Advisory Committee on Reactor Safeguards

Full Committee Meeting

Palisades Restart Informational Briefing

August 21, 2025

Agenda

- Restart Evaluation Process
- Update on Licensing Actions
- Emergency Preparedness
- Status of Inspection Activities
- Palisades Restart Activities
- Update on Inspection and Technical Topics of Interest

Licensing Basis and Actions
Palisades Restart

Marlayna Doell, Project Manager
Palisades Restart
NRR/DORL

Evaluation Criteria for Restart

- Leveraged existing operating license to make changes under normal NRC processes (i.e., amendments and exemptions)
- General approach was to review requested changes for consistency with previous licensing basis and focus on any areas of change from previous approaches or analyses
- Focus on meeting the same safety, security, and environmental requirements that were applicable to the previously operating plant, with changes as needed

Licensing Actions Completed

- July 24, 2025 – Issued the licensing "bundle" to restore the operational licensing basis at Palisades
  - License transfer, exemption, four license amendments
- August 25 – Planned implementation date for the bundle
  - Will serve as the official transition date from decommissioning to operations for licensing, inspections to the ROP, fee billing, etc.
- Post-August 25 – Palisades will continue restart activities under the operational TS requirements

Licensing Actions Bundle

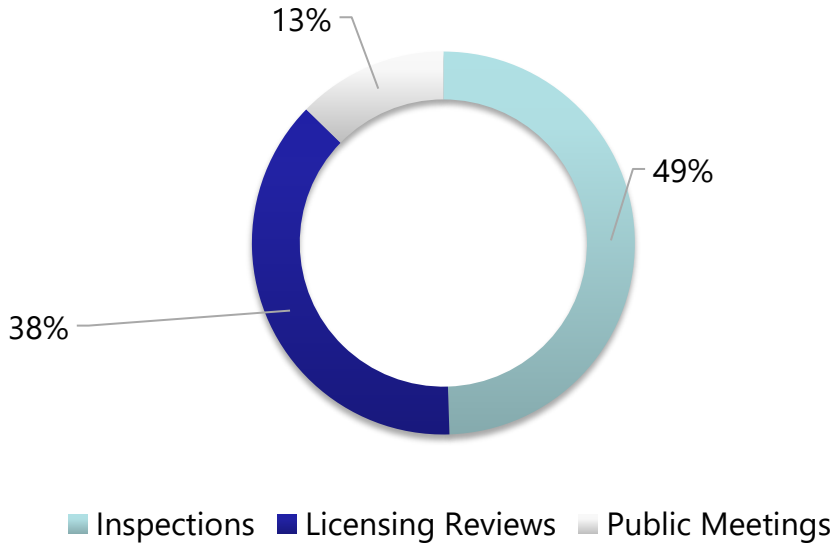
Submittal	Licensing Action	Implementation
Sept. 28, 2023	Exemption from 10 CFR 50.82(a)(2)	Aug. 25, 2025
Dec. 6, 2023	License Transfer	Jul. 24, 2025
Dec. 14, 2023	Operating License Technical Specifications	Aug. 25, 2025
Feb. 9, 2024	Operating License Administrative Technical Specifications	Aug. 25, 2025
May 1, 2024	Emergency Plan	Aug. 25, 2025
May 23, 2024	Quality Assurance Plan (supplement to license transfer)	Aug. 25, 2025
May 24, 2024	Update to MSLB Analysis Methodology	Aug. 25, 2025

