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10 CFR 50.90

PNP 2019-034

August 23, 2019

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

#### Subject: Response to Request for Additional Information Regarding License Amendment Request Resubmittal to Adopt TSTF-425, Revision 3, *Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b*

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

In Reference 1, Entergy Nuclear Operations, Inc. (Entergy) submitted a license amendment request (LAR) to adopt TSTF-425 Revision 3, *Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b.* 

In Reference 2, Entergy submitted supplemental information to the LAR to adopt TSTF-425 Revision 3, *Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b.* 

In Reference 3, Entergy received an electronic request for additional information (RAI) from the NRC on the LAR and the LAR supplement. The Entergy response to the RAI is provided in the enclosure to this letter.

This letter identifies no new regulatory commitments.

In accordance with 10 CFR 50.91, *Notice for public comment; State consultation*, paragraph (b), a copy of this RAI response, with enclosure, is being provided to the designated State Official.

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

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I declare under penalty of perjury that the foregoing is true and correct. Executed on August 23, 2019.

Respectfully,

Ron Gaston

RWG/jpm

- Enclosure: Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-425, Revision 3, *Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b*
- References: 1) Entergy Nuclear Operations, Inc., PNP 2019-004, "License Amendment Request Resubmittal to Adopt TSTF-425, Revision 3, *Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b,*" (NRC ADAMS Package Accession Number ML19098A966), dated March 28, 2019
  - Entergy Nuclear Operations, Inc., PNP 2019-027, "Supplement to License Amendment Request Resubmittal to Adopt TSTF-425, Revision 3, *Relocate Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b,*" (NRC ADAMS Package Accession Number ML19127A018), dated May 6, 2019
  - NRC electronic mail, from K. Green (NRC) to J. P. Miksa (Entergy), Subject: "Request for Additional Information re License Amendment Request to Adopt TSTF-425, Revision 3, for the Palisades Nuclear Plant (EPID L-2019-LLA-0070)," (NRC ADAMS Accession Number ML19226A293), dated August 14, 2019
- cc: NRC Region III Regional Administrator NRC Senior Resident Inspector - Palisades Designated State Official - Michigan NRC Project Manager - Palisades

Enclosure to

# PNP 2019-034

Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-425, Revision 3, *Relocate* Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b

#### Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-425, Revision 3, *Relocate* Surveillance Frequencies to Licensee Control – Risk Informed Technical Specification Task Force (RITSTF) Initiative 5b

# NRC RAI

By letter dated March 28, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19098A966) to the U.S. Nuclear Regulatory Commission (NRC), as supplemented on May 6, 2019 (ADAMS Accession No. ML19127A018), Entergy Operations, Inc. (Entergy) submitted a license amendment request (LAR) for the Palisades Nuclear Plant (PNP). The proposed amendment would modify the PNP technical specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Technical Specifications Task Force (TSTF) Traveler TSTF-425, "Relocate Surveillance Frequencies to Licensee Control – RITSTF [Risk-Informed TSTF] Initiative 5b," Revision 3, (ADAMS Accession No. ML090850642) in accordance with Nuclear Energy Institute (NEI) 04-10, Revision 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies" (ADAMS Accession No. ML071360456).

The NRC staff is reviewing the LAR and has determined that additional information is needed to complete its review.

## NRC APLA RAI 01 – PRA Facts and Observations (F&Os)

Regulatory Guide (RG) 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-informed Activities" (ADAMS Accession No. ML090410014), provides guidance for addressing the acceptability of a probabilistic risk assessment (PRA) for use in regulatory decision-making. RG 1.200, Revision 2, describes a process utilizing a peer review team to assess a PRA against pertinent technical elements in the American Society for Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA standard (currently ASME/ANS-RA-Sa-2009). The primary result of a peer review are the F&Os recorded by the peer review team and the subsequent resolution of these F&Os by the licensee. A process to close out finding-level F&Os is documented in Appendix X to NEI 05-04, NEI 07-12, and NEI 12-13, "Close-Out of Facts and Observations" (ADAMS Accession No. ML17086A431) dated February 21, 2017, and was accepted by the NRC in the letter from Joseph Giitter and Mary Jane Ross-Lee, NRC, to Greg Krueger, NEI, dated May 3, 2017 (ADAMS Accession Number ML17079A427).

