UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

September 22, 2025

The Honorable David A. Wright
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE REAUTHORIZATION OF POWER OPERATIONS FOR THE PALISADES NUCLEAR PLANT

Dear Chairman Wright:

During the 728th meeting of the Advisory Committee on Reactor Safeguards (ACRS), September 3 through 5, 2025, we reviewed the facts and circumstances regarding the return from decommissioning to an operational state of the Palisades Nuclear Plant (PNP). Our review considered actions by Holtec Decommissioning International, LLC (Holtec/HDI/licensee) as well as the oversight provided by Nuclear Regulatory Commission (NRC) staff from both Region III and Headquarters (HQ). Briefings for the Committee were held on October 3, 2024, and August 21, 2025. During these meetings, we had the benefit of discussions with NRC staff from the region and HQ, including the NRC Palisades Restart Panel (PRP) members, and representatives from HDI. We also had the benefit of the referenced documents. This report contains our conclusions and recommendations regarding our review.

CONCLUSIONS AND RECOMMENDATIONS

1. The process set forth by the PRP is sound and provides the necessary steps to ensure the regulatory and technical issues are sufficiently resolved to ensure safe operation. The necessary and appropriate license amendments, the depth of review, reestablishment of programs necessary to support operational control, and the level of oversight inspections provide the necessary basis for transitioning to an operational mode defined in the Technical Specifications (TS).

2. The membership on the PRP established to oversee the transition process from decommissioning to an operational state is appropriate, technically competent, and sets a good organizational model for future plant transitions. The panel's diverse expertise and structured approach enables a comprehensive review of both technical and regulatory requirements, ensuring a robust safety framework.

3. An appropriate inspection and evaluation program was developed and implemented addressing the material condition of the plant, with particular focus on the reactor coolant pressure boundary.

4. The PNP steam generator (SG) tube integrity is being managed through implementation of well-established industry guidance, Nuclear Energy Institute (NEI) 97-06, “Steam Generator

Program Guidelines." Deferred maintenance, uncontrolled chemistry conditions during the extended plant layup, and inspection results raise concern that conditions unique to PNP may have increased the incidence of stress corrosion cracking (SCC). It is essential that the SG Operational Assessment take this uncertainty into consideration when establishing the next inspection interval to assure tube integrity and no increase in the likelihood of a steam generator tube failure. The NRC staff review will confirm that uncertainties in rate of progression of tube cracking were adequately taken into consideration.

5. We advise the NRC inspection staff to maintain a heightened vigilance in oversight during the first operating cycle and any subsequent cycles with the existing SGs. Any signs of elevated primary-to-secondary leakage needs to be highly scrutinized.

6. The ACRS will follow the plant restart and initial operational period to ensure these conclusions remain valid.

BACKGROUND

PNP permanently ceased operations on May 20, 2022. On March 13, 2023, HDI submitted a letter of intent to restart the PNP facility. This marked the first application seeking reauthorization for the operation of a reactor that had permanently ceased operations. The NRC staff reviewed its existing procedures for considering commercial nuclear reactor license requests and determined that these processes are sufficient to evaluate whether adequate justification and evidence exists to permit the operation of a previously shut-down reactor.

On September 28, 2023, HDI submitted an exemption request to the permanent cessation of operations under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(2) as the initial step in a series of licensing actions. Subsequently, on December 6, 2023, HDI submitted a license transfer application to transfer operating authority to a new entity, Palisades Energy LLC, which would serve as an indirect, wholly owned subsidiary of Holtec, established and resourced specifically for power operations at PNP. On December 14, 2023, HDI submitted a license amendment request to restore the operating license, TS, and environmental protection plan to their pre-shutdown status. In May 2024, HDI filed additional license amendments to reinstate the Palisades Emergency Plan and to update the Quality Assurance Plan. Collectively, these amendments comprise the necessary documentation to support the resumption of power operations. As of July 25, 2025, NRC staff granted approval for all requisite license amendment requests, allowing PNP to enter operational mode and accept onsite fuel delivery.[1]

After HDI submitted the exemption request to reverse permanent cessation of operation, the NRC established the PRP on November 27, 2023. The PRP was tasked with overseeing inspection and licensing activities until resuming commercial operations. The PRP ensures that NRC staff conduct licensing and regulatory functions in a manner that provides reasonable assurance of adequate protection of public health and safety, supports common defense and security, and safeguards the environment. Panel membership includes representatives from the Office of Nuclear Reactor Regulation, the Office of Nuclear Security and Incident Response, the Office of General Counsel, and the Office of Nuclear Materials Safety and Safeguards. The PRP is chaired by officials from the Office of Nuclear Reactor Regulation, Division of Operating Reactor Licensing, and Region III Division of Operating Reactor Safety.