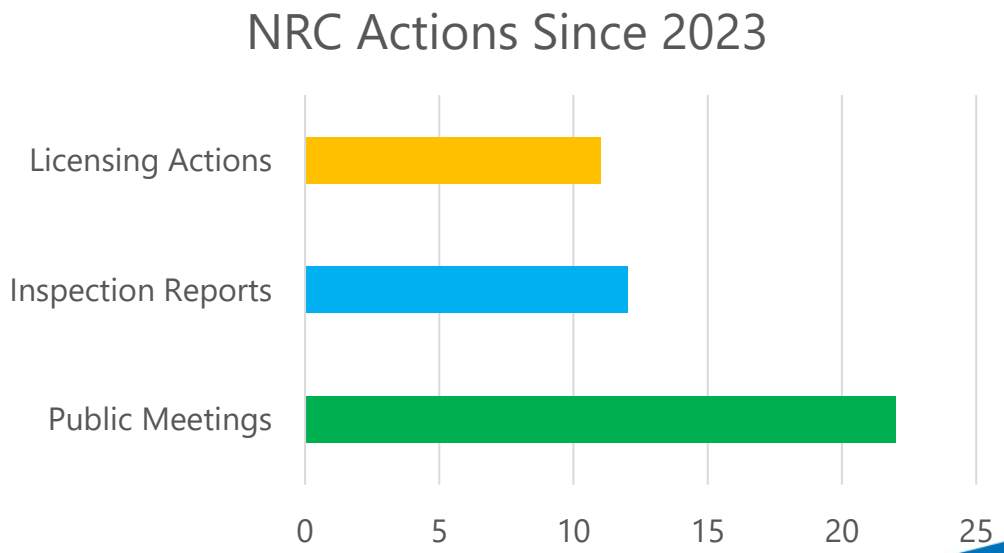
Licensing Actions in Progress

- Leak Before Break Methodology
- Steam Generator Repairs
- Fire Protection NFPA-805 Implementation
- Relief Requests for Certain ISI Activities

Public Outreach

The NRC conducted numerous public meetings throughout the potential restart project, allowing the opportunity to speak directly to NRC inspectors and technical staff. Additional meetings are still underway for the items still under review.





The NRC dedicates **over 35 direct staff hours** to each public meeting

Steam Generators
Palisades Restart

Paul Klein, Senior Materials Engineer
Corrosion and Steam Generator Branch
NRR/DNRL

Special Technical Topic - Steam Generators

- Combustion Engineering Model 2530 Steam Generators (SGs)
  - 8219 tubes per SG, installed in 1990
  - Alloy 600 mill annealed tubing
  - Nominal 0.75 inch diameter, 0.042 inch wall thickness
  - Rows 1-18 U-bend, Rows 19-138 square bend design
  - Horizontal stainless steel lattice type “eggcrate” support plates
- September 3, 2024 phone call between NRC Staff and Holtec to discuss ongoing SG inspections (ML24267A296). Palisades experienced significant increase in axial outside diameter stress corrosion cracking indications (ODSCC) at the eggcrate supports.
- The NRC released a Preliminary Notification on September 18, 2024 (ML24262A092)
- During 2025, in-situ pressure testing (ISPT) of 17 tubes in SG A and 5 tubes in SG B was performed to confirm tube integrity as part of condition monitoring.

  All tubes passed ISPT.

Special Technical Topic - Steam Generators

- The licensee submitted an LAR in Feb. 2025 requesting approval for use of a Framatome Alloy 690 leak limiting sleeve to repair hot leg support plate ODSCC locations. This LAR is under review, RAI responses (ML25211A324, public)
- NRC technical staff performed an audit at Framatome in May 2025 to better understand the sleeve design, installation process, and eddy current qualification work
- Sleeve installation (in lieu of tube plugging) would maintain the SGs heat transfer capability to operate Palisades at full power

Emergency Preparedness Palisades Restart

Jeffrey Herrera, Senior EP Specialist
Reactor Licensing Branch
NSIR/DPR

Emergency Preparedness Timeline

SAFETY FIRST
Palisades Restart Review

May 2022

Palisades shutdown

June 2022

Entergy certified permanent cessation of operations

Dec 2023

Decommissioning emergency plan approved

May 2024

License amendment request to restore operating emergency plan

July 2025

Operating emergency plan approved with license condition

July 2025

Emergency exercise with offsite participation (NRC and FEMA evaluation)

