



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 13, 2015

Vice President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT - REPORT FOR THE AUDIT REGARDING
IMPLEMENTATION OF MITIGATING STRATEGIES AND RELIABLE SPENT
FUEL POOL INSTRUMENTATION RELATED TO ORDERS EA-12-049 AND
EA-12-051 (TAC NOS. MF0768 AND MF0769)

Dear Sir or Madam:

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Issuance of Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12054A736 and ML12054A679, respectively). The orders require holders of operating reactor licenses and construction permits issued under Title 10 of the *Code of Federal Regulations* Part 50 to submit for review, Overall Integrated Plans (OIPs) including descriptions of how compliance with the requirements of Attachment 2 of each order will be achieved.

By letter dated February 28, 2013 (ADAMS Accession No. ML13060A361), Entergy Nuclear Operations, Inc. (Entergy, the licensee) submitted its OIP for Palisades Nuclear Plant (Palisades) in response to Order EA-12-049. By letters dated August 28, 2013, February 28, 2014, August 28, 2014, February 27, 2015 and August 28, 2015 (ADAMS Accession Nos. ML13241A234, ML14059A078, ML14240A279, ML15062A011 and ML15240A074, respectively), the licensee submitted its first five six-month updates to the OIP. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit holders that the staff is conducting audits of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the Palisades interim staff evaluation (ISE) (ADAMS Accession No. ML13365A261) on February 10, 2014, and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13060A360), the licensee submitted its OIP for Palisades in response to Order EA-12-051. By e-mail dated July 18, 2013 (ADAMS Accession No. ML13200A328), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 19, 2013, August 28, 2013, February 28, 2014, August 28, 2014, February 27, 2015 and August 28, 2015 (ADAMS Accession Nos. ML13231A126, ML13241A235, ML14059A078, ML14240A278, ML15062A056 and ML15240A074, respectively), the licensee submitted its RAI responses and first five six-month updates to the OIP. The NRC staff's review to date led to the issuance of the Palisades ISE

March 26, 2014 (ADAMS Accession No. ML14083A620), the NRC notified all licensees and construction permit holders that the staff is conducting in-office and onsite audits of their responses to Order EA-12-051 in accordance with NRC NRR Office Instruction LIC-111, as discussed above.

The ongoing audits allow the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses from the spent fuel pool instrumentation (SFPI) ISE, the licensee's integrated plans, and other audit questions. Additionally, the staff gains a better understanding of submitted and updated information, audit information provided on ePortals, and preliminary Overall Program Documents/Final Integrated Plans while identifying additional information necessary for the licensee to supplement its plan and staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at Palisades from June 15 - 18, 2015, per the audit plan dated April 22, 2015 (ADAMS Accession No. ML15110A051). The purpose of the onsite portion of the audit was to provide the NRC staff the opportunity to continue the audit review and gain key insights most easily obtained at the plant as to whether the licensee is on the correct path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, review of staging and deployment of offsite equipment, and review of installation details for SFPI equipment.

The enclosed audit report provides a summary of the activities for the onsite audit portion. Additionally, this report contains an attachment listing all open audit items currently under NRC staff review.

If you have any questions, please contact me at 301-415-3204 or by e-mail at John.Hughey@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "John D. Hughey". The signature is written in a cursive style with a large, stylized "H".

John D. Hughey, Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No.: 50-255

Enclosure:
Audit plan

cc w/encl: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO ORDERS EA-12-049 AND EA-12-051 MODIFYING LICENSES
WITH REGARD TO REQUIREMENTS FOR
MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS
AND RELIABLE SPENT FUEL POOL INSTRUMENTATION
ENTERGY NUCLEAR OPERATIONS, INC
PALISADES NUCLEAR PLANT
DOCKET NO. 50-255

BACKGROUND AND AUDIT BASIS

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Issuance of Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12054A736 and ML12054A679, respectively). Order EA-12-049 directs licensees to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities in the event of a beyond-design-basis external event (BDBEE). Order EA-12-051 requires, in part, that all operating reactor sites have a reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a BDBEE. The orders require holders of operating reactor licenses and construction permits issued under Title 10 of the *Code of Federal Regulations* Part 50 to submit for review, Overall Integrated Plans (OIPs) including descriptions of how compliance with the requirements of Attachment 2 of each order will be achieved.

