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

April 12, 2018

Mr. Christopher Church
Site Vice President
Northern States Power Company –
Minnesota
Monticello Nuclear Generating Plant
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION (CAC NO. MF9872; EPID NO. L-2017-JLD-0006)

Dear Mr. Church:

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, under 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 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. ML12056A048). By letter dated May 12, 2016 (ADAMS Accession No. ML16145A179), Northern States Power Company - Minnesota (the licensee) responded to this request for Monticello Nuclear Generating Plant, (Monticello).

After its review of the licensee's response, on September 16, 2016 (ADAMS Accession No. ML16248A003), the NRC issued an interim staff response (ISR) letter for Monticello. The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the current design basis (CDB) for Monticello and parameters that are a suitable input for the mitigating strategies assessment. As stated in this letter, because the local intense precipitation (LIP) flood-causing mechanism at Monticello is not bounded by the plant's CDB, additional assessments of this flood hazard mechanism are necessary.

By letter dated April 3, 2017 (ADAMS Accession No. ML17093A871), the licensee submitted a focused evaluation (FE) for Monticello. 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 a 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 LIP. The purpose of this letter is to provide the NRC's assessment of the Monticello FE.

The NRC staff concludes that the Monticello 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 the NRC in 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 further concludes that the licensee has demonstrated that they have effective flood protection during beyond-design-basis external flooding events at Monticello. This closes out the licensee's response for Monticello for the reevaluated flooding hazard portion of the 50.54(f) letter and the NRC's efforts associated with CAC No. MF9872 and EPID No. L-2017-JLD-0006.

If you have any questions, please contact me at 301-415-2833 or by e-mail at Peter.Bamford@nrc.gov.

Sincerely,

Peter J. Bamford, Senior Project Manager
Beyond-Design-Basis Management Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

Enclosure:
Staff Assessment Related to the
Flooding Focused Evaluation for Monticello

Docket No: 50-263

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STAFF ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE FOCUSED EVALUATION FOR

MONTICELLO NUCLEAR GENERATING PLANT

AS A RESULT OF THE REEVALUATED FLOODING HAZARD NEAR-TERM TASK FORCE

RECOMMENDATION 2.1 - FLOODING

CAC NO. MF9872; EPID L-2017-JLD-0006

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, under 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. ML12056A048). 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 states that an integrated assessment should be submitted, and describes 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 Project Directorate (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 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 Monticello Nuclear Generating Plant (Monticello) has effective flood protection.

2.0 BACKGROUND

This NRC staff assessment is the last 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, the background section includes a discussion of the reevaluated flood information provided by the licensee and the associated staff assessments. The reevaluated flood information includes: 1) the flood hazard reevaluation report (FHRR); 2) the mitigation strategies assessment (MSA); and 3) the FE.

Flood Hazard Reevaluation Report

By letter dated May 12, 2016 (ADAMS Accession No. ML16145A179), Northern States Power – Minnesota (NSPM, the licensee), doing business as Xcel Energy, responded to the 50.54(f) letter for Monticello and submitted its FHRR. After reviewing the licensee's response, the NRC issued an interim staff response (ISR) letter for Monticello on September 16, 2016 (ADAMS Accession No. ML16248A003). The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the CDB for Monticello and parameters that are a suitable input for the MSA. As stated in the letter, because the local intense precipitation (LIP) flood-causing mechanism at Monticello is not bounded by the plant's CDB, additional assessments of this flood hazard mechanism are necessary. The staff issued a final staff assessment of the FHRR by letter dated April 24, 2017 (ADAMS Accession No. ML17104A310). In this assessment, the staff's conclusions regarding LIP exceeding the Monticello CDB remained unchanged from the information provided in the NRC's ISR letter.

Mitigation Strategies Assessment

By letter dated March 28, 2017 (ADAMS Accession No. ML17087A343), NSPM submitted the MSA for Monticello. The MSAs are intended to confirm that licensees have adequately addressed the reevaluated flooding hazards within their mitigating strategies for beyond-design-basis external events. By letter dated August 1, 2017 (ADAMS Accession No. ML17192A468), the NRC issued its assessment of the Monticello MSA. The NRC staff concluded that the Monticello MSA was performed consistent with the guidance described in Appendix G of Nuclear Energy Institute 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 appear to be reasonably protected from reevaluated flood hazard conditions for beyond-design-basis external events.