Holtec Emergency Plan Request

- License amendment request
  - Restore operating emergency plan prior to shutdown revision 32 (using NUREG-0654, Rev. 2)
  - Restore emergency action level scheme prior to shutdown (using NEI 99-01, rev. 5)
- Requested timeline
  - May 1, 2024 – license amendment request submitted.
  - Holtec requested completion prior to fuel load (4th Quarter 2025)

Emergency Plan Requirements

License Amendment

- NRC Regulatory requirements
  - 10 CFR 50.47 and Appendix E
    - 16 planning standards
    - Applicable sections of Appendix E
- Guidance Documents:
  - NUREG-0654/FEMA REP-1 Revision 2 "Criteria for Preparation and Evaluation of Radiological Emergency response Plans and Preparedness in Support of Nuclear Power Plants" (ML19347D139)
  - NEI 99-01 "Development of Emergency Action Levels for Non-Passive Reactors" Revision 5 and 6 (one EAL) [ML080450149 and ML12326A805 respectively]
- Additional regulatory requirements
  - Submit updated annual population estimate (Part 50 Appendix E.IV.5)
- FEMA evaluation of state and local emergency plans
  - FEMA requirements under 44 CFR 350
  - FEMA to review offsite emergency plans and evaluate offsite actions during exercise
  - FEMA reviews the alert and notification system design report and submits results to the NRC

Emergency Plan Review

- Reactor Licensing Branch (RLB) staff reviewed Holtec's emergency plan in two parts:
  - Review of the emergency plan
  - Review of the emergency action levels (EALs)
- Emergency Plan Review
  - Review of submitted emergency plan using guidance. Previous emergency plan (Rev. 32) was compared to ensure there were no additional changes.
  - NUREG-0654/FEMA REP-1 Revision 2
- EALs
  - Reviewed submitted emergency action levels using NEI Guidance document 99-01, Revision 5
- FEMA Interim finding
  - FEMA provided an interim finding to the NRC on June 27, 2025, which allowed the NRC to issue the license amendment with a license condition pending a FEMA final finding of reasonable assurance

Emergency Plan Deviations

- Emergency Action Levels (EALs)
  - Added EALs to address lessons learned from Fukushima added to NEI 99-01, Revision 6
  - Modified EAL associated with Independent spent fuel storage installation (based on draft NEI 99-01, Revision 7)
- Emergency Plan
  - Three deviations from NUREG-0654 Revision 2
    - Remote staffing of augmenting engineers (Rx, Mechanical, Electrical) as well as EOF Dose Assessor
    - Information Technology services not necessarily being in the emergency response facilities
    - No TSC dose assessor due to EOF dose assessor staffing at same time

Evacuation Time Estimates (ETE)

- Palisades submitted an updated ETE on September 7, 2022, using the 2020 Census data in accordance with Appendix E to Part 50 Section IV
  - Section 1.4 – Permanent resident population decreased by 4.5% (2010 to 2020 Census Data)
  - Section M.3 – 107% change in permanent resident population within the 2-mile region would require an updated ETE study
- Completeness review of ETE study completed in February 2023
  - Reviewed in accordance with NUREG/CR-7002 "*Criteria for Development of Evacuation Time Estimate Studies*" Revision 1 (ML21013A504)
    - Reviewed and found to be generally consistent with the guidance in NUREG/CR-7002 Revision 1 and, as such, found to be complete
- Holtec completed an annual population estimate in August 2024

Emergency Exercise

- Palisades conducted an emergency preparedness exercise on July 29, 2025
  - This exercise was led by Region III Emergency Preparedness inspectors
  - Two Reactor Licensing Branch Members (Emergency Preparedness Specialist and Branch Chief) supported the exercise evaluation at the TSC and EOF
- FEMA conducted the evaluation of the offsite response capabilities as part of their ability to issue a final finding
  - FEMA conducted a public meeting after the exercise and there were no issues that rose to the level of a FEMA finding

