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

March 13, 2018

Mr. J. J. Hutto
Regulatory Affairs Director
Southern Nuclear Operating Co., Inc.
P.O. Box 1295 /BIN B038
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION (CAC NOS. MF9687 AND MF9868; EPID NOS. 000495/05000321/L-2017-JLD-0029 AND 000495/05000366/L-2017-JLD-0029)

Dear Mr. Hutto:

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f), "Conditions of Licenses" (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807). Enclosure 2 to the 50.54(f) letter requested that licensees reevaluate flood hazards for their sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). By letter dated March 6, 2014 (ADAMS Accession No. ML14069A054), Southern Nuclear Operating Company, Inc. (SNC, the licensee) responded to this request for Edwin I. Hatch Nuclear Plant, Units 1 and 2 (Hatch).

After its review of the licensee's response, by letter dated December 4, 2015 (ADAMS Accession No. ML15321A156), the NRC issued an interim staff response (ISR) letter for Hatch. The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the current design basis (CDB) for Hatch and parameters that are suitable for other assessments associated with NTTF Recommendation 2.1 "Flooding". As stated in the letter, because the local intense precipitation (LIP) and Combined Effects Flooding (Probable Maximum Flood (PMF) with upstream dam overtopping with wind-induced waves) are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms are necessary.

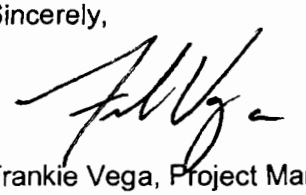
Enclosure 1 transmitted herewith contains Security-Related Information. When separated from Enclosure 1, this document is decontrolled.

By letter dated June 22, 2017 (ADAMS Accession No. ML17173A777), the licensee submitted the focused evaluation (FE) for Hatch. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the ISR letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is local intense precipitation. The purpose of this letter is to provide the NRC's assessment of the Hatch FE.

As set forth in the attached staff assessment, the NRC staff has concluded that the Hatch FE was performed consistent with the guidance described in Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178). Guidance document NEI 16-05, Revision 1, has been endorsed by Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). The NRC staff has further concluded that the licensee has demonstrated that effective flood protection, if appropriately implemented, exists for the LIP and Combined Effects Flooding mechanisms during a beyond-design-basis external flooding event at Hatch. This closes out the licensee's response for Hatch for the reevaluated flooding hazard portion of the 50.54(f) letter and the NRC's efforts associated with CAC Nos. MF9687 and MF9868.

If you have any questions, please contact me at 301-415-1617 or at Frankie.Vega@nrc.gov.

Sincerely,



Frankie Vega, Project Manager
Beyond-Design-Basis Management Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

Enclosures:
1. Staff Assessment Related to the Flooding Focused Evaluation for Hatch (non-public)
2. Staff Assessment Related to the Flooding Focused Evaluation for Hatch (public)

Docket Nos: 50-321 and 50-366

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STAFF ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO THE FOCUSED EVALUATION FOR EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2 AS A RESULT OF THE REEVALUATED FLOODING HAZARD NEAR-TERM TASK FORCE RECOMMENDATION 2.1 - FLOODING (CAC NOS. MF9687 AND MF9868)

1.0 INTRODUCTION

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807).

Enclosure 2 of 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 and combined licenses (ADAMS Accession No. ML12056A046). If the reevaluated hazard for any flood-causing mechanism is not bounded by the plant's current design basis (CDB) flood hazard, an additional assessment of plant response would be necessary. Specifically, the 50.54(f) letter stated that an integrated assessment should be submitted, and described the information that the integrated assessment should contain. By letter dated November 30, 2012 (ADAMS Accession No. ML12311A214), the NRC staff issued Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding."

On June 30, 2015 (ADAMS Accession No.ML15153A104), the NRC staff issued COMSECY-15-0019, describing the closure plan for the reevaluation of flooding hazards for operating nuclear power plants. The Commission approved the closure plan on July 28, 2015 (ADAMS Accession No. ML15209A682). COMSECY-15-0019 outlines a revised process for addressing cases in which the reevaluated flood hazard is not bounded by the plant's CDB. The revised process describes a graded approach in which licensees with hazards exceeding their CDB flood will not be required to complete an integrated assessment, but instead will perform a focused evaluation (FE). As part of the FE, licensees will assess the impact of the hazard(s) on their site and then evaluate and implement any necessary programmatic, procedural, or plant modifications to address the hazard exceedance.

Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178), has been endorsed by the NRC as an appropriate methodology for licensees to perform the focused evaluation in response to the 50.54(f) letter.

The NRC's endorsement of NEI 16-05, including exceptions, clarifications, and additions, is described in NRC JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). Therefore, NEI 16-05, Revision 1, as endorsed, describes acceptable methods for demonstrating that Edwin I. Hatch, Units 1 and 2 (Hatch) has effective flood protection.

2.0 BACKGROUND

This document provides the final NRC staff assessment associated with the information that the licensee provided in response to the reevaluated flooding hazard portion of the 50.54(f) letter. Therefore, this background section includes a summary description of the reevaluated flood information provided by the licensee and the associated assessments performed by the NRC staff. The reevaluated flood information includes: 1) the flood hazard reevaluation report (FHRR); 2) the mitigation strategies assessment (MSA); and 3) the focused evaluation.

Flood Hazard Reevaluation Report

By letter dated March 6, 2014 (ADAMS Accession No. ML14069A054), as supplemented by letters dated August 6, 2014, June 3, 2015, and March 7, 2016 (ADAMS Accession Nos. ML14219A570 (non-public), ML15154B601 (non-public), and ML16069A088 (non-public), respectively), Southern Nuclear Operating Company, Inc. (SNC, the licensee) submitted its FHRR for Hatch. After its review of the licensee's response, by letter dated December 4, 2015 (ADAMS Accession No. ML15321A156), the NRC issued an interim staff response (ISR) letter for Hatch. The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the current design basis (CDB) for Hatch and parameters that are suitable for the mitigating strategies assessment (MSA) and the FE. As stated in the letter, because the local intense precipitation (LIP), flooding in rivers and streams, and failures of dams and onsite water control structures flooding mechanisms are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms are necessary. The NRC staff issued a final staff assessment of the FHRR in a letter dated October 11, 2016 (ADAMS Accession No. ML16237A095). The NRC staff's conclusions regarding LIP, flooding in rivers and streams, failures of dams and onsite water control structures exceeding the Hatch CDB remained unchanged from the information provided in the ISR letter.

Mitigation Strategies Assessment

By letter dated December 16, 2016 (ADAMS Accession No. ML16351A087), SNC submitted the Hatch MSA for review by the NRC staff. The MSAs are intended to confirm that licensees have adequately addressed the reevaluated flooding hazards within their mitigation strategies for beyond-design-basis external events. By letter dated April 13, 2017 (ADAMS Accession No. ML17069A234), the NRC issued its assessment of the Hatch MSA. The NRC staff concluded that the Hatch MSA was performed consistent with the guidance described in Appendix G of NEI 12-06, Revision 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" (ADAMS Accession No. ML16005A625). The NRC's endorsement of NEI 12-06, Revision 2, is described in JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15357A163). The NRC staff further concluded that the licensee has demonstrated that the mitigation strategies, if appropriately implemented, are reasonably protected from reevaluated flood hazards conditions for beyond-design-basis external events.

Focused Evaluation

By letter dated June 22, 2017 (ADAMS Accession No. ML17173A777), the licensee submitted the FE for Hatch. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the ISR letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is local intense precipitation. These 3 options associated with performing an FE are referred to as Path 1, 2, or 3, as described in NEI 16-05, Revision 1. The purpose of this staff assessment is to provide the results of the NRC's evaluation of the Hatch FE.

3.0 TECHNICAL EVALUATION

The licensee stated that its FE followed Path 2 of NEI 16-05, Revision 1 and utilized Appendix B for guidance on evaluating the site strategy. The following flooding mechanisms from the FHRR were not bounded by the CDB: LIP; flooding in rivers and streams (all season probable maximum flood (PMF) with a 1/2 PMF antecedent storm); seismic upstream dam failure; PMF with upstream overtopping dam failure; and combined effects flooding (CEF) (PMF with upstream dam failure with wind-induced waves). In its MSA, the licensee states that three of these mechanisms have maximum flooding elevations that are below the elevation of the intake structure and power block and are therefore not required to be further evaluated in the MSA. The NRC agreed with this assessment for flooding in rivers and streams (all season PMF with a 1/2 PMF antecedent storm), seismic upstream dam failure, and PMF with upstream overtopping dam failure and no further flooding evaluations are required for these flooding mechanism. Further evaluation of the LIP and CEF protection features was provided by Hatch in its FE. This technical evaluation will address the following topics: characterization of flood parameters; evaluation of flood impact assessments; evaluation of available physical margin; reliability of flood protection features; and overall site response.