Focused Evaluation

By letter dated April 3, 2017 (ADAMS Accession No. ML17093A871), the licensee submitted its FE for Monticello. 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 a 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 LIP. These 3 options associated with performing an FE are referred to as Path 1, 2, or 3, respectively, 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 Monticello 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. As described in the ISR letter, the LIP flooding mechanism was found to exceed the plant's CDB flood at Monticello, and was addressed by NSPM in the Monticello FE. Therefore, consistent with NEI 16-05, Appendix B, this technical evaluation will address the following topics: characterization of flood parameters; evaluation of flood impact assessments; evaluation of available physical margin (APM); reliability of flood protection features; and overall site response.

3.1 Characterization of Flood Parameters

The calculated water levels from a LIP event are below the controlling CDB event, which is a slowly developing probable maximum flood (PMF) on the Mississippi River. For the CDB PMF-based flooding event, protection for the site depends on installing temporary features such as a bin wall extension and a levee system, as well as sealing certain penetrations during the flood warning time. For a LIP event, these temporary features will not be in place due to the lack of warning time. Thus, the licensee's FE evaluates the impact of the LIP event in the absence of the PMF-based temporary protection features to show that key structures, systems, and components (SSCs) are not impacted by floodwaters during the LIP event. The FE credits passive protection features and evaluates certain key doorways to demonstrate that key SSCs are protected from the LIP flooding mechanism.

3.2 Evaluation of Flood Impact Assessment for LIP

3.2.1 Description of Impact of Unbounded Hazard

The Monticello FE references a LIP flood evaluation level of 935.72 feet National Geodetic Vertical Datum of 1929 (NGVD29). All flooding-related elevations described in this assessment are referenced to NGVD29. The level of 935.72 feet represents the highest flooding evaluation computed in the LIP analysis. The licensee's model predicts varying water surface elevations for the key locations on the site. The nominal site grade elevation for the majority of power-block structures at Monticello is 930 feet. Thus, the building entry elevations for any LIP water ingress that could potentially impact key SSCs are generally higher than 930 feet. The primary exception to this is the Intake Structure which has a building entry elevation of 919.5 feet.

According to the licensee's FE submittal, the LIP model differs from the model that was evaluated in the staff's FHRR review and the ISR letter. Specifically, the model has been modified in the following three areas: (1) the analysis uses site-specific precipitation inputs in lieu of the applicable HMR [hydrometeorological report] methods for determining precipitation inputs, (2) an unsteady flow approach is used to better quantify the impacts of water outside of various plant doors, and (3) credit is taken for two openings in the security barrier in the vicinity of the Off-Gas Stack. The licensee's FE submittal lists the resulting water surface elevations calculated by the revised analysis at the key doors providing potential access paths to key

SSCs. The staff compared these water surface elevations to those presented in the licensee's MSA submittal and found them to be identical. Therefore, the staff concluded that the LIP parameters used in the FE match those used in the licensee's MSA that had previously been evaluated by the NRC. In the MSA staff assessment, the staff concluded that the water surface elevations were nearly identical to those in the FHRR and thus it was not necessary to review the revised LIP model in detail. For the FE review, the staff reaffirmed this conclusion while noting that the water surface elevations in the vicinity of the Off-Gas Stack are significantly lower (933.50 feet versus 935.6 feet) than the value presented in the FHRR. Since the staff had previously found the LIP parameters to be acceptable in the MSA review, the staff concludes that the licensee has used appropriate inputs for the FE.

3.2.2 Evaluation of Available Physical Margin and Reliability

With the exception of the doors that provide water access pathways, the licensee relies on passive features to demonstrate that the key safety functions of core cooling, spent fuel pool cooling, and containment are maintained for the postulated LIP event. Based on the locations of plant equipment needed to maintain the key safety functions, the licensee evaluates critical plant structures for potential LIP event water intrusion. Generally, the licensee's FE discusses protection for key SSCs in the applicable structures that are at the lowest elevation. Other key SSCs may be located in the same structures, but they are not discussed in the licensee's FE because they are not limiting in terms of elevation. The structures evaluated in the FE are the Intake Structure, Turbine Building, Reactor Building, Emergency Diesel Generator (EDG) Building, Plant Administration Building (PAB), and Fuel Oil Pump House.