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1 The PNP entered an operational condition known as "no mode", which is not defined by TSs but is considered below TS Mode 6 or when the reactor is completely defueled.

During the 719th meeting of the ACRS, October 2 through 3, 2024 , the Committee received a comprehensive briefing from both NRC staff and HDI. This presentation contributed significantly to the ongoing Committee review and informed the recommendations developed following the staff briefing held on August 21, 2025, at an ACRS Plant Operations Subcommittee meeting.

DISCUSSION

Our review considered the overall approach to ensuring the licensee performed the necessary steps to restore the regulatory documentation and compliance with the operational licensing basis. We also reviewed the appropriate physical restoration activities at the plant and preparation to assume operational control. In addition, we reviewed the oversight provided by the Region that was supplemented by the NRC HQ staff.

The regulatory path HDI presented, described above, used the existing regulatory framework of exemptions and license amendments to allow recission of certifications of permanent cessation of power operations and permanent removal of fuel from the reactor vessel. Although this regulatory path, with appropriate inspections and oversight, was initially defined for PNP, it can generically apply to the restoration of the operational state for similarly shutdown plants in the decommissioning process.

Next, the physical plant and equipment material condition was reviewed. Although no major decommissioning activities were undertaken during the shutdown period, control of layup conditions within the reactor coolant pressure boundary and associated systems lapsed. The HDI evaluated the potential for adverse effects on pressure boundary materials and implemented an appropriate inspection and condition assessment program to ensure pressure boundary integrity is maintained. Maintenance activities are in progress and are being closely observed and inspected by the Region III staff to return all systems and components to an operational condition and opportunistic preventive measures are also being taken to improve the physical condition of systems and components. The NRC inspection reports have the necessary detail and scope to provide confidence in comprehensive NRC oversight and adequate performance by the plant owner.

The most significant restoration activity undertaken within the plant systems was reestablishing SG tube integrity. PNP has a unique challenge due to an increased number of tubes requiring repair following the layup conditions during the extended shutdown period. Inspections revealed 1,032 degraded SG tubes (out of 16,438 SG total tubes). Presently, TS only allows defective tubes to be addressed through removal from service by plugging at both ends. A license amendment request submitted on February 11, 2025, proposes to revise this requirement by allowing the installation of Alloy 690 sleeves to repair defective tubes and will require approval prior to placing the SGs in service for heat removal. Sleeving avoids plugging of tubes, which would reduce the heat transfer surface area and primary coolant flow. This tube-sleeving activity is complete and was closely inspected by the Region III and HQ staff. Successful operation with sleeved tubes has previously been demonstrated, including over ten years of operation at Beaver Valley Power Station, Unit 2, which uses similar SG materials. Additionally, to recapture additional heat transfer surface area, HDI unplugged, inspected and returned to service approximately half of the 600 tubes that were proactively plugged during initial SG installation in 1990 to minimize risk of in-service leakage. The tubes that met the required operational service criteria were returned to service, and the other tubes were replugged. In addition, the secondary side of the SGs had extensive cleaning activities (sludge lancing, chemical cleaning and flushes, and Foreign Object Search and Retrieval) removing crud and any loose debris.

Deferred maintenance, uncontrolled chemistry conditions during the extended plant layup, and inspection results raised concerns that conditions unique to PNP may have increased the incidence of SCC. HDI indicated the SG Operational Assessment, as required by TS, is being issued in late September 2025. This report will establish the next required inspection by projecting the tube condition monitoring findings forward to ensure continued tube integrity and operational readiness with appropriate risk management. The staff review of this report will ensure the proper regulatory oversight of HDI's justification for SG tube integrity. We advise the inspection staff to maintain a heightened vigilance in oversight during the first operating cycle and any subsequent cycles with the existing SGs. Any signs of elevated primary-to-secondary leakage needs to be highly scrutinized.

The Committee then focused on readiness to assume operational control through the three fundamental safety functions of reactivity control, heat removal, and radionuclide barriers. Under reactivity control, since the fuel and control systems were unchanged, we queried the training to restore the licensed reactor operator staff. The training program was reestablished early and many of the previous staff returned, providing a base level of experienced operators. The PNP training program has now achieved full accreditation from the National Academy of Nuclear Training (Institute of Nuclear Power Operations) across all five key disciplines: operations, maintenance, chemistry, radiation protection and engineering.