3.1 Characterization of Flood Parameters

Associated effects (AEs) and flood event duration (FED) parameters were assessed by SNC and have already been reviewed by the NRC, as summarized by letter dated October 11, 2016 (ADAMS Accession No. ML16237A095), and letter dated April 13, 2017 (ADAMS Accession No. ML17069A234). The licensee used the AE and FED parameters as input to the Hatch FE and concluded that the site's flood strategy is effective in protecting structures, systems, and components (SSCs) that support key safety functions (KSFs). The licensee supported its conclusion of adequate flood protection by demonstrating adequate available physical margin (APM) and reliable flood protection features for LIP and CEF. In its FE for Hatch, SNC indicated that the site does not require manual actions by plant personnel to protect key SSCs; therefore, an evaluation of the overall site response was not necessary.

The Hatch plant grade and floor elevations for the power block (Reactor, Turbine and Control buildings) are 130 feet (ft.) National Geodetic Vertical Datum of 1929 (NGVD29). Table 3.1 of this assessment provides the maximum exterior water surface elevations for the two reevaluated flood mechanisms in the FE. For the LIP condition, the licensee relies on permanent passive flood protection features such as doors, to demonstrate that adequate protection is available. For the CEF, the stillwater elevation is [redacted] NGVD29 and with wind induced waves the flood height is [redacted] NGVD29, which has the potential to impact

the intake structure with plant elevation of 111 ft. NGVD29, but not the power block. The potential impacts from this flooding-causing mechanisms were further evaluated by SNC as part of the Hatch FE.

Table 3.1 Summary of Reevaluated Flood Hazards Elevations Included in the Hatch FE.

Mechanism	Stillwater Elevation	Wind-Wave Run up
Local Intense Precipitation		
Control Building	130.5 ft. NGVD29	N/A
Intake Structure	111.2 ft. NGVD29	N/A
Diesel Generator Building	130.2 ft. NGVD29	N/A
Turbine and Reactor Building	130.4 ft. NGVD29	N/A
Combined Effect Flood (PMF with overtopping dam failure with wind-induced waves)	[redacted] NGVD29]]	[redacted] NGVD29]]

3.2 Evaluation of Flood Impact Assessment for LIP

3.2.1 Description of Impact of Unbounded Hazard

The Hatch FE identified the potential impacts on key SSCs as a result of water ingress due to LIP. The beyond-design-basis (BDB) LIP event leads to flood water surface elevations above the plant floor elevations at some locations. In order to assess the impacts of the unbounded flood levels, the licensee identified the maximum water surface elevations at the exterior door openings, maximum flood depths above the door threshold, and duration of when the flood levels are above the door threshold. With this information, the licensee assessed the impacts of water ingress and potential for accumulation into rooms housing key SSCs.

The licensee's evaluation indicated that the LIP mechanism will produce ingress of flood waters through several doors that could impact key SSCs in the main power block. The licensee determined that water must enter the power block buildings through open pathways at 130.0 ft. NGVD29 since all the penetrations below 130 ft. NVGD29 were inspected and confirmed sealed during the Recommendation 2.3 Flooding Walk downs. Therefore, the licensee identified the door characteristics, such as gap dimensions, and floor areas to determine water accumulation at floor elevations of 130 ft. NGVD29. In addition, the licensee assumed that all water volume used to evaluate flood height at the 130 ft. floor area will enter the Turbine and Control Buildings and flood their basement floors (112 ft. NGVD29 elevation). After determining the water accumulation on floor areas, the licensee compared the flooding height with the minimum elevations of key SSCs housed in each area.

The licensee concluded that:

- Flood water ingress due to the LIP flood would not impact the plant's key safety functions because the estimated water accumulation would not reach the elevation of key SSCs at the Reactor, Turbine and Control buildings; and

- Water was determined to not accumulate in the Intake Structure due to building configuration and site topography that will drain water back to the river.

