Enclosure to

PNP 2019-028

Response to Request for Additional Information -
License Amendment Request to
Revise Existing Facility Operating License Conditions
Regarding NFPA 805 Modifications

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NRC RAI

By letter dated November 1, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML 18305B320), Entergy Nuclear Operations, Inc. (ENO) submitted a license amendment request (LAR) for the Palisades Nuclear Plant (PNP) that requested approval of several changes to the PNP's approved fire protection program under 10 CFR 50.48(c), "National Fire Protection Association [NFPA] Standard NFPA 805." Specifically, ENO has proposed to cancel 6 modifications and clarify 10 modifications, which are described in Attachment S, Table S-2, as referenced in the PNP's NFPA 805 transition license condition. The NRC staff is reviewing the LAR and has determined that additional information is needed to complete its review.

NRC Probabilistic Risk Assessment (PRA) RAI 01

The LAR included an updated Attachment W that has been revised to reflect the deletion of the six modifications as described in the LAR, according to the text in section "Under Attachment W, Table W-1, Fire Initiating Events Contributing > 1% to the Calculated Fire Risk and Table W-2 PNP Fire Area Risk Summary." The discussion related to Attachment W does not indicate that the clarifications to the modifications are included in the updated Attachment W results.

Of the 10 modifications where clarifications are being provided, Attachment S, Table S-2 indicated that modification items S2-15 and S2-21 are included in the PRA. The LAR indicates that the methodology described in NUREG/CR-7150, Volume 2, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE), Technical Resolution to Open Issues on Nuclear Power Plant Fire-Induced Electrical Circuit Failure," (ADAMS Accession No. ML 14141A129), was applied to modification S2-15. Removal of plant-specific fire-related modifications due to more refined analysis is typical of plants submitting LARs to request changes to its obligations, but these changes are incorporated in the PRA and the results are compared to Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" guidelines (ADAMS Accession No. ML17317A256).

Based on the information provided in the LAR, it is unclear whether the clarifications related to modification items S2-15 and S2-21 have been included in the PRA and the updated Attachment W. If the clarifications for S2-15 and S2-21 are not included in the PRA, provide a justification for this exclusion. Absent a justification, provide an updated Attachment W that incorporates these changes, including updated total risk and change in risk values and compare the risk with RG 1.174 guidelines. Should the delta risk not be negative, provide the new additional risk of recovery actions.

ENO Response to PRA RAI 01

The clarifications related to modification items S2-15 (regarding reactor head/pressurizer vents) and S2-21 (regarding motor operated valve MO-2160) were included in the fire PRA and are reflected in the updated Attachment W results provided in Reference 1.

NRC Request PRA RAI 02

Section 4.2.4.2 of NFPA 805 requires that the use of fire risk evaluation for the performance-based approach shall consist of an integrated assessment of the acceptability of risk, defense-in-depth (DID), and safety margins.

Item iv of the LAR, "Defense-in-Depth and Safety Margin," indicates that a review of prior determinations for DID, taking into account the modifications being eliminated, established that DID continues to meet the acceptance criteria of NFPA 805, Section 4.2.4, with no change to the required modifications or DID actions. However, the only stated acceptance criteria in NFPA 805, Section 4.2.4, are the "risk acceptance criteria." Meeting risk guidelines does not constitute meeting DID. Indicate whether the DID approach accepted for NFPA 805 implementation applies to the modifications that are being deleted and modifications S2-15 and S2-21 that are being clarified and describe how each proposed change satisfies each DID echelon.

ENO Response to PRA RAI 02

The last paragraph of Attachment 1, Section 3, Item iv of Reference 1 requires clarification and is re-stated as follows:

"A review of the prior determinations for defense-in-depth and safety margins, taking into account the modifications being eliminated and clarified, established that the changes do not alter the prior determination that defense-in-depth and sufficient safety margin (SM) are maintained. Required defense-in-depth recovery actions are not impacted by the changes and remain capable of being performed."

The defense-in-depth (DID) approach for NFPA 805 implementation remains applicable to the modification eliminations and clarifications. The elements of DID are: (1) preventing fires from starting; (2) rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting fire damage; and (3) providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. DID is achieved when an adequate balance between each of the elements is provided.

Element (1) corresponds to the product of fire ignition frequency and the severity factor (IGF x SF), element (2) corresponds to the non-suppression probability (NSP), and element (3) corresponds to the conditional core damage probability (CCDP).

