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10 CFR 50.4
10 CFR 50.54(f)

Serial: RA-18-0265

DEC 19 2018

United States Nuclear Regulatory Commission
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H. B. Robinson Steam Electric Plant, Unit No. 2
Docket Number 50-261/Renewed License Number DPR-23

Subject: RESPONSE TO MARCH 12, 2012 REQUEST FOR INFORMATION ENCLOSURE 2,
RECOMMENDATION 2.1, FLOODING; INTEGRATED ASSESSMENT SUBMITTAL

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 Number ML12056A046
2. NRC Letter, Supplemental Information Related to Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) regarding Flooding Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 1, 2013, ADAMS Accession Number ML13044A561
3. Duke Energy Letter, H. B. Robinson Steam Electric Plant, Unit No. 2, Flood Hazard Reevaluation Report, Response to NRC 10 CFR 50.54(f) 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, 2014, ADAMS Accession Number ML14086A384
4. Duke Energy Letter, H. B. Robinson Unit 2 - Submittal of Response to the NRC Request for Additional Information Regarding Flood Hazard Reevaluation Report, dated July 9, 2014, ADAMS Accession Number ML14206A787 (Non-Publicly Available)
5. Duke Energy Letter, Response to NRC Request for Additional Information Regarding H. B. Robinson Steam Electric Plant, Unit No. 2, Flood Hazard Reevaluation Report (FHRR), dated May 26, 2015, ADAMS Accession Number ML15146A390
6. Duke Energy Letter, Submittal of Revision to Flooding Hazard Reevaluation Report to Provide a Revised Site Specific Local Intense Precipitation Storm for H. B. Robinson Steam Electric Plant, Unit No. 2, dated August 29, 2015 ADAMS Accession Number ML15243A077 (Non-Publicly Available)
7. Duke Energy Letter, Submittal of Response to the NRC Request for Additional Information Regarding H. B. Robinson Steam Electric Plant, Unit No. 2, Flood Hazard Reevaluation Report Related to Selection of the Dam Breach Trigger Elevation, dated December 15, 2015, ADAMS Accession Number ML15349A796 (Non-Publicly Available)

8. NRC Letter, H. B. Robinson Steam Electric Plant, Unit 2 - Request for Additional Information Regarding Flood Hazard Reevaluation Report, dated June 18, 2014, ADAMS Accession Number ML14168A050
9. NRC email, Request for Additional Information - H.B. Robinson 2.1 Flood Hazard Reevaluation Report, dated March 4, 2015, ADAMS Accession Number ML15065A085
10. COMSECY-15-0019, Closure Plan for the Reevaluation of Flooding Hazard for Operating Nuclear Power Plants, dated June 30, 2015, ADAMS Accession Number ML15153A104
11. NRC Letter, Coordination of Requests for Information Regarding Flooding Hazard Reevaluations and Mitigating Strategies for Beyond-Design-Basis External Events, dated September 1, 2015, ADAMS Accession Number ML15174A257
12. NRC email, Robinson RAI regarding NTTF 2.1 Flooding, Duke, dated December 14, 2015, ADAMS Accession Number ML15348A340
13. NRC Letter, H. B. Robinson Steam Electric Plant, Unit No. 2 - Interim Staff Response to reevaluated Flood Hazards Submitted in Response to 10 CFR 50.54(f) Information Request - Flood Causing Mechanism Reevaluation, dated December 23, 2015, ADAMS Accession Number ML15357A065 (non-publicly Available)
14. Nuclear Energy Institute (NEI) Report, NEI 16-05, Revision 1, External Flooding Assessment Guidelines, dated June 2016
15. JLD-ISG-2016-01, Revision 0, Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation; Focused Evaluation and Integrated Assessment, dated July 11, 2016
16. NRC Letter, H. B. Robinson Steam Electric Plant, Unit No. 2 - Staff Assessment of Response to 10 CFR 50.54(f) Information Request - Flood Causing Mechanism Reevaluation, dated January 5, 2017, ADAMS Accession Number ML 16355A381
17. NRC Letter, H. B. Robinson Steam Electric Plant, Unit No. 2 – Flood Hazard Mitigation Strategies Assessment, dated May 9, 2018, ADAMS Accession Number ML17249A701 (non-publicly Available)

Ladies and Gentlemen:

On March 12, 2012, the NRC issued Reference 1, which requested information associated with Near-Term Task Force (NTTF) Recommendation 2.1 for flooding. One of the Required Responses in Reference 1 directed licensees to submit a Flood Hazard Reevaluation Report (FHRR) to reevaluate the flood hazards for their sites using present-day methods and guidance. For H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, the FHRR was submitted on March 12, 2014 (Reference 3). Additional information was provided with References 4 through 7, which were in response to References 8, 9 and 12. In accordance with Reference 2, the NRC considers the reevaluated flood hazard to be "beyond the current design/licensing basis of operating plants."