RG 1.200, Revision 2, states that the LAR should include:

...[a] discussion of the resolution of the peer review ... findings and observations that are applicable to the parts of the PRA required for the application [including] a discussion of how the PRA model has been changed [or] a justification ... that demonstrates the accident sequences or contributors significant to the application decision were not adversely impacted ... by the particular issue.

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NEI 04-10, Revision 1, states that:

Plants implementing TSTF-425 shall evaluate their PRAs in accordance with this regulatory guide [RG 1.200, Revision 2]. The RG specifically addresses the need to evaluate important assumptions that relate to key modeling uncertainties (such as reactor coolant pump seal models, common cause failure methods, success path determinations, human reliability assumptions, etc.). Further, the RG addresses the need to evaluate parameter uncertainties and demonstrate that calculated risk metrics (e.g., CDF [core damage frequency] and LERF [large early release frequency]) represent mean values. The identified "Gaps" to Capability Category II requirements from the endorsed PRA standards in the RG and the identified key sources of uncertainty serve as inputs to identifying appropriate sensitivity cases.

The LAR supplement dated May 6, 2019, provides PNP PRA acceptability information. Tables 1, 2, 3, and 4 of the enclosure to the LAR supplement provide a list of open finding F&Os and application-specific dispositions for the internal events and flooding PRAs models, and fire PRA (FPRA) models, respectively. Provide the following information regarding these open F&Os below:

#### NRC APAL RAI 01 Part a.

Internal Events and Internal Flooding PRA F&O IFSO-A4-01 pertains to the identification and characterization of human-induced flooding events. The disposition for this F&O states that "human induced flood events were characterized for each flood area initiating event as part of the maintenance induced flooding frequency development." The "Importance to Application" column further states that plant-wide maintenance induced flood frequency is distributed among plant flood areas with greater weighting applied to areas with more potential flood sources. Thus, there is greater apportionment of frequency where greater maintenance induced flooding is expected due to increased levels on on-line maintenance. However, the section also states that current plant maintenance and risk mitigation limits periodic maintenance in these areas.

Considering this, clarify if the apportionment of frequency is based only on the level of potential flood sources and the anticipated increased maintenance activities or the level of potential flood sources and the actual maintenance activities and how the choice affects frequency apportionment.

## Entergy Response to APAL RAI 01 Part a.

Currently Palisades' apportionment of frequency is based on the level of potential flood sources and the anticipated increased maintenance activities. More specifically, the maintenance induced flooding apportionment of frequency in each plant area is derived using the plant wide maintenance induced flooding frequency and the area's relative quantity of piping and components. The model does not adjust the frequency apportionment based on work management practices to reduce risk. Review and documentation of actual maintenance activities that may result in maintenance-induced flooding is needed to fully meet standard element IFSO-A4. This review and documentation, and any resultant frequency adjustments that may be warranted, will be included in the model prior to use in surveillance test interval evaluations.

## NRC APAL RAI 01 Part b.

Internal Events and Internal Flooding PRA F&O IFSN-A3-01 pertains to the identification and documentation of automatic and operator responses that can terminate or contain the flood propagation for each defined flood area and source. The disposition for this F&O states that a flood mitigation abnormal operating procedure defines operator actions for flood mitigation in all 11 PRA defined flood areas; however, the independent assessment team indicated that human error probability (HEP) values were developed for only the 1D switchgear room. The "Importance to Application" column states that detailed flood mitigating actions were developed for important flood areas (cable spreading room, 1-D and 1-C switchgear rooms, and EDG 1-1 and EDG 1-2 rooms).

Identify each flood area for which an HEP has been calculated and clarify the relationship between these flood areas with an HEP and the 11 PRA defined flood areas.

