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CNS-17-029

10 CFR 50.4
10 CFR 50.54(f)

June 20, 2017

Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Duke Energy Carolinas, LLC
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414
Renewed License Nos. NPF-35 and NPF-52

Subject: Catawba Nuclear Station Flood Hazard Mitigating Strategies Assessment (MSA)
Report 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 ML12053A340).
2. Duke Energy Letter, Flood Hazard Reevaluation Report, Response to NRC 10 CFR 50.54(f) Request for Additional 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 ML14077A054).
3. NRC Letter, Catawba Nuclear Station, Units 1 and 2 - Interim Staff Response to Reevaluated Flood Hazards Submitted in Response to the 10 CFR 50.54(f) Information Request - Flood-Causing Mechanism Reevaluation, dated October 5, 2015 (ADAMS Accession Number ML15278A028).
4. NRC Letter, Catawba Nuclear Station, Units 1 and 2, - Revised Interim Staff Response to Reevaluated Flood Hazards Submitted in Response to the 10 CFR 50.54(f) Information Request - Flood-Causing Mechanism Reevaluation, dated December 21, 2015 (ADAMS Accession Number ML15352A192).

**Enclosures 1 and 2 contain Security Sensitive Information;
Withhold from public per 10 CFR 2.390
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5. Duke Energy Letter, Final Notification of full Compliance with Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events" and with Order EA-12-051, "Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" for Catawba Nuclear Station, dated February 15, 2016 (ADAMS Accession Number ML16049A041).
6. Duke Energy Letter, Additional Information Regarding Flood Hazard Reevaluation Report, Response to Request for Information Pursuant to Title 10 of the Code of the 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 June 23, 2016 (ADAMS Accession Number ML16179A196).
7. NRC Letter, Catawba Nuclear Station, Units 1 and 2 - Staff Assessment of Response to 10 CFR 50.54(f) Information Request - Flood-Causing Mechanism Reevaluation, dated September 30, 2016 (ADAMS Accession Number ML16251A281).
8. NRC Staff Requirements Memoranda to COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards", dated March 30, 2015 (ADAMS Accession Number ML15089A236).
9. Nuclear Energy Institute (NEI), Report NEI 12-06 [Rev 2], Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, dated December 2015 (ADAMS Accession Number ML16005A625).
10. U.S. Nuclear Regulatory Commission, JLD-ISG-2012-01, Revision 1, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design-Basis External Events, dated January 22, 2016 (ADAMS Accession Number ML15357A163).
11. United States Nuclear Regulatory Commission, NUREG/CR-7046, Design-Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America, date published November 2011 (ADAMS Accession Number ML11321A195).

On March 12, 2012, the NRC issued Reference 1 to request for information associated with Near-Term Task Force (NTTF) Recommendation 2.1 for Flooding. Enclosure 2 to the 50.54(f) letter requested that licensees reevaluate flood hazards for their respective sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits (ESPs) and combined licenses (COLs). By letter dated March 12, 2014 (Reference 2), Duke Energy provided its Flooding Hazard Reevaluation Report (FHRR) for Catawba Nuclear Station, Units 1 and 2 (CNS).

Concurrent to the flood hazard reevaluation, CNS developed and implemented mitigating strategies in accordance with NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events." The Final Integrated Plan provides a summary of the Mitigation Strategies (Reference 5). In Reference 8, the Commission affirmed that licensees need to address the reevaluated flooding hazards within their mitigating strategies for Beyond Design Basis external events. Guidance for performing mitigating strategies assessments (MSAs) is contained in Appendix G of Reference 9, endorsed by the NRC (with conditions) in Reference 10.

