Palisades would be reinstating the UFSAR Chapter 14 Revision 35 accident analysis as part of the return to power operations at PNP

LAR Content

- Reason for the Proposed Changes
- Description of the Proposed Changes
- Technical Evaluation
  - Palisades Nuclear Plant (PNP) LBB (Leak-Before-Break) Licensing Background
  - Approved CE Owner's Group (CEOG) LBB Analysis (CEN-367-A*)
  - CEN-367-A Application to PNP
  - Regulatory Guide (RG) 1.45 Adherence
- Regulatory Evaluation
- Precedent
- No Significant Hazards Consideration Determination
- Environmental Evaluation

*CEN-367-A "Leak Before Break Evaluation of Primary Coolant Loop Piping in Combustion Engineering Designed Nuclear Steam Supply Systems" February 1991 (ADAMS Accession No. ML20070S390)

LAR Content

HOLTEC PALISADES

- Reason for the Proposed Changes
  - Application of CEN-367-A CEOG LBB Analysis to Palisades
    - Recover unnecessary conservatism in Large Break Loss of Coolant Accident (LBLOCA) loads analysis using approved LBB analysis and taking credit for Primary Coolant System (PCS) Leak Detection Systems’ capabilities allowed by General Design Criteria (GDC) 4
    - LBB analysis for the CEOG plants was approved by the NRC in 1990 in CEN-367-A (ADAMS Accession No. ML20070S390)
    - CEN-367-A provides the technical basis for all CEOG plants to incorporate LBB for on the hot and cold legs of the RCS piping (PCS)*
    - The NRC Safety Evaluation Report (SER) recognized that CEN-367-A the analysis was bounding for Palisades plant

*CEOG and CEN-367-A documentation refers to Reactor Coolant System (RCS) which is the same as Palisades nomenclature for Primary Coolant System (PCS)

LAR Content

HOLTEC PALISADES

- Reason for Proposed Changes (cont.)
  - First LBB Application - Reactor Vessel Internals Loading (Core Shroud Bolts)
    - At shutdown in 2022, Palisades did not have an acceptable bolt pattern analysis (ABPA) to meet Section 7.5 of MRP-227 requirements
    - As part of ABPA work process, review of the Palisades design basis is performed which includes LBLOCA
    - Crediting approved LBB analysis provides acceptable results for ABPA

LAR Content

HOLTEC PALISADES

- Description of the Proposed Changes
  - No Technical Specification (TS) changes needed
  - Updated Final Safety Analysis Report (UFSAR) sections will be changed as necessary to incorporate reference to CEN-367-A
    - 1.9.2 (Time-Limited Aging Analysis)
    - 4.7 (Primary Coolant Pressure Boundary Leakage Detection)
    - 14.17.3 (Reactor Internals Structural Behavior Following a LOCA)
  - TS Bases Sections will be changed to incorporate reference to RG 1.45, Rev. 0*
    - 3.4.13 (PCS Operational Leakage)
    - 3.4.15 (PCS Leakage Detection Instrumentation)

*RG 1.45 “Reactor Coolant Pressure Boundary Leakage Detection Systems” May 1973 (ADAMS Accession No. ML003740113)

LAR Content

HOLTEC PALISADES

- Technical Evaluation - PNP LBB Licensing Background
  - RG 1.45 May 1973
    - Version of RG in place when CEN-367-A approved by the NRC
    - NRC evaluated Palisades against RG 1.45 during NUREG-0820 “Integrated Plant Safety Assessment (IPSA) Systematic Evaluation Program (SEP),” October 1982 (ADAMS Accession No. ML18047A670) SEP Topic V-5
      - Palisades agreed to submit a Technical Specification Change Request (TSCR) concerning operability of the leak-detection system when review of Topic III-5.A “Effects of Pipe Break on Structures, Systems, and Components Inside Containment” is complete.
      - NRC concluded that *although all of the leakage-detection systems recommend by RG 1.45 are not present, Palisades incorporates six additional diverse systems*, and that small Loss of Coolant Accident (LOCA) risk was low.
    - Palisades License Amendment 162 (ADAMS Accession No. ML020840096 & ML20076N029) incorporated Primary Coolant System (PCS) Leakage Detection Limiting Conditions for Operation (LCOs) and Surveillance Requirements (SRs) into Technical Specifications (TS) closing SEP Topic V-5.
    - 1982 SEP evaluation along with License Amendment 162 meet the CEN-367-A stipulation to demonstrate that leakage detection systems installed at Palisades are consistent with RG 1.45