Inspection and Site Activities Palisades Restart

Jason Kozal, Division Director
April Nguyen, Team Lead
Region III/DORS

Palisades Site Activities Update

- Inspection Activities
- Staffing
- Overview of Startup Sequence
- Technical Topics of Interest

Inspection Activities

Completed	In Progress	Planned
Simulator	System Return to Service	Cybersecurity (Pre-Fuel Load & Post-Fuel Load)
Biennial Problem Identification and Resolution	Plant Modifications	Fire Protection Team Inspection
Emergency Preparedness Exercise	In-service Inspection Repair Activities	License Renewal Phase IV
	Physical Security	

Inspections are being conducted using mostly baseline procedures to ensure programs, procedures, and SSCs meet regulatory requirements and industry standards for normal plant operations. Some reactor startup procedures are being utilized, as well as newly created procedures for Cyber Security.

Inspection Focus Item – System Return to Service Reviews

SRTS Plans

- Completed initial reviews of 70% of the 75 System Return to Service (SRTS) plans
- Plans document activities performed to verify configuration & condition of systems, structures, & components (SSCs)
- Plans identify required maintenance and testing, including modifications
- Plans prioritize repairs, open corrective action items, & system enhancements

Inspection

- Phased approach for review of plans and associated activities
- Risk-informed in-field walkdowns and observations of maintenance and testing
- Inspection based on licensee schedule & when systems needed for plant operations
- Verification of operability/functionality by reviewing work orders, technical specifications, and code requirements

Examples of SRTS Inspection Activities

Emergency Diesel Generators

- Review of plan identified critical preventive maintenance activities and prior deficiencies that needed to be addressed
- In-field inspection observed maintenance activities and verified system material condition
- Work also included corrective maintenance to address discovery items
- Test starts and 24-hour endurance run for post-maintenance testing

Additional Follow-Up

- Inspection and cleaning of safety-related Fuel Oil Tank
- Evaluation of any issues identified during maintenance that may impact operability
- Dedication of safety-related parts
- Operators and Inspectors conduct system walkdowns/alignment prior to transitioning to Mode of Applicability for EDGs

Inspection Focus Items – Modifications for Longer-Term Reliability

- On-Site and Off-site Power maintenance
  - Replace Station Batteries
  - Replace Generator Output Breaker
  - Address prior issue with coordination of DC Breakers
- Implementation of modifications for Digital I&C and to address obsolescence issues
  - Auxiliary Feedwater Actuation System
  - Replacement of Rosemont Transmitters
  - Core Monitoring System Upgrade

Inspection Focus Items – Inspection & Verification of Mechanical Reliability

- Inspection, cleaning, and NDE of critical heat exchangers per Generic Letter 89-13 program
- Inspect and repair known susceptible areas of buried piping
  - Service Water System, Condensate Storage Tank outlet piping, Radwaste piping to external hold tanks
- Verification of Containment Structural Integrity
  - Inspection, testing, and cleaning of containment tendons
  - Containment penetration maintenance and verification
  - Internal containment concrete structural inspections and repairs

Inspection Focus Item – Program Re-implementation

- Inspectors have reviewed plans for re-implementation of required programs
- Focus on verifying guidance documents and implementing procedures are revised for normal plant operations and meets regulatory requirements and current industry standards