Adequate balance is provided for each fire scenario if there is not an over-reliance on either preventing fires from starting, or from detecting and suppressing fires, in order to ensure that high consequence scenarios (high CCDP) have acceptably low risk. That is, if the scenario CDF is not made acceptably small by undue reliance on small values of a combination of fire ignition frequency (FIF), severity factor (SF) and the non-suppression probability (NSP), balance is considered achieved and adequate DID is maintained.

This approach remains applicable and was the approach used in the prior determinations that were reviewed, as discussed in the clarified paragraph above, to establish that the changes continue to ensure that DID is maintained. None of the eliminated or clarified modifications were originally proposed as satisfying or supporting DID. Moreover, eliminating and clarifying these modifications has no impact on any element of DID. Therefore, an adequate balance between

DID elements is maintained, and DID remains satisfied as discussed below for each such modification.

S2-06 - Bypass for Auxiliary Feedwater (AFW) Pumps Low Suction Pressure Trips (eliminated)

Eliminating the modification to bypass AFW pump low suction pressure trips for the existing AFW pumps does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Eliminating this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. Eliminating this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

The intent of the modification was to support decay heat removal; additional defense-in-depth for this function is now provided by installation of the diesel driven AFW pump (modification S2-01) which does not have automatic trip circuitry that could be impacted by fire.

S2-07 - Manual Control of Component Cooling Water (CCW) and Service Water System (SWS) Valves for Engineered Safeguards System (ESS) Pump Cooling (eliminated)

Eliminating the modification to provide a control room action to align SWS cooling to ESS pumps using a nitrogen supply installed by the modification does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Eliminating this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. Eliminating this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

The intent of the modification was to support inventory control by improving the ability to perform an action to provide backup cooling to the high pressure safety injection pumps; additional defense-in-depth for this function is now provided by reducing the contribution from risk significant scenarios causing loss of primary coolant system (PCS) inventory with alternate trip circuitry for the primary coolant pumps, charging pumps, and alternate control of letdown isolation valves (modifications S2-05, S2-11 and S2-04).

S2-08 - Insulate Emergency Diesel Generator (EDG) Exhaust Pipe (eliminated)

Eliminating the modification to add insulation to a portion of the exhaust piping for each EDG does not affect ignition sources or involve transient combustibles or their controls; therefore, the

change does not impact element (1) for preventing fires from starting. Eliminating this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. Eliminating this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

The intent of the modification was to support vital auxiliaries by increasing the time available to operators to take actions supporting emergency 2400v AC given a loss of offsite power. AC power supports operation of the existing motor driven AFW pumps and refill of the condensate storage tank to ensure adequate inventory to meet the system mission time. Additional DID for the motor driven AFW pumps is provided by the turbine driven AFW pump and is now provided by the independently powered diesel driven AFW pump (modification S2-01). Additional DID for condensate inventory is now provided by the cross-tie between the condensate storage tank and demineralized water storage tank, which has no AC power dependency (modification S2-10).

S2-14 - Prevent Spurious Energization of CCW Solenoid Valves (eliminated)

Eliminating the modification to replace existing control cables for air-operated valves controlling CCW flow to containment (CV-0910, CV-0911, and CV-0940) does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Eliminating this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. Eliminating this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

The intent of the modification was to support inventory control by reducing the likelihood of loss of primary coolant pump (PCP) seal cooling coupled with loss of the PCP pump trip circuitry. Additional DID for inventory control is now provided by installation of the alternate trip circuitry for the primary coolant pumps (modification S2-05).

S2-26 - Provide Same Train Power to Battery Chargers (eliminated)

Eliminating the modification to provide a second power source to the cross-train battery chargers to provide the ability to power these battery chargers from the same side power division in additional to the current cross-train source does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Eliminating this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting

fires and controlling and extinguishing promptly those fires that do occur. Eliminating this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

The intent of the modification was to support vital auxiliaries by providing the ability to power the battery chargers from cross-train or same-train AC. The battery chargers ultimately provide DC control power that supports operation of the existing motor driven AFW pumps and pumps to refill the condensate storage tank to ensure adequate inventory to meet the system mission time. Additional DID for AFW pumps is now provided by installation of the independently powered diesel driven AFW pump (modification S2-01). Additional DID for condensate inventory is now provided by the cross-tie between the condensate storage tank and the demineralized water storage tank, which has no AC power dependency (modification S2-10).