By letter dated February 28, 2013 (ADAMS Accession No. ML13060A361), Entergy Nuclear Operations, Inc. (Entergy, the licensee) submitted its OIP for Palisades Nuclear Plant (Palisades) in response to Order EA-12-049. By letters dated August 28, 2013, February 28, 2014, August 28, 2014, February 27, 2015 and August 28, 2015 (ADAMS Accession Nos. ML13241A234, ML14059A078, ML14240A279, ML15062A011 and ML1520A053, respectively), the licensee submitted its first five six-month updates to the OIP. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction

Enclosure

permit holders that the staff is conducting audits of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the Palisades interim staff evaluation (ISE) (ADAMS Accession No. ML13365A261) on February 10, 2014, and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13060A360), the licensee submitted its OIP for Palisades in response to Order EA-12-051. By e-mail dated July 18, 2013 (ADAMS Accession No. ML13200A328), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 19, 2013, August 28, 2013, February 28, 2014, August 28, 2014, February 27, 2015 and August 28, 2015 (ADAMS Accession Nos. ML13231A126, ML13241A235, ML14059A078, ML14240A278, ML15062A056 and ML15240A074, respectively), the licensee submitted its RAI responses and first five six-month updates to the OIP. The NRC staff's review to date led to the issuance of the Palisades ISE and RAI dated November 26, 2013 (ADAMS Accession No. ML13312A423). By letter dated March 26, 2014 (ADAMS Accession No. ML14083A620), the NRC notified all licensees and construction permit holders that the staff is conducting in-office and onsite audits of their responses to Order EA-12-051 in accordance with NRC NRR Office Instruction LIC-111, as discussed above.

The ongoing audits allow the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses from the spent fuel pool instrumentation (SFPI) ISE, the licensee's integrated plans, and other audit questions. Additionally, the staff gains a better understanding of submitted and updated information, audit information provided on ePortals, and preliminary Overall Program Documents (OPDs)/Final Integrated Plans (FIPs) while identifying additional information necessary for the licensee to supplement its plan and address staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at Palisades from June 15 - 18, 2015, per the audit plan dated April 22, 2015 (ADAMS Accession No. ML15110A051). The purpose of the onsite portion of the audit was to provide the NRC staff the opportunity to continue the audit review and gain key insights most easily obtained at the plant as to whether the licensee is on the correct path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussion, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, review of staging and deployment of offsite equipment, and review of installation details for SFPI equipment.

Following the licensee's declarations of order compliance, the NRC staff will evaluate the OIPs, as supplemented; the resulting site-specific OPDs/FIPs; and, as appropriate, other licensee submittals based on the requirements in the orders. For Order EA-12-049, the staff will make a safety determination using the Nuclear Energy Institute (NEI) developed guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," issued in August 2012 (ADAMS Accession No. ML12242A378), as endorsed, by NRC Japan Lessons-Learned Directorate (JLD) interim staff guidance (ISG) JLD-ISG-2012-01 "Compliance with Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events'" (ADAMS Accession No. ML12229A174). For Order EA-12-051, the staff will make a safety determination using the NEI developed

guidance document NEI 12-02, Revision 1, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'" (ADAMS Accession No. ML12240A307), as endorsed, with exceptions and clarifications, by NRC ISG JLD-ISG-2012-03 "Compliance with Order EA-12-051, 'Reliable Spent Fuel Pool Instrumentation'" (ADAMS Accession No. ML12221A339), as providing one acceptable means of meeting the order requirements. Should the licensee propose an alternative strategy for compliance, additional staff review will be required to evaluate the alternative strategy in reference to the applicable order.

