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

December 23, 2015

Vice President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT – INTERIM STAFF RESPONSE TO REEVALUATED FLOOD HAZARDS SUBMITTED IN RESPONSE TO 10 CFR 50.54(f) INFORMATION REQUEST – FLOOD-CAUSING MECHANISM REEVALUATION (TAC NO. MF6128)

Dear Sir or Madam:

The purpose of this letter is to provide a summary of the U.S. Nuclear Regulatory Commission (NRC) staff's assessment of the re-evaluated flood-causing mechanisms described in the March 11, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15106A681), flood hazard reevaluation report (FHRR) submitted by Entergy Nuclear Operations, Inc. (Entergy, the licensee) for Palisades Nuclear Plant (Palisades), as well as supplemental information resulting from requests for additional information and audits.

By letter dated March 12, 2012, the NRC issued a request for information pursuant to Title 10 of the *Code of Federal Regulations*, Section 50.54(f) (hereafter referred to as the 50.54(f) letter) (ADAMS Accession No. ML12053A340). The request was issued as part of implementing lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 2 to the 50.54(f) letter requested licensees to re-evaluate flood-causing mechanisms using present-day methodologies and guidance. Concurrently, with the reevaluation of flooding hazards, licensees were required to develop and implement mitigating strategies in accordance with NRC Order EA-12-049, "Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12054A735). On March 30, 2015, the Commission provided Staff Requirements Memoranda (SRM) (ADAMS Accession No. ML15089A236) to COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards," dated November 21, 2014 (ADAMS Accession No. ML14309A256), affirming that licensees need to address the reevaluated flooding hazards within their mitigating strategies for beyond-design-basis external events.

The NRC staff has reviewed the information submitted by the licensee and has summarized the results of the review in the tables provided as an Enclosure to this letter. Table 1 provides the current design-basis flood hazard mechanisms. Table 2 provides the reevaluated flood hazard mechanisms; however, the reevaluated hazard mechanisms bounded by the current design-basis (Table 1) are not included.

The NRC staff has concluded that the licensee's reevaluated flood hazards information, as summarized in the Enclosure, is suitable for the assessment of mitigating strategies, developed

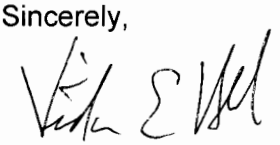
in response to Order EA-12-049 (i.e., defines the mitigating strategies flood hazard information described in guidance documents currently being finalized by the industry and NRC staff) for Palisades. Further, the NRC staff has concluded that the licensee's reevaluated flood hazard information is a suitable input for other assessments associated with Near-Term Task Force Recommendation 2.1 "Flooding." The NRC staff plans to issue a staff assessment documenting the basis for these conclusions at a later time.

In addition, Nuclear Energy Institute (NEI) guidance document NEI 12-06 "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" is currently being revised. This revision will include a methodology to perform a Mitigating Strategies Assessment (MSA) with respect to the reevaluated flood hazards. Once this methodology is endorsed by the NRC, flood event duration parameters and applicable flood associated effects should be considered as part of the Palisades MSA. The NRC staff will evaluate the flood event duration parameters (including warning time and period of inundation) and flood-related associated effects developed by the licensee during the NRC staff's review of the MSA.

As stated above, Table 2 of the enclosure to this letter describes the reevaluated flood hazards that exceed the current design-basis. In order to complete its response to the information requested by Enclosure 2 to the 50.54(f) letter, the licensee is expected to submit an integrated assessment or a focused evaluation, as appropriate, to address these reevaluated flood hazards, as described in NRC letter, "Coordination of Request for Information Regarding Flooding Hazard Reevaluation and Mitigating Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15174A257). This letter describes the changes in the NRC's approach to the flood hazard reevaluations that were approved by the Commission in its SRM to COMSECY-15-0019, "Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants" (ADAMS Accession No. ML15209A682).

If you have any questions, please contact me at (301) 415-2915 or e-mail at Victor.Hall@nrc.gov.