S2-39 - Turbine Building Fresh Air Fan V-21D Fire Rating (eliminated)

Eliminating the modification to restore the fire rating of the exterior wall associated with turbine building fan V-21D does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Eliminating this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, or any elements for fire brigade performance. An adequate for the hazard evaluation determined that existing program controls for the area were adequate and assure that the existing configuration is adequate for the allowed combustible load in the area of the fan and damper; therefore, the change does not impact any fire barriers or defense-in-depth element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. Eliminating this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

S2-15 - Spurious Operation of Reactor Head/Pressurizer Vent Valves (clarified)

Revising the modification to reactor head/pressurizer vent valves, from replacing existing cabling with fire-rated cables, to modifying the control circuit and replacing existing cabling to the reactor head vent and pressurizer vent isolation valves, does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Revising this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. As the revised modification is functionally equivalent to the originally proposed modification, revising this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions

from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

S2-21 - Motor Operated Valve MO-2160 Manual Operation Capability (clarified)

Revising the modification to MO-2160, from modifying MOV circuitry such that the torque switch is not disabled due to a fire that could also cause the MOV to spuriously operate, to modifying the actuator such that the valve internals are not damaged due to a fire that could cause the MOV to spuriously operate and simultaneously cause loss of the MOV limit and torque switches, does not affect ignition sources or involve transient combustibles or their controls; therefore, the change does not impact element (1) for preventing fires from starting. Revising this modification does not alter or impact any fire protection systems or features, any detection or suppression systems, any fire barriers, or any elements for fire brigade performance; therefore, the change does not impact element (2) for rapidly detecting fires and controlling and extinguishing promptly those fires that do occur. As the revised modification is functionally equivalent to the originally proposed modification, revising this modification does not impact the level of fire protection for structures, systems, and components important to safety; therefore, the change does not impact element (3) for providing an adequate level of fire protection for structures, systems, and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed. Therefore, an adequate balance between the elements is maintained and DID remains satisfied for this change.

Therefore, DID, SM and risk remain acceptable for each of the eliminated and clarified modifications.

NRC Request Fire Protection RAI 01

The LAR states that several modifications in Attachment S, Table S-2 have been implemented since Table S-2 was last submitted on August 14, 2014 (ADAMS Accession No. ML14226A498), and that Table S-2 was not updated to reflect modifications that have already been installed and could be transferred to Table S-1, "Plant Modifications Completed." The LAR proposes a revision to transition license condition 2.C.(3)(c)2. to reference the Table S-2 dated November 1, 2018, which based on your statement above, does not reflect the current status of the modifications. The regulation at 10 CFR 50.48(c)(3)(i) states, in part, that the application must identify any orders and license conditions that must be revised or superseded, and contain any necessary revisions to the plant's technical specifications and the bases thereof, and the Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the licensee has identified orders, license conditions, and the technical specifications that must be revised or superseded, and that any necessary revisions are adequate. Based on the information provided in the LAR, the NRC cannot determine whether the proposed change to transition license condition 2.C.(3)(c)2. is adequate. Provide revised Attachment S, Tables S-1 and S-2, that reflect the current status of the modifications. Also provide a revised license condition 2.C.(3)(c)2 that reflects the date that Table S-2 was revised.

ENO Response to Fire Protection RAI 01

Enclosure Attachment 2 provides an updated Attachment S and includes Table S-1, “Plant Modifications Completed,” and Table S-2, “Plant Modifications Committed,” to reflect the current implementation status of the modifications. Enclosure Attachment 2 supersedes in their entirety

Attachment 3 of Reference 1 and Attachment 3, Table S-1, of Reference 3. Enclosure Attachment 2 contains security related information and should be withheld from public disclosure in accordance with 10 CFR 2.390. The following revisions were made to Attachment S:

Item	Attachment S Revision	Reason for the Change
1	Modification S2-1 was revised to reflect completed status in Table S-2 and was moved to Table S-1 as S1-5.	Modification S2-1 was implemented and therefore was moved from Table S-2 to Table S-1.
2	Modification S2-2 was revised to reflect the previously determined cancelled status.	Modification S2-2 was previously concluded to provide no risk benefit so Table S-2 was revised to more clearly reflect this status administratively.
3	Modification S2-3 was revised to reflect the previously determined cancelled status.	Modification S2-3 was previously concluded to provide no risk benefit so Table S-2 was revised to more clearly reflect this status administratively.
4	Modification S2-4 was revised to reflect completed status in Table S-2 and was moved to Table S-1 as S1-6.	Modification S2-4 was implemented and therefore was moved from Table S-2 to Table S-1.
5	Modification S2-5 was revised to reflect completed status in Table S-2 and was moved to Table S-1 as S1-7.	Modification S2-5 was implemented and therefore was moved from Table S-2 to Table S-1.
6	Modification S2-6 was administratively revised to reflect the cancelled status.	Modification S2-6 was concluded to provide no risk benefit so Table S-2 was administratively revised to more clearly reflect this status.
7	Modification S2-7 was administratively revised to reflect the cancelled status.	Modification S2-7 was concluded to provide no risk benefit so Table S-2 was administratively revised to more clearly reflect this status.
8	Modification S2-8 was administratively revised to reflect the cancelled status.	Modification S2-8 was concluded to provide no risk benefit so Table S-2 was administratively revised to more clearly reflect this status.
9	Modification S2-9 was administratively revised to reflect the previously determined cancelled status.	Modification S2-9 was previously concluded to provide no risk benefit so Table S-2 was administratively revised to more clearly reflect this status.

Item	Attachment S Revision	Reason for the Change
10	Modification S2-10 was revised to reflect completed status in Table S-2 and was moved to Table S-1 as S1-8.	Modification S2-10 was implemented and therefore was moved from Table S-2 to Table S-1.
11	Modification S2-14 was administratively revised in Table S-2 to reflect the risk rank as N/A and the cancelled status.	Modification S2-14 was concluded to provide no risk benefit so Table S-2 was administratively revised reflect the risk rank as N/A and to more clearly reflect the cancelled status.
12	Modification S2-16 was administratively revised in Table S-2 to reflect the previously determined completed status.	Modification S2-16 was previously revised to indicate implemented status and moved to Table S-1 as S1-4. Modification S2-16 was administratively revised in Table S-2 to more clearly reflect this status.
13	Modification S2-23 was revised to reflect partial implementation and is now reflected in both Table S-2 and Table S-1 accordingly.	S2-23 remains in Table S-2 to reflect the portion of the modification still pending for implementation. S2-23 was listed in Table S-1 as S1-9, to reflect the portion of the modification that has been implemented.
14	Modification S2-26 was administratively revised in Table S-2 to reflect the cancelled status.	Modification S2-26 was concluded to provide no risk benefit so Table S-2 was administratively revised to more clearly reflect this status.
15	Modification S2-33 was administratively revised in Table S-2 to reflect the previously determined cancelled status.	Modification S2-33 was previously concluded to provide no risk benefit so Table S-2 was administratively revised to more clearly reflect this status.
16	Modification S2-39 was administratively revised in Table S-2 to reflect the cancelled status.	Modification S2-39 was concluded to no longer be necessary so Table S-2 was administratively revised to more clearly reflect this status.

The ten modifications that were clarified in Reference 1 were previously reflected in the revised Table S-2 that was submitted in Reference 1, therefore these clarifications are not discussed above as new revisions. In addition, the Table S-2 note regarding design flexibility discussed in Reference 1 is reflected at the end of Table S-2 as an administrative change.

ENO proposes to revise the PNP RFOL fire protection program transition license condition 2.C.(3)(c)2, to reflect the date that Table S-2 was revised and to reflect the revision to the full compliance date to allow an extension for the implementation of the remaining modifications necessary to achieve full compliance with 10 CFR 50.48(c). Enclosure Attachment 1 provides a revision (markup & clean) to the proposed RFOL pages. Enclosure Attachment 1 supersedes in their entirety Attachment 2 of Reference 1 and Attachments 1 and 2 of Reference 2.

References

1. ENO letter to NRC, PNP 2018-040, "License Amendment Request to Revise Existing Facility Operating License Conditions Regarding NFPA 805 Modifications," (ADAMS Accession Number ML18305B320), dated November 1, 2018

2. ENO letter to NRC, PNP 2019-007, "License Amendment Request to Change the Full Compliance Implementation Date for the Fire Protection Program Transition License Condition for Required Modifications," (ADAMS Accession Number ML19067A004), dated March 8, 2019

3. ENO letter to NRC, PNP 2014-080, "Response to Request for Additional Information - License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactors," (ADAMS Accession Number ML14226A498), dated August 14, 2014