AUDIT ACTIVITIES

The onsite audit was conducted at the Palisades facility from June 15, 2015, through June 18, 2015. The NRC audit team staff was as follows:

Title	Team Member	Organization
Team Lead/Project Manager	John Hughey	NRR/JLD
Technical Support – Electrical	Matthew McConnell	NRR/JLD
Technical Support – Reactor Systems	Joshua Miller	NRR/JLD
Technical Support – Balance of Plant	Kevin Roche	NRR/JLD
Technical Support – SFPI	Khoi Nguyen	NRR/JLD
Observer	Bruce Bartlett	Region III/DRP
Management Observer	Mandy Halter	NRR/JLD

The NRC staff executed the onsite portion of the audit per the three part approach discussed in the April 22, 2015, plan, to include conducting a tabletop discussion of the site's integrated mitigating strategies compliance program, a review of specific technical review items, and discussion of specific program topics. Activities that were planned to support the above included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, staging and deployment of offsite equipment, and physical sizing and placement of SFPI equipment.

AUDIT SUMMARY

1.0 Entrance Meeting (June 15, 2015)

At the onsite audit entrance meeting, the NRC staff audit team introduced itself followed by introductions from the licensee's staff. The NRC audit team provided a brief overview of the audit's objectives and anticipated schedule.

2.0 Integrated Mitigating Strategies Compliance Program Overview

Per the audit plan and as an introduction to the site's program, the licensee provided a presentation to the NRC audit team describing the site's strategies to meet the NRC orders. The licensee presented a review of its strategy to maintain core cooling, containment, and SFP cooling in the event of a BDBEE, and the plant modifications

being done in order to implement the strategies. Also reviewed were the design and location of the storage facilities for the FLEX equipment, the interface with the National SAFER [Strategic Alliance for FLEX Emergency Response] Response Centers (NSRCs), and the SFPI modification.

3.0 Onsite Audit Technical Discussion Topics

Based on the audit plan, and with a particular emphasis on the Part 2 "Specific Technical Review Items," the NRC staff technical reviewers conducted interviews with licensee technical staff, site walk-downs, and detailed document review for the items listed in the plan. Results of these technical reviews and any additional review items needed from the licensee are documented in the audit item status table in Attachment 3, as discussed in the Conclusion Section below.

3.1 Reactor Systems Technical Discussions and Walk-Downs

The NRC staff met with licensee staff to discuss the amount of leakage from the reactor coolant pump (RCP) seals, the timing of the injection of borated water into the reactor coolant system (RCS), and the availability of water sources. The NRC staff reviewed the analyses and flow calculations along with applicable procedures including the plant parameters that will be monitored to determine whether adequate core cooling is being provided. The NRC staff also walked down the licensee's strategies and reviewed plant procedures for implementing the core cooling and makeup strategies. The NRC staff also reviewed Palisades' modeling of an extended loss of alternating current power (ELAP) event and its ability to mitigate the event, including the computer code used and input parameters for the ELAP analysis.

3.2 Electrical Technical Discussions and Walk-Downs

The NRC staff reviewed the calculations regarding battery life and FLEX generating sizing. The NRC staff walked down the procedures for electrical load shedding to evaluate feasibility. The NRC staff also walked down the diesel-driven auxiliary feedwater pump room, battery rooms and control room envelope to evaluate strategies for hydrogen control and temperature control due to the presence of heat generating electrical equipment. The NRC staff reviewed the isolation and interactions of electrical power sources regarding the protection of class 1E equipment from faults in portable FLEX equipment and the design elements that ensure multiple electrical sources do not attempt to simultaneously power electrical buses. The NRC staff also walked down panels used for load shedding to evaluate feasibility and timing. Lastly, the NRC staff conducted a walk-through of portable FLEX diesel generator procedures, to include power pathways, areas where manual actions are required, and electrical isolation.

3.3 SFPI Technical Discussions and Walk-Downs

The NRC staff walked down instrument, transmitter, electronics, and display locations for the SFP level instrumentation, along with the associated cable runs. In addition, the NRC staff noted that the licensee had completed design calculations and drawings detailing the installation of the SFPI components as well as the associated calibration, maintenance and test procedures.

The NRC staff also identified that recently identified failures of the SFPI equipment required reevaluation of the SFPI equipment qualification. Given the generic nature of this issue, it was addressed by the SFPI vendor (MOHR Test and Measurement, LLC).