Heat removal system activities include not only the aforementioned SG tube repairs, but also the restoration of shutdown decay heat removal systems and emergency core cooling systems. The appropriate activities were completed for both systems. Integrated system testing will ensure adequate operational status and the ability to comply with TS requirements.

The restoration and verification of the barriers to the release of radionuclides include containment inspection and tests, reactor coolant system valve maintenance, piping inspections and nondestructive examinations, and the nuclear fuel quality assurance. The most significant areas of concern after the SG tube maintenance and inspections are mitigating the potential for reactor vessel closure head degradation and reactor vessel integrity. Both activities were discussed with the staff, and we are confident in the restoration actions taken.

Finally, on April 18, 2024, HDI indicated that they will submit a subsequent license renewal application after power operation has been achieved. The present renewed 20-year license term ends on March 24, 2031. Since the subsequent license renewal application will likely be submitted within 5 years of 2031, another near-term comprehensive review of plant performance and aging management programs will be undertaken by the staff.

SUMMARY

The process set forth by the PRP is sound and provides the necessary steps to ensure the regulatory and technical issues are sufficiently resolved to assure safe operation. The necessary and appropriate license amendments, the depth of review, reestablishment of programs necessary to support operational control, and the level of oversight inspections provide the necessary basis for transitioning to an operational mode defined in the TS. The membership on the PRP established to oversee the transition process from decommissioning to an operational state is appropriate, technically competent, and sets a good organizational model for future plant transitions. The panel's diverse expertise and structured approach enables a comprehensive review of both technical and regulatory requirements, ensuring a robust safety framework.

An appropriate inspection and evaluation program was developed and implemented addressing the material condition of the plant, with particular focus on the reactor coolant pressure boundary.

The PNP SG tube integrity is being managed through implementation of well-established industry guidance, NEI 97-06. Deferred maintenance, uncontrolled chemistry conditions during the extended plant layup, and inspection results raised concerns that conditions unique to PNP may have increased the incidence of SCC. It is essential the SG Operational Assessment take this uncertainty into consideration when establishing the next inspection interval to assure tube integrity and no increase in the likelihood of a SG tube failure. The staff review will confirm uncertainties in rate of progression of tube cracking were adequately taken into consideration. We advise the inspection staff to maintain a heightened vigilance in oversight during the first operating cycle and any subsequent cycles with the existing SGs. Any signs of elevated primary-to-secondary leakage needs to be highly scrutinized.

The ACRS will follow the plant restart and initial operational period to ensure these conclusions remain valid.

We do not request a formal response to this letter report.

Sincerely,

Walter L Kirchner Signed by Kirchner, Walter on 09/22/25

Walter L. Kirchner
Chairman

REFERENCES

1. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant, Restart Panel Charter,” November 27, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23297A053).

2. Nuclear Energy Institute, NEI 97-06, “Steam Generator Program Guidelines, Revision 3,” January 31, 2011 (ADAMS Accession No. ML111310712).

3. Entergy, “Certification of Permanent Cessation of Power Operations and Permanent Removal of Fuel from the Reactor Vessel,” June 13, 2022 (ADAMS Accession No. ML22164A067).

4. Holtec Palisades, LLC, “Palisades Nuclear Plant - Notification of Readiness for Transition to Power Operations Licensing Basis,” July 1, 2025 (ADAMS Accession No. ML25182A066).

5. Holtec Decommissioning International, LLC, “Regulatory Path to Reauthorize Power Operations at Palisades Nuclear Plant,” February 1, 2023 (updated March 13, 2023) (ADAMS Accession Nos. ML23032A398, ML23032A399, and ML23072A404).

6. Holtec Decommissioning International, LLC, “Request for Exemption from Certain Termination of License Requirements of 10 CFR 50.82,” September 28, 2023 (ADAMS Accession No, ML23271A140).

7. Holtec Decommissioning International, LLC, “Application for Order Consenting to Transfer of Control of License and Approving Conforming License Amendments,” December 6, 2023 (ADAMS Accession No. ML23340A161).

8. Holtec Decommissioning International, LLC, “License Amendment Request to Revise Renewed Facility Operating License and Permanently Defueled Technical Specifications to Support Resumption of Power Operations,” December 14, 2023 (ADAMS Accession No. ML23348A148).

9. Holtec Decommissioning International, LLC, “License Amendment Request to Revise Selected Permanently Defueled Technical Specifications Administrative Controls to Support Resumption of Power Operations,” February 9, 2024 (ADAMS Accession No. ML24040A089).

10. Holtec Decommissioning International, LLC, “License Amendment Request to Revise the Palisades Nuclear Plant Site Emergency Plan to Support Resumption of Power Operations,” May 1 2024 (ADAMS Accession No. ML24122C666).