The NRC staff reviewed the information provided by the licensee in order to ensure that adequate flood parameters were used for the calculation of water ingress and water accumulation. Specifically, the NRC staff verified that the assumed duration of flooding above threshold elevation was consistent with previous information reviewed by the staff for the Hatch FHRR and MSA.

3.2.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

The licensee relies on passive features and existing doors to justify that there is available margin using a deterministic approach. Therefore, the licensee evaluated the key SSC elevations when compared to water ingress accumulation from exterior doors to obtain the APM.

Water Ingress through Exterior Doors

The licensee determined the lowest elevations (equipment is raised off the floor) of key SSCs needed for safe shutdown. These elevations are shown below:

- Reactor Building, Units 1 and 2, 130 ft. NGVD29 elevation: 4 inches
- Turbine and Control Building, Unit 1, 130 ft. NGVD29 elevation: 3 inches;
- Turbine and Control Building, Unit 2, 130 ft. NGVD29 elevation: 4 inches; and
- Turbine and Control Building, Unit 1 and 2, 112 ft. NGVD29 elevation: 1 inch.

The licensee estimated the accumulation of flood water due to LIP water ingress as follows:

- Reactor Building- Licensee assumed that all Unit 2 Truck Bay flooding volume will enter the Reactor Building in Unit 2, creating an estimated flooding depth of 0.03 feet when distributed over the Reactor Building, Unit 2 area of 17,446 $ft.^2$. The licensee determined that the .03 feet of flood height is well below the lowest key SSC which is located 0.33 ft. (4 inches) off the finished floor.
- Turbine and Control Buildings- Licensee estimated the flooding depths on the 130 ft. NGVD29 elevation to be 0.05 ft. (0.64 inches). The licensee determined that the flooding height is well below the lowest elevation of the key SSCs which are raised at 3.0 inches or higher off the floor. The flooding depths in the Turbine and Control Building on the 112 ft. NGVD29 elevation were estimated to be 0.04 ft. (0.47 inches). The licensee determined that the flooding height is below the lowest elevation of the key SSCs which are 1.0 inch off the floor.

As a result, the licensee concluded that adequate APM exits based on the high factor of safety associated with the computation of the flooding depths and the lowest elevations where the key SSCs would be impacted. Furthermore, the licensee stated that several conservative assumptions were made in the estimation of water ingress, such as not crediting storm drains in the computation of water heights at the exterior doors and not considering the reduction due to water leakage through doors during the time of inundation.

The NRC staff concludes, based on the information provided by SNC, that adequate margin exists for the reevaluated LIP mechanism. The calculation assumed that the water head at the exterior doors was at its maximum height over the entire duration of the event, and treated the door gap as a sluice gate to obtain the estimated flow. Therefore, the NRC staff agrees that the licensee's estimation of water accumulation is conservative. Therefore, the NRC staff concludes that the licensee has demonstrated that adequate passive features exist to provide flood protection of key SSCs.

Evaluation of Reliability of Protection Features

Hatch relies on permanent passive flooding protection features such as exterior doors to provide protection for flooding from LIP. The licensee evaluated the ability of these passive engineering features to protect key SSCs by limiting floodwater inflow into plant floors during the LIP flood conditions through engineering evaluations. The reliability of the doors to withstand the pressure from floodwater was not specifically evaluated by Hatch. Because the exterior water depths at the doors is relatively small, in the order of inches, the NRC staff used engineering judgment to conclude that the design capacity of the doors should not be compromised and that the doors are a reliable passive protection feature.

The NRC staff performed an audit of SNC calculation SCNH-16-007, "MSA Hazard Evaluation", Version 1.0 dated December 14, 2016, in accordance with an NRC audit plan dated July 18, 2017 (ADAMS Accession No. ML17192A452). Based on the audit of this calculation, the NRC staff concludes that there is reasonable assurance that areas containing key SSCs will not be adversely impacted by water ingress from the LIP reevaluated hazard, and that the flood protection features associated with key SSCs will ensure their continued function in the event of LIP.

In addition, the licensee indicated that credited flood protection features are passive features that are checked as part of normal operator rounds. Therefore, the NRC staff concludes, with the information provided by the licensee as the basis, that the above-mentioned passive features are evaluated by an appropriate maintenance and inspection regime to ensure they will continue to be available to perform their intended flood protection function.

