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10 CFR 50.59(d)(2)
10 CFR 72.48(d)(2)

PNP 2019-035

October 09, 2019

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Palisades Nuclear Plant Report of Changes, Tests and Experiments and
Summary of Commitment Changes

Palisades Nuclear Plant
Docket No. 50-255
Renewed Facility Operating License No. DPR-20

Entergy Nuclear Operations, Inc. (Entergy) is submitting the Palisades Nuclear Plant (PNP) Report of Changes, Tests, and Experiments for the time period of October 1, 2017, through September 30, 2019. This report is submitted in accordance with the requirements of Title 10 of the Code of Federal Regulations, Part 50, Section 59 (10 CFR 50.59), Changes, tests and experiments," paragraph (d)(2) and 10 CFR, Part 72, Section 48 (10 CFR 72.48), Changes, tests, and experiments, paragraph (d)(2). During this period, there were four changes to the facility, but no tests or experiments, made pursuant to 10 CFR 50.59, and no changes, tests or experiments made pursuant to 10 CFR 72.48.

The report in Enclosure 1 contains descriptions of the changes to the facility, and summaries of the evaluations performed for the changes, in accordance with 10 CFR 50.59(d)(2) and 10 CFR 72.48(d)(2).

Enclosure 2 contains a summary report of regulatory commitment changes requiring NRC notification that were made from October 1, 2017, through September 30, 2019. The report includes a justification for each change per Nuclear Energy Institute (NEI) Guideline NEI 99-04, "Guidelines for Managing NRC Commitment Changes," and NRC Regulatory Issue Summary 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff."

This letter contains no new commitments and no revised commitments.

Should you have any questions or require additional information, please contact Jim Miksa, regulatory assurance engineer at (269) 764-2945.

Respectfully,

A handwritten signature in blue ink, appearing to read 'JAH 2'.

Jeffery A. Hardy

JAH/jpm

Enclosures: 1. Palisades Nuclear Plant, Report of Changes, Tests, and Experiments
2. Palisades Nuclear Plant, October 2017 – September 2019, Commitment
Change Summary Report

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

Enclosure 1 to

PNP 2019-035

**PALISADES NUCLEAR PLANT
REPORT OF CHANGES, TESTS, AND EXPERIMENTS**

10 CFR 50.59/72.49 Evaluation Log Number	Document Number and Title
18-0051	Engineering Change (EC) 55441, "Install High Head AFW Pump P-8D & Shed and Cross-Connect Tank T-2 to T-939"
19-0021	Engineering Change (EC) 76687, "V-24A/B/C/D Emergency Diesel Generator Room Ventilation Fans Modify Control Circuit to Resolve CR-PLP-2016-03456"
19-0022	Engineering Change (EC) 76688, "V-27A/B/C/D Engineering Safeguards Room Ventilation Fans Modify Control Circuit to Resolve CR-PLP-2016-03456"
19-0117	Engineering Change (EC) 83306, "Issue Revised MSLB Analysis"

5 pages follow

**PALISADES NUCLEAR PLANT
REPORT OF CHANGES, TESTS, AND EXPERIMENTS**

10 CFR 50.59 Evaluation Log Number: 18-0051

Document Number and Title: Engineering Change (EC) 55441 – “Install High Head AFW Pump P-8D & Shed and Cross-Connect Tank T-2 to T-939”

Description of Change:

EC 55441 installed a non-safety-related, high-head, diesel-driven auxiliary feedwater pump (AFW) pump, associated piping, and valves that would be free of fire damage from scenarios that impact the operation of the existing AFW system trains. This change was part of the transition of the site’s fire protection program licensing basis to National Fire Protection Association (NFPA) Standard 805, as approved in NRC safety evaluation dated February 27, 2015 (Amendment No. 254).