According to the licensee's FE, the Intake Structure finished floor elevation is 919 feet and the sill for the applicable door is at 919.5 feet, or 6 inches above the finished floor elevation. The licensee's FE also indicates that the water surface elevation at the door reaches a maximum elevation of 920.02 feet and exceeds the door sill elevation for 30 minutes during the postulated LIP event. The licensee's analysis assumes this door is open. According to the licensee, water flowing into the Intake Structure will flow to the Turbine Building through a tunnel, thus preventing water accumulation in the Intake Structure. The critical elevation for key SSCs in the Intake Structure is 921 feet, leaving an APM of 0.98 feet. Based on the short duration of in-leakage, the APM, and the large volume of available space in the Turbine Building, the licensee asserts there is adequate APM for the Intake Structure.

In its FE, the licensee estimated the total water volume that could accumulate in the Turbine Building at 8,753 cubic feet. This calculation used the time history of the postulated LIP water surface elevations to calculate in-leakage through realistic Turbine Building door gap sizes, plus the assumed leakage from the Intake Structure previously described. According to the licensee, this is a small fraction of the available volume of 140,874 cubic feet to accept in-leakage. In order to assess APM, the licensee also performed a similar calculation using conservative door gap sizes and calculated the total in-leakage as 23,715 cubic feet. Based, in part, on the margin available to accept in-leakage when considering the most conservative case, the licensee concludes that there is adequate APM for the Turbine Building.

For the Reactor Building, the licensee calculated a volume of 1,669 cubic feet of in-leakage using realistic door gap sizes. According to the licensee's FE, the critical elevation corresponds to a water volume of 6,713 cubic feet in the Reactor Building. Thus, the total in-leakage is approximately 25 percent of the available capacity. Using a similar technique to the Turbine Building, the licensee also calculated the in-leakage volume using conservative door gap sizes to be 3,337 cubic feet, approximately 50 percent of the available capacity. Based, in part, on

the margin available to accept in-leakage when considering the most conservative case, the licensee concludes that there is adequate APM for the Reactor Building.

For the EDG Building, the licensee's FE states that the peak water elevation outside the doors is 931.11 feet, or approximately 1.3 inches above the EDG room floor; which is less than the water depth of 16 inches that can be accommodated before reaching the critical elevation of 932.33 feet. In addition, the licensee's FE states that there are curbs which separate the two EDG rooms from each other and separate the EDG Building from the Turbine Building. At a water level of 9 inches in the EDG Building, any water ingress would overtop the curbs and flow into the Turbine Building. Based on the relatively short time period that the water surface elevation exceeds the door sill; that the maximum water level that would be reached in the room assuming the drains were blocked is less than the critical elevation; and that the maximum water level is limited by the curbs to less than the critical elevation, the licensee concludes that there is adequate APM.

For the PAB, the licensee calculated a volume of 1,238 cubic feet of in-leakage using realistic door gap sizes. According to the licensee, this is equivalent to a water depth of 1.6 inches and can be compared to the critical elevation of 4.75 inches. Using conservative door gap sizes the total water volume that could accumulate in the PAB Basement is 2,430 cubic feet. Based, in part, on the margin available between the total in-leakage for the conservative case and the available volume (approximately 33 percent), the licensee concludes that there is adequate APM for the PAB.

For the Fuel Oil Pump House, the licensee's FE states that the critical water elevation corresponds to an allowable total in-leakage of 80 cubic feet. Using a conservative door gap the licensee calculates the in-leakage to be 28 cubic feet, or 35 percent of the available volume. In addition the licensee's estimates that if the access door is open, the total water volume that could accumulate in the Fuel Oil Pump House is 52 cubic feet or 65 percent of the available volume. Based on the calculated in-leakage versus available volume margin available, even with the normally closed door assumed to be open, the licensee concludes that there is adequate APM for the Fuel Oil Pump House.