Sincerely,



Victor E. Hall, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure:
Summary of Results of Flooding
Hazard Re-Evaluation Report

cc w/encl: Distribution via Listserv

ENCLOSURE:

SUMMARY TABLES OF
REEVALUATED FLOOD HAZARD LEVELS

**Table 1. Current Design Basis Flood Hazards for Use in the MSA**

| Mechanism | Stillwater Elevation | Waves/ Runup | Design Basis Hazard Elevation | Reference |
|---|---|---|---|---|
| **Local Intense Precipitation** | | | | |
| East Side of Service Building | 601.0 ft NGVD29 | Minimal | 601.0 ft NGVD29 | FHRR Section 2.3.1.1 |
| Site Other than Service Building (Ponding) | 0.5 ft Depth | Minimal | 0.5 ft Depth | FHRR Section 2.3.1.1 & Table 4-1 |
| **Streams and Rivers** | Not included in DB | Not included in DB | Not included in DB | FHRR Table 4-1 |
| **Failure of Dams and Onsite Water Control/Storage Structures** | Not included in DB | Not included in DB | Not included in DB | FHRR Table 4-1 |
| **Storm Surge** | 594.1 ft NGVD29 | 8.0 ft | 602.1 ft NGVD29 | FHRR Table 4-1<br>FHRR Table 4-4 |
| **Seiche** | No Impact on the Site Identified | No Impact on the Site Identified | No Impact on the Site Identified | FHRR Table 4-1 |
| **Tsunami** | Not included in DB | Not included in DB | Not included in DB | FHRR Table 4-1 |
| **Ice-Induced Flooding** | Not included in DB | Not included in DB | Not included in DB | FHRR Table 4-1 |
| **Channel Migrations/Diversions** | Not included | Not included | Not included | FHRR Table 4-1 |

Note 1: Reported values are rounded to the nearest one-tenth of a foot.

Note 2: For LIP-Scenario 2, the total stillwater ponding depth is reported to be up to a maximum of 0.5 ft. For total elevation, add ponding depth to ground elevation.

**Table 2. Reevaluated Flood Hazards for Flood-Causing Mechanisms for Use in the MSA**

| Mechanism | Stillwater Elevation | Waves/ Runup | Reevaluated Hazard Elevation | Reference |
|---|---|---|---|---|
| **Local Intense Precipitation** | | | | |
| Service Building - East Side (Non-Category 1 Structure) | 605.8 ft NGVD29 | Minimal | 605.8 ft NGVD29 | FHRR Section 2.3.1.1 & Table 4-1 |
| Upper Level (Category 1 Structures) | 626.1 ft NGVD29 | Minimal | 626.1 ft NGVD29 | FHRR Section 2.3.1.1 & Tables 4-1 and 5-2 |
| Lower Level (Category 1 Structures) | 594.4 ft NGVD29 | Minimal | 594.4 ft NGVD29 | FHRR Section 2.3.1.1 & Tables 4-1 and 5-1 |
| **Storm Surge** | | | | |
| H.4 Combined Flood Event: Lakeward of Circulation Pipes | 593.9 ft NGVD29 | 8.3 ft | 602.2 ft NGVD29 | FHRR Section 3.9.2.1.2 FHRR Table 4-5 & Figure 3-29 |
| H.4 Combined Flood Event: Landward of Circulation Pipes | 593.9 ft NGVD29 | 0.4 ft | 594.3 ft NGVD29 | FHRR Section 3.9.2.1.2 FHRR Table 4-5 & Figure 3-29 |
| H.4 Combined Flood Event: Landward of Turbine Building | 593.9 NGVD29 | 0.4 ft | 594.3 NGVD29 | FHRR Section 3.9.2.1.2 FHRR Table 4-5 & Figure 3-29 |
| H.4 Combined Flood Event: North of Turbine Building | 593.9 NGVD29 | 1.1 ft | 595.0 NGVD29 | FHRR Section 3.9.2.1.2 FHRR Table 4-5 & Figure 3-29 |

Note 1: The licensee is expected to develop flood event duration parameters and applicable flood associated effects to conduct the MSA. The staff will evaluate the flood event duration parameters (including warning time and period of inundation) and flood associated effects during its review of the MSA.

Note 2: Reevaluated hazard mechanisms bounded by the current design basis (see Table 1) are not included in this table

Note 3: Reported values are rounded to the nearest one-tenth of a foot.

If you have any questions, please contact me at (301) 415-2915 or e-mail at Victor.Hall@nrc.gov.

Sincerely,

***/RA/***

Victor E. Hall, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure:
Summary of Results of Flooding
Hazard Re-Evaluation Report

cc w/encl: Distribution via Listserv

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**ADAMS Accession Nos.:PKG ML15356A766; LTR: ML15356A765; ENCL: ML15344A080 *via email**

| OFFICE | NRR/JLD/JHMB/PM | NRR/JLD/LA | NRO/DSEA/RHM2/TR* |
|---|---|---|---|
| NAME | VHall | SLent | LHibler |
| DATE | 12/22/15 | 12/22/15 | 12/21/15 |
| OFFICE | NRO/DSEA/RHM1/BC* | NRR/JLD/JHMB/BC | NRR/JLD/JHMB/PM |
| NAME | CCook | MShams | VHall |
| DATE | 12/21/15 | 12/23/15 | 12/23/15 |

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