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On October 5, 2015 (Reference 3), the NRC issued an Interim Staff Response (ISR) letter for CNS. A revised ISR letter for CNS was issued on December 21, 2015 (Reference 4). The December 21, 2015, letter supersedes the October 5, 2015, letter. The purpose of the ISR letter was to inform CNS that the flood hazard information provided was suitable for the assessment of the mitigating strategies developed in response to Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events." The reevaluated flood hazard results for Local Intense Precipitation (LIP); streams and rivers (referred to as "Flooding in Reservoirs" in the CNS FHRR); Probable Maximum Flood (PMF); and dam failures and Combined Effects (CE) were not bounded by the current design basis flood hazard. In response to the unbounded flood-causing mechanism, Duke Energy has completed an assessment of the mitigation strategies developed in response to Order EA-12-049 (Enclosure 1).

By letter dated June 23, 2016 (Reference 6), Duke Energy advised the NRC that a refinement to the Combined Effects (CE) PMF flooding mechanism in the original CNS FHRR was in process utilizing the Hierarchical Hazard Assessment (HHA) as described in NUREG/CR-7046 (Reference 11). The purpose of this refined analysis was to more accurately characterize the Probable Maximum Precipitation (PMP) for the Catawba-Wateree river basin. In addition, a more appropriate method to model precipitation losses to compute runoff in conjunction with the re-evaluation of Combined Effects, Appendix H, of NUREG/CR-7046 (Reference 11) was performed. A summary of this refined analysis is provided in Enclosure 2.

Based on the refined analysis from the HHA process, the only flooding mechanisms that are not bounded by the Current Design Basis for CNS are the following:

1. LIP – not refined from the original FHRR, i.e. results are the same as the original FHRR
2. Dam Failures – results provided in Table 2 of Enclosure 2 from refinement through HHA process
3. Combined Effects at Lake Wylie CNS Intake – Table 2 of Enclosure 2 from refinement through HHA process

In accordance with Enclosure 2 results, the Streams and Rivers (also referred to as Flooding in Reservoirs) event is now bounded by the Current Design Basis. The flooding mechanisms for Dam Failures and Combined Effects (Items 2 and 3 above) do not impact the CNS site due to the topography between the plant yard and Lake Wylie. The reevaluated LIP flood hazard results indicate that the yard inundation would impact the Auxiliary Building. Water intrusion through Auxiliary Building doors could affect plant equipment relied upon for the FLEX strategy. CNS will implement modifications to the FLEX strategies, so that the FLEX strategies can be performed during the LIP event.

Enclosure 1 to this letter provides the Mitigating Strategies Assessment for the CNS Flooding Report. The overall FLEX planned response to an Extended Loss of All AC Power (ELAP) and Loss of Ultimate Heat Sink (LUHS) will be initiated through normal plant command and control procedures and practices. Site Emergency Operating Procedures (EOPs) or Abnormal Operating Procedures (AOPs) govern the operational response. The FLEX Support Guidelines (FSGs) will provide direction for using FLEX equipment in maintaining or restoring key safety functions. Therefore, the FLEX strategies can be deployed and implemented as modified for all applicable flood-causing mechanisms.

The FHRR submittal (Reference 2) also provided a list of interim actions taken along with the dates these actions were implemented as regulatory commitments to address plant-specific

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vulnerabilities. The intent of these actions was to enhance the current capability to maintain the plant in a safe condition during the beyond-design-basis external flooding events that exceed the current design basis flood levels while completing additional assessments and evaluations. Duke Energy also committed not to modify any of these interim actions or completion dates without notifying the NRC in advance. By copy of this letter, Duke Energy is providing advance notification that interim actions as discussed in the FHRR Submittal will be terminated on July 20, 2017.

There are no new regulatory commitments associated with this letter. Please address any comments or questions regarding this matter to Cecil A. Fletcher II, Nuclear Regulatory Affairs Manager, at (803) 701-3622.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 20, 2017.

Sincerely,



Tom Simril
Vice President, Catawba Nuclear Station

Enclosures:

1. Mitigating Strategies Assessment for Flooding
2. Refinement to CNS FHRR Flooding in Reservoirs, Dam Failures & Combined Effects Pursuant to 10 CFR 50.54(f) Regarding the Fukushima Near-Term Task Force Recommendation 2.1

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