## Entergy Response to APAL RAI 01 Part b.

Detailed human error probabilities (HEPs) for terminating flood events prior to equipment submergence were developed for Flood Area 8 (Cable Spreading Room/1-D Switchgear Room/Electrical Equipment Room) and Flood Area 9 (Emergency Diesel Generator (EDG) 1-1 and EDG 1-2 rooms). For the remaining nine probabilistic risk assessment (PRA) defined flood areas, which were not risk significant enough to warrant development of detailed HEPs or for which Operator action was not feasible, the equipment in the flood area was assumed to fail due to the flood, except in the cases where plant physical configuration prevented equipment failure (i.e., operator action to terminate the flood was not credited to protect equipment).

## NRC APAL RAI 01 Part c.

FPRA F&O FQ-C1-01 and HRA-D2-01 indicate that additional updating is needed in the fire PRA human reliability analysis (HRA) dependency analysis. The LAR states that the updated analysis will be performed to support NFPA 805 implementation. Because F&O FQ-C1-01 is identified in the May 6, 2019, supplement to the LAR as "open" with additional update needed, the NFPA-805 implementation item does not appear to be completed. Table 3 in the LAR supplement indicates that for those surveillance test intervals (STIs) which HRA dependency is determined to have a potential impact, the effect is expected to be assessed in the change evaluations for the affected STIs. Furthermore, the LAR supplement states the assessment may involve either completion of the HRA dependency analysis or sensitivity cases using bounding assumptions of (1) no dependency between human failure events (HFEs), and (2) complete dependency between HFEs.

## NRC APAL RAI 01 Part c.i.

Provide an assessment and status of current HRA dependency modeling that will be used as the basis for sensitivity cases for STI evaluations.

## Entergy Response to APAL RAI 01 Part c.i.

Palisades' fire PRA is being updated in 2019. The fire PRA includes a human reliability analysis (HRA) that considers the effects of fire on performance shaping factors and a fire-specific dependency analysis. The fire PRA update, which will include a completed fire

HRA and completed fire HRA dependency analysis, will be finished prior to use in surveillance test interval evaluations.

The HRA dependency modeling that will be used for the fire PRA was reviewed with respect to internal events through a Focused Scope Peer Review (FSPR) in the spring of 2019. No open findings exist as a result of the FSPR. The same modeling methodology (which utilizes Electrical Power Research Institute's (EPRI's) HRA Calculator) is used for the fire HRA dependency analysis and will be used as the basis for sensitivity cases for surveillance tests interval (STI) evaluations.

## NRC APAL RAI 01 Part c.ii.

Provide an explanation that describes how the sensitivity evaluation using bounding assumptions can accurately characterize the impact of STI increases using an incomplete HRA dependency model.

## Entergy Response to APAL RAI 01 Part c.ii.

As discussed in the response to RAI 01 Part c.i above, the internal fire PRA will be updated in 2019. The update will utilize the same HRA dependency methodology as currently used in the internal events HRA dependency analysis (which was subjected to a FSPR). As a result of this update the fire PRA will utilize a complete HRA dependency model. Therefore, since the fire PRA update will be finished prior to use in STI evaluations, any sensitivity evaluations related to human actions used in STI evaluations will be based on a complete HRA dependency model.

#### NRC APAL RAI 01 Part c.iii.

The terms "expected" and "may" indicate flexibility in the utilization of sensitivity studies for STIs affected by HRA dependency. Therefore, provide assurance that sensitivity studies associated for those STIs that are impacted by HRA dependency analysis will be completed.

## Entergy Response to APAL RAI 01 Part c.iii.

Palisades will evaluate STI sensitivity studies in accordance with Entergy Nuclear Management Manual Procedure EN-DC-354, *Risk Assessment of Surveillance Test Frequency Changes.* This procedure requires that the site perform sensitivity calculations to bound the impacts on the application if a peer review finding or model change request (MCR) affects the analysis. For cases where there is an open finding related to the fire PRA human error dependency, the site is procedurally required to perform sensitivity analyses if it impacts the STI evaluation. In addition, as previously stated, any sensitivity evaluations related to human actions will be based on the updated fire HRA dependency model prior to completing STI evaluations.