3.4 FLEX Equipment Storage Configuration Discussion Areas and Walk-Downs

The Palisades FLEX storage configuration utilizes two storage locations; one located inside the protected area (PA) and one located outside the PA. FLEX storage building A is located inside the PA and protects FLEX equipment from extreme temperature, probable maximum flooding and seismic BDBEE. FLEX storage building B is located outside the PA and protects the FLEX equipment from extreme temperatures, probable maximum flooding and high wind BDBEE, including tornado missiles. FLEX building B itself protects against seismic BDBEE. However, liquefaction concerns due to a seismic BDBEE were identified for the equipment haul path areas between FLEX building B and the PA. Therefore, FLEX equipment stored in FLEX building B cannot be credited for successful deployment into the PA staging areas in a seismic BDBEE.

In NEI 12-06, Rev. 0, Section 11.3.3 states the following:

FLEX mitigation equipment should be stored in a location or locations informed by evaluations performed per Sections 5 through 9 such that no one external event can reasonably fail the site FLEX capability (N).

In NEI 12-06, Rev. 0, Section 10.1, "Aggregation of FLEX Strategies," includes the following:

Provision of at least N+1 sets of portable on-site equipment stored in diverse locations or in structures designed to reasonably protect from applicable BDBEEs is essential to provide reasonable assurance that N sets of FLEX equipment will remain deployable to assure success of the FLEX strategies.

Per the guidance above, it is essential to reasonably protect N+1 sets of FLEX equipment from all applicable BDBEEs to reasonably assure that N sets (FLEX capability, per section 11.3.3) will remain deployable after the BDBEE.

The Palisades FLEX storage configuration utilizes both storage locations to protect a total of N sets of FLEX equipment from all hazards. Section 4 of the Palisades fifth

6-Month Update (ADAMS Accession No. ML15240A053) identifies the FLEX storage configuration as an Alternative to NEI 12-06, Rev. 0. The alternative approach does not protect N+1 FLEX equipment from all applicable BDBEE hazards as stipulated in Section 10.1 of the guidance. Thus, when a piece of FLEX equipment is out of service, the site capability is less than N.

The FLEX unavailability time allowance of 90 days (NEI 12-06, Rev. 0, Section 11.5.3.b) is predicated on protection of N+1 sets of equipment such that site capability is still N when one piece of FLEX equipment is unavailable. Therefore, the 90 day unavailability allowance is not applicable to the Palisades FLEX storage configuration. Entergy is requested to propose and justify a reduced unavailability allowance time commensurate with the Palisades FLEX storage configuration alternative. See additional information with associated audit item 12-E in Attachment 3.

3.5 Other Technical Discussion Areas and Walk-Downs

- a. The NRC staff reviewed the licensee's plans to ensure adequate communications, lighting, personnel access, and equipment access, to successfully implement the strategies. The staff interviewed plant personnel responsible for these areas, and observed lighting and communication needs during plant walkdowns.
- b. The NRC staff reviewed the Palisades SAFER Response Plan, which describes the coordination with the NSRC and State authorities to provide and facilitate delivery of phase 3 portable equipment and commodities. During the NRC Audit, the NRC staff requested that Palisades submit evidence of the ability to obtain offsite support during an ELAP (e.g., fuel, equipment and personnel transport, food, etc.). Palisades added a corrective action to the corrective action program to develop a BDBEE response plan to address this request. (Reference corrective actions CR-PLP-2015-02482 CA-32 and CA-33.)
- c. The NRC staff walked down the licensee's strategy for ventilating the control room envelope, battery room and turbine-driven auxiliary feedwater pump room to ensure equipment reliability and personnel habitability.
- d. The NRC staff reviewed the strategy that will be implemented by the licensee to refuel the portable diesel-powered FLEX equipment. The NRC staff reviewed the instructions for refueling the equipment, as well as the equipment needed to perform the refueling. The staff noted that the licensee's controls for ensuring adequate fuel quality will be addressed in the Palisades FLEX maintenance and testing program.
- e. The NRC staff confirmed that implementation of the Palisades FLEX maintenance and testing program is in progress. During the onsite audit, the licensee generated a corrective action (CR-PLP-2015-02482 CA-7) in the Palisades corrective action program to ensure consideration of the Electric Power Research Institute Templates, Manufacturer Recommendations and to utilize standard plant preventive maintenance (PM) processes when developing the maintenance and testing PMs for

FLEX equipment. The corrective action also included language to ensure that acceptance criteria and shelf life of FLEX equipment components (e.g., o-rings, gaskets, batteries, etc.) are included in the PMs.