LAR Content

HOLTEC PALISADES

- Technical Evaluation – Approved CEOG LBB Analysis (CEN-367-A)
  - The results demonstrate that the primary coolant loop piping meets the criteria which demonstrate the applicability of leak-before break presented in NUREG 1061, Volume 3, "Evaluation of Potential for Pipe Breaks"
  - Safety Evaluation Report (SER) stipulates *licensees must submit information to demonstrate that leakage detection systems installed at the specific facility are consistent with Regulatory Guide (RG) 1.45*.

- Technical Evaluation – CEN-367-A Application to Palisades
  - CEN-367-A was fully applicable to PNP when approved in 1990.
  - The LAR will address the following plant changes since NRC approval
    - Steam Generator Replacement (1990)
    - License Renewal – Aging Management (1991)

LAR Content

- Technical Evaluation – RG 1.45 Adherence
  - RG 1.45 “Guidance on Monitoring and Responding to Reactor Coolant System Leakage,” Revision 1, May 2008 (ADAMS Accession No. ML073200271)
    - Expanded the NRC guidance and expectations for PCS leakage detection systems and their capability over that contained in original issuance of RG 1.45
  - LAR provides a comparison of Palisades design against RG 1.45 Revision 1
    - Includes information previously covered by Revision 0 NRC evaluation in the closure of SEP Topic V-5
    - Provided to baseline Palisades design and PCS leak detection program against most recent industry guidance
    - Reaffirms that Palisades meets the CEN-367-A stipulation to demonstrate that leakage detection systems installed at Palisades are consistent with RG 1.45

LAR Content

HOLTEC PALISADES

- Technical Evaluation – RG 1.45 Adherence (cont.)
  - Palisades has voluntarily made enhancements to PCS Leakage Detection Program since License Amendment 162
  - Implemented Palisades Administrative Procedure (ADMIN) 4.19 “PCS Leak Rate Monitoring Program” in 2010
    - Specifies requirements for assessment and response to a rise in PCS Unidentified Leakage
    - Describes administration, assessment and response guidelines, data verification guidelines, and actions in response to a rise in PCS Unidentified Leakage
    - Follows industry best practices per Westinghouse PWR Owners Group Letter OG-07-286
  - Modified Palisades Plant Computer (PPC) to provide for automated or on-demand PCS leakage (inventory balance) calculation

Westinghouse PWR Owners Group Letter OG-07-286, ‘Recommendations for Implementation of Guidelines Defined in “Standard Process and Methods for Calculating RCS Leak Rate for Pressurized Water Reactors” (WCAP-16423-NP, Rev 0) and “Standard RCS Leakage Action Levels and Response Guidelines for Pressurized Water Reactors” (WCAP-16465-NP, Rev 0) (PA-OSC-0189 and PA-OSC-0218) with respect to NEI-03-08’

LAR Content

- Technical Evaluation – RG 1.45 Adherence (cont.)
  - Modified the PPC to provide enhanced, real-time trends for important PCS Leakage indications such as:
    - Containment Sump Level
    - Containment Sump Rate of Rise
    - Containment Air Radiation Monitor
    - Chemical Volume & Control System (CVCS) Charging and Letdown Flow Rates
    - Condenser Off Gas Radiation Monitor
    - Steam Generator Blowdown Radiation Monitor
  - Strict adherence to RG 1.45 R0 and R1 regulatory positions would require Palisades backfits previously evaluated by the NRC as not required based on low safety significance and diversity of existing leakage detection system