3.2.3 NRC Evaluation of Available Physical Margin

In order to assess APM, NEI 16-05, Appendix B describes examples of techniques that may be used to demonstrate adequate APM. For example, negligible or zero APM can be justified as acceptable if the use of conservative inputs, assumptions, and/or methods can be established. In addition, sensitivity analysis can be performed for key input parameters based on acceptable upper and lower limits.

The licensee generally relies on passive features to demonstrate that key SSCs are protected for a LIP event. In certain cases, doors that are not necessarily designed for flood protection are credited in the licensee's analysis. The structures evaluated in the FE are the Intake Structure, Turbine Building, Reactor Building, EDG Building, PAB, and Fuel Oil Pump House.

For the Intake Structure the licensee assumes the applicable door is wide open and thus the inflow from the LIP event is calculated based on the water elevation from the LIP analysis, the geometry (width) of the door opening, and the time the water level exceeds the door threshold. According to the licensee, the water would not accumulate in the Intake Structure, but would drain to the Turbine Building. Considering that the critical elevation of any plant components in

the Intake Structure are above the LIP elevation at the ingress point, the staff concludes that the APM of 0.98 feet is acceptable, based on the conservative inputs of the LIP analysis.

For the Turbine Building, Reactor Building, and PAB, the licensee calculates in-leakage based upon not only the LIP elevations and duration, but also by crediting the presence of closed doors while evaluating the maximum inflow that results from the gaps around the doors. In the analysis for the door gaps, the licensee uses a sensitivity analysis that compares realistic and conservative door gaps to assess the APM. The staff review finds that the sensitivity analyses show that using conservative parameters still yields acceptable results, while also demonstrating that further margin is present. For the Fuel Oil Pump House, the licensee uses a similar technique; however, the sensitivity analysis assumes that, for the conservative case, the access door is open. The staff reviewed the licensee's sensitivity analysis technique for these buildings and finds that it is consistent with the provisions of NEI 16-05, Appendix B, for assessing APM. Based on the conservatism of the LIP analysis and the analyses results for these buildings, the staff concludes that the calculated APM is adequate.

Similar to the Intake Structure analysis, the EDG Building review shows that the critical elevation of a plant SSC is above the calculated LIP elevation at the applicable doorway. Since the maximum LIP elevation is below the critical SSC elevation, the staff concludes that the APM of 1.2 feet is acceptable, based on the conservative inputs of the LIP analysis.

In summary, the NRC staff concludes that the Monticello flood protection features described above have adequate APM, as described in Appendix B of NEI 16-05, Revision 1.

3.2.4 NRC Evaluation of Reliability

There are several key features of the Monticello LIP flooding evaluation for which the reliability provisions of NEI 16-05 are applicable. Specifically, the licensee's evaluation credits the exterior structure of the key buildings, two security barrier gaps that limit the LIP flood height (primarily in the vicinity of the Off-Gas Stack), the tunnel between the Intake Structure and Turbine Building, and certain doors to the key buildings that restrict the analyzed water entry paths. In order to establish reliability of flood features, NEI 16-05 outlines considerations applicable to these features, based, in part, on whether they are passive or active. The passive features of the licensee's strategy are the exterior building structure, the security barrier gaps, and the tunnel between the Intake Structure and Turbine Building. The active features are the analyzed doors.

Regarding the structure of the key buildings, the licensee's FE states that the water surface elevation for the PMF-based scenario is much higher than a LIP event, thus the permanently installed plant structures (other than the doors) will provide flood protection for the LIP event. In general, the NRC staff considers features designed for flood protection to be inherently reliable if the reevaluated flood level is bounded by the design-basis elevation. Implicit in the licensee's evaluation is that penetrations, other than doors, would not be impacted by the LIP flood elevations. According to NEI 16-05, building features such as plugs and penetration seals would be considered reliable using the guidance of the design basis walkdowns performed for NTTF Recommendation 2.3. In order to confirm the licensee's assessment that only doorways would provide a potential pathway into the key buildings during a LIP event, the NRC staff reviewed AR [Action Request] 1523129, dated June 30, 2016, and calculation 180999.51.1005, "Local Intense PMP [Probable Maximum Precipitation] Hydrology and Hydraulics," Revision 4. The staff's review of these documents used the audit process for flooding focused assessments, performed in accordance with a generic audit plan dated July 18, 2017 (ADAMS Accession No.