- f. The NRC staff confirmed that the deployment path and debris removal evaluations adequately justified the site capability to deploy FLEX equipment to mitigate the applicable BDBEES inside the PA. The alternative FLEX storage configuration described in Section 3.4 of this report addresses liquefaction concerns regarding the deployment path outside of the PA.
- g. The NRC staff noted that the licensee completed FLEX training for Non-Licensed Operators, Licensed Operators, and Emergency Response Organization decision makers. Simulator training was utilized to validate timelines for FLEX strategy implementation. Gap training will be performed to address any differences between draft and approved FLEX procedures before they are issued and periodic, on-going FLEX training has been established.
- h. The potential for extreme temperature hazards to impact the storage and deployment of FLEX equipment was reviewed. During the ongoing audit process, the NRC staff requested that Palisades identify the maximum and minimum ambient operating and storage temperatures for the FLEX equipment that will be deployed and confirm that these temperatures are bounded by the maximum/minimum ambient temperature for the Palisades site/storage locations. See additional information with associated audit item OI 3.1.5.3.A in Attachment 3.
- i. The NRC staff reviewed the licensee's planned routes for SFP and reactor core cooling hoses through a portion of the turbine building. The Palisades FLEX evaluation report PLP-RPT-13-00050, "Turbine Driven Auxiliary Feedwater (TDAFW) Upgrade and Evaluation for FLEX," Rev. 0, refers to section 5.7.3.1.2 of the Palisades Final Safety Analysis Report to support its position that the turbine building will not collapse following a seismic event. During the on-going audit process, the NRC staff requested that Palisades determine if additional hose is available to bypass the turbine building, if necessary. See additional information with associated audit item CI 3.2.1.F in Attachment 3.
- j. Palisades identified procedural actions to remove missile hazards from the zone of influence as an alternate approach to the guidance in NEI 12-06 regarding alternate water sources. Palisades initiated corrective action CR-PLP-2015-02482 CA-12 to track the completion of the actions required to implement this alternative. During the on-going audit process, the NRC staff requested that Palisades provide the text of this initiated corrective action item. See additional information with associated audit item CI 3.2.7.A in Attachment 3.

4.0 Exit Meeting (June 18, 2015)

The NRC staff audit team conducted an exit meeting with licensee staff following the closure of onsite audit activities. The NRC staff highlighted items reviewed and noted that the results of the onsite audit trip will be documented in this report. The NRC staff also discussed the remaining open items with the licensee and information needed for closure. The outstanding open items are listed in Attachment 3 of this report.

CONCLUSION

The NRC staff completed all three parts of the April 22, 2015, onsite audit plan. The audit items referenced in Part 2 of the plan were reviewed by NRC staff members while on site. In addition to the list of NRC and licensee onsite audit staff participants in Attachment 1, Attachment 2 provides a list of documents reviewed during the onsite audit portion.

In support of the continuing audit process as the licensee proceeds towards orders compliance for this site, Attachment 3 provides the status of all open audit review items that the NRC staff is evaluating in anticipation of issuance of a combined safety evaluation (SE) for both the Mitigation Strategies (MS) and SFPI orders. The five sources for the audit items referenced below are as follows:

- a. ISE Open Items (OIs) and Confirmatory Items (CIs)
- b. Audit Questions (AQs)
- c. Licensee-identified OIP OIs
- d. SFPI RAIs
- e. Additional SE needed information

The attachments provide audit information as follows:

- a. Attachment 1: List of NRC staff and licensee staff audit participants
- b. Attachment 2: List of documents reviewed during the onsite audit
- c. Attachment 3: MS/SFPI SE Audit Items currently under NRC staff review
(licensee input needed, as noted)

While this report notes the completion of the onsite portion of the audit per the audit plan dated April 22, 2015, the ongoing audit process continues, as per the letters dated August 28, 2013, and March 26, 2014, to all licensees and construction permit holders for both orders.

