



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

May 6, 2022

Mr. Rod L. Penfield
Site Vice President
Energy Harbor Nuclear Corp.
Perry Nuclear Power Plant
P.O. Box 97, Mail Stop A-PY-A290
Perry, OH 44081-0097

SUBJECT: PERRY NUCLEAR POWER PLANT, UNIT NO. 1 – REGULATORY AUDIT
SUMMARY RELATED TO THE REVIEW OF LICENSE AMENDMENT
REGARDING REVISING THE FLOOD HAZARD PROTECTION SCHEME
(EPID L-2021-LLA-0067)

Dear Mr. Penfield:

By letter dated April 7, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21106A027), Energy Harbor Nuclear Corp. (EHNC, the licensee) submitted license amendment requests for Perry Nuclear Power Plant (PNPP), to revise the Updated Safety Analysis Report (USAR) to change the methodology used for analysis of flooding hazards and drainage within the local intense precipitation (LIP) domain and reflect the results from the new analysis. Based on the new analysis, a new flood hazard protection scheme is also proposed for PNPP. In addition, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.12, EHNC requests exemptions to credit nonsafety-related protection features including: (1) permanent (passive) and temporary (deployable), as flood barriers, and (2) the plant storm drain system in mitigation of flood levels during a LIP event.

To support its review, by letter dated July 9, 2021 (ADAMS Accession No. ML21165A001), the U.S. Nuclear Regulatory Commission (NRC) staff notified the licensee that they would conduct a regulatory audit from July 26, 2021, to November 26, 2021, through an online portal (also known as electronic portal, ePortal, electronic reading room) established by EHNC. Due to the volume of documents and the necessity to have clarification of the proposed model and the use of temporary flood barriers, the virtual audit was extended to March 31, 2022.

A summary of the regulatory audit is enclosed. During the audit, the NRC staff identified a potential issue regarding the procedure for implementing flood protection barriers in the event of a LIP event. At the conclusion of the audit, the licensee informed the NRC that a supplement was to be sent to the NRC addressing this issue.

R. Penfield

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If you have any questions, please contact me at (301) 415-2855, or by e-mail at Scott.Wall@nrc.gov.

Sincerely,

Scott P. Wall, Senior Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosure:
Regulatory Audit Summary

cc: Listserv



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REGULATORY AUDIT SUMMARY
REGARDING LICENSE AMENDMENT REQUEST TO
REVISE THE FLOOD HAZARD PROTECTION SCHEME
ENERGY HARBOR NUCLEAR CORP.
ENERGY HARBOR NUCLEAR GENERATION, LLC
PERRY NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-440
EPID NO. L-2021-LLA-0003

1.0 BACKGROUND

A regulatory audit is an activity undertaken by the U.S. Nuclear Regulatory Commission (NRC) staff to examine and evaluate licensee information with the intent to gain an understanding of, verify, or identify information that will require docketing to support the basis of a licensing or regulatory decision.

By letter dated April 7, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21106A027), Energy Harbor Nuclear Corp (EHNC, the licensee) submitted license amendment requests (LARs) for Perry Nuclear Power Plant (PNPP), to revise the Updated Safety Analysis Report (USAR) to change the methodology used for analysis of flooding hazards and drainage within the local intense precipitation (LIP) domain and reflect the results from the new analysis. Based on the new analysis a new flood hazard protection scheme is also proposed for PNPP. In addition, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.12, EHNC requests exemptions to credit non-safety-related protection features including: (1) permanent (passive) and temporary (deployable), as flood barriers, and (2) the plant storm drain system in mitigation of flood levels during a LIP event.

The NRC staff performed a preliminary review of the LAR and determined that a regulatory audit would assist in the timely completion of the review. An audit plan was provided to the licensee on July 9, 2021 (ADAMS Accession No. ML21165A001). The purpose of the audit was to gain an understanding of the information needed to support the NRC staff's licensing decision regarding the LAR and to develop requests for additional information (RAIs). The information submitted in support of the LAR is under final review, and any additional information needed to support the LAR review will be formally requested by the NRC staff using the RAI process in accordance with Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-101, Revision 6, "License Amendment Review Procedures" (ADAMS Accession No. ML19248C539).