ML17192A452). Based on the audit review, the NRC staff concludes that the licensee walkdowns that supported the assessments of potential building in-leakage rates and volumes considered the reevaluated LIP elevations. To confirm the licensee's assessment of the buildings' structural capability, the staff consulted the Monticello Updated Safety Analysis Report (USAR), Revision 34, submitted by letter dated January 11, 2017 (ADAMS Accession No. ML17027A226). The staff noted that USAR Section 12.2.1.4 states that structures housing safety-related equipment were evaluated for the hydrostatic load corresponding to the PMF level of 939.2 feet. In addition, according to the licensee, the LIP event will not include debris impact or appreciable hydrodynamic effects due to the direction of flow being away from the buildings. Based on the licensee's FE description, supplemented by the audit review and USAR description, the staff concludes that the licensee's building assessment is reasonable and that the key structures (other than the doors) provide reliable passive flood protection for the LIP event consistent with the provisions of NEI 16-05.

Regarding the security barrier gaps, the licensee's FE does not describe any means to keep them clear, consistent with the reliability provisions for concrete barriers in NEI 16-05, Appendix B, Section B.2.1.4. However, the licensee's FE describes the openings as unlikely to be reduced by debris due to a lack of debris sources and the relatively large opening size. In order to confirm the licensee's FE assessment of the security barrier openings, the staff reviewed Monticello drawing NH-236801-28, "Grading and Drainage Plan," Revision 1 during the audit process. Based on the licensee's FE description, confirmed by the drawing review, the staff concludes that the gaps are likely to remain open such that they will perform as reflected in the licensee's analysis during a LIP event. Similarly, for the tunnel connecting the Intake Structure and the Turbine Building, the staff concludes that this underground passageway is sufficiently protected and of a large enough size to ensure that it will remain available to conduct water flow during a LIP event. In addition to these considerations, the staff views the use of operating experience, as described below, in conjunction with the licensee's corrective action program, to be key programmatic elements to ensure that the flooding features described in the FE are maintained on a continual basis.

Regarding the active features of the licensee's plan (the doors), NEI 16-05 describes factors for consideration for non-flood doors such as hydrostatic force resistance, hydrodynamic force resistance, and debris impact force resistance. According to the licensee, since plant doors will not be protected for the LIP by the same protection that would be installed as part of the PMF flood response, potential loads during the LIP event were evaluated. According to the licensee, these doors and supporting structures have been evaluated and determined to be capable of withstanding the loads from the LIP water level. Based on the description in the FE submittal, the NRC staff concludes that the licensee has evaluated the applicable doors consistent with the reliability provisions of NEI 16-05.

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.

Based on the evaluation above, the NRC staff concludes that the Monticello flood protection features are reliable to maintain key safety functions, as described in Appendix B of NEI 16-05, Revision 1.

3.2.5 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the beyond-design-basis LIP event. As described above, the licensee's evaluation relies on existing plant features to demonstrate adequate flood protection. Therefore, the staff concludes that no specific LIP-based site response evaluation is required.

4.0 AUDIT REPORT

The generic audit plan dated July 18, 2017, 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 Monticello audit included a review of the licensee's FE submittal, MSA submittal, AR 1523129, calculation 180999.51.1005, drawing NH-236801-28, and the Monticello USAR, as described above. 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 NRC staff's letter dated July 18, 2017.

5.0 CONCLUSION

The NRC staff concludes that NSPM performed the Monticello 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 they have effective flood protection from the reevaluated flood hazards. Furthermore, the staff concludes that Monticello screens out for an integrated assessment based on the guidance found in JLD-ISG-2016-01. As such, the staff concludes that 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 staff further concludes that the licensee has satisfactorily completed providing responses to the 50.54(f) activities associated with the reevaluated flood hazards.

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION DATED April 12, 2018

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