This EC also installed a cross-connect pipeline and valves between demineralized water storage tank (T-939) and the condensate storage tank (T-2). Previously, T-2 inventory alone is not sufficient for 24 hours of decay heat removal following a reactor trip without the use of fire water. With this change, T-2 will still normally be aligned to supply water to the suction of AFW pumps P-8A, P-8B, and P-8C. However, upon detecting low T-2 levels, mechanically actuated automatic control valve CV-0790, installed by the modification, will open and allow AFW pumps P-8A, P-8B, and P-8C to take suction from T-939 as well as T-2. The new cross-connection will ensure that sufficient water inventory from these tanks is available to supply the AFW system for at least 24 without operator action outside the Control Room.

There were two aspects of the EC that required evaluation, as described below:

- (1) New Required Operator Action - Tank T-939 and associated new, non-safety related piping are non-seismic and are not protected from missiles generated from tornados or high wind events. If either of these external events were to occur, safe shutdown using the AFW system may be required. T-939 inventory may be lost due to damage to the tank or associated non-safety related piping. If pump P-8C is being utilized for safe shutdown, the design change hydraulic analysis shows that air ingestion into pump P-8C via the damaged piping or tank may occur when the water level in T-2 drops to a level which is above the current low-low level trip setpoint where a backup water source would normally be established. In this case, a new operator action will be required to close the safety-related manual isolation valve MV-FW10024, located in a seismically qualified and tornado proof structure, to prevent air ingestion into P-8C.
- (2) Reliance on a Non-Safety Related Valve to Isolate T-939 from the AFW System to Prevent T-2 Overfill - T-2 could be overfilled following plant trip transients in which main condenser hotwell level surges and rejects inventory to T-2 via the condensate system. Currently, T-2 levels are not maintained at full capacity to allow for a surge volume to accommodate hotwell reject. However, the tank cross-connect modification has the potential to increase T-2 levels beyond the current capacity margin.

When the AFW pumps are running, all recirculation flow will return to T-2, and given the additional inventory available to the AFW and condensate systems from T-939 due to the

modification, condensate reject following a plant trip could overfill T-2 and potentially cause tank failure. To mitigate this risk, automatic control valve CV-0790 was installed in the cross-connect piping to isolate the T-939 tank from the AFW system unless low T-2 levels are detected. Isolation of T-939, if needed, can be accomplished either by manually closing the non-safety related CV-0790 or safety related MV-FW10024. However, reliance on a non-safety related control valve to isolate T-939 from the AFW system to prevent T-2 overfill was deemed to adversely affect a design function and a method of performing or controlling a design function, and therefore required an evaluation.

Summary of 50.59 Evaluation:

With this EC, sufficient AFW flow will continue to be available during anticipated operational occurrences and accident conditions. The proposed new operator action to close MV-FW10024 will be developed in accordance with controlled procedures and Operator training. The action, following seismic or tornado/high wind-induced damage to T-939 and/or piping, can be performed with significant time available before P-8C begins to ingest air, and does not increase the likelihood of loss of the AFW system water supply from the credited T-2. As a result, the AFW system will continue to perform as intended, such that the change would not affect the radiological consequences of an accident previously evaluated in the Updated Final Safety Analysis Report (UFSAR) or of a malfunction of a system, structure, or component (SSC) important to safety previously evaluated in the UFSAR. The changes to the design of the AFW system and the means of ensuring adequate water supply from the condensate system to support the AFW design function do not introduce any new type of accident. Since sufficient AFW flow will continue to be available during anticipated operational occurrences and accident conditions, the AFW system will continue to perform as intended, such that no fission product barrier is affected. The proposed activity does not adversely affect a method, or constitute a departure from, a method of evaluation that demonstrates intended design functions of an SSC will be accomplished as described in the UFSAR.