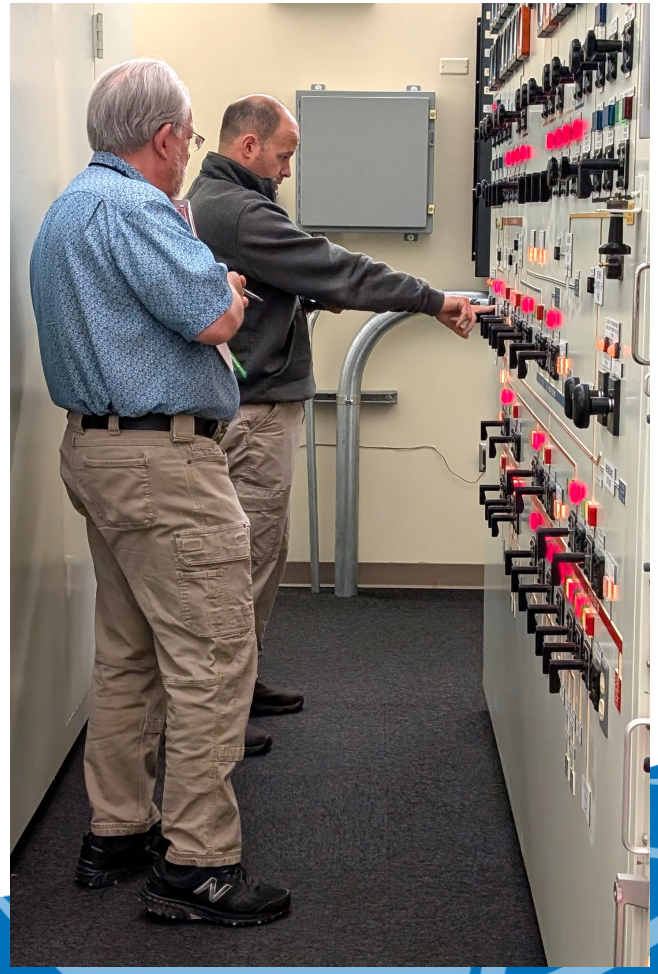
Examples include the Corrective Action Program, Fire Protection Program, and Cyber Security Program

Staffing – Licensed Operators

- Simulator restored as a plant-reference simulator in February 2024
- Full accreditation of Licensed Operator Training in March 2025
- NRC inspection of licensed operator training found that training has shown to be effective