Enclosure

2.0 SCOPE

By letter dated July 9, 2021 (ADAMS Accession No. ML21165A001), the NRC staff issued an audit plan for the flood protection scheme. The original audit plan was from July 26, 2021, to November 26, 2021. Due to the volume of documents and the necessity to have clarification of the proposed model and the use of temporary flood barriers, the virtual audit was extended to March 31, 2022. The NRC staff held clarification discussions with the EHNC staff via Microsoft Teams on November 18, 2021, December 1, 2021, December 2, 2021, February 28, 2022, and March 30, 2022.

The NRC audit team reviewed the licensee's analyses and calculations supporting the USAR changes related to the methodology used for analysis of flooding hazards and drainage within the LIP domain.

3.0 AUDIT TEAM

The NRC audit team included the following:

- Scott Wall, Senior Project Manager
- Kenneth See, Senior Hydrologist
- Yuan Cheng, Hydrologist
- Brian Lee, Safety and Plant Systems Engineer
- Raul Hernandez, Safety and Plant Systems Engineer
- Bryce Lehman, Structural Engineer
- Juan Lopez, Civil Engineer
- John Ma, Senior Civil Engineer
- Aaron Armstrong, Reactor Ops Engineer
- Robert Elliott, Senior Safety and Plant Systems Engineer

4.0 DOCUMENT AND FILES REVIEWED

Document or File	Need on Docket?
Calculation 21.02 Rev. 0, Misc. Yard Structures – Railroad Bridge	No
Calculation 21:02 Rev. 0 Addendum A-01, Misc. Yard Structures – Railroad Bridge	No
PNPP Calculation 50:64.000, “PNPP Site Modifications Local Intense Precipitation (Design Basis)”	No
PNPP Calculation 50:65.000 Rev. 1, “Evaluation of Structural Roof Capacity for USAR Described PMP Event”	No
PNPP Calculation 50:65.000 Rev. 1 Addendum A-01, “Evaluation of Structural Roof Capacity for USAR Described PMP Event”	No
PNPP Calculation 50:68.000 Rev. 0, “Perry Nuclear Power Plant (PNPP) Diversion Stream Design Basis Shore Protection Analysis”	No
PNPP Calculation 50:71.000, “Design Basis Probable Maximum Precipitation (PMP) Determination”	No
PNPP Calculation 50:72.000, “Design Basis Major Stream Probable Maximum Flood (PMF)”	No

PNPP Calculation 50:73.000, "Design Basis Diversion Stream Probable Maximum Flood (PMF)"	No
PNPP Calculation 50:75.000, "Design Basis Standard Project Storm (SPS) Determination"	No
PNPP Calculation 50:76.000 Rev. 0, PNPP Design Basis Standard Project Storm (SPS) Rainfall Effects	No
PNPP Calculation 50:77.000, "Evaluation of Flood Barriers"	No
PNPP Calculation 50:77.000 Rev. 0 Addendum A-01, Evaluation of Flood Barriers	No
PNPP Calculation 50:79.000, "Probable Maximum Winter Precipitation (PMWP, Cool-Season PMP) and Snowmelt Contribution (Design Basis)"	No
PNPP Calculation 50:80.000, "Effects of Cool-Season Probable Maximum Winter Precipitation (PMWP) Event"	No
PNPP Calculation 50:80.000 Rev. 0 Post-It-Note P-01, "Effects of Cool-Season Probable Maximum Winter Precipitation (PMWP) Event"	No
PNPP Calculation 50:82.000, "ESW Swale Discharge Flooding Evaluation"	No
PNPP Calculation 50:83.000, "Mixed Bed Tank Discharge Evaluation"	No
PNPP Calculation 50:85.000, "Precipitation Hazard Alert Evaluation."	No
Calculation 50:87.000, "PNPP Local Intense Precipitation Study Calculation,"	No
Calculation 50:87.000 Rev. 0 Addendum A-01, PNPP Local Intense Precipitation Study Calculation	No
Calculation 50:87.000 Rev. 0 Addendum A-02, PNPP Local Intense Precipitation Study Calculation	No
PNPP Drawing 744-0177-00012, "Stream Relocation Outfall profile – Stream Outfall"	No
Engineering Change Package (ECP) 13-0802-000 Rev. 1, "Modification to Restore Minor Stream and Major Stream Design Basis Capabilities"	No
ECP 13-0802-001 Rev. 0, "Minor Stream Modification"	No
ECP 13-0802-001 Rev. 1, "Minor Stream Modification"	No
ECP 13-0802-001 Rev. 2, "Minor Stream Modification"	No
ECP 13-0802-002 Rev. 0, "Vehicle Barrier System (VBS) Realignment"	No
ECP 13-0802-002 Rev. 1, "Vehicle Barrier System (VBS) Realignment"	No
ECP 13-0802-002 Rev. 2, "Vehicle Barrier System (VBS) Realignment"	No
ECP 13-0802-003 Rev. 0, "Major Stream Modification"	No
ECP 13-0802-003 Rev. 1, "Major Stream Modification"	No