Because increased focus has been placed on flood protection since the accident at Fukushima, licensees and NRC inspectors have identified deficiencies with equipment, procedures, and analyses relied on to either prevent or mitigate the effects of external flooding at a number of licensed facilities. Recent examples include those found in Information Notice 2015-01, "Degraded Ability to Mitigate Flooding Events" (ADAMS Accession No. ML14279A268). In addition, the NRC is cooperatively performing research with the Electric Power Research Institute to develop flood protection systems guidance that focuses on flood protection feature descriptions, design criteria, inspections, and available testing methods in accordance with a memorandum of understanding dated September 28, 2016 (ADAMS Accession No. ML16223A495). The NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis. The NRC staff further expects that continued research involving flood protection systems will be performed and shared with licensees in accordance with the guidance provided in Management Directive 8.7, "Reactor Operating Experience Program" (ADAMS Accession No. ML122750292), as appropriate.

The NRC staff concludes that the Hatch flood protection features described above are reliable to maintain key safety functions as defined in Appendix B of NEI 16-05, Rev 1.

3.2.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the BDB LIP event. As described above, the licensee's evaluation relied on passive existing flood protection features to demonstrate adequate flood protection; therefore, there is no need to review overall site response.

3.3 Evaluation of Flood Impact Assessment for combined effects flooding (PMF with upstream dam failure with wind-induced waves)

3.3.1 Description of Impact of Unbounded Hazard

As described in the FE, the stillwater elevation from the CEF mechanism is [redacted] NGVD29 and the maximum flood elevation including wind-induced waves is [redacted] NGVD29. The licensee indicates that the primary feature protecting the site from the reevaluated flood hazard along the Altamaha River is site topography and grading. Since the main power block buildings (i.e., Reactor, Turbine, and Control Buildings) are located at elevation 130 ft. NGVD29, no impacts were identified on key SSCs located in such buildings. Therefore, for the main power block, the licensee calculated an APM of [redacted] for stillwater and [redacted] NGVD29)]] for wind-wave run-up.

For the Intake Structure, the wind-induced waves exceed the Intake Structure elevation of 111 feet NGVD29. The intake structure houses the Plant Service Water and Residual Heat Removal pumps, both key SSCs required for shutdown. However, the licensee indicates that the reevaluated CEF mechanism does not impact key SSCs at the Intake structure because: 1) the bathymetry of the site will allow the waves to break before impacting the intake structure; 2) the Intake Structures doors are placed in labyrinth offsets and are weather-stripped; and 3) in the case of water ingress the floor gratings will drain the water into a pit that houses two submersible water pumps that will drain the water out. Therefore, for the Intake Structure, the licensee calculated an APM of [redacted] for stillwater and qualitatively considered a justification of adequate APM for the wind wind-wave run-up given the protection features described above. As a result, the licensee concluded that the CEF mechanism has no impacts to key SSCs.

3.3.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

As described above, the licensee calculated an APM for the main power block of [redacted] for stillwater and [redacted] for wind-wave run-up. The licensee calculated an APM of [redacted] for stillwater and qualitatively considered a justification of adequate APM for the wind wind-wave run-up given the protection features on the Intake Structure. The licensee also stated that there would be no impact to the structural integrity of the Intake Structure from the reevaluated CFE mechanism.

The NRC staff reviewed the APM calculation and concludes, based on the information provided by SNC, that adequate margin exists for the reevaluated CEF mechanism. The natural topography around the site provides effective flood protection against the CEF, with adequate margin. Furthermore, the NRC staff reviewed the methodology used to evaluate the structural

integrity of the walls and foundations from the increased flood/wave heights elevation and found it to be acceptable.

Evaluation of Reliability of Protection Features

Hatch relies on the natural topography around the site to provide protection from the reevaluated CEF conditions. For the main power block, the site topography provides adequate APM for buildings housing key SSCs. Since this feature is already credited as part of the Hatch design-basis flood protection, the NRC staff concludes that a reliability analysis of these features is not necessary in accordance with the guidance found in NEI 16-05, Revision 1.