LAR Content

HOLTEC PALISADES

- Regulatory Evaluation
  - 10 CFR 50, Appendix A, General Design Criteria
    - GDC 4 – Environmental and dynamic effects design bases
    - "… However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping."
    - GDC 30 – Quality of Reactor Coolant Pressure Boundary
  - 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
  - Regulatory Guide 1.45 – "Reactor Coolant Pressure Boundary Leakage Detection Systems"
  - NUREG 1061, Volume 3, "Evaluation of Potential for Pipe Breaks"

LAR Content

- Precedent
  - PNP received interim approval for LBB methodology referencing CEN-367 for pre-HTP fuel spacer grids - October 1989 (ADAMS Accession No. ML19325E446)
  - CEOG Plant LBB Applications Referencing CEN-367-A
    - St. Lucie Units 1 and 2 – March 1993 (ADAMS Accession No. ML20138E042 and ML20136D807)
    - San Onofre Generating Station, Units 2 and 3 – April 1996 (ADAMS Accession No. ML20107B709)
    - Arkansas Nuclear One, Unit 2 – June 1996 (ADAMS Accession No. ML20114E466 and ML20114E470)
    - Millstone Nuclear Power Station, Unit 2 – November 1998 (ADAMS Accession No. ML20195B763 and ML20195B871)
    - Waterford Steam Electric Station, Unit 3 - February 2011 (ADAMS Accession No. ML110410119)

LAR Content

- No Significant Hazards Consideration Determination
  - The proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

- Environmental Evaluation
  - The proposed amendment meets the eligibility criterion for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with issuance of the amendment.

Schedule

- Intend to submit the LAR in February 2025
- Respectfully request the NRC review the LAR on a schedule that will permit approval of the proposed LAR by August 15, 2025
- Targeting implementation in September of 2025

Questions

- NRC Staff Questions or Comments?

Thank You

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Palisades Nuclear Plant Pre-Submittal Meeting (Open Portion)
License Amendment Request to Support Repairing of Steam Generator (SG) Tubes by Sleeving

January 14, 2025

SG Sleeving Meeting Agenda

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Open Session

- Introductions
- Meeting Purpose & Outcome
- Background
- License Amendment Request (LAR) Content
- Schedule
- Questions

Introductions

HOLTEC PALISADES

- U.S Nuclear Regulatory Commission (NRC) Staff
- Holtec Decommissioning International, LLC (HDI)
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  - Michael Schultheis, Palisades Director, Regulatory & Site Strategies
  - Jim Miksa, Palisades Manager, Regulatory Assurance
  - Joe Jerz, Palisades Director, Engineering
- Framatome Inc.
  - Philip Opsal, Regulatory Programs Director
  - Richard Coe, Consulting Engineer
  - Raj Persad, Project Engineer

Additional HDI and Framatome subject matter experts participating remotely

Meeting Purpose & Outcome

HOLTEC PALISADES

- Purpose:
  - Present the proposed Palisades License Amendment Request to add sleeving as an approved method for repairing of steam generator (SG) tubes
- Outcome:
  - Engage in dialogue with the NRC staff regarding the regulatory criteria and standards to be applied during the NRC staff's review of the future licensee submittal
  - Solicit and address NRC Staff questions and comments ahead of submittal
  - Provide schedule and technical information to support NRC acceptance for review and resource allocation

Background

HOLTEC PALISADES

- March 13, 2023, HDI submitted a description of the regulatory path to reauthorize power operations (ADAMS Accession No. ML23072A404)
- December 14, 2023, HDI submitted License Amendment Request to Support Resumption of Power Operation Technical Specifications (POTS) (ADAMS Accession No. ML23348A148)
- September 3, 2024, US NRC and HDI participated in a conference call to discuss the ongoing steam generator tube inspection activities (ADAMS Accession No. ML24267A296)