10 CFR 50.59 Evaluation Log Number: 19-0021

Document Number and Title: Engineering Change (EC) 76687, "V-24A/B/C/D Emergency Diesel Generator Room Ventilation Fans Modify Control Circuit to Resolve CR-PLP-2016-03456"

Description of Change:

EC 76687 added an "on-delay" time delay relay to the start circuitry for the emergency diesel generator room ventilation fans (V-24A, B, C, and D). The breakers for the ventilation fans had been tripping during normal fan operation. The problem occurred when a ventilation fan control switch, "Hand/Standby/Auto", is manipulated while the fan is operating. The "Hand/Standby/Auto" control switch is a "break before make" configuration which will open the circuit for one position before closing the circuit for the next position. If both positions require the fan/motor to be running, then moving the switch from one position to the other will cause the fan/motor to go from on to off, and back to on, during the switch position change. The time delay relay allows the motor to re-start without generating a large current transient that can trip the breaker for the fan. This delay also helped to reduce the associated mechanical stress on the motor stator winding and the rotor.

Installing the time delay relay had the potential to decrease the reliability of the fans, which are relied on to support accident mitigation. That is, the installation of an additional component, such as the time delay relay, which is required to operate in order for the fan to perform its design function, could affect the reliability of the fan, and therefore could involve an increase in the probability of a malfunction of a system or component important to safety previously evaluated in the UFSAR.

Summary of 50.59 Evaluation:

The installation of the time delay relays will not result in a more than minimal increase in frequency of a malfunction. The time delay relays meet all applicable design, functional, and regulatory requirements, such as those in regulatory guides and Institute of Electrical and Electronics Engineers (IEEE) standards. Further, the time delay relays do not depart from the design, fabrication, construction, testing, and performance standards as outlined in the General Design Criteria (UFSAR Section 5.1). In addition, installation of the time delay relays will not result in a more than a minimal increase in the frequency of occurrence of an accident, will not represent a more than minimal increase in accident or malfunction consequences, will not create the possibility of a different type of accident or malfunction with a difference result, will not affect fission product barriers, and will not affect UFSAR-specified safety evaluation methodologies.

10 CFR 50.59 Evaluation Log Number: 19-0022

Document Number and Title: Engineering Change (EC) 76688, "V-27A/B/C/D Engineering Safeguards Room Ventilation Fans Modify Control Circuit to Resolve CR PLP 2016-03456"

Description of Change:

EC 76688 added an "on-delay" time delay relay to the start circuitry for the engineering safeguards room ventilation fans (V-27A, B, C, and D). The breakers for the ventilation fans had been tripping during normal fan operation. The problem occurred when a ventilation fan control switch, "Hand/Standby/Auto", is manipulated while the fan is operating. The "Hand/Standby/Auto" control switch is a "break before make" configuration which will open the circuit for one position before closing the circuit for the next position. If both positions require the fan/motor to be running, then moving the switch from one position to the other will cause the fan/motor to go from on to off, and back to on, during the switch position change. The time delay relay allows the motor to re-start without generating a large current transient that can trip the breaker for the fan. This delay also helps reduce the associated mechanical stress on the motor stator winding and the rotor.

Installing the time delay relay had the potential to decrease the reliability of the fans, which are relied on to support accident mitigation. That is, the installation of an additional component, such as the time delay relay, which is required to operate in order for the fan to perform its design function, could affect the reliability of the fan, and therefore could involve an increase in the probability of a malfunction of a system or component important to safety previously evaluated in the UFSAR.

Summary of 50.59 Evaluation:

The installation of the time delay relays will not result in a more than minimal increase in frequency of a malfunction. The time delay relays meet all applicable design, functional, and regulatory requirements, such as those in regulatory guides and IEEE standards. Further, the time delay relays do not depart from the design, fabrication, construction, testing, and performance standards as outlined in the General Design Criteria (UFSAR Section 5.1). In addition, installation of the time delay relays will not result in a more than a minimal increase in the frequency of occurrence of an accident, will not represent a more than minimal increase in accident or malfunction consequences, will not create the possibility of a different type of accident or malfunction with a difference result, will not affect fission product barriers, and will not affect UFSAR-specified safety evaluation methodologies.