ECP 13-0802-004 Rev. 0, "Shore Protection"	No
ECP 13-0802-004 Rev. 1, "Shore Protection"	No
ECP 13-0802-004 Rev. 2, "Shore Protection"	No
ECP 13-0802-005 Rev. 0, "Sanitary Sewer Force Main Relocation"	No
ECP 13-0802-005 Rev. 1, "Sanitary Sewer Force Main Relocation"	No
ECP 13-0802-005 Rev. 2, "Sanitary Sewer Force Main Relocation"	No
ECP 13-0802-005 Rev. 3, "Sanitary Sewer Force Main Relocation"	No
PNPP Procedure EMARP-0005, "Monitoring of Shoreline Recession and Bluff Erosion"	No
Calculation 35:02.011 Rev. 1 Addendum No. A-01, "SR Electrical Manhole Curb for Flood Protection"	No
Calculation 35:02.011 Rev. 1, "SR Electrical Manhole Curb for Flood Protection"	No
Engineering Change (EC) 19-0155-005 Rev. 2, Installation of Aluminum Flood Barrier Panels in Plant Buildings"	No
Procedure ONI-ZZZ-1 Rev. 33, Acts of Nature – Severe Weather	No
Procedure PDB-R0001 R-46, "Operational Requirements Manual (ORM)"	No

5.0 RESULTS OF THE AUDIT

As a result of the audit, the NRC staff has gained a better understanding of the licensee's analyses and calculations supporting the USAR changes related to the methodology used for analysis of flooding hazards and drainage within the LIP domain. The information submitted in support of the PNPP LAR is under review, and additional information needed to support the LAR review will be formally communicated by the NRC staff using the RAI process in accordance with NRR Office Instruction LIC-101.

During the audit, the NRC staff identified a potential issue regarding the procedure for implementing flood protection barriers in the event of a LIP event. Specifically, the NRC staff inquired for the licensee's basis for concluding that a technical specification (TS) limiting condition for operation (LCO) is not required for the new procedure implementing flood protection barriers in the event of a LIP event. Regulation 10 CFR, Section 50.36, "Technical Specifications," defines an LCO as "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met." The PNPP LAR states, "Entry into the plant off-normal instructions is initiated by a meteorological forecast warning. This action is required by the PNPP Operations Requirement Manual (a site procedure) in lieu of placing a limiting condition of operation into the TSs. If barriers are not deployed in the timeframe allotted, a plant shutdown is initiated." The NRC staff believes that this requirement appears to meet the definition of an LCO as implementation of the

flood protection procedure appears necessary to meet “the lowest functional capability or performance levels of equipment required for safe operation of the facility.” The clarification discussions held on February 28, 2022, and March 30, 2022, were on this topic. At the conclusion of the March 30, 2022, call, the licensee informed the NRC that a supplement was to be sent to the NRC addressing this LCO topic.

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Accession No.: ML22101A282

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