LAR Content

- Reason for the Proposed Changes
- Description of the Proposed Changes
- Technical Evaluation
- Regulatory Evaluation
- Precedent
- No Significant Hazards Consideration Determination
- Environmental Evaluation
- Supporting Framatome Technical Report Enclosed

LAR Content

HOLTEC PALISADES

- Reason for the Proposed Changes
  - Status of the Palisades SG tubes previously discussed with NRC (ADAMS Accession No. ML24267A296)
  - POTS only allow degraded tubes to be removed from service by plugging
  - Plugging reduces heat transfer and reduces primary coolant flow available for core cooling
  - Sleeving will repair tubes to prevent them having to be removed from service and can also restore previously plugged tubes to service to improve primary coolant flow margin

LAR Content

HOLTEC PALISADES

- Description of the Proposed Changes
  - Proposed changes allow the use of Alloy 690 sleeves to repair degraded SG tubes as an alternative to tube plugging
  - Surveillance Requirement 3.4.1.3 revised to require verification of Primary Coolant System total flow rate when plugging or sleeving results in the same primary system flow reduction as plugging ten or more SG tubes
  - TS 3.4.17, Steam Generator (SG) Tube Integrity, revised to allow the option to plug or repair tubes
  - Specification 5.5.8, Steam Generator (SG) Program, revised to provide provisions for plugging or repairing SG tubes, update the provisions to clarify that tube plugging is not a repair and include a repaired tube (sleeve and tube) inspection interval that shall not exceed 24 effective full power months or one refueling outage (whichever is less), and specify the allowable SG tube repair methods with establishment of a ten-year sleeve in service limit
  - Specification 5.6.8, Steam Generator Tube Inspection Report, revised to add reporting requirements for tubes repaired by sleeving
  - Proposed TS changes are generally consistent with the Standard Technical Specifications for Combustion Engineering Plants (NUREG-1432, Rev. 5). TS Bases mark-ups will also be provided.

LAR Content

HOLTEC PALISADES

- Technical Evaluation
  - Summarized in the Application and Supported by the enclosed Framatome Technical Document (Proprietary and non-proprietary versions will be provided)
  - Includes sections addressing
    - Sleeve Design Description
    - Sleeve Installation
    - Sleeve Materials Selection and Corrosion Evaluation
    - Sleeve Qualification Testing and Evaluation
      - Included mechanical tests/evaluations (leakage, axial load, and cyclic fatigue loading testing) and MSLB and LOCA burst and collapse evaluations
    - Sleeve Inspection
      - Includes pre-installation and post-installation eddy current inspections
    - Sleeve Structural Analysis
      - Satisfies Palisades' NPP ASME Code requirements
    - Sleeve Leakage Integrity
    - Operating Experience with Alloy 690 Corrosion Performance
  - Additional details to be discussed in the Closed Session

LAR Content

- Regulatory Evaluation
  - Conformance discussions provided for
    - 10 CFR 50.36, Technical Specifications
    - 10 CFR 50.36(c)(2)(ii), Limiting conditions for operation
    - 10 CFR50.36(c)(3), Surveillance requirements
    - 10 CFR50.36(c)(5), Administrative controls
    - 10 CFR 50, Appendix A, General Design Criteria
      - GDCs 14, 15, 19, 30, 31, and 32
    - 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
    - 10 CFR 50.55a, Codes and standards
    - Regulatory Guide 1.121, Bases for Plugging Degraded PWR Steam Generator Tubes

LAR Content

HOLTEC PALISADES

- Precedent
  - Most recent sleeving amendment was for Watts Bar Nuclear Plant, Unit 2. NRC issued the Safety Evaluation on August 10, 2020 (ADAMS Accession No. ML20156A018)
  - Information submitted to obtain the Watts Bar Unit 2 approval used as guidance in the development of the Palisades request

- No Significant Hazards Consideration Determination
  - The proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of “no significant hazards consideration” is justified

- Environmental Evaluation
  - The proposed amendment meets the eligibility criterion for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with issuance of the amendment.