Additionally, while Attachment 3 provides a list of currently open items, the status and progress of the NRC staff's review may change based on licensee plan changes, resolution of generic issues, and other NRC staff concerns not previously documented. Changes in the NRC staff review will be communicated in the ongoing audit process.

Attachments:

1. NRC and Licensee Staff Onsite Audit Participants
2. Onsite Audit Documents Reviewed
3. MS/SFPI Audit Items currently under NRC staff review

Onsite Audit Participants

NRC Staff:

John Hughey	NRR/JLD/JOMB
Khoi Nguyen	NRR/JLD/JERB
Matthew McConnell	NRR/JLD/JERB
Kevin Roche	NRR/JLD/JCBB

Joshua Miller	NRR/JLD/JERB
Bruce Bartlett	Region III/DRP
Mandy Halter	NRR/JLD

Palisades Staff:

Kevin O'Connor	Design Engineering
Brian Sova	Design Engineering
Adam Bono	Design Engineering
Kirk Cramer	Design Engineering
Greg Hubers	Design Engineering
Al Lyon	Design Engineering
Dan G. Malone	Emergency Planning
Tim Horan	Emergency Planning
Thom Higinbotham	Emergency Planning
Jeff Hardy	Licensing
Jeff Erickson	Licensing
Jim Miksa	Licensing
Bob Tucker	Operations
Bill Townes	Operations
Paul Rhodes	Operations
Vern Jorgensen	Projects
Diana Fried	Projects
Bob Hamm	Projects
Robert Kaup	Projects
Darrel Turner	Projects
Tom McCarthy	Project Support
Kevin Bessell	Project Support
Brian Gereg	Project Support
Kevin Homan	Project Support
Margot Wilson	Project Support
Brian Norman	Project Support
Mike Cymbor	Project Support
Matt Rohrer	Entergy Corporate Support
Dave Stallings	Entergy Corporate Support
David Viener	Entergy Corporate Support
Alvin Robertson	Pressurized Water Reactors Owners Group

Documents Reviewed

- Calculation CN-SEE-II-12-42, "Determination of the Time to Boil in the Palisades Nuclear Plants Spent Fuel Pools after Earthquake," Rev. 0.
- Calculation EA-EC46465-02, "PLP MAAP4 Containment Analysis for BDBEE," Rev. 0.
- Calculation EA-ELEC-LDTAB-021, "Station Batteries ED-01 & ED-02 FLEX Coping Capability," Rev. 0.
- Calculation EA-ELEC-LDTAB-022, "PLP FLEX Diesel Sizing Calculation," Rev. 0.
- Calculation EA-GOTHIC-AFW-01, "Auxiliary Feedwater Pump Room Heat Up Analysis," Rev. 0.
- Calculation EA-EC46465-03, "Control Room Heatup for Extended Loss of AC Power," Rev. 0.
- Calculation EC 46465-06, "Hydraulic Analysis of FLEX Coping Strategies," Rev 0.
- Calculation EC 46465-09, "Evaluation of the ADV Air Requirements for FLEX Event," Rev. 0.
- Calculation EA-EC46466-01, "Design of SFPI Probe Mounting Bracket," Rev. 0.
- Calculation EA-EC46466-02, "Qualification of SFP Instrumentation Mounting Details," Rev. 0.
- Calculation NAI-1791-006, "Seismic Induced Hydraulic Response in the Palisades Spent Fuel Pool," Rev. 0.
- DBD[Design Basis Document]-7.01, "Entergy Nuclear Northeast Palisades Design Basis Document for Electrical Equipment Qualification Program," Rev. 10.
- DBD-1.07, "Entergy Nuclear Northeast Palisades Design Basis Document for Auxiliary Building HVAC Systems," Rev. 5.
- Drawing WD 950, "Single Line Meter and Relay Diagram," Sheet A, Rev. 6.
- Engineering Analysis EA-JEF-97-01, "Operation of Charging Pumps P-55B & C without CCW flow to the oil coolers," Rev 0.
- Engineering Change EC 46465, "FLEX Basis," Rev 0.
- Engineering Change EC46465 Topic Notes Attachment 9.3.3 (pages 12 – 14), "Phase 2 Electrical Evaluations."
- Engineering Change EA-EC46465-03, "Control Room Heatup for Extended Loss of AC Power," Rev. 0.
- Engineering Change EC 46465-08, "Freezing of Coolant Sources for FLEX Event." Rev. 4.
- Engineering Change EC 46466, "Design Input Record," Rev. 0.
- Evaluation No. EA-SC-94-004-02, "Evaluation of Tubing and Supports," Rev. 1.
- FLEX Implementation Guide (FIG)-1, "FLEX Generator Staging and Operation," Rev. D.
- FIG-6, "Filling the T-2 (CST [condensate storage tank]) from the Fire Header," Rev. B.
- FIG-8, "FLEX Alternate Ventilation," Rev. C.
- FIG-10, "Fuel Oil Transfer," Rev. C.
- FIG-12, "4160 VAC Generator – Phase 3," Rev. A.
- FSG-4, "ELAP DC Load Shed and Management," Rev. D.
- FSG-5, "Initial Assessment and FLEX Equipment Staging," Rev. D.
- FSG-6, "Alternate CST (T-2) Makeup," Rev. D.