11. Holtec Decommissioning International, LLC, “Supplement to Application for Order Consenting to Transfer of Control of License and Approving Conforming License Amendments, Proposed Power Operations Quality Assurance Program Manual, Revision 0,” May 23, 2024 (ADAMS Accession No. ML24144A106).

12. Holtec Decommissioning International, LLC, “License Amendment Request to Approve the Biasi Critical Heat Flux (CHF) Correlation for Use with the Palisades Main Steam Line Break (MSLB) Analysis,” May 24, 2024 (ADAMS Accession No. ML24145A145).

13. Holtec Decommissioning International, LLC, “Notice of Intent to Pursue Subsequent License Renewal,” June 26, 2025 (ADAMS Accession No. ML25177C201).

14. Holtec Palisades, LLC, “License Amendment Request to Include Leak Before Break Methodology for Primary Coolant System Hot and Cold Leg Piping in Palisades Licensing Basis,” February 5, 2025 (ADAMS Accession No. ML25035A216).

15. Holtec Palisades, LLC, “License Amendment Request to Revise Selected Permanently Defueled Technical Specifications to Support Repairing of Steam Generator Tubes by Sleeving,” February 11, 2025 (ADAMS Accession No. ML25043A348).

16. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant – Notification of NRC Request for Information for Post-Approval Site Inspection for License Renewal – Phase IV; Inspection Report 05000255/2025007,” May 19, 2025 (ADAMS Accession No. ML25139A027).

17. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant – Restart Inspection Report 05000255/2025002,” May 21, 2025 (ADAMS Accession No. ML25140A945).

18. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant – Restart Inspection Report 05000255/2025001 and 07200007/2024001,” March 26, 2025 (ADAMS Accession No. ML25083A268).

19. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant – Restart Inspection Report 05000255/2025003,” July 17, 2025 (ADAMS Accession No. ML25197A764).

20. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant – Restart Inspection Report 05000255/2024011,” July 15, 2024 (ADAMS Accession No. ML24197A185).

21. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant – Restart Inspection Report 05000255/2024013,” January 24, 2025 (ADAMS Accession No. ML25024A083).

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23. U.S. Nuclear Regulatory Commission, “Updated Restart Inspection Activity Plan for Palisades Nuclear Plant,” August 21, 2025 (ADAMS Accession No. ML25232A205).

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25. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant - Issuance of Amendment No. 276 Re: Amendment Request to Revise Renewed Facility Operating License and Permanently Defueled Technical Specifications to Support Resumption of Power Operations (EPID L-2023-LLA-0174),” July 24, 2025 (ADAMS Accession No. ML25157A127).

26. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant - Issuance of Amendment No. 277 Re: Amendment Request to Revise Selected Permanently Defueled Technical Specifications Administrative Controls to Support Resumption of Power Operations (EPID L-2024-LLA-0013),” July 24, 2025 (ADAMS Accession No. ML25157A107).

27. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant - Issuance of Amendment No. 278 RE: Revise the Site Emergency Plan to Support Resumption of Power Operations (EPID L-2024-LLA-0060),” July 24, 2025 (ADAMS Accession No. ML25150A281).

28. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant - Summary of Conference Call Regarding Steam Generator Tube Inspections (EPID L-2024-NFO-0008),” October 1, 2024 (ADAMS Accession No. ML24267A296).

29. U.S. Nuclear Regulatory Commission, “Beaver Valley Power Station, Unit No. 2 - Review of the 2014 Steam Generator Tube Inspection Report (TAC No. M4620),” May 22, 2015 (ADAMS Accession No. ML15132A496).

30. U.S. Nuclear Regulatory Commission, “Palisades Nuclear Plant Restart Inspection Plan, Light-Water Reactor Inspection Program for Restart of Reactor Facilities Following Permanent Cessation of Power, Operations Inspection Manual Chapter 2562,” August 20, 2024 (ADAMS Accession No. ML24228A195).

LIST OF ACRONYMS

ACRS	Advisory Committee on Reactor Safeguards
ADAMS	Agencywide Documents Access and Management System
HDI	Holtec Decommissioning International, LLC
HQ	Headquarters
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PNP	Palisades Nuclear Plant
PRP	Palisades Restart Panel
SG	Steam Generator
SCC	Stress Corrosion Cracking
TS	Technical Specifications

September 22, 2025

SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE REAUTHORIZATION OF POWER OPERATIONS FOR THE PALISADES NUCLEAR PLANT

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