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PNP 2015-047

July 2, 2015

U. S. Nuclear Regulatory Commission
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SUBJECT: Palisades Nuclear Plant Response to Request for Additional Information on Expedited Seismic Evaluation Process Report Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident

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

- REFERENCES:
1. NRC letter, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, dated March 12, 2012 (ADAMS Accession Package No. ML12056A046).
 2. Entergy Nuclear Operations, Inc. letter, PNP 2014-108, *Palisades Nuclear Plant Expedited Seismic Evaluation Process Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, dated December 18, 2014 (ADAMS Accession No. ML14357A165).
 3. NRC e-mail, *Palisades ESEP Clarification Questions*, dated June 5, 2015.

Dear Sir or Madam:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a 50.54(f) letter to all power reactor licensees and holders of construction permits in active or deferred status. Enclosure 1 of Reference 1 requested each addressee located in the Central and Eastern United States (CEUS) to submit a Seismic Hazard Evaluation and Screening Report within 1.5 years from the date of Reference 1.

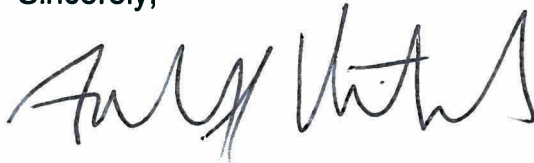
Reference 1 also requested that licensees provide interim evaluations and actions taken or planned to address the higher seismic hazard relative to the design basis, as appropriate, prior to completion of the risk evaluation. In response to the request, the Expedited Seismic Evaluation Process (ESEP) Report for Palisades Nuclear Plant (PNP) was submitted in Reference 2.

In Reference 3, the NRC requested additional information concerning the ESEP Report for PNP. The attachment provides the requested additional information.

This letter contains no new or revised commitments.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 2, 2015.

Sincerely,



ajv/jse

Attachment: Response to Request for Additional Information Concerning the Palisades Nuclear Plant Expedited Seismic Evaluation Process Report

cc: Director of Office of Nuclear Regulation
Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

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Response to Request for Additional Information Concerning the Palisades Nuclear Plant Expedited Seismic Evaluation Process Report

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In Reference 3, the NRC requested additional information concerning the ESEP Report for PNP. The Entergy Nuclear Operations, Inc. (ENO) responses to the information request questions are provided below.

References:

1. NRC letter, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, dated March 12, 2012 (ADAMS Accession Package No. ML12056A046).
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3. NRC e-mail, *Palisades ESEP Clarification Questions*, dated June 5, 2015.

NRC Information Request dated June 5, 2015

The following clarification questions are raised in the context of the NRC evaluation of the ESEP submittals only and licensees' responses will be reviewed by NRC staff only to the extent the use of this information affects the elements and outcomes of the ESEP evaluation. As many licensees have used information from their ongoing SPRA analyses, the current review will not evaluate methods or results as they pertain to the SPRA. They will be reviewed later at the time of SPRA review.

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NRC Question #1:

ESEP Report Section 6.2 describes ESEL component screening using Table 2-4 of EPRI NP-6041-SL. This table is applicable to components located up to 40 ft above grade. The ESEP report is silent concerning screening or HCLPF calculations at elevations beyond 40 ft above grade. Describe how ESEL components located at elevations beyond 40 ft above grade either were screened or had their HCLPF capacities calculated, including specific references for the applicable guidance utilized.

ENO Response:

The PNP Expedited Seismic Equipment List (ESEL) contains four (4) components located more than about 40 feet above grade. These components are four (4) Safety Injection Tanks, which are located inside containment and were identified as inaccessible in Section 7.1 of the PNP ESEP Report. The walkdown of these components is scheduled to occur during the next refueling outage at PNP, scheduled in fall 2015. A screening, or a High Confidence of a Low Probability of Failure (HCLPF) calculation, will be performed for these components after the completion of the walkdowns.

NRC Question #2:

In ESEP Report Section 5.2, it states "The vertical direction RLGM ISRS is obtained by scaling the vertical amplified ground response spectrum." The statement implies that the vertical ground spectrum, scaled by a factor of 2, is used at all elevations.

- *Describe in more detail the scaling process used to obtain the vertical RLGM ISRS and the associated technical rationale.*

ENO Response:

The scaled vertical ground spectrum is considered for all elevations within the plant. This approach is consistent with the PNP seismic design basis as described in PNP Specification C-175(Q), "Requirements for Seismic Evaluation of Electrical and Mechanical Equipment." The vertical ground spectrum values are equal to two thirds of the horizontal ground spectrum.

NRC Question #3:

Section 3.1.5 - Critical Instrumentation Indicators, in the ESEP report states:

"Critical indicators and recorders are typically physically located on panels/cabinets and are included as separate components; however, seismic evaluation of the

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instrument indication may be included in the panel/cabinet seismic evaluation (rule-of-the-box)."

Section 6.1 - Summary of the Methodologies Used, does not provide any detail related to use of the "rule-of-the-box" for critical indicators and recorders in the ESEL.