- FSG-7, "Loss of Vital Instrument or Control Power," Rev. F.
- FSG-11, "Alternate SFP Makeup and Cooling," Rev. B.
- Palisades FLEX evaluation report PLP-RPT-13-00050, "Turbine Driven Auxiliary Feedwater (TDAFW) Upgrade and Evaluation for FLEX," Rev. 0.
- Palisades FLEX evaluation report PLP-RPT-13-00051, "Boric Acid Storage Tank (BAST) Suction Piping and Component Evaluation for FLEX," Rev. 0.
- Palisades procedure EOP-3.0, "Station Blackout Recovery," Rev. 16.
- Palisades site specific report NAI-1791-006, "Seismic Induced Hydraulic Response in the Palisades Spent Fuel Pool," Rev. 0.
- Work Order-Task#/Package Type: 00374145-04 – Level-2 Package.
- Work Order-Task#/Package Type: 00374145-04 – Level-2 Package-EB19.
- Work Order-Task#/Package Type: 00374147-04 – Level-2 Package.
- Work Order-Task#/Package Type: 00374147-04 – Level-2 Package – EB-20.

Palisades
Mitigation Strategies/Spent Fuel Pool Instrumentation Safety Evaluation Audit Items:
Audit Items Currently Under NRC Staff Review, Requiring Licensee Input As Noted

Audit Item Reference	Item Description	Licensee Input Needed
ISE OI 3.1.5.3.A	Evaluate the potential for high temperature hazards to impact the deployment of FLEX equipment.	Identify the maximum and minimum ambient operating and storage temperatures for the FLEX equipment that will be deployed and confirm that these temperatures are bounded by the maximum/minimum ambient temperature for the Palisades site/storage locations.
ISE CI 3.2.1.F	Confirm the ability of any non-safety related equipment to function as credited in the mitigation strategies in accordance with the external event criteria described in NEI-12-06.	Palisades is requested to determine if additional hose is available to bypass the turbine building.
ISE CI 3.2.4.7.A	Confirm that the evaluation of the CST and T-81 shows that the tank qualification is consistent with the strategy and the provisions of NEI 12-06.	Palisades is requested to provide the text of corrective action CR-PLP-2015-02482 CA-12
SE #12	Justify a FLEX equipment allowed unavailability time associated with the proposed FLEX equipment storage configuration alternative to NEI 12-06.	Entergy is requested to propose and justify a reduced unavailability allowance time commensurate with the Palisades FLEX storage configuration alternative.

If you have any questions, please contact me at 301-415-3204 or by e-mail at John.Hughey@nrc.gov.

Sincerely,

/RA/

John D. Hughey, Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No.: 50-255

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