Following the Commission's directive to NRC Staff (Reference 10), the NRC issued a letter to industry (Reference 11) indicating that new guidance is being prepared to replace instructions and provide for a "graded approach to flooding reevaluations" and "more focused evaluations of local intense precipitation and available physical margin in lieu of proceeding to an integrated assessment."

The Nuclear Energy Institute (NEI) prepared NEI 16-05, "External Flooding Assessment Guidelines" (Reference 14). The NRC endorsed NEI 16-05 (Reference 15) and recommended changes, which have been incorporated into NEI 16-05, Revision 1. NEI 16-05 indicates that each flood-causing

mechanism not bounded by the Design Basis (DB) flood (using only stillwater and/or wind-wave runup level) should follow one of the following five assessment paths:

- Path 1: Demonstrate Flood Mechanism is Bounded Through Improved Realism
- Path 2: Demonstrate Effective Flood Protection
- Path 3: Demonstrate a Feasible Response to Local Intense Precipitation (LIP)
- Path 4: Demonstrate Effective Mitigation
- Path 5: Scenario-Based Approach

Non-bounded flood-causing mechanisms in Paths 1, 2 or 3, would only require a Focused Evaluation (FE) to complete the actions related to external flooding required by the March 12, 2012 10 CFR 50.54(f) letter (Reference 1). Mechanisms in Paths 4 or 5 require an Integrated Assessment (IA).

The reevaluated flood hazard, summarized by the NRC in References 13 and 16, was utilized as input to this Flooding Integrated Assessment. There are five mechanisms that were found to be not bounded by the plant's design basis. These mechanisms were evaluated for the need to improve realism as described in Section 6.1 of NEI 16-05, and in accordance with NEI 16-05 Appendix A Reduction of Conservatism (Reference 14). These mechanisms are listed below:

1. LIP
2. Upstream Dam Failures
3. Seiche
4. Storm Surge
5. Streams & Rivers

Regarding the LIP mechanism, the NEI 16-05, Appendix A process was followed with a site-specific storm and subsequently the FHRR was revised in December 2015 (Reference 7). Following the FHRR Revision, HBRSEP concluded that no further evaluation for improving realism in the LIP flooding mechanism was warranted. The most appropriate path for the LIP mechanism, crediting strategies in the Flood Mitigation Strategies Assessment, was determined to be NEI 16-05 Path 3. Enclosure 1 of this submittal addresses the site response to the LIP hazard.

The Upstream Dam Failures, Seiche, and Storm Surge flooding mechanisms are unbounded by the current design bases. Stillwater levels for these flooding mechanisms are below site grade, but the maximum water surface elevation including combined effects are above site grade. The Streams & Rivers mechanism is above site grade, and bounds all other flooding mechanisms, therefore, conservatism was re-evaluated for this mechanism. The Wind-Driven Wave (WDW) component in each of the combined effects scenarios were also re-evaluated. Enclosure 2 of this submittal describes the refinements to the Streams & Rivers Probable Maximum Flood (PMF) hazard and the changes to the WDW component. After improving realism in the controlling Streams & Rivers mechanism, it was determined the NEI 16-05 Path 5 Scenario Based Approach is the most appropriate path. Enclosure 3 describes the site response to the Streams & Rivers PMF hazard.

The Flooding FE and IA concludes that HBRSEP's response to non-bounded flood events ensure availability of all Key Safety Functions and includes a FLEX-based mitigation strategy. This submittal completes the actions related to external flooding required by the March 12, 2012 10 CFR 50.54(f) Request for Information letter (Reference 1).

This letter contains no new regulatory commitments. Please address any comments or questions regarding this submittal to Kevin Ellis, Manger – Nuclear Regulatory Affairs, at 843-951-1329.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 19 DEC 2018.

Sincerely,



Ernest J. Kapopoulos, Jr.
Site Vice President

EJK/jmw

Enclosures:

- 1: Demonstration of Feasible Response to the LIP Event (NEI 16-05 Path 3)
 - 2: Refinement to RNP FHRR Flooding in Streams & Rivers and Wind-Driven Wave Component
 - 3: Scenario-Based Approach on Streams & Rivers PMF with Combined Effects (NEI 16-05 Path 5)
- c: NRC Resident Inspectors, HBRSEP, Unit No. 2
Regional Administrator, NRC, Region II
Nate Jordan, NRC Project Manager, NRR