Re-licensed Operators
• 16 SROs • 7 ROs

2025 Initial Licensed Operator Class
• 2 SROs • 8 ROs

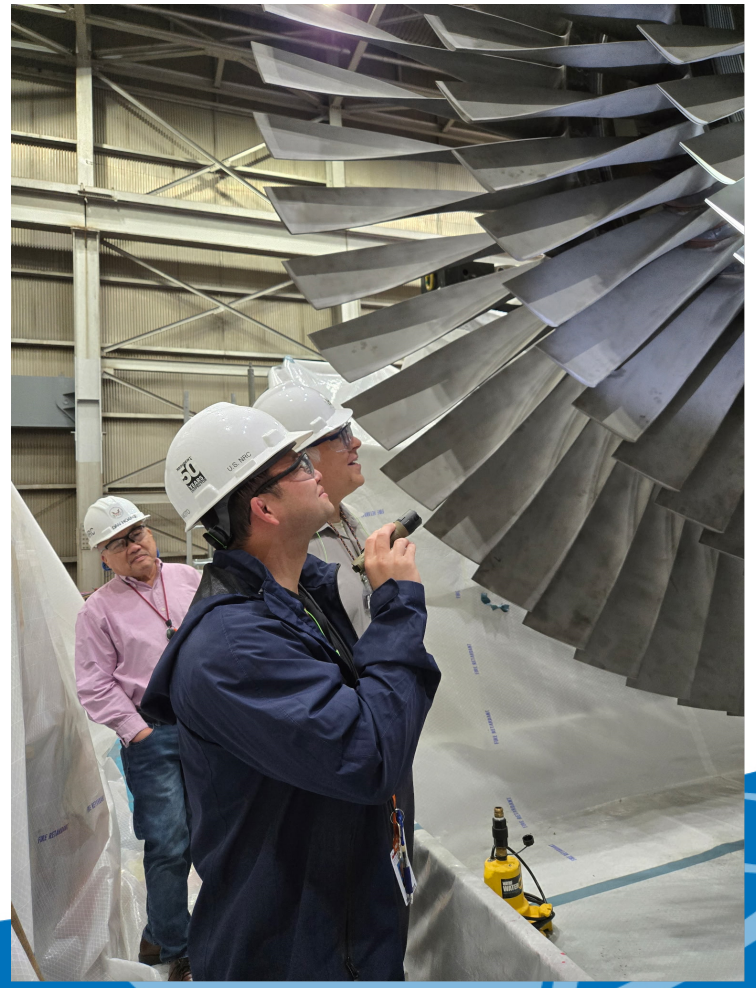


Staffing – Other Site Groups

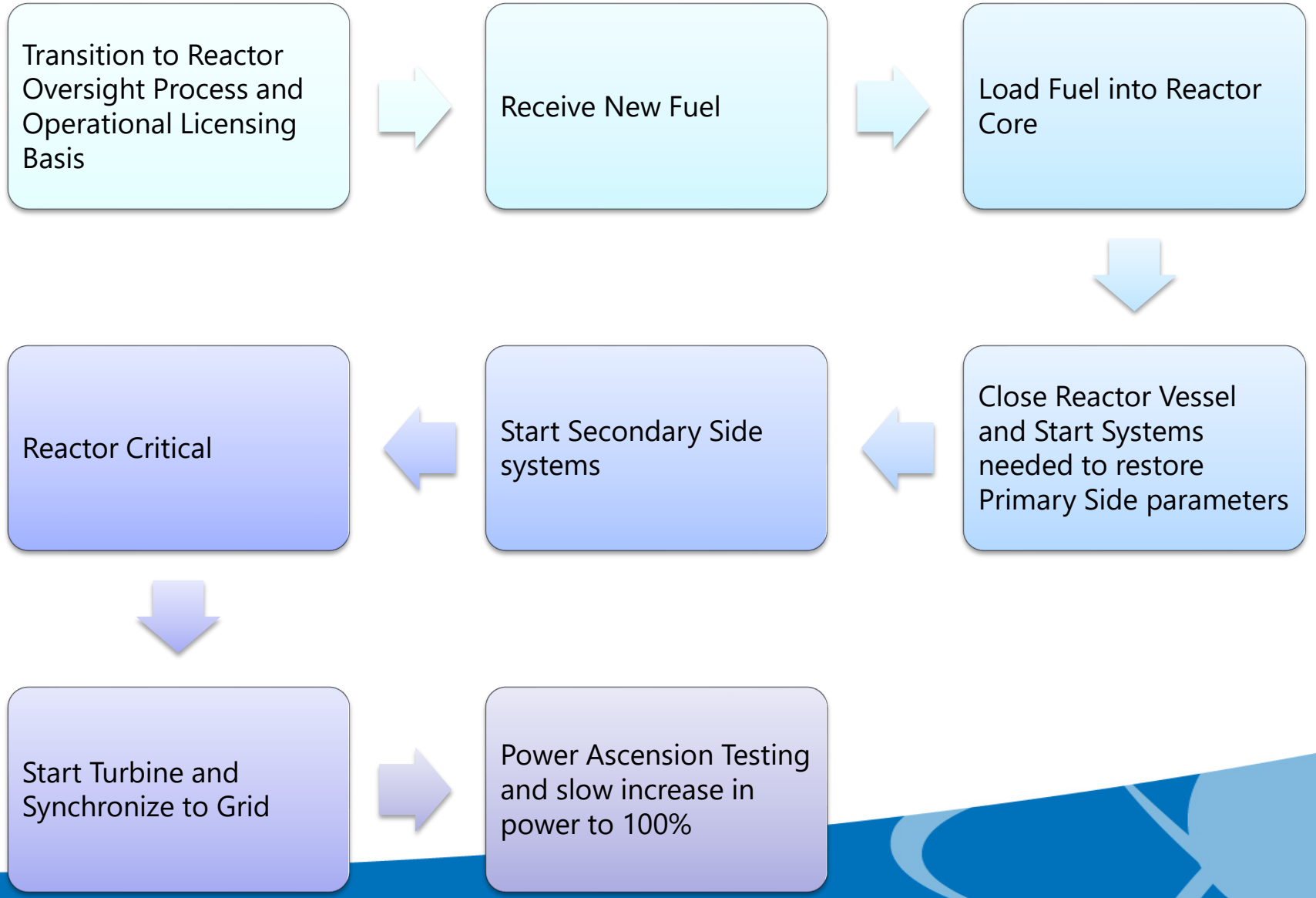
- The site's organizational structure, functions and responsibilities were reviewed as part of the license transfer application using applicable guidance in NUREG-0800
- Total permanent site staff 600 individuals across all departments. Open positions are supplemented by contractors.
- Full accreditation of Maintenance and Technical Training in May 2025
- Emergency Response Organization teams are fully staffed and qualified to meet the requirements for license transition to operations