10 CFR 50.59 Evaluation Log Number: 19-0117

Document Number and Title: Engineering Change (EC) 83306, "Issue Revised MSLB Analysis"

Description of Change:

EC-83306 incorporates an updated Main Steam Line Break (MSLB) core response analysis (UFSAR Section 14.14) into the plant design and licensing basis. The need to update the analysis is documented in CR-PLP-2018-04548, "Framatome identified Deficiency in the Modified Barnett Critical Heat Flux Correlation used in the Palisades Main Steam Line Break Analysis." Framatome, Palisades fuel vendor, identified that the Critical Heat Flux (CHF) correlation used in the current Palisades MSLB analysis (Modified Barnett CHF Correlation) may be non-conservative for predicting departure from nucleate boiling (DNB). To resolve this potential non-conservatism Framatome re-analyzed the MSLB event using Nuclear Regulatory Commission (NRC) approved CHF correlations with adjusted (when appropriate) correlation limits and has shown that DNB does not occur.

The Palisades MSLB event is analyzed to assess the potential for fuel failure due to a DNB. A CHF correlation is used in the analysis to obtain the minimum DNB ratio (MDNBR), which is the ratio of the heat flux at the predicted core conditions that would result in DNB to the actual heat flux at those conditions. This ratio is verified to be above the CHF correlation limit, which includes appropriate uncertainties at an appropriate confidence interval (i.e., 95/95), to ensure the MSLB event does not result in fuel failures due to DNB.

The current Palisades MSLB analysis utilizes the Modified Barnett CHF correlation to determine the MDNBR (UFSAR Section 14.14.2.1) and the associated Modified Barnett DNB Correlation Limit (UFSAR Table 14.1-1). Palisades revised MSLB analysis utilizes three CHF correlations (Modified Barnett, Biasi, and HTP) and the associated correlation limits to cover the range of boundary conditions, with a corrected limit used for Modified Barnett that addresses the identified deficiency (CR-PLP-2018-04548).

Summary of 50.59 Evaluation:

EC-83306, which incorporates the updated Main Steam Line Break (MSLB) core response analysis into the plant design and licensing basis, is a change to a method of evaluation only.

The change to use three CHF correlations (Modified Barnett, Biasi, and HTP) instead of one (Modified Barnett) is not a departure from a method of evaluation described in the UFSAR, as it is a change from a method described in the UFSAR to another method that has been approved by the NRC for the intended application. Also, the use of the corrected Modified Barnett correlation limit is not a departure from a method of evaluation, as it represents a different method of evaluation that is approved by the NRC for the intended application.

Enclosure 2 to

PNP 2019-035

PALISADES NUCLEAR PLANT

OCTOBER 2017 – SEPTEMBER 2019

COMMITMENT CHANGE SUMMARY REPORT

1 page follows

**PALISADES NUCLEAR PLANT
OCTOBER 2017 – SEPTEMBER 2019
COMMITMENT CHANGE SUMMARY REPORT**

Commitment Number	Letter Title and Date of Original Commitment	Date of Commitment Change	Description
2000078	Response to Generic Letter (GL) 89-13: "Service Water System Problems Affecting Safety-Related Equipment" 01/29/1990	01/15/2019	<p>Original Commitment: Periodically submit sample of service water pump intake bay sediment to a laboratory for detailed analysis.</p> <p>Revised Commitment: This commitment is being cancelled.</p> <p>Justification: The commitment was intended to provide notice of arrival of Asiatic clams. The Generic Letter states, "Samples of water and substrate should be collected annually to determine if Asiatic clams have populated the water source. Water and substrate sampling is only necessary at freshwater plants that have no previously detected the presence of Asiatic clams in their source water bodies. If Asiatic clams are detected, utilities may discontinue this sampling activity..."</p> <p>Palisades has had zebra mussels for many years. There is an appropriate chlorination treatment system and Clam-Trol additions are performed to satisfy GL 89-13 requirements.</p>