- Supporting Framatome Technical Report Enclosed
  - Proprietary details discussed in the closed session

Schedule

- Intend to submit the LAR in February 2025

- Respectfully request the NRC review the LAR on a schedule that will permit approval of the proposed LAR by August 15, 2025

- Targeting implementation in September of 2025

Questions

HOLTEC PALISADES

- NRC Staff Questions or Comments?

Thank You

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Palisades Nuclear Plant Pre-Submittal Meeting (Closed Portion)

License Amendment Request to Support Repairing of Steam Generator Tubes by Sleeving

January 14, 2025

SG Sleeving Meeting Agenda

HOLTEC PALISADES

Closed Session

- Introductions
- Meeting Purpose & Outcome
- Technical Evaluation
- Conclusions
- Questions

Introductions

- U.S Nuclear Regulatory Commission (NRC) Staff

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Additional HDI and Framatome subject matter experts participating remotely

Meeting Purpose & Outcome

HOLTEC PALISADES

- Purpose
  - Describe the technical justification for the proposed Palisades License Amendment Request (LAR) to add sleeving as an approved method for repairing of Steam Generator tubes

- Outcome
  - Engage in dialogue with the NRC staff regarding the technical analyses to be submitted and made available to demonstrate compliance with regulatory criteria
  - Solicit and address NRC Staff questions and comments ahead of submittal

Technical Evaluation

- LAR summarizes the Framatome Proprietary 51-9385467, Steam Generator Mechanical Tube Support Plate (TSP) Sleeve Qualification Assessment for ¾” Tubes at Palisades Nuclear Power (Docketed with LAR)