For the Intake Structure, Hatch relies on passive features such as the configuration of doors and drainage capabilities around the Intake Structure. Furthermore, Hatch evaluated the structural integrity of the Intake Structure through engineering evaluations to verify that the loads from the reevaluated CFE will not affect the structural integrity of the walls. This calculation was provided as part of SNC calculation SCNH-16-007, "MSA Hazard Evaluation", Version 1.0 dated December 14, 2016. The licensee evaluated the loads imposed on the structural walls of the Intake Structure and concluded that it will not create any impacts. The licensee determined that the maximum hydrostatic pressure and force on the Intake Structure walls due to the CEF mechanism is [redacted], respectively. In addition, the maximum hydrodynamic pressure and force on the Intake Structure walls due to breaking wave is 4,312 lb/ft.^{2} and 93,648 lb/ft., respectively. With this information, the licensee concluded that the maximum hydrodynamic and hydrostatic pressures are less than the concrete strength of 4,000 pounds per square inch (psi) (or 576,000 lb/ft.^{2}) at the Intake Structure. Based on the audit of this calculation, the NRC staff concludes that there is reasonable assurance that the Intake Structure has adequate flood protection such that its functions will not be adversely impacted by the CFE reevaluated hazard.

As noted in Section 3.2.2 of this document, the NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis. The NRC staff concludes that the Hatch flood protection features described above are reliable to maintain key safety functions as defined in Appendix B of NEI 16-05, Rev 1.

3.3.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the BDB Probable Maximum Storm Surge event. As described above, the licensee's evaluation relied on passive existing features to demonstrate adequate flood protection. Therefore, there is no need to review overall site response.

4.0 AUDIT REPORT

The July 18, 2017, generic audit plan describes the NRC staff's intention to issue an audit report that summarizes and documents the NRC's regulatory audit of the licensee's FE. The NRC staff's Hatch audit was limited to the review of the calculation number SCNH-16-007, "MSA Hazard Evaluation", Version 1.0 dated December 14, 2016, and drawings listed at the end of this section. Because this staff assessment appropriately summarizes the results of the audit, the NRC staff concludes a separate audit report is not necessary, and that this document serves as the audit report described in the staff's July 18, 2017, letter.

- Drawing H-12192 Version 11.0, "Edwin I. Hatch Nuclear Plant Unit No. 1 Outdoor Concrete Intake Structure General Arrangement," February 12, 1971.

- Drawing E-10173 Version 23.0, "Edwin I. Hatch Nuclear Plant Unit No. 1 & 2 General Building Site Plan."

- Drawing H-21102 Version 20.0, ""Edwin I. Hatch Nuclear Plant Unit No. 2 Piping-Service Water at River Intake Structure," April 7, 1971.

- Drawing H12610 Version 5.0, ""Edwin I. Hatch Nuclear Plant Unit No. 1 Architectural River Intake Structure Pump Room-Plans, Elevations & Details," September 29, 2009.

5.0 CONCLUSION

The NRC staff concludes that SNC performed the Hatch FE in accordance with the guidance described in NEI 16-05, Revision 1, as endorsed by JLD-ISG-2016-01, and that the licensee has demonstrated that effective flood protection exists against the reevaluated flood hazards. Furthermore, the NRC staff concludes that Hatch screens out of performing an integrated assessment based on the guidance found in JLD-ISG-2016-01. As such, in accordance with Phase 2 of the process outlined in the 50.54(f) letter, additional regulatory actions associated with the reevaluated flood hazard, beyond those associated with mitigation strategies assessment, are not warranted. The licensee has satisfactorily completed providing responses to the 50.54(f) activities associated with the reevaluated flood hazards.

SUBJECT: EDWIN I. HATCHNUCLEAR PLANT, UNITS 1 AND 2 – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION DATED MARCH 13, 2018

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ADAMS Accession Nos.: PKG ML18030B055; ML18029A915 (NON-PUBLIC); ML18030B076 (PUBLIC) ***via email**

OFFICE	NMSS/FCSS/PORSB*	NRR/DLP/PBMB/PM	NRR/DLP/PBMB/LA
NAME	JMarcano	FVega	SLent
DATE	01/26/2018	02/28/2018	01/30/2018
OFFICE	NRR/DLP/PBMB/BC(A)	NRR/DLP/PBMB/PM	
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