Process for Startup

- Once Holtec implements their licensing bundle and other licensing actions, they are required to follow the operating license to meet NRC's safety requirements
- Implementation of actions will allow Holtec to commence moving through the startup process
- Holtec's Licensed Operators are licensed by the NRC and are personally responsible for safe operation of the nuclear reactor
- NRC inspectors are onsite to observe how they meet the requirements



Overview of Startup Sequence



Inspection Topics of Interest – Steam Generators

What has been completed?

- Initial Eddy Current Testing (ECT) of all tubes
- Visual examinations of the secondary side
- FOSAR and sludge lancing
- SG Tube In-Situ pressure testing for selected tubes in both generators
- Sleeving of SG tubes to repair identified indications
- Post-sleeving ECT

Additional Activities

- Secondary side repairs
- Secondary side cleaning and flushes

Inspection Topics of Interest – Reactor Pressure Vessel and Head

What has been completed?

- Visual examination of RPV interior surface, supports, core shroud plates, core support plate, and fuel alignment plate
- NDE and evaluation of Core Shroud Bolts and Clevis Bolts
- NDE of RPV Head Vent Line
- NDE of vessel welds, vessel-to-nozzle welds, and nozzle-to-pipe welds

*Inspections completed per ASME Code and MRP-227

Activities in Progress

- RPV Head CRDM Half Nozzle repairs to address Alloy 600 weld issue
- Reactor Vessel evaluations for power operations
- Currently, no issues of safety significance have been identified from these activities.

Inspection Topics of Interest – Primary Coolant System

Alloy 600 Mitigation Activities

- NDE of weld overlay locations completed
- Full dissimilar metal structural weld overlays completed for specific areas such as Safety Injection piping, branch connections, and Shutdown Cooling system connections
- Continue full weld overlays

System Cleanliness

- Completed an initial PCS decontamination system flush in July 2024
- Foreign Material Exclusion program is continuously observed by site personnel and inspectors to ensure proper controls are in place for work activities
- Will conduct PCS flushes with chemical treatment after work completed and prior to restarting reactor

Inspection Topics of Interest – Reactor Fuel

- Reactor will be loaded with a mix of new and used fuel
- Used fuel maintained since shutdown in the spent fuel pool
- Used fuel is inspected and cleaned prior to core load
- The core configuration will not change
- New fuel has been ordered and is being manufactured

Safety Culture

- The site has re-established its nuclear safety culture monitoring program, Employee Concerns Program, and management oversight board
- As part of the Problem Identification and Resolution inspection, safety culture inspectors determined that the licensee has maintained a SCWE where personnel feel free to raise safety concerns
  - Trust seems to permeate the work environment from the top down
  - Assessors conducted focus groups and interviews of over 90 personnel

For More Information:

- For additional information about the Palisades Potential Restart Project, please visit:

  https://www.nrc.gov/info- finder/reactors/pali.html

- Contact us at:

  PalisadesRestartProject@nrc.gov