## NRC APLA RAI 02 – Plant Changes Not Yet Incorporated

Section 3.2.1 of the LAR supplement enclosure states:

PNP is installing a number of plant modifications for NFPA 805 implementation that impact the PRA model. The PNP model infrastructure allows for enabling or disabling of these

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modifications as needed to ensure the model reflects the current plant, as-built and as-operated. When performing STI evaluations, the PNP model will only credit NFPA [National Fire Protection Association] 805 modifications that are currently installed and reflected in current plant procedures.

The relationship between the PNP model infrastructure and the internal events, internal flooding and internal fire models is unclear. Regarding consistency of the PRA models with the as-built and as-operated plant, provide the following:

# NRC APLA RAI 02 Part a.

An explanation about how the PNP model infrastructure enabling or disabling NFPA 805 modifications is reflected in the internal events, internal flooding, and internal fire PRA models, and how the enabled or disabled modification are automatically or manually reflected in all three hazard models.

#### Entergy Response to APLA RAI 02 Part a.

Per Entergy fleet procedure EN-DC-151, *PSA Maintenance and Update*, Palisades maintains the internal events, internal flooding, and internal fire PRA models to reflect the as-built, as-operated plant. Each of these models utilizes the same underlying base fault tree logic. House events, controlled by a flag file, are utilized to enable and disable modifications related to NFPA-805 as well as hazard specific logic (e.g. HEPs) for all three hazard models.

## NRC APLA RAI 02 Part b.

A mechanism to ensure that the PRA models for all three hazards that are used for performing STI evaluations include changes such that the PRA reflects the as-built, as-operated plant.

## Entergy Response to APLA RAI 02 Part b.

As stated in the response to RAI 02 Part a, Palisades' model is maintained per EN-DC-151. Per the procedure, Palisades maintains a Model Change Request (MCR) database. MCRs capture changes to the plant and procedures. Each MCR is screened in accordance with the procedure and assigned a priority based on expected impact to the PRA models. This includes changes that affect all three hazard models. Therefore this procedural process ensures that the PRA models for all three hazards that are used for performing STI evaluations include changes such that the PRA reflects the as-built, as-operated plant.

## NRC APLA RAI 03 – External Hazards Analysis

LAR Section 3.5 states, "PNPS does not have a PRA model . . . associated with external hazards such as seismic" and "When performing STI extension evaluations PNP will assess the risk from external events hazards (seismic) by applying the screening evaluations generated in response to the IPEEE [Individual Plant Examination of External Events] in accordance with NEI-04-10 guidance"; and "These base insights would then be assessed to account for any updated information or attributes that may have changed since the IPEEE to better reflect the as-built, as-operated plant."

Based on the information above, provide the following:

## NRC APLA RAI 03 Part a.

According to the LAR, PNP does not have a seismic PRA model, and according to the May 1996 IPEEE submittal (ADAMS Accession No. ML080030218), PNP does not have a seismic margins analysis. Therefore, explain how PNP intends to meet the guidance outlined in NEI 04-10, Revision 1, Step 10, "Initial Assessment of Seismic Events" using a screening evaluation. If PNP intends to deviate from the guidance, provide an assessment for how the approach is technically justifiable.

## Entergy Response to APLA RAI 03 Part a.

Palisades intends to follow the guidance in NEI 04-10 Step 10 which states, *If the SSC is not* evaluated in the seismic PRA, (either explicitly or implicitly, and it is judged to have no impact on the PRA results), or not evaluated in the SMA (either explicitly or implicitly), then the SSC can be qualitatively screened with the information summarized in Step 15 for presentation to the IDP.

If screening determines that the system structure or component (SCC) potentially has some impact on the PRA results, then Palisades intends to utilize qualitative assessments and/or bounding assessments discussed in Steps 10a and 10b for the seismic portions of STI evaluations. These assessments are proceduralized in Entergy fleet procedure EN-DC-354, "Risk Assessment of Surveillance Test Frequency Changes."

Seismic hazard assessments will apply insights from the seismic probabilistic risk assessment (SPRA) documented in the individual plant examination of external events (IPEEE) as well as the USI A-46 Equipment Evaluation Report which includes the as-built seismic safe shutdown equipment list.

The USI A-46 report provides the preferred SSC paths to be used in achieving the safe shutdown functions following a seismic event: Reactor Reactivity Control, Reactor Coolant Pressure Control, Reactor Coolant Inventory Control, and Decay Heat Removal. The report also identifies auxiliary paths required to support the preferred paths, and the corresponding equipment and instrumentation. High level fault-tree-like diagrams indicate separate trains and redundant equipment paths, which facilitates the determination of component importance (e.g., component is a redundant component in one train supporting a two-train safe shutdown function).

## NRC APLA RAI 03 Part b.

Provide an explanation for how PNP intends to update seismic information or attributes that have changed since the IPEEE to better reflect the as-built, as-operated plant.

## Entergy Response to APLA RAI 03 Part b.

As discussed in the response to RAI 02 Part b, Palisades screens changes (MCRs) to the plant for their impact on risk per procedure EN-DC-151. In order to monitor seismic attributes, Palisades utilizes a Renewed License Program checklist for modification, proceduralized in Entergy fleet procedure EN-DC-115, *Engineering Change Process*. The checklist assesses if existing qualification is being affected by the modification. Palisades also utilizes Entergy Engineering Standard EN-CS-S-010-L, *Seismic Technical Evaluations*, for projects affecting PNP 2019-034 Enclosure Page 7 of 8

seismic equipment (including components described on the seismic safe shutdown equipment list, per the USI A-46 report). The procedure ensures the site's licensing and design basis seismic requirements are maintained.

In addition, Palisades implements a Structural Monitoring program requiring walkdowns which provides assurance that existing seismic qualification is not degrading over time. The program is proceduralized in Entergy fleet procedure EN-DC-150, *Condition Monitoring of Maintenance Rule Structures*, and EN-DC-178, *System Walkdowns*. This ensures that structures, systems, and components (including equipment anchorage) are monitored for degradation.

## NRC APLA RAI 04 – Performance Monitoring

RG 1.174 Element 3 states that an implementation and monitoring program should be developed to ensure that the engineering evaluation conducted to examine the impact of the proposed changes continues to reflect the actual reliability and availability of the systems, structures, and components evaluated. NEI 04-10, Section 3.0, "Key Safety Principles" outlines the key safety principles to be addressed in risk-informed change applications. The fifth principle addresses monitoring changes using performance monitoring strategies. The LAR provides a brief statement in Section 2.1, "Surveillance Frequency Change Process" that indicates the integrated decision-making panel is responsible for reviewing the performance monitoring strategies to monitoring strategies.

## Entergy Response to APLA RAI 04

Palisades will utilize existing Entergy fleet procedures EN-DC-355-02, *Engineering Evaluation of Proposed Surveillance Test Interval Changes*, and EN-DC-355-05, *Monitoring the Effects of Changes to the Surveillance Frequency Control Program (SFCP)*, to implement performance monitoring strategies. The monitoring strategy is developed as part of the STI Evaluation in EN-DC-355-02, which follows the guidance of Step 18 of NEI 04-10 Section 4.0. Following approval of the STI change, effects of the STI change are monitored in accordance with EN-DC-355-05. These procedures implement performance monitoring strategies to monitor changes to surveillance frequencies consistent with the requirements of NEI 04-10, Revision 1, as required by proposed TS 5.5.6, Surveillance Frequency Control Program.

The performance monitoring strategies include the following:

- Confirmation that no failure mechanisms that are related to the revised STI become important enough to alter the failure rates assumed in the justification of the program changes.
- Performance monitoring ensures adequate component capability (i.e., margin) exists, relative to design-basis conditions, so that component operating characteristics do not result in reaching a point of insufficient margin before the next scheduled test.
- Component or train level monitoring is expected for high safety significant structures, systems, and components as defined by the Palisades Maintenance Rule program.

- In general, performance will be monitored per the monitoring requirements of the Maintenance Rule program. However, additional monitoring unique to a revised STI may be specified.
- The output of the performance monitoring will be periodically re-assessed, and appropriate adjustments made to the surveillance frequencies, if needed.