Specify whether there are any critical indicators and recorders in the ESEL. If yes, describe the implementation of the "rule-of-the-box" in developing HCLPF capacities for critical indicators and recorders, including how the HCLPF values of the devices were determined, and how cabinet amplification, if applicable, was considered. Also, describe whether any of these devices are sensitive to vibration, as are relays and other devices with contacts, and if so, how they were evaluated. Lastly, if the qualification of the devices is based on the cabinet/panel they are housed in, which have been previously qualified as part of an equipment class ("parent" component), how is it known/confirmed that the parent component normally contains the particular device.

ENO Response:

Critical indicators and recorders are included on the ESEL. The PNP ESEL contains indicators and recorders that are defined as "rule-of-the-box" components mounted within or attached to racks, panels, or other "host" components. Rule-of-the-box components, including indicators and recorders, were identified during the walkdowns of host components and noted on walkdown forms. During these walkdowns, the mounting of rule-of-the-box components was verified by the Seismic Review Team (SRT). Additionally, SRT members evaluated rule-of-the-box and host components during the walkdown, based on earthquake experience data and seismic training, and confirmed that ESEL components are bounded by equipment classes defined in EPRI NP-6041-SL, Revision 1, "Methodology for Assessment of Nuclear Power Plant Seismic Margin." Consistent with Section 3.3.3 of the Seismic Qualification Utility Group (SQUG) Generic Implementation Procedure (GIP), Revision 2, rule-of-the-box equipment is evaluated as part of the host component. Host components are screened for functional failure using the bounding spectrum defined in GIP, and EPRI NP-6041-SL, which bounds the Review Level Ground Motion (RLGM) at PNP. Consequently, rule-of-the-box components were also screened for functional failure. ESEL indicators and recorders do not have contacts that are susceptible to chatter. Thus, in-cabinet amplification factors defined in EPRI NP-6041-SL for relays are not considered.

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NRC Question #4:

Section 6.5 "Functional Evaluations of Relays" states:

"As discussed in Section 3.1.1, no seal in/lockout type relays were identified on Palisades Nuclear Plant ESEL. Therefore, no relay evaluations were performed."

Section 3.1.1 states, in part:

"An extensive relay evaluation was performed as part of the A-46 and IPEEE programs and after screening out relays for which relay chatter is not an issue, no bad actors were identified. In addition, due to the Extended Loss of AC Power (ELAP) from the BDBEE, without power, chatter of relays supporting higher voltage equipment will not result in any negative effects from energized relay seal-in or lock-out. Therefore, no relays were listed on the ESEL."

The statements in Section 3.1.1 require the following clarifications:

- (a) If one of the reasons no relays are listed in the ESEL, even if they support ESEP functions, is that they were previously evaluated under the A-46 and IPEEE programs, the staff notes that the RLGM seismic demand may not be enveloped by the seismic demand evaluated in the A-46 and IPEEE programs. Confirm that the RLGM seismic demand is enveloped.*
- (b) Confirm that the potential for in-cabinet/in-panel amplification was considered, consistent with the guidance in EPRI 6041 for evaluation of relays.*
- (c) Confirm that the A-46 and IPEEE relay evaluations included within their scope all relays that support ESEP functions. If not, what is the basis to exclude those not within the scope.*
- (d) Clarify the following statement: "In addition, due to the Extended Loss of AC Power (ELAP) from the BDBEE, without power, chatter of relays supporting higher voltage equipment will not result in any negative effects from energized relay seal-in or lock-out." Does this apply to all relays that support ESEP functions, or only to relays that support ESEP function but are not covered by the A-46 and IPEEE relay evaluations?*

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ENO Response:

- (a) The RLGM is enveloped by the SQUG GIP bounding spectrum but no judgment was made regarding the adequacy of relays included in the A-46, "Seismic Qualification of Equipment in Operating Plants"/Individual Plant Examination of External Events (IPEEE) program for the RLGM. Electric Power Research Institute (EPRI) ESEP guidance [EPRI Report 3002000704, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic"], Section 3.2, and the accompanying published Questions & Answers (Question 3.3), dated August 6, 2014, indicates that relays should only be included on the ESEL if relay or contactors lead to circuit seal-in or lock-out. For ESEL components, any relay chatter will be automatically or manually overridden for the required equipment after the seismic event is over. Control switches in the control room are sufficient for manual actions. Therefore, evaluation of ESEL components containing relays identified no seal-in or lock-out type relays requiring further evaluation. Thus, no seismic HCLPF capacity evaluations were performed for relays.
- (b) As stated in the response to question 4(a), no seismic HCLPF capacity evaluations were performed for relays. Therefore, in-cabinet amplification for relays defined in EPRI NP-6041-SL is not considered.
- (c) Relays located within ESEP components were reviewed only to identify those that may lead to circuit seal-in or lock-out. Exclusion of these relays from the ESEL is based solely on this criterion. The statement referencing the A-46/IPEEE evaluation is included to provide background information on previous relay evaluations.
- (d) This statement applies to the high voltage system components only, which are not ESEP functions. That is, the electrical distribution system and equipment that is assumed lost due to the ELAP/seismic event do not have any negative ESEP effects due to relay seal-in or lock-out, since they have no power.