- Other supporting documents approved and available for NRC review

Technical Evaluation

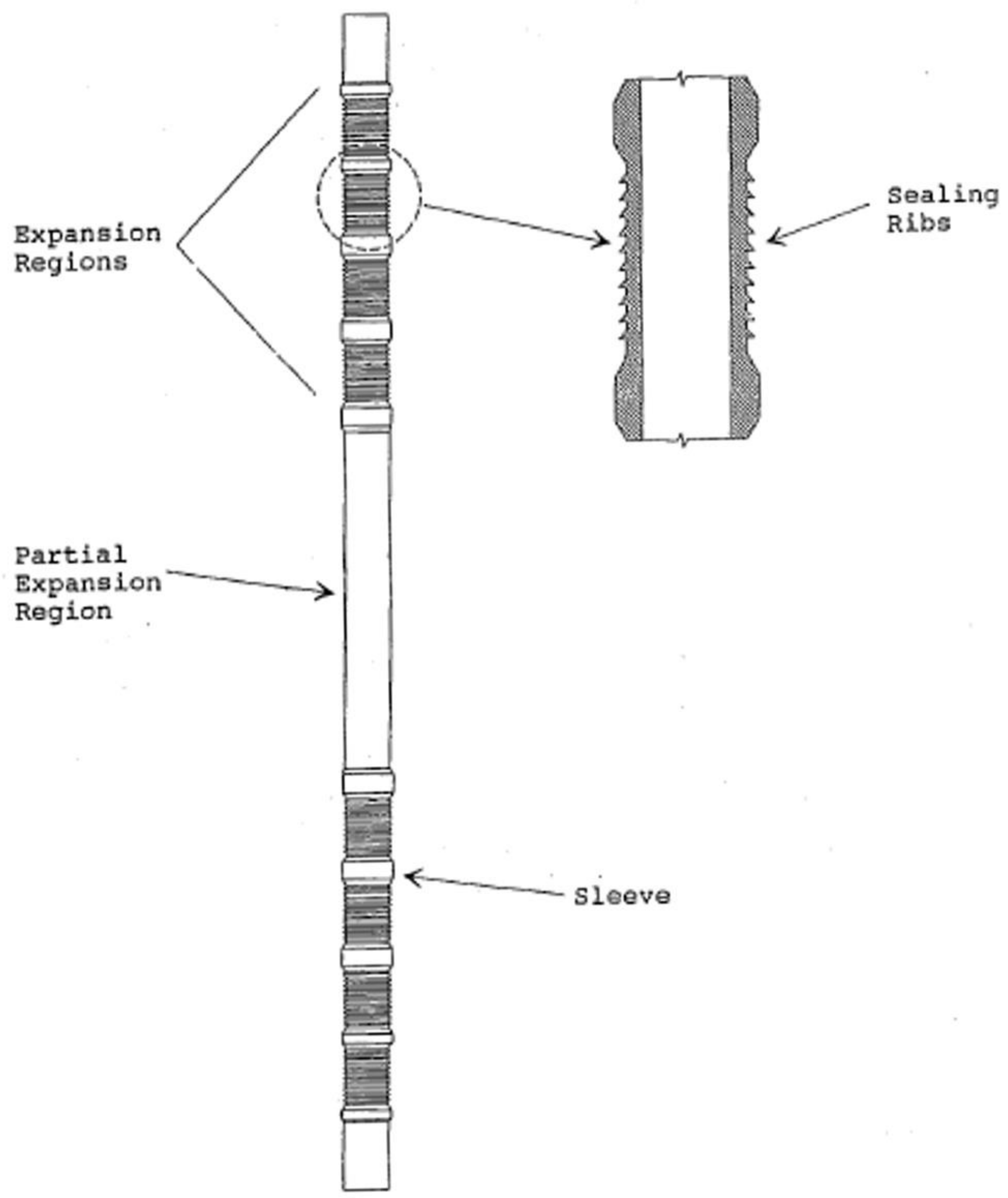
- Sleeve Technical Description
  - Sleeving is a method used to repair defective steam generator tubes and thus keep the tubes in service
  - A mechanical sleeve is a tube segment that is inserted into an existing SG tube and expanded to create an interference fit between the sleeve and the tube. The proposed sleeve uses hydraulic expansion to create the interference fit.
  - Sleeve design uses four hydraulically expanded joints above and four hydraulically expanded joints below the defective region of the tube
  - Sleeve expansion size is controlled and has been kept small to provide a structural, leak-limiting joint while minimizing residual stresses in the parent tube
  - TSP sleeve is designed for tube degradation at TSP intersections of SG tubes
  - Lengths of the TSP sleeves are sized according to the length of the degraded tubing regions into which they are inserted
  - Installing approximately 10 to 12 sleeves will have the same flow impact as plugging a single tube

Technical Evaluation

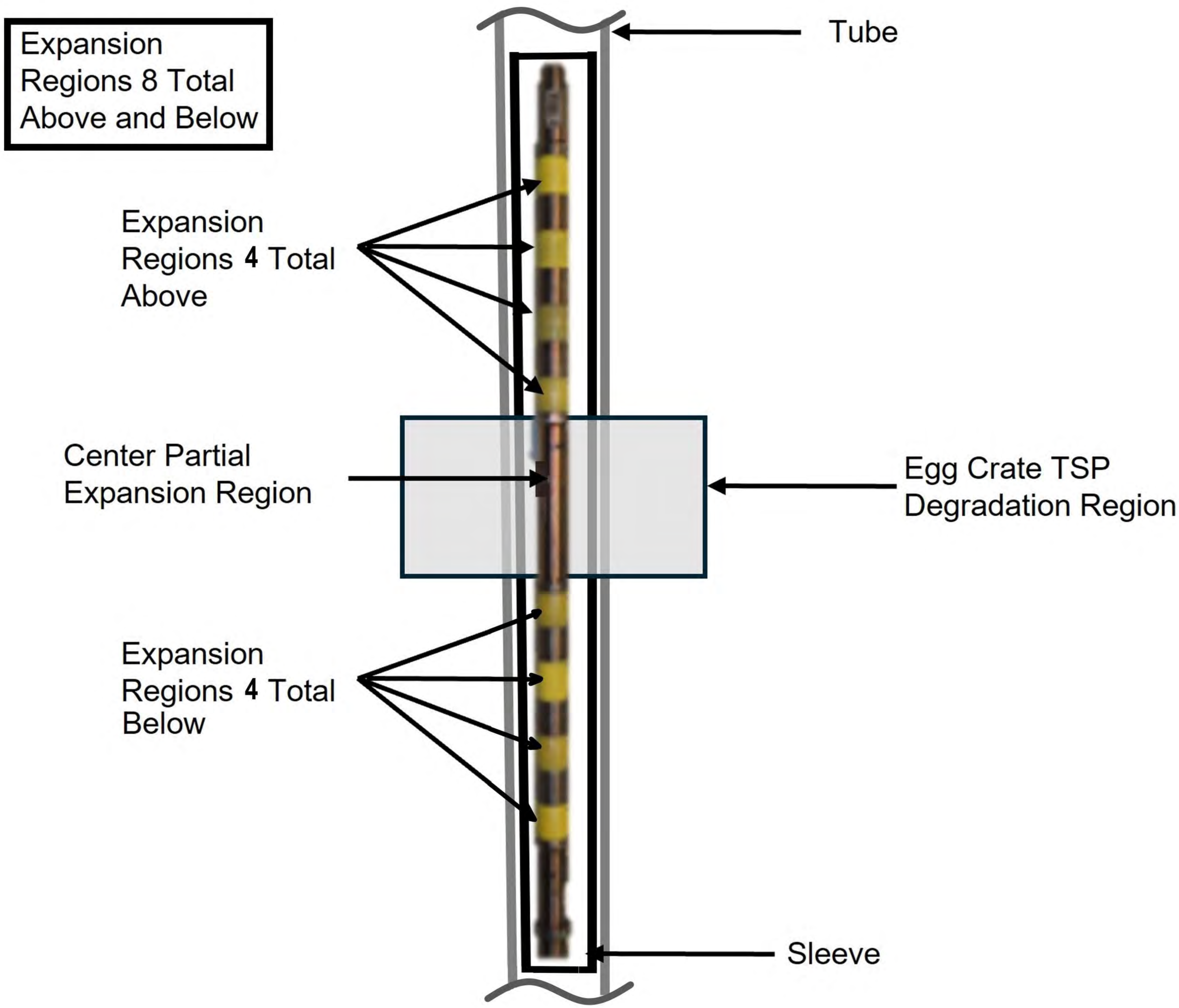
- Sleeve Technical Description
  - Mechanical sleeves are designed to the following codes and standards

Application	Criteria
Structural Design of the Sleeve	ASME B&PV Code Section II & III
Sleeve Plugging Limit	NRC Reg. Guide 1.121 NEI 97-06
Material Procurement	ASME B&PV Code Section II & III
Mechanical Sleeve Qualification	ASME B&PV Code Section XI
Sleeve NDE	ASME B&PV Code Section V & XI

Technical Evaluation



Technical Evaluation



Technical Evaluation

Sleeve Installation

- Sleeves installed with processes that address sleeve design, qualification, installation methods, non-destructive examination, and ALARA considerations
- Sleeve installation accomplished remotely, using tooling attached to a steam generator manipulator
- Sleeve is mounted on an expansion device and inserted into a tube for expansion
- Expansion device controlled and monitored to ensure consistent diametrical expansion via a volume-controlled process
- A hydraulic expansion tool is used simultaneously at both ends of the TSP sleeves
- Following the hydraulic expansion, an additional expansion is made in the middle of the sleeve to preload the sealing ribs and improve their sealing function
- After installation, sleeve-to-tube joints undergo an initial acceptance and baseline inspection using eddy current methods

Technical Evaluation

HOLTEC PALISADES

- Sleeve Materials Selection
  - Sleeve material, Alloy 690, is procured in accordance with ASME Code, Section II, Part B, SB-163, NiFeCr Alloy, Unified Numbering System N06690, and Section III, Subsection NB-2000, “Material.” Additional restrictions applied to alloying elements, final annealing temperature, and yield strength
  - Alloy 690 is a nickel-iron-chromium alloy selected for its favorable properties, including corrosion resistance in both the primary and secondary side water chemistries
  - In the US, material chosen for tubing in replacement steam generators is overwhelmingly Alloy 690
  - Based on decades of experience with replacement SGs, Alloy 690 is virtually impervious to PWSCC and has greatly improved resistance to ODSCC. In some SGs with Alloy 800 tubing, ODSCC has been found in tubesheet crevices, within lattice support plate locations, and at dents. Thus, Alloy 690 is the best alloy currently available for both primary and secondary side corrosion concerns.

Technical Evaluation

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Sleeve Qualification Testing

- Testing program included leakage and mechanical load tests
- Leak-rate tests were performed on the sleeve/tube assembly for various temperatures and pressures under normal operating and main steam line break conditions
- Mechanical load tests included leakage, axial load, and thermal and pressure fatigue cycling loads
  - The sleeves were axially cycled for 10 years' worth of plant transients
- Test loads included the full range of loadings expected under normal power, transient, and accident conditions
- Load-cycling tests performed to demonstrate structural and leakage integrity

Technical Evaluation

HOLTEC PALISADES

Sleeve Inspection

- Sleeve examination program requires that no detectable degradation be present in the parent tube at the location of the hydraulic expansions prior to sleeve installation
- Eddy current examination performed on both sleeve and tube following sleeve installation. This verifies proper sleeve position and provides a baseline inspection of the new primary coolant pressure boundary.
- Eddy current examination of the sleeve and tube performed with qualified techniques that meet the EPRI Steam Generator Management Program: Pressurized Water Reactor Steam Generator Examination Guidelines
- TS 5.5.8 to be revised to require a repaired tube (sleeve and tube) inspection interval that shall not exceed 24 effective full power months or one refueling outage (whichever is less)
- TS 5.6.8 to be revised to require the SG Tube Inspection Report contain:
  - Total number and percentage of tubes plugged or repaired
  - The effective plugging percentage for all tubes plugged or repaired

Technical Evaluation

HOLTEC PALISADES

- Sleeve Structural Analysis
  - Structural analyses being performed in accordance with Section III of the ASME Code
  - Structural analyses include applied loads under normal and accident loading conditions; and calculations for minimum required sleeve thickness based on ASME Code, Section III
  - Percentage of acceptable sleeve wall thickness calculated per Reg Guide 1.121

Technical Evaluation

HOLTEC PALISADES

- Sleeve Leakage Integrity
  - Sleeve-to-tube joint leakage is targeted to be very small compared to the plant operating and MSLB leakage limits, which allows for the installation of numerous sleeves without exceeding those limits
  - Sleeve-to-tube joint leakage determined via laboratory testing
  - Conservatively assumes all installed sleeves leak under post-accident leakage conditions
  - Total sleeve leak rate combined with total amount of leakage from all other sources for comparison against accident-induced leakage limit

Conclusions

HOLTEC PALISADES

- Evaluations to demonstrate sleeve qualified for repairs at every TSP location (other than locations it will not physically fit) within the Palisades Nuclear Power Plant steam generators

- Intend to submit the LAR in February 2025

- Respectfully request the NRC review the LAR on a schedule that will permit approval of the proposed LAR by August 15, 2025

- Targeting implementation in September of 2025

Questions

- NRC Staff Questions